

Singapore Electricity Market Rules

Chapter 1

Introduction & Interpretation of the Market Rules

Energy Market Authority

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1 DEFINITIONS

1.1 MARKET RULES

- 1.1.1 The rules set forth in Chapters 1 to 8 are called the Singapore Electricity Market Rules and constitute the *market rules* made under the authority and for the purposes of the *Electricity Act*.

1.2 ITALICISED EXPRESSIONS

- 1.2.1 Italicised expressions used in the *market rules* have the meanings ascribed thereto in the definitions set forth in Chapter 8. Unless the context otherwise requires, words and phrases defined in the *Electricity Act* have the same meaning when used in the *market rules*.

2 LEGISLATIVE AUTHORITY

2.1 LEGISLATIVE AUTHORITY

2.1.1 The legislative authority for the *market rules* is contained in the *Electricity Act*. Specifically, subsection 46(1) of the *Electricity Act* contemplates that there will be made rules:

2.1.1.1 establishing and governing:

a. *the wholesale electricity markets; and*

b. *agreements and arrangements in connection with trading;*

2.1.1.2 governing the activities of the *EMC* and *market participants* in and in relation to the *wholesale electricity markets*; and

2.1.1.3 governing the operation of the *electricity system*.

2.1.2 Pursuant to subsection 3(3)(e) of the *Electricity Act*, the *market rules* also contain provisions designed to enable the *PSO* to fulfil the functions and duties described in that subsection relative to the security of *supply of electricity to consumers* and the *secure operation of the power system*.

3 MARKET RULES

3.1 OBJECTS AND CONTENT

3.1.1 The objects of the *market rules* are:

- 3.1.1.1 to establish and govern efficient, competitive and reliable markets for the wholesale sale and purchase of *electricity* and *ancillary services* in Singapore;
- 3.1.1.2 to provide *market participants* and *market support services licensees* with non-discriminatory access to the *transmission system*;
- 3.1.1.3 to facilitate competition in the *generation of electricity*; and
- 3.1.1.4 to protect the interests of *consumers* with respect to prices and the *reliability* and quality of *electricity* service.

3.1.2 Accordingly, the *market rules* include provisions:

- 3.1.2.1 governing the making, *modification* and *publication* of the *market rules*;
- 3.1.2.2 governing the conveying of *electricity* into, through or out of the *transmission system* and the provision of *ancillary services*;
- 3.1.2.3 governing the terms and conditions pursuant to which persons may be authorised by the *EMC* to participate in the *wholesale electricity markets* or to cause or permit *electricity* to be conveyed into, through or out of the *transmission system*;
- 3.1.2.4 governing the manner in which *electricity* and *ancillary services* are sold, purchased and *dispatched* in the *wholesale electricity markets*;
- 3.1.2.5 governing standards and procedures to be observed in emergencies affecting the *power system*;
- 3.1.2.6 authorising and governing the giving of directions by the *EMC* and the *PSO*;
- 3.1.2.7 authorising and governing the making of orders by the *EMC* and the *PSO*;

- 3.1.2.8 providing a mechanism for the resolution of certain disputes arising under the *market rules*;
- 3.1.2.9 providing mechanisms for monitoring, surveillance and investigation of activities in the *wholesale electricity markets* and the conduct of *market participants* and *market support services licensees*; and
- 3.1.2.10 providing generally for the exercise by the *EMC* and the *PSO* of such authority as may be necessary or desirable for the purpose of carrying out their respective functions, powers and duties in relation to the *wholesale electricity markets* and the *electricity system*.

3.2 CONTRACTUAL FORCE

- 3.2.1 In accordance with section 49 of the *Electricity Act*, the *market rules* have the effect of a contract between each *market participant* and the *EMC*. Each *market participant* and the *EMC* shall be deemed to have entered into a contract with one another under which each *market participant* and the *EMC* agree to perform and observe the *market rules* so far as they are applicable to each *market participant* and the *EMC* as provided for in the *market rules*.
- 3.2.2 The *market rules* have the effect of a contract between each *market participant* and the *PSO* by virtue of the execution by the *PSO* and each *market participant* of the *PSO/MP agreement* under which each *market participant* and the *PSO* agree to perform and observe the *market rules* so far as they are applicable to each *market participant* and the *PSO* as provided for in the *market rules*.
- 3.2.2A The *market rules* have the effect of a contract between the *EMC* and the *PSO* by virtue of the execution by the *EMC* and the *PSO* of the *EMC/PSO agreement* under which the *EMC* and the *PSO* agree to perform and observe the *market rules* so far as they are applicable to the *EMC* and the *PSO* as provided for in the *market rules*.
- 3.2.3 The *market rules* have the effect of a contract between the *EMC* and each *market support services licensee* referred to in section 3.2.4 by virtue of the execution by the *EMC* and such *market support services licensee* of an agreement under which the *EMC* and such *market support services licensee* agree to perform and observe the *market rules* so far as they are applicable to the *EMC* and such *market support services licensee* as provided for in the *market rules*.
- 3.2.4 Section 3.2.3 shall only apply to a *market support services licensee* that has been directed by the *Authority*, under the terms of the *market support*

services licensee's electricity licence, to enter into the agreement referred to in that section.

- 3.2.5 Subject to section 3.2.6, the *market rules* have the effect of a contract between the *PSO* and each *market support services licensee* by virtue of the execution by the *PSO* and each *market support services licensee* of an agreement under which each *market support services licensee* and the *PSO* agree to perform and observe the *market rules* so far as they are applicable to each *market support services licensee* and the *PSO* as provided for in the *market rules*.
- 3.2.6 Section 3.2.5 shall only apply where the agreement referred to in that section is required to be executed by the *PSO* and the *market support services licensee* in the applicable *market manual* in accordance with section 1.2.5.3 of Chapter 2.

3.3 COMING INTO FORCE AND TRANSITIONAL PROVISIONS

- 3.3.1 With the exception of section 2.4 of Chapter 7, the *market rules* shall come into force on the *market commencement date*.
- 3.3.2 The *Authority* shall determine the *market commencement date* and the *EMC* shall promptly *publish* a notice indicating the *market commencement date* so established.

4 THE EMC

4.1 RESPONSIBILITY FOR MARKET RULES

4.1.1 The body corporate responsible for the administration and supervision of the *market rules* is the *EMC*.

4.2 FUNCTIONS OF THE EMC

4.2.1 In accordance with subsection 43(1) of the *Electricity Act*, the functions of the *EMC* are to:

- 4.2.1.1 operate and administer the *wholesale electricity markets*;
- 4.2.1.2 schedule *generating units, loads* and the *PSO controlled grid*;
- 4.2.1.3 facilitate the planning and augmentation of the *PSO controlled grid*;
- 4.2.1.4 provide information and other services to facilitate decisions for investment and the use of resources in the *electricity industry*; and
- 4.2.1.5 exercise and perform the functions, powers and duties assigned to the *EMC* under the *Electricity Act*, its *electricity licence*, the *market rules* and applicable *codes of practice*,

the whole of which in accordance with the *market rules, market manuals, the system operation manual, the constituent documents, the electricity licence* of the *EMC* and *applicable law*.

4.3 COMPLIANCE WITH MARKET RULES

4.3.1 The *EMC* is bound to comply with, observe and perform any duties and obligations imposed on the *EMC* by the *market rules, all applicable market manuals* and the *system operation manual*.

5 THE PSO

5.1 FUNCTIONS OF THE PSO

5.1.1 In accordance with subsection 3(3)(e) of the *Electricity Act*, the function of the *PSO* is to ensure security of *supply* of *electricity* to *consumers* and to arrange for the *secure* operation of the *PSO controlled grid*.

5.1.2 Accordingly, the functions of the *PSO* include:

5.1.2.1 maintaining the *reliability* of the *PSO controlled system*;

5.1.2.2 forecasting and reporting on conditions on the *PSO controlled grid*;

5.1.2.3 coordinating the *outage* of facilities;

5.1.2.4 coordinating the actions of the *EMC* and *market participants* during emergencies; and

5.1.2.5 *dispatching* facilities,

the whole of which in accordance with the *market rules*, *market manuals*, the *system operation manual*, *operating agreements* and *applicable law*.

5.2 COMPLIANCE WITH MARKET RULES

5.2.1 The *PSO* is bound to comply with, observe and perform any duties and obligations imposed on the *PSO* by the *market rules*, *market manuals* and the *system operation manual*.

6 MARKET PARTICIPANTS

6.1 CLASSES OF MARKET PARTICIPANTS

6.1.1 The classes of *market participants* are described in section 2.1.1 of Chapter 2.

6.2 THIRD PARTY RIGHTS OR BENEFITS

6.2.1 Unless otherwise expressly stated in the *market rules* or the *Electricity Act*, a person, other than the *EMC*, the *PSO* and a *market support services licensee*, who is not a *market participant* is not entitled to any rights or benefits under the *market rules*, any *market manual* or the *system operation manual*.

6.3 COMPLIANCE WITH MARKET RULES

6.3.1 Subject to the terms of its *electricity licence* and to the *Electricity Act*, each *market participant* and each *market support services licensee* is bound to comply with, observe and perform any duties and obligations imposed on the *market participant* or the *market support services licensee* by the *market rules*, any *market manual* and the *system operation manual*.

6.4 AGENTS

6.4.1 A *market participant* or *market support services licensee* (the “*principal*”) may use any information system, communication system, business process, personnel or service provider or other agent to assist in performing the *principal*’s obligations under the *market rules*, any *market manual* or the *system operation manual*, upon the following conditions:

6.4.1.1 the *principal* shall, as between it and each of the *EMC* and the *PSO*, be bound by and fully liable for all acts or omissions of its personnel or *agents* as if those acts or omissions were its own; and

6.4.1.2 the *principal* shall, as between it and each of the *EMC* and the *PSO*, remain solely liable for the due performance of such obligations.

6.4.2 Section 6.4.1 shall not apply to the extent that the *Electricity Act*, the *electricity licence* of the *principal* or the *market rules* state otherwise.

- 6.4.3 If the *EMC* gives a *market participant* or *market support services licensee* notice that the use of an *agent* is not in the best interests of the *wholesale electricity markets*, the *market participant* or *market support services licensee* shall not use that *agent* on and from the effective date stated in the notice.
- 6.4.4 In the notice issued under section 6.4.3, the *EMC* shall state an effective date which shall be at least ten *business* days from when the notice is issued.
- 6.4.5 On and from the effective date stated in the notice issued under section 6.4.3:
- 6.4.5.1 the *EMC* shall not recognise the authority of the *agent*; and
 - 6.4.5.2 an act by the *agent* shall not constitute the performance of any obligation under the *market rules*, any *market manual* or the *system operation manual* by the *market participant* or *market support services licensee*.

7 INTERPRETATION AND RULES OF CONSTRUCTION

7.1 GENERAL

7.1.1 In the *market rules*, any *market manual* and the *system operation manual*, unless the context otherwise requires:

7.1.1.1 words importing the singular include the plural and vice versa;

7.1.1.2 words importing a gender include any gender;

7.1.1.3 when italicised, other parts of speech and grammatical forms of a word or phrase defined in the *market rules* have a corresponding meaning;

7.1.1.4 an expression importing a natural person includes any company, partnership, trust, joint venture, association, corporation or other private or public body corporate, and any government agency or body politic or collegiate;

7.1.1.5 a reference to a thing includes a part of that thing;

7.1.1.6 a reference to a Chapter, section, provision, condition, part or appendix is to a Chapter, section, provision, condition, part or appendix of the document in which the reference appears;

7.1.1.7 a reference in a Chapter of the *market rules*, other than in an appendix, to a section is to a section of that Chapter and a reference in an appendix of a Chapter to a section is to a section of that appendix;

7.1.1.8 a reference to any statute, subsidiary legislation, proclamation, ordinance, by-law, resolution, rule, order, supplements, gazette notification or directive includes all statutes, subsidiary legislation, proclamations, ordinances, by-laws or resolutions, rules, orders, supplements, gazette notifications or directives varying, consolidating, re-enacting, extending or replacing it and a reference to a statute includes all subsidiary legislation, proclamations, ordinances, orders, rules, supplements, gazette notifications, directives and by-laws of a legislative nature issued under that statute;

- 7.1.1.9 a reference to a document or provision of a document includes a *modification* or supplement to, or replacement or novation of, that document or that provision of that document, as well as any exhibit, schedule, appendix or other annexure thereto;
- 7.1.1.10 a reference to a person includes that person's executors, administrators, successors, substitutes (including, but not limited to, persons taking by novation) and permitted assigns;
- 7.1.1.11 a reference to a body (including, without limitation, an institute, association or authority), whether statutory or not, which ceases to exist or whose functions are transferred to another body is a reference to the body which replaces it or which substantially succeeds to its functions, powers or duties;
- 7.1.1.12 a reference to sections of a document separated by the word "to" (i.e., "sections 1.1 to 1.4") shall be a reference to the sections inclusively;
- 7.1.1.13 a reference to the word "including" means "including but not limited to";
- 7.1.1.14 a reference to a month shall mean a calendar month; and
- 7.1.1.15 a reference to a year shall mean a calendar year.

7.2 HEADINGS

- 7.2.1 Headings in the *market rules*, in any *market manual* and in the *system operation manual* are inserted for convenience of reference only and shall not affect the interpretation of the applicable document, nor shall they be construed as indicating that all of the provisions of the document relating to any particular topic are to be found in any particular Chapter, section, subsection, clause, provision, part or appendix.

7.3 SHALL, MUST AND MAY

- 7.3.1 In the *market rules*, any *market manual* and the *system operation manual*, the words "shall" and "must" shall be construed as imperative and the word "may" shall be construed as permissive.

7.4 EXPLANATORY NOTES

7.4.1 Any provision in the *market rules* which is indicated as being an "explanatory note" or a "rule note" shall be deemed not to form a part of the *market rules*. Such explanatory notes or rule notes are inserted for convenience only and shall not affect the interpretation of the market rules nor be binding on the *EMC*, the *PSO*, any *market participant* or any *market support services licensee*.

7.5 COMPUTATION OF TIME

7.5.1 Unless otherwise stated, if the *market rules*, any *market manual* or the *system operation manual* refers to a number of days between two events, that number shall be computed by excluding the day on which the first event happens and including the day on which the second event happens.

7.5.2 Under Chapters 1 to 3 and 7, unless otherwise stated, if the deadline for doing any act or thing is not a *business day*, that deadline shall be extended to the end of the next *business day*.

7.6 CURRENCY

7.6.1 All references in:

7.6.1.1 the *market rules*, any *market manual* or the *system operation manual*;

7.6.1.2 a *settlement statement*; or

7.6.1.3 an *invoice*,

to a monetary amount are expressed in Singapore dollars.

7.6.2 Any payment required to be made by or to the *EMC*, by or to the *PSO*, by or to a *market participant* or by or to a *market support services licensee* pursuant to any of the documents referred to in sections 7.6.1.1 to 7.6.1.3 shall be made in Singapore dollars.

7.7 EXERCISE OF DISCRETION

7.7.1 Unless a contrary intention appears or the context otherwise requires, where a power is conferred or a duty is imposed on the *EMC* or the *PSO* under the *market rules*, any *market manual* or the *system operation manual*, the power may be exercised and the duty shall be performed from time to time as the circumstances may require.

7.8 RECORDS

7.8.1 Unless a contrary intention appears or the context requires otherwise requires, a reference in these *market rules* to a “record” shall be a reference to any record of information however recorded, whether in printed form, on film, by electronic means or otherwise and includes:

7.8.1.1 correspondence, a memorandum, a book, a plan, a map, a drawing, a diagram, a pictorial or graphic work, a photograph, a film, a microfilm, a sound recording, a videotape, a machine readable record, any other documentary material, regardless of physical form or characteristics, and any copy thereof;

7.8.1.2 any record that is capable of being produced from a machine readable record under the control of a person by means of computer hardware and software or any other information storage equipment and technical expertise normally used by the person; and

7.8.1.3 any electronic record within the meaning of the Electronic Transactions Act (Cap. 88).

7.9 HIERARCHY OF REGULATIONS

7.9.1 The hierarchy of regulations shall be in the following sequence in order of priority and overriding precedence with the regulation first appearing in the sequence being of ultimate priority and overriding precedence:

- a. *Electricity Act*;
- b. *electricity licenses*;
- c. *transmission code*;
- d. *market rules*;
- e. regulated supply service code;
- f. market support services code;
- g. *metering code*; and
- h. code of conduct for retail electricity licensees.

7.9.2 In the event of any conflict between any of the above regulations, the regulation(s) first before appearing in the above sequence shall prevail.

8 MARKET MANUALS

- 8.1.1 The *EMC* may create, and the *EMC Board* may, subject to section 8.1.10, adopt one or more *market manuals* in accordance with the procedures set forth in sections 8.1.2 to 8.1.4. A *market manual* shall not come into force until:
- 8.1.1.1 approved by the *Authority* pursuant to section 8.1.5; and
 - 8.1.1.2 the date that is ten *business days* from the date of *publication* of the *market manual* or such later date as may be specified at the time of such *publication*, provided that such *publication* shall not be effected until such time as the approval referred to in section 8.1.1.1 has been given.
- 8.1.2 A *market manual* created by the *EMC* shall be *published* in draft form and submitted to the *rules change panel* for review. The *rules change panel* shall review a *market manual* submitted to it:
- 8.1.2.1 using such procedures;
 - 8.1.2.2 in consultation with such persons; and
 - 8.1.2.3 by means of such meetings,
- as it considers appropriate.
- 8.1.3 Following the conclusion of the review of a *market manual*, the *rules change panel* shall submit a written report, which the *EMC* shall *publish*, to the *EMC Board* indicating:
- 8.1.3.1 the recommendations of the *rules change panel* and the reasons for its recommendations; and
 - 8.1.3.2 a summary of any objections raised by any member of the *rules change panel* to the recommendations.
- 8.1.4 Following the receipt of the written report described in section 8.1.3, the *EMC Board* shall convene on one or more occasions and shall vote on whether to adopt the *market manual*. A resolution of the *EMC Board* passed by at least half of the directors then in office, excluding those who abstain voluntarily or who are required to abstain pursuant to the *constituent documents*, is required to adopt a *market manual*.
- 8.1.5 A *market manual* adopted by the *EMC Board* shall be submitted to the *Authority* for approval, together with a copy of the report of the *rules*

change panel referred to in section 8.1.3. The *Authority* shall approve the *market manual* unless the *Authority* determines that the *market manual*:

- 8.1.5.1 unjustly discriminates in favour of or against a *market participant*, a class of *market participants* or a *market support services licensee*;
 - 8.1.5.2 is inconsistent with the *market rules* or the *Electricity Act*;
or
 - 8.1.5.3 is inconsistent with the functions and duties of the *Authority* under section 3 of the *Electricity Act*.
- 8.1.6 In the event of an inconsistency between a provision in a *market manual* and:
- 8.1.6.1 a provision in the *market rules*; or
 - 8.1.6.2 a provision in the *Electricity Act*,
- the *market rules* or the *Electricity Act*, as the case may be, shall govern to the extent of the inconsistency.
- 8.1.7 Subject to section 8.1.6, once approved by the *Authority* pursuant to section 8.1.5, a *market manual* shall be *published* by the *EMC*. The *EMC*, the *PSO*, each *market participant* and each *market support services licensee* shall, subject where applicable to the provisions of their respective *electricity licences*, be bound to comply with the provisions of any such *market manual* once it has come into force in accordance with section 8.1.1.
- 8.1.8 The *EMC Board* or an *EMC Board Committee* may *modify*, replace or repeal any *market manual*. Subject to section 8.1.9, sections 8.1.1 to 8.1.7 shall apply *mutatis mutandis* to any *modification*, replacement or repeal of such *market manual*.
- 8.1.9 A *modification* to a *market manual* to correct a typographical or grammatical error, to effect a change of a non-material procedural nature or to effect a change which, in the opinion of the *rules change panel*, will not have a material effect on the conditions for participation in the *wholesale electricity markets* or the *reliable* operation of the *power system* is not required to be approved by the *Authority* and shall come into force on:
- 8.1.9.1 the date that is ten *business days* from the date of *publication* of the *modification*; or

8.1.9.2 such later date as may be specified at the time of such *publication*.

8.1.10 Any form, policy, guideline, standard or other document required by the *market rules* to be implemented as a *modification* to the *market rules* shall be implemented in accordance with the procedures set forth in section 5 of Chapter 3.

9 SYSTEM OPERATION MANUAL

- 9.1.1 The *PSO* shall create and adopt the *system operation manual* in accordance with this section 9.
- 9.1.2 The *system operation manual* shall not come into force or be used by the *PSO* in furtherance of its functions and duties under the *Electricity Act* or the *market rules* until:
- 9.1.2.1 the *PSO* has consulted with *market participants* in respect of any subject-matter to be covered by the *system operation manual* where and to the extent that these *market rules* require such consultation;
 - 9.1.2.2 the *PSO* has submitted the *system operation manual* for review by the *rules change panel* and has provided the *rules change panel* with a reasonable opportunity to submit comments in respect of the *system operation manual*;
 - 9.1.2.3 the *PSO* has published the *system operation manual*; and
 - 9.1.2.4 at least ten days, or such greater number of days as may be specified at the time of *publication* referred to in section 9.1.2.3, has elapsed from the date of such *publication*.
- 9.1.3 In the event of an inconsistency between a provision in the *system operation manual* and:
- 9.1.3.1 a provision in the *market rules*; or
 - 9.1.3.2 a provision in the *Electricity Act*,
- the *market rules* or the *Electricity Act*, as the case may be, shall govern to the extent of the inconsistency.
- 9.1.4 Subject to section 9.1.3, the *EMC*, the *PSO*, each *market participant* and each *market support services licensee* shall be bound to comply with the provisions of the *system operation manual* once it has come into force in accordance with section 9.1.2.
- 9.1.5 The *PSO* may *modify*, replace or repeal the *system operation manual*, and sections 9.1.1 to 9.1.4 shall apply *mutatis mutandis* to any such *modification*, replacement or repeal.

10 DELEGATION AND PANELS

- 10.1.1 Subject to section 10.1.2, delegation by the *EMC* of its functions, powers and duties under these *market rules* shall be governed by the provisions of the *constituent documents*, provided that the *EMC Board* shall not delegate to any person any of the functions, powers or duties that are expressly reserved to the *EMC Board* in these *market rules*.
- 10.1.2 Without prejudice to the right of the *EMC Board* to establish such other panels as it determines appropriate for the fulfilment of its functions, powers and duties under these *market rules*, the *EMC Board* shall establish and maintain a *rules change panel* and a *market surveillance and compliance panel* in accordance with the provisions of section 2 of Chapter 3.
- 10.1.3 Liability of members of the *rules change panel* and the *market surveillance and compliance panel* shall be governed by section 13.7.

11 NOTICE, NOTIFICATION, SERVICE AND FILING

11.1 PROVISION OF NOTICE

11.1.1 Subject to section 11.3, and unless otherwise stated, a notice, notification, service, filing, issuance or submission (each of these referred to in section 11 as a “notice”) shall be effected under the *market rules*, any *market manual* or the *system operation manual* in the following manner:

11.1.1.1 by courier or other form of personal delivery;

11.1.1.2 by prepaid mail to the addressee:

a. at the address for service (if any) supplied by the addressee to the sender;

b. at the address shown for that addressee in the list of *market participants* maintained under section 3.1.12 of Chapter 2 if the addressee is a *market participant*;

c. at the registered office of the *EMC* if the addressee is the *EMC*; or

d. at the registered office of the *PSO* if the addressee is the *PSO*; or

11.1.1.3 by facsimile or electronic mail addressed to the addressee at the facsimile number or electronic mail address supplied by the addressee to the sender.

11.2 TIME OF NOTICE

11.2.1 Subject to section 11.3, and unless otherwise stated, a notice shall be deemed duly effected at the following times:

	Method by which notice effected	Time notice deemed duly effected
11.2.1.1	By courier or other form of personal delivery	Upon actual receipt of the notice
11.2.1.2	By prepaid mail on day	- 4 th <i>business day</i> after day ‘D’

	'D' in accordance with section 11.1.1.2	<p>if to an address in Singapore; and</p> <ul style="list-style-type: none"> - 20th <i>business day</i> after day 'D' if to an address outside Singapore
11.2.1.3	By facsimile in accordance with section 11.1.1.3 where a complete transmission report is issued from the sender's facsimile transmission equipment indicating a day of transmission 'D' and time of transmission 'T'	<ul style="list-style-type: none"> - where the addressee is obliged to monitor receipt of such type of notice by facsimile at all times, on day 'D' and at time 'T'; and - in all other cases, <ul style="list-style-type: none"> - on day 'D' and at time 'T' if 'D' is a <i>business day</i> and 'T' is before 5:00 pm (addressee's time); or - on the 1st <i>business day</i> after day 'D' at 9:00 am if 'D' is not a <i>business day</i> or 'T' is after 5:00pm.
11.2.1.4	By electronic mail in accordance with section 11.1.1.3 where the notice is recorded by the sender's electronic communication system as having been first received at the electronic mail destination on day 'D' and at time 'T'	<ul style="list-style-type: none"> - where the addressee is obliged to monitor receipt of such type of notice by electronic mail at all times, on day 'D' and at time 'T'; and - in all other cases, <ul style="list-style-type: none"> - on day 'D' and at time 'T' if 'D' is a <i>business day</i> and 'T' is before 5:00 pm (addressee's time); or - on the 1st <i>business day</i> after day 'D' at 9:00 am if 'D' is not a <i>business day</i> or 'T' is after 5:00pm.

In this table, 'D' denotes a given day and 'T' denotes a given time.

11.3 NOTICE OF DIRECTIONS AND ORDERS

11.3.1 Unless otherwise stated, instructions, directions and orders of the *EMC* or the *PSO* may be given to *market participants* and *market support services licensees*:

11.3.1.1 in accordance with sections 11.1 or 11.2; or

11.3.1.2 by voice communication, in which case the instruction, direction or order shall be deemed duly given at the time of communication.

12 PUBLICATION

- 12.1.1 Subject to section 12.1.3, where any document or information, including the *market rules*, is required by the *market rules*, any *market manual*, the *system operation manual*, *applicable law*, the *constituent documents* or the *electricity licence* of the *EMC* to be *published* by the *EMC*, publication shall be effected by placing the document or information on the *EMC* web site. The document or information shall be deemed to be *published* when the document or information has been so placed.
- 12.1.2 Subject to section 12.1.3, where any document or information is required by the *market rules*, any *market manual*, the *system operation manual* or *applicable law* to be *published* by the *PSO*, the *PSO* shall submit such document or information to the *EMC* and the *EMC* shall place the document or information on the *EMC* web site. The document or information shall be deemed to be *published* when the document or information has been so placed.
- 12.1.3 Where the *market rules*, any *market manual*, the *system operation manual*, *applicable law*, the *constituent documents* or the *electricity licence* of the *EMC* prescribe a mode of publication other than that described in section 12.1.1 or 12.1.2 in respect of a specified document or information, the *EMC* or the *PSO*, as the case may be, shall, in addition to complying with section 12.1.1 or 12.1.2, comply with the publication requirement applicable to such document or information as is so prescribed. In such a case, the document or information shall be deemed to be *published* on the date on which the prescribed publication requirement has been satisfied.

13 LIABILITY AND INDEMNIFICATION

13.1 LIABILITY OF EMC

- 13.1.1 Except as otherwise provided in these *market rules*, the *EMC* shall not be liable for any claim, loss, cost, liability, obligation, action, judgement, suit, expense, disbursement or damages of a *market participant* or its directors, officers or employees whatsoever, howsoever arising and whether as claims in contract, claims in tort (including but not limited to negligence) or otherwise, arising out of any act or omission of the *EMC* in the execution or the purported execution of any function, power or duty under these *market rules*, any *market manual* or the *system operation manual* except to the extent that such claim, loss, cost, liability, obligation, action, judgement, suit, expense, disbursement or damages arises out of any wilful misconduct by or any negligent act or omission of the *EMC* in the execution or purported execution of any function, power or obligation under these *market rules*, any *market manual* or the *system operation manual*.
- 13.1.2 Subject to section 13.1.4, the *EMC* shall indemnify and hold harmless a *market participant* and the *market participant's* directors, officers and employees from any and all claims, losses, liabilities, obligations, actions, judgements, suits, costs, expenses, disbursements and damages incurred, suffered, sustained or required to be paid, directly or indirectly, by, or sought to be imposed upon, the *market participant*, its directors, officers or employees from or in respect of any matter with respect to which liability may be imposed on the *EMC* pursuant to section 13.1.1.
- 13.1.3 For the purposes of section 13.1.1, an act or omission of the *EMC* effected in compliance with these *market rules*, any *market manual* or the *system operation manual* shall be deemed not to constitute wilful misconduct or a negligent act or omission.
- 13.1.4 Except as otherwise provided in these *market rules*, in no event shall the *EMC* be liable to indemnify and hold harmless a *market participant* or the *market participant's* directors, officers or employees from or in respect of:
- 13.1.4.1 any indirect or consequential loss or incidental or special damages including, but not limited to, punitive damages;
 - 13.1.4.2 any loss of profit, loss of contract, loss of opportunity or loss of goodwill; or,
 - 13.1.4.3 any damages where the amount claimed, exclusive of amounts claimed for costs, in respect of a given event or

circumstance and a given person, is in the aggregate less than \$5,000;

and no *market participant* shall assert or attempt to assert against the *EMC* any claim in respect of any of the losses or damages referred to in section 13.1.4.1 to 13.1.4.3.

- 13.1.5 Each *market participant* shall have a duty to mitigate damages, losses, liabilities, expenses or costs relating to any claims for indemnification that may be made by the *market participant* pursuant to section 13.1.2.

13.2 LIABILITY OF PSO

- 13.2.1 Except as otherwise provided in these *market rules*, the *PSO* shall not be liable for any claim, loss, cost, liability, obligation, action, judgement, suit, expense, disbursement or damages of a *market participant* or its directors, officers or employees whatsoever, howsoever arising and whether as claims in contract, claims in tort (including but not limited to negligence) or otherwise, arising out of any act or omission of the *PSO* in the execution or the purported execution of any function, power or duty under these *market rules*, any *market manual* or the *system operation manual* except to the extent that such claim, loss, cost, liability, obligation, action, judgement, suit, expense, disbursement or damages arises out of any wilful misconduct by or any negligent act or omission of the *PSO* in the execution or purported execution of any function, power or obligation under these *market rules*, any *market manual* or the *system operation manual*.
- 13.2.2 Subject to section 13.2.4, the *PSO* shall indemnify and hold harmless a *market participant* and the *market participant's* directors, officers and employees from any and all claims, losses, liabilities, obligations, actions, judgements, suits, costs, expenses, disbursements and damages incurred, suffered, sustained or required to be paid, directly or indirectly, by, or sought to be imposed upon, the *market participant*, its directors, officers or employees from or in respect of any matter with respect to which liability may be imposed on the *PSO* pursuant to section 13.2.1.
- 13.2.3 For the purposes of section 13.2.1, an act or omission of the *PSO* effected in compliance with these *market rules*, any *market manual* or the *system operation manual* shall be deemed not to constitute wilful misconduct or a negligent act or omission.
- 13.2.4 Except as otherwise provided in these *market rules*, in no event shall the *PSO* be liable to indemnify and hold harmless a *market participant* or the *market participant's* directors, officers or employees from or in respect of:

- 13.2.4.1 any indirect or consequential loss or incidental or special damages including, but not limited to, punitive damages;
- 13.2.4.2 any loss of profit, loss of contract, loss of opportunity or loss of goodwill; or,
- 13.2.4.3 any damages where the amount claimed, exclusive of amounts claimed for costs, in respect of a given event or circumstance and a given person, is in the aggregate less than \$5,000;

and no *market participant* shall assert or attempt to assert against the *PSO* any claim in respect of any of the losses or damages referred to in sections 13.2.4.1 to 13.2.4.3.

- 13.2.5 Each *market participant* shall have a duty to mitigate damages, losses, liabilities, expenses or costs relating to any claims for indemnification that may be made by the *market participant* pursuant to section 13.2.2.

13.3 LIABILITY OF MARKET PARTICIPANTS

- 13.3.1 Except as otherwise provided in these *market rules*, a *market participant* shall not be liable for any claim, loss, cost, liability, obligation, action, judgement, suit, expense, disbursement or damages of the *EMC* or the *PSO*, their respective directors, officers or employees or any member of a *panel* whatsoever, howsoever arising and whether as claims in contract, claims in tort (including but not limited to negligence) or otherwise, arising out of any act or omission of the *market participant* in the execution or the purported execution of any function, power or duty under these *market rules*, any *market manual* or the *system operation manual* except to the extent that such claim, loss, cost, liability, obligation, action, judgement, suit, expense, disbursement or damages arises out of any wilful misconduct by or any negligent act or omission of the *market participant* in the execution or purported execution of any function, power or obligation under these *market rules*, any *market manual* or the *system operation manual*.
- 13.3.2 Subject to section 13.3.4, a *market participant* shall indemnify and hold harmless the *EMC*, the *PSO* or both, as the case may be, their respective directors, officers or employees and any member of a *panel* from any and all claims, losses, liabilities, obligations, actions, judgements, suits, costs, expenses, disbursements and damages incurred, suffered, sustained or required to be paid, directly or indirectly, by, or sought to be imposed upon, the *EMC*, the *PSO* or both, as the case may be, their respective directors, officers or employees and any member of a *panel* from or in respect of any matter with respect to which liability may be imposed on the *market participant* pursuant to section 13.3.1.

13.3.3 For the purposes of section 13.3.1, an act or omission of a *market participant* effected in compliance with the *market rules*, any *market manual* or the *system operation manual* shall be deemed not to constitute wilful misconduct or a negligent act or omission.

13.3.4 Except as otherwise provided in these *market rules*, in no event shall a *market participant* be liable to indemnify and hold harmless the *EMC*, the *PSO*, their respective directors, officers or employees or any member of a *panel* from or in respect of:

13.3.4.1 any indirect or consequential loss or incidental or special damages including, but not limited to, punitive damages;

13.3.4.2 any loss of profit, loss of contract, loss of opportunity or loss of goodwill; or,

13.3.4.3 any damages where the amount claimed, exclusive of amounts claimed for costs, in respect of a given event or circumstance and a given person, is in the aggregate less than \$5,000;

and neither the *EMC* nor the *PSO* shall assert or attempt to assert against a *market participant* any claim in respect of any of the losses or damages referred to in section 13.3.4.1 to 13.3.4.3.

13.3.5 Nothing in this section 13.3 shall be read as limiting the right of the *EMC* to impose a financial penalty or other sanction, including the issuance of a *suspension order*, a *disconnection order* or a *termination order*, on a *market participant* in accordance with the provisions of these *market rules*.

13.3.6 Each of the *EMC* and the *PSO* shall have a duty to mitigate damages, losses, liabilities, expenses or costs relating to any claims for indemnification that may be made by the *EMC* or the *PSO*, as the case may be, pursuant to section 13.3.2.

13.4 FORCE MAJEURE

13.4.1 Subject to section 13.4.14, neither the *EMC* nor the *PSO* shall be liable to any *market participant* for any failure or delay in the performance of any of their respective obligations under these *market rules*, any *market manual* or the *system operation manual*, other than the obligation to make payments of money, to the extent that such failure or delay is due to a *force majeure event*, provided that the *EMC* or the *PSO*, as the case may be, shall only be excused from performance pursuant to this section 13.4.1:

13.4.1.1 for so long as the *force majeure event* continues and for such reasonable period of time thereafter as may be necessary for

the *EMC* or the *PSO*, as the case may be, to resume performance of the obligation; and

13.4.1.2 where and to the extent that the failure or delay in performance would not have been experienced but for such *force majeure event*.

13.4.2 Subject to section 13.4.14, a *market participant* shall not be liable to the *EMC* or the *PSO* for any failure or delay in the performance of any of its obligations under these *market rules*, any *market manual* or the *system operation manual*, other than the obligation to make payments of money, to the extent that such failure or delay is due to a *force majeure event*, provided that the *market participant* shall only be excused from performance pursuant to this section 13.4.2:

13.4.2.1 for so long as the *force majeure event* continues and for such reasonable period of time thereafter as may be necessary for the *market participant* to resume performance of the obligation; and

13.4.2.2 where and to the extent that such failure or delay would not have been experienced but for such *force majeure event*.

13.4.3 The *EMC*, the *PSO* or a *market participant* shall not invoke a *force majeure event* unless it has given notice in accordance with section 13.4.4 or 13.4.5, as the case may be.

13.4.4 Where the *EMC* or the *PSO* invokes a *force majeure event*, it shall give notice to *market participants* and shall *publish* notice of the *force majeure event* as soon as reasonably practicable but in any event within two *business days* of the date on which the *EMC* or the *PSO*, as the case may be, becomes aware of the occurrence of the *force majeure event*, which notice shall include particulars of:

13.4.4.1 the nature of the *force majeure event*;

13.4.4.2 the effect that such *force majeure event* is having on the *EMC's* or the *PSO's*, as the case may be, performance of its obligations under these *market rules*, any *market manual* or the *system operation manual*; and

13.4.4.3 the measures that the *EMC* or the *PSO*, as the case may be, is taking, or proposes to take, to alleviate the impact of the *force majeure event*.

13.4.5 Where a *market participant* invokes a *force majeure event*, it shall give notice to the *EMC* and the *PSO* of the *force majeure event* as soon as reasonably practicable but in any event within two *business days* of the

date on which the *market participant* becomes aware of the occurrence of the *force majeure event*, which notice shall include particulars of:

- 13.4.5.1 the nature of the *force majeure event*;
 - 13.4.5.2 the effect that such *force majeure event* is having on the *market participant's* performance of its obligations under these *market rules*, any *market manual* or the *system operation manual*; and
 - 13.4.5.3 the measures that the *market participant* is taking, or proposes to take, to alleviate the impact of the *force majeure event*.
- 13.4.6 Subject to section 13.4.7, where the *EMC*, the *PSO* or a *market participant* invokes a *force majeure event*, it shall:
- 13.4.6.1 use all reasonable endeavours to mitigate or alleviate the effects of the *force majeure event* on the performance of its obligations under these *market rules*, any *market manual* or the *system operation manual*; and
 - 13.4.6.2 continue to comply with its obligations under these *market rules*, any *market manual* or the *system operation manual* to the maximum extent practicable.
- 13.4.7 The settlement of any strike, lockout, restrictive work practice or other labour disturbance constituting a *force majeure event* shall be within the sole discretion of the *EMC*, the *PSO* or the *market participant*, as the case may be, involved in such strike, lockout, restrictive work practice or other labour disturbance and nothing in section 13.4.6 shall require the *EMC*, the *PSO*, or the *market participant*, as the case may be, to mitigate or alleviate the effects of such strike, lockout, restrictive work practice or other labour disturbance.
- 13.4.8 Where the *EMC* or the *PSO* invokes a *force majeure event*, it shall as soon as practicable *publish* notice of any material change in the information contained in the notice referred to in section 13.4.4 or in any previous notice given and *published* pursuant to this section 13.4.8.
- 13.4.9 Where a *market participant* invokes a *force majeure event*, it shall as soon as practicable notify the *EMC* and the *PSO* of any material change in the information contained in the notice referred to in section 13.4.5 or in any previous notice given pursuant to this section 13.4.9.
- 13.4.10 Where the *EMC* or the *PSO* invokes a *force majeure event*, it shall *publish* notice of the cessation of the *force majeure event* and of the cessation of

the effects of such *force majeure event* on the *EMC*'s or the *PSO*'s, as the case may be, performance of its obligations under these *market rules*.

13.4.11 Where a *market participant* invokes a *force majeure event*, it shall give notice to the *EMC* and the *PSO* of the cessation of the *force majeure event* and of cessation of the effects of such *force majeure event* on the *market participant's* performance of its obligations under these *market rules*.

13.4.12 The *EMC* shall *publish* any notice provided to it pursuant to section 13.4.5, 13.4.9 or 13.4.11.

13.4.13 Nothing in this section 13.4 shall be read as limiting the right of the *EMC* to impose on a *market participant* a sanction, other than a financial penalty, including the issuance of a *suspension order*, a *disconnection order* or a *termination order*, in accordance with the provisions of these *market rules*.

13.4.14 Nothing in this section 13.4 shall excuse the *EMC*, the *PSO* or a *market participant* from performing any of their respective obligations contained in:

13.4.14.1 those provisions of these *market rules*, any *market manual* and the *system operation manual* that govern the *EMC*, the *PSO* or the *market participant* during an emergency or while the *PSO controlled system* is in a *high-risk operating state* or an *emergency operating state*;

13.4.14.2 the Singapore electricity emergency plan;

13.4.14.3 the Singapore power system restoration plan;

13.4.14.4 the *EMC's* or the *market participant's*, as the case may be, emergency preparedness plan; or

13.4.14.5 the *market participant's* restoration plan *market participant* attachment,

during an emergency or while the *power system* is in a *high-risk operating state* or an *emergency operating state*.

13.5 CONTRACTUAL LIABILITY

13.5.1 The liability and indemnification provisions of sections 13.1 to 13.3 and, where applicable, of any other section of these *market rules* other than this section 13.5, and the *force majeure provisions* of section 13.4 shall apply to any agreement referred to in these *market rules* to which the *EMC* and a *market participant* or the *PSO* and a *market participant* are parties and to

all acts or omissions of the *EMC* or the *PSO*, as the case may be, or the *market participant* in the execution or purported execution of any function, power or duty under such agreement. In the event of an inconsistency between such liability, indemnification and *force majeure provisions* and the liability, indemnification and *force majeure provisions* of such agreement, the liability and indemnification provisions of sections 13.1 to 13.3 and, where applicable, of any other section of these *market rules* other than this section 13.5, and the *force majeure provisions* of section 13.4 shall prevail to the extent of the inconsistency.

13.6 CESSATION OF EFFECT OF CERTAIN SECTIONS

- 13.6.1 Subject to section 13.6.5, sections 13.1.1 to 13.1.3 shall cease to have effect in respect of any act or omission of the *EMC* that occurs on or after the date that is the last day of the 3rd month following the month in which the *market commencement date* occurs.
- 13.6.2 Subject to section 13.6.5, sections 13.2.1 to 13.2.3 shall cease to have effect in respect of any act or omission of the *PSO* that occurs on or after the date that is the last day of the 3rd month following the month in which the *market commencement date* occurs.
- 13.6.3 Subject to section 13.6.5, sections 13.3.1 to 13.3.3 shall cease to have effect in respect of any act or omission of a *market participant* that occurs on or after the date that is the last day of the 3rd month following the month in which the *market commencement date* occurs.
- 13.6.4 Subject to section 13.6.5, section 13.5.1 shall cease to have effect in respect of any agreement having an effective date that occurs on or after the date that is the last day of the 3rd month following the month in which the *market commencement date* occurs.
- 13.6.5 The *Authority* may, by notice given to the *EMC* no less than twenty *business days* prior to the date referred to in each of sections 13.6.1 to 13.6.4, extend the application of those sections for a period of three months. In such case, sections 13.6.1 to 13.6.4 shall remain in effect for an additional period of three months, calculated from the last day of the month referred to in those sections.
- 13.6.6 The *EMC* shall promptly *publish* any notice received from the *Authority* pursuant to section 13.6.5 and shall give notice of the extension of the application of sections 13.6.1 to 13.6.4 in the manner described in section 5.13.2 of Chapter 3.
- 13.6.7 The *Authority* shall not, in the exercise of the power referred to in section 13.6.5, extend the application of some but not all of sections 13.6.1 to 13.6.4.

13.6.8 The *Authority* may, subsequent to the initial exercise of the power referred to in section 13.6.5, extend the application of sections 13.6.1 to 13.6.4 for such further periods of three months each as the *Authority* determines appropriate. Sections 13.6.5 to 13.6.7 shall apply *mutatis mutandis* to each such additional extension.

13.7 LIABILITY OF PANEL MEMBERS AND DISPUTE RESOLUTION COUNSELLOR

13.7.1 No suit or other legal proceeding shall lie against the *dispute resolution counsellor* or any member of the *rules change panel*, the *market surveillance and compliance panel* or the *dispute resolution and compensation panel* for anything which is in good faith done or not done in the purported execution of the functions, powers and duties respectively of such office.

13.7.2 Nothing in section 13.7.1 shall be construed as limiting the right of a person to appeal from or seek the judicial review of a decision of the *rules change panel*, the *market surveillance and compliance panel* or an *arbitration tribunal* in accordance with these *market rules* and *applicable law*.

13.8 LIABILITY OF MARKET SUPPORT SERVICES LICENSEES

13.8.1 Sections 13.1, 13.3, 13.4 and 13.6 apply in respect of liability, indemnification and *force majeure* as between the *EMC* and any *market support services licensee* that has executed the agreement referred to in section 3.2.3 and, for such purpose, all references in sections 13.1, 13.3, 13.4 and 13.6 to a *market participant* shall be deemed to include references to any such *market support services licensee*.

13.8.2 Sections 13.2, 13.3, 13.4 and 13.6 apply in respect of liability, indemnification and *force majeure* as between the *PSO* and any *market support services licensee* that has executed the agreement with the *PSO* referred to in section 3.2.5 and, for such purpose, all references in sections 13.2, 13.3, 13.4 and 13.6 shall be deemed to include references to any such *market support services licensee*.

14 DEROGATIONS

14.1 SCOPE

14.1.1 Subject to section 14.1.2, a *derogation applicant* may, in accordance with section 14.2.1, apply to the *EMC* for a derogation from the application of any obligation, requirement or standard which is or may be imposed upon the *derogation applicant* or in respect of the *derogation applicant's* facilities or equipment pursuant to these *market rules*, any *market manuals* or the *system operation manual*.

14.1.2 [Intentionally Left Blank].

Explanatory Note: The preceding clause is reserved for any obligations (i.e., confidentiality, payment, etc.) with respect to which a derogation cannot be granted. The text would read:

This section 14 shall not apply in respect of any obligation, requirement or standard referred to in [•].

14.1.3 In this section 14, a reference to a *derogation applicant* shall, where the context so requires, be deemed to include a reference to a *derogation applicant* to whom a derogation has been granted pursuant to this section 14.

14.2 APPLICATION

14.2.1 A *derogation applicant* shall apply for a derogation by filing with the *EMC* a *derogation application* in such form as may be prescribed in the applicable *market manual* and containing the information and supporting documentation:

14.2.1.1 prescribed in the applicable *market manual*; and

14.2.1.2 described in section 14.2.2.

14.2.2 A *derogation application* shall include:

14.2.2.1 the identification of the specific obligation, requirement or standard that is the subject of the *derogation application*;

14.2.2.2 the reasons and a detailed justification for the *derogation application*;

14.2.2.3 a plan:

- a. containing:
 - (i) details of the manner and time within which the *derogation applicant* will become compliant with the obligation, requirement or standard that is the subject of the *derogation application*;
 - (ii) a request for a permanent derogation from any obligation, requirement or standard that is the subject to the *derogation application*; and
- b. specifying the manner in which the *derogation applicant* proposes to mitigate any adverse effects of any non-compliance the obligation, requirement or standard, and to operate or modify its equipment or facilities or to otherwise conduct its operations during the period of time for which the derogation would be in effect so as to operate in a manner that achieves, as closely as possible, the objectives of the obligation, requirement or standard that is the subject of the *derogation application*; and

14.2.2.4 the *derogation applicant's* estimate of any costs that may be imposed on the *EMC*, the *PSO*, *market participants* or *market support services licensees* if the derogation requested in the *derogation application* were to be granted.

14.3 PROCESSING OF DEROGATION APPLICATIONS

14.3.1 The *EMC Board* or an *EMC Board Committee* shall, within 20 *business days* of receipt of a *derogation application* or within such longer period of time as may be required having regard to the complexity of the *derogation application*:

14.3.1.1 subject to section 14.3.4, grant a derogation to the *derogation applicant*, on such terms and conditions as the *EMC Board* or the *EMC Board Committee* considers appropriate; or

14.3.1.2 reject the *derogation application*,

and shall provide reasons for its decision. Where the *EMC Board* or the *EMC Board Committee* does not expect to issue such decision within 20 *business days* of receipt of the *derogation application*, it shall so notify the *derogation applicant*, indicating the date on or before which the decision will be issued and the reasons for the inability to issue the decision within the 20 *business day* period.

14.3.2 In considering a *derogation application*, the *EMC Board* or an *EMC Board Committee* shall have regard to the following:

- 14.3.2.1 whether and the extent to which the derogation that is the subject of the *derogation application* would, if granted:
- a. materially threaten the ability of the *PSO* to direct the operation or maintain the *reliability* of the *PSO controlled system*;
 - b. materially affect the ability of the *EMC* to operate the *wholesale electricity markets* in an efficient manner;
 - c. give the *derogation applicant* an undue preference or advantage over other *market participants* in the *wholesale electricity markets*;
 - d. impose significant extra costs on *market participants* or *market support services licensees*; or
 - e. impose significant extra costs on the *EMC* or the *PSO*;
- 14.3.2.2 the adequacy and efficacy of the plan submitted by the *derogation applicant* pursuant to section 14.2.2.3;
- 14.3.2.3 whether the cost or delay to the *derogation applicant* of complying with the obligation, requirement or standard that is the subject of the *derogation application* is unreasonable, having regard to:
- a. the nature of such obligation, requirement or standard;
 - b. the identity and nature of the *derogation applicant*; and
 - c. the anticipated impact of non-compliance by the *derogation applicant* with such obligation, requirement or standard in terms of the elements referred to in section 14.3.2.1;
- 14.3.2.4 where section 14.3.4 applies, the submissions of the *PSO* with respect to the *derogation application*; and
- 14.3.2.5 such other matters as the *EMC Board* or the *EMC Board Committee* determines appropriate.

- 14.3.3 In considering a *derogation application*, the *EMC Board* or the *EMC Board Committee* may have regard to any previous decision on *derogation applications* but is not bound to follow any previous decision.
- 14.3.4 The *EMC* shall consult with the *PSO* in respect of any *derogation application* that would, if the derogation were granted, be likely to have the effect referred to in section 14.3.2.1(a). In such cases, the *EMC Board* or the *EMC Board Committee* shall not grant a derogation without the consent of the *PSO*.
- 14.3.5 A derogation granted pursuant to section 14.3.1.1 shall identify:
- 14.3.5.1 the obligation, requirement or standard that is the subject of the derogation;
 - 14.3.5.2 any terms and conditions attaching to the grant of the derogation, including the manner in which the *derogation applicant* must operate or modify its equipment or facilities or otherwise conduct its operations during the period of time for which the derogation is in effect; and
 - 14.3.5.3 the dates on which the derogation takes effect and expires.

14.4 EFFECT OF DEROGATION AND MONITORING

- 14.4.1 A *derogation applicant* to whom a derogation has been granted pursuant to this section 14 shall, for the period of time that the derogation is in effect:
- 14.4.1.1 not be required to comply with:
 - a. the obligation, requirement or standard in respect of which, and only to the extent to which, the derogation has been granted; or
 - b. any reporting or similar obligation to the extent that compliance with such obligation is rendered inapplicable by reason of the derogation; and
 - 14.4.1.2 comply with all of the terms and conditions of the derogation, including any *modified* terms and conditions imposed pursuant to section 14.5.5.2 or 14.5.8.2.
- 14.4.2 A *derogation applicant* to whom a derogation has been granted pursuant to this section 14 shall from time to time provide to the *EMC* such information as the *EMC* may request for the purposes of monitoring:

- 14.4.2.1 compliance by the *derogation applicant* with any terms and conditions of the derogation, including any *modified* terms and conditions imposed pursuant to section 14.5.5.2 or 14.5.8.2; and
 - 14.4.2.2 the progress of implementation by the *derogation applicant* of the plan referred to in section 14.2.2.3, as such plan may be *modified* by the terms and conditions of the derogation, including any *modified* terms and conditions imposed pursuant to section 14.5.5.2 or 14.5.8.2.
- 14.4.3 Failure by a *derogation applicant* to comply with any of the terms and conditions of a derogation, including any *modified* terms and conditions imposed pursuant to section 14.5.5.2 or 14.5.8.2, shall constitute a breach of these *market rules*.

14.5 CANCELLATION, RECONSIDERATION AND REVOCATION OF DEROGATIONS

- 14.5.1 A *derogation applicant* may, at any time prior to the date of expiry of a derogation, request that the *EMC Board* or an *EMC Board Committee* cancel the derogation on the date specified by the *derogation applicant* in the request, which date shall be earlier than the date of expiry of the derogation.
- 14.5.2 Upon receipt of a request referred to in section 14.5.1, the *EMC Board* or an *EMC Board Committee* shall cancel the derogation with effect from:
- 14.5.2.1 the date specified in the request; or
 - 14.5.2.2 such later date as may be specified by the *EMC Board* or the *EMC Board Committee*,
- and the derogation shall cease to have effect as of such date.
- 14.5.3 The *EMC Board* or an *EMC Board Committee* may at any time reconsider a derogation granted pursuant to this section 14 where the *EMC Board* or the *EMC Board Committee* determines that such reconsideration is necessary in light of a change in circumstances relative to the circumstances that existed on the date on which the derogation was granted.
- 14.5.4 Where the *EMC Board* or an *EMC Board Committee* intends to reconsider a derogation pursuant to section 14.5.3, it shall give notice of such intention to the *derogation applicant*, together with reasons, and shall provide the *derogation applicant* with a reasonable opportunity to show

cause as to why its derogation should not be withdrawn or *modified* pursuant to section 14.5.5.

14.5.5 Where the *EMC Board* or an *EMC Board Committee* reconsiders a derogation pursuant to section 14.5.3, the *EMC Board* or the *EMC Board Committee* may:

14.5.5.1 withdraw the derogation with effect from a specified date, having regard to the time needed to bring the applicable facility or equipment into compliance with the obligation, requirement or standard that is the subject of the derogation;

14.5.5.2 *modify* the derogation with effect from a specified date, having regard to the time needed to bring the applicable facility or equipment into compliance with such *modified* terms and conditions; or

14.5.5.3 confirm the derogation as originally granted,
and shall give reasons for its decision.

14.5.6 A derogation that is withdrawn pursuant to section 14.5.5.1 shall cease to have effect on the date referred to in that section.

14.5.7 In the event that the circumstances of section 14.5.3 arise as a result of the granting of subsequent derogations by the *EMC Board* or an *EMC Board Committee*, the *EMC* shall compensate the *derogation applicant* for any costs that will need to be incurred by it as a result of the withdrawal or *modification* of its derogation pursuant to section 14.5.5. The *EMC* shall recover any costs so paid in accordance with section 4.2.1 of Chapter 7.

14.5.8 Without prejudice to section 14.4.3, where a *derogation applicant* fails to comply with any term or condition of a derogation, including any *modified* terms and conditions imposed pursuant to section 14.5.5.2 or 14.5.8.2, the *EMC Board* or an *EMC Board Committee* may:

14.5.8.1 revoke the derogation with effect from a specified date; or

14.5.8.2 *modify* the derogation with effect from a specified date,
and shall give reasons for its decision.

14.5.9 Where the *EMC Board* or an *EMC Board Committee* intends to revoke or *modify* a derogation pursuant to section 14.5.8, it shall give notice of such intention to the *derogation applicant*, together with reasons, and shall provide the *derogation applicant* with a reasonable opportunity to show cause as to why its derogation should not be revoked or *modified*.

14.5.10 A derogation that is revoked pursuant to section 14.5.8.1 shall cease to have effect on the date referred to in that section.

14.6 TRANSFER OF DEROGATIONS

14.6.1 A derogation granted in respect of facilities or equipment shall remain in full force and effect in accordance with its terms notwithstanding the sale, assignment, lease, transfer of control or other disposition of such facilities or equipment by the *derogation applicant* to a third party transferee provided that:

14.6.1.1 the *derogation applicant* submits to the *EMC* a request for approval of the transfer of the derogation to such third party transferee in such form as may be prescribed in the applicable *market manual*; and

14.6.1.2 the *EMC Board* or an *EMC Board Committee* approves the transfer in accordance with section 14.6.2.

14.6.2 Subject to section 14.6.4.2, the *EMC Board* or an *EMC Board Committee* shall approve a request for the transfer of a derogation where:

14.6.2.1 the *EMC Board* or the *EMC Board Committee* is satisfied that the transfer would not affect the ability of the proposed transferee to comply with all of the terms and conditions of the derogation;

14.6.2.2 the proposed transferee is a *market participant* or undertakes in writing to the *EMC* to apply for registration as a *market participant*;

14.6.2.3 the proposed transferee and the *derogation applicant* undertake in writing to the *EMC* to provide such information and documentation as may be required by the *EMC* as a result of or to reflect the transfer;

14.6.2.4 the *EMC Board* or the *EMC Board Committee* is satisfied that the transfer of the derogation will not materially threaten the implementation of the plan referred to in section 14.2.2.3, as such plan may be *modified* by the terms and conditions of the derogation, including any *modified* terms and conditions imposed pursuant to section 14.5.5.2 or 14.5.8.2; and

14.6.2.5 the *EMC Board* or the *EMC Board Committee* is satisfied that the transfer of the derogation will not increase concerns relating to the elements referred to in section 14.3.2.1

beyond those that exist in respect of the *derogation applicant*.

14.6.3 The transfer of a derogation shall not take effect until:

14.6.3.1 the date on which the *EMC Board* or the *EMC Board Committee* approves the transfer;

14.6.3.2 where the proposed transferee is not a *market participant*, the date on which the proposed transferee is registered as a *market participant*; or

14.6.3.3 where the *derogation applicant* or the proposed transferee are required pursuant to section 14.6.2.3 to provide information or documentation, on the date on which such information or documentation is provided,

whichever is the later.

14.6.4 In considering a request for the transfer of a derogation, the *EMC Board* or an *EMC Board Committee* shall:

14.6.4.1 consult with the *PSO* if approval of the transfer would be likely to have the effect referred to in section 14.3.2.1(a); and

14.6.4.2 not approve the transfer without the consent of the *PSO*.

14.6.5 All references in this section 14 to a *derogation applicant* shall be deemed to include a reference to an approved transferee of that *derogation applicant*.

14.7 PUBLICATION, THIRD PARTY SUBMISSIONS AND COSTS

14.7.1 The EMC shall publish:

14.7.1.1 notice of each derogation application filed pursuant to section 14.2.1;

14.7.1.2 notice of the cancellation of a derogation pursuant to section 14.5.2;

14.7.1.3 notice of an intention to reconsider a derogation pursuant to section 14.5.3;

14.7.1.4 notice of each request for the transfer of a derogation filed pursuant to section 14.6.1.1; and

- 14.7.1.5 notice of any decision made pursuant to section 14.3.1, 14.5.5, 14.5.8 or 14.6.2.
- 14.7.2 Any person may make representations to the *EMC* in respect of a *derogation application*, the reconsideration of a derogation or a request for the transfer of a derogation within such time as the *EMC* may specify when it *publishes* the applicable notice pursuant to section 14.7.1.1, 14.7.1.3 or 14.7.1.4.
- 14.7.3 Subject to section 14.5.7, each *derogation applicant* shall bear all costs associated with:
- 14.7.3.1 the processing of its *derogation application*;
 - 14.7.3.2 the processing of a request to cancel its derogation;
 - 14.7.3.3 the processing of a request for the transfer of its derogation;
 - 14.7.3.4 the derogation granted to it, including compliance with the terms and conditions of the derogation including any *modified* terms and conditions imposed pursuant to section 14.5.5.2 or 14.5.8.2; and
 - 14.7.3.5 the provision and processing of the monitoring information referred to in section 14.4.2.
- 14.7.4 The costs of processing any of the elements referred to in sections 14.7.3.1 to 14.7.3.3 and 14.7.3.5 shall be considered to create an obligation under the *market rules* to pay the amount of such costs and such amount may, without prejudice to any other manner of recovery available under *applicable law*, be recovered accordingly.

14.8 DISPUTE RESOLUTION

- 14.8.1 A decision of the *EMC Board* or an *EMC Board Committee*:
- 14.8.1.1 rejecting a derogation application;
 - 14.8.1.2 respecting the terms and conditions of a derogation;
 - 14.8.1.3 revoking, withdrawing or *modifying* a derogation, other than with respect to the calculation of the costs referred to in section 14.5.7; or
 - 14.8.1.4 approving or denying the transfer of a derogation pursuant to section 14.6,

shall, subject to section 14.8.2, be final and binding and shall not be the subject of dispute resolution, appeal or review by the *derogation applicant* or any other person in any civil or other proceeding.

14.8.2 Section 14.8.1 shall not preclude a *derogation applicant* from disputing a decision referred to in that section in relation to matters of law and jurisdiction, including on the grounds that the *EMC Board* or the *EMC Board Committee*, as the case may be, failed to follow the procedures set forth in this section 14 in arriving at the decision.

14.8.3 A dispute that:

14.8.3.1 is not final and binding in accordance with section 14.8.1.3;
or

14.8.3.2 is subject to dispute resolution, appeal or review pursuant to section 14.8.2,

shall be resolved using the dispute resolution process described in section 3 of Chapter 3.

14.8.4 Initiation of the dispute resolution process shall, notwithstanding section 3.2.2 of Chapter 3, stay implementation of a decision to withdraw or *modify* a derogation pursuant to section 14.5.5.

15 INTERPRETATION BULLETINS

- 15.1.1 The *EMC* may, from time to time upon receipt of material requests for clarification of the interpretation or application of the *market rules*, *publish* bulletins as to the interpretation or application of the *market rules*.
- 15.1.2 Where the request for clarification referred to in section 15.1.1 relates to a section of the *market rules* that sets forth a function, power or duty of the *PSO*, any bulletin *published* pursuant to section 15.1.1 shall be prepared jointly by the *EMC* and the *PSO*.
- 15.1.3 No bulletin *published* pursuant to section 15.1.1 shall be binding on the *EMC* or the *PSO*.

Singapore Electricity Market Rules

Chapter 2 Participation

Energy Market Authority

1 January 2022

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1 INTRODUCTION

1.1 INTRODUCTION

1.1.1 This Chapter sets forth:

- 1.1.1.1 the procedures pursuant to which a person may apply to the *EMC* for registration as a *market participant* and a *market support services licensee* may apply for authorisation to participate in the *wholesale electricity markets*;
- 1.1.1.2 the terms and conditions upon which a *market participant* may cease to be a *market participant* and upon which a *market support services licensee* may cease to be authorised to participate in the *wholesale electricity markets*;
- 1.1.1.3 the procedures pursuant to which persons may apply to the *EMC* for the registration of facilities;
- 1.1.1.4 the terms and conditions upon which the registration of a *registered facility*, a *generation settlement facility* or a *non-exporting embedded intermittent generation facility* may be cancelled or transferred at the request of a *market participant*;
- 1.1.1.5 the prudential and technical requirements which must be met by prospective *market participants*, *market participants* and *market support services licensees*;
- 1.1.1.6 the manner in which the *EMC* may recover from *market participants* and *market support services licensee* shortfalls resulting from payment defaults; and
- 1.1.1.7 the fees payable by prospective *market participants*, *market participants* and *market support services licensees*.

1.2 MARKET PARTICIPANT REGISTRATION AND MARKET SUPPORT SERVICES LICENSEE AUTHORISATION

- 1.2.1 No person, other than a *market support services licensee*, shall participate in the *wholesale electricity markets* or cause or permit any *physical service* to be conveyed into, through or out of the *transmission system* unless:
 - 1.2.1.1 that person has been registered by the *EMC* as a *market participant* pursuant to this section 1.2 and section 3; and

- 1.2.1.2 subject to sections 5.1.2 to 5.1.9A, the facility to or from which the *physical service* is to be so conveyed has been registered by the *EMC* as a *registered facility*, as a *commissioning generation facility*, as a *generation settlement facility*, or as a *non-exporting embedded intermittent generation facility* pursuant to section 5.2, 5.3, 5.4, 5.4B or 5.4C, as the case may be.
- 1.2.2 No person shall be registered by the *EMC* as a *market participant* unless the *EMC* is satisfied:
- 1.2.2.1 on the basis of the certification, tests, and inspections referred to in section 8.2, that the person satisfies the technical requirements referred to in that section applicable to all *market participants*, to the class of *market participant* of which the person forms part and the *wholesale electricity market* in which the person wishes to participate;
- 1.2.2.2 on reasonable grounds, if the person applies to participate in the *real-time markets*, that the person will satisfy the prudential requirements set forth in section 7;
- 1.2.2.3 that the person has executed the *PSO/MP agreement*; and
- 1.2.2.4 that the person:
- a. if it engages in an activity for which an *electricity licence* is required under section 6 of the *Electricity Act*, holds an *electricity licence* permitting it to engage in such activity or is exempt by an order made pursuant to section 8 of the *Electricity Act* from the obligation to hold such an *electricity licence*; and
- b. holds an *electricity licence* permitting it to *trade* in the *wholesale electricity markets* or is exempt by an order made pursuant to section 8 of the *Electricity Act* from the obligation to hold such an *electricity licence*.
- 1.2.3 A person that has been registered by the *EMC* as a *market participant* may, subject to the registration of its facilities under section 5 where required, participate in the *wholesale electricity market* to which the registration relates.
- 1.2.4 No *market support services licensee* shall participate in the *wholesale electricity markets* to:
- 1.2.4.1 *supply* and sell *electricity* to non-contestable *consumers*;

1.2.4.2 facilitate access to any *wholesale electricity market* for obtaining *supply of electricity* for *contestable consumers* and *retail electricity licensees*; or

1.2.4.3 provide other services related to access to any *wholesale electricity market*,

unless it has been authorised to do so by the *EMC* pursuant to this section 1.2 and section 3.

1.2.5 No *market support services licensee* shall be authorised to participate in the *wholesale electricity markets* for the purpose referred to in section 1.2.4 unless the *EMC* is satisfied:

1.2.5.1 on the basis of the certification, tests and inspections referred to in section 8.2.3, that the *market support services licensee* satisfies the technical requirements referred to in that section;

1.2.5.2 on reasonable grounds, that the *market support services licensee* will satisfy the prudential requirements set forth in section 7;

1.2.5.3 that the *market support services licensee* has executed such agreement with the *PSO* as may be required by the applicable *market manual*; and

1.2.5.4 that the *market support services licensee* holds an *electricity licence* permitting it to engage in and provide the relevant *market support services* referred to in section 1.2.4 pertaining to the *wholesale electricity markets*, for which the *market support services licensee* seeks to be authorised.

2 CLASSES OF MARKET PARTICIPANTS

- 2.1.1 For the purposes of these *market rules*, *market participants* shall be comprised in the following classes:
- 2.1.1.1 *generation licensee* class of *market participants*, comprising of all *market participants* who are *generation licensees*;
 - 2.1.1.2 *retail electricity licensee* class of *market participants*, comprising of all *market participants* who are *retail electricity licensees*;
 - 2.1.1.3 wholesale trader class of *market participants*, comprising of all *market participants* (other than *generation licensees*, *retail electricity licensees* and *transmission licensees*), that either have been granted an *electricity licence* permitting them to *trade* in the *wholesale electricity markets* or are exempt by an order made pursuant to section 8 of the *Electricity Act* from the obligation to hold such an *electricity licence*; and
 - 2.1.1.4 *transmission licensee* class of *market participants*, comprising of all *market participants* who are *transmission licensees*.

3 APPLICATION FOR REGISTRATION OR AUTHORISATION

- 3.1.1 If a person wishes to be registered by the *EMC* as a *market participant*, he shall file a completed *participant registration application* with the *EMC*. Such *participant registration application* shall be in the form set out in the applicable *market manual*.
- 3.1.2 If the *EMC* determines that a *participant registration application* which it receives is incomplete or contains information with respect to which the *EMC* requires clarification, the *EMC* shall request that the relevant *participation applicant* provide further information or clarification required to support that application. Such request shall be made by the *EMC* within ten *business days* of its receipt of that application (or such longer period as the *EMC* may agree with the *participation applicant*).
- 3.1.3 The *participation applicant* shall be deemed to have withdrawn its *participant registration application* if it does not provide the information or clarification requested under section 3.1.2 to the *EMC's* satisfaction within fifteen *business days* of the request (or such longer time as the *EMC* may agree with it).
- 3.1.4 Within twenty *business days* of receiving (i) a *participation applicant's participant registration application*; or (ii) further information or clarification requested under section 3.1.2, whichever is later (or within such longer period as it may agree with the *participation applicant*), if the *EMC*:
- 3.1.4.1 is satisfied that the *participation applicant* meets all the requirements in section 1.2.2 and all the requirements as prescribed in the applicable *market manual*, it shall register the *participation applicant* as a *market participant* on such terms and conditions (that comply with section 3.1.7) as it determines appropriate; or
- 3.1.4.2 is not satisfied that the *participation applicant* meets all the requirements in section 1.2.2 and all the requirements as prescribed in the applicable *market manual*, it shall deny the *participation applicant* registration as a *market participant*, except that, if the *EMC* is satisfied that a *participation applicant* meets the requirements in sections 1.2.2.2 and 1.2.2.3, it may conditionally register the *participation applicant* as a *market participant*,

and notify the *participation applicant* of the same. If the *EMC* denies the *participation applicant* registration, the notice shall identify the reason for the denial. If the *EMC* conditionally registers the *participation applicant* as a *market participant*, the notice shall state a date by which the *participation applicant* shall satisfy all the remaining unsatisfied requirements in section 1.2.2 and in the applicable *market manual*.

- 3.1.5 For the purposes of section 3.1.4, *conditional registration* means the registration of a *participation applicant* by the *EMC* as a *market participant* whose registration is conditional upon the *participation applicant* satisfying all the remaining unsatisfied requirements in section 1.2.2 and in the applicable *market manual* by the date stated in the notice to a *participation applicant* that it has been *conditionally registered* (“conditional registration deadline”). Such *conditional registration* shall:
- 3.1.5.1 permit the *participation applicant* to commence the process of registration of its facilities pursuant to section 5 (provided that the *EMC* shall not register such facilities if the *participant applicant* has not been issued with the notice referred to in section 3.1.5.3);
 - 3.1.5.2 not otherwise have effect, or impose any other obligations on or grant any other rights to the *participation applicant* as a *market participant*, until the *participant applicant* has been issued with the notice referred to in section 3.1.5.3; and
 - 3.1.5.3 lapse on the fifth *business day* from the conditional registration deadline unless the *participation applicant* has by that fifth *business day* received a notice from the *EMC* that the *participation applicant* has satisfied all the requirements in section 1.2.2 and in the applicable *market manual*.
- 3.1.6 When a *participation applicant* (who has been granted *conditional registration*) receives a notice from the *EMC* that it has satisfied all the requirements in section 1.2.2 and in the applicable *market manual*, it shall be deemed registered as a *market participant* on the terms and conditions (that comply with section 3.1.7) set forth in the notice.
- 3.1.7 *Registration terms* imposed in respect of a *market participant* shall not unjustly discriminate against or in favour of the *market participant*. However, if the *market participant* intends to register a facility outside Singapore under section 5, the *registration terms* imposed on it may be different from (including more onerous than) the *registration terms* imposed on other *market participants*. For the avoidance of doubt, *registration terms* may, impose new or more onerous requirements on a *market participant* than the requirements that would otherwise apply to it under these *market rules*.

- 3.1.8 A *person* shall comply with the dispute resolution procedures in section 3 of Chapter 3 if he wishes to dispute a decision made by the *EMC* under section 3.1.4.2 to deny a *participation applicant* registration as a *market participant*, or to dispute any *registration terms*.
- 3.1.9 A *participation applicant* or a *market participant* shall immediately inform the *EMC* of any circumstances which result (or will likely result) in a change to the information provided in its *participant registration application* or in any updates to its *participant registration application*.
- 3.1.10 If a *market support services licensee* intends to participate in the *wholesale electricity markets* to:
- 3.1.10.1 *supply* and sell *electricity* to non-contestable *consumers*;
 - 3.1.10.2 facilitate access to any *wholesale electricity market* for obtaining *supply* of *electricity* for contestable *consumers* and *retail electricity licensees*; or
 - 3.1.10.3 provide other services related to access to any *wholesale electricity market*,
- it shall file a completed *application for authorisation* with the *EMC* in the form set out in the applicable *market manual*.
- 3.1.11 If a *market support services licensee* seeks authorisation to participate in the *wholesale electricity markets* for the purposes referred to in section 3.1.10, sections 3.1.1 to 3.1.9 shall apply to it and all references in those sections to:
- 3.1.11.1 a *person* who wishes to be registered as a *market participant* shall be read as references to a *market support services licensee* who wishes to be authorised to participate in the *wholesale electricity markets*;
 - 3.1.11.2 a *participant registration application* shall be read as references to its *application for authorisation*;
 - 3.1.11.3 a *participation applicant* shall be read as references to the *market support services licensee*;
 - 3.1.11.4 registration as *market participant* shall be read as references to authorisation of a *market support services licensee* to participate in the *wholesale electricity markets*; and
 - 3.1.11.5 *registration terms* shall (notwithstanding the definition thereof in Chapter 8) be read as references to the terms and conditions which the *EMC* may impose in respect of the authorisation of a

market support services licensee to participate in the *wholesale electricity market*, under section 3.1.4.1 or 3.1.6 (as the case may be and each as modified and applied pursuant to this section 3.1.11); and

3.1.11.6 *section 1.2.2, 1.2.2.1, 1.2.2.2, 1.2.2.3 or 1.2.2.4* shall be read as references to *section 1.2.5, 1.2.5.1, 1.2.5.2, 1.2.5.3 or 1.2.5.4* respectively.

3.1.12 The *EMC* shall establish, maintain, update and *publish* a list of:

3.1.12.1 all *market participants*;

3.1.12.2 all *participation applicants* whose applications are currently under consideration by the *EMC*; and

3.1.12.3 all *market support services licensees* that have been granted authorisation under section 3.

3.1.13 The *EMC* shall notify each *market support services licensee* in accordance with the applicable *code of practice* of the receipt and the status of a *participant registration application* filed by a *contestable consumer*.

4 WITHDRAWAL BY A MARKET PARTICIPANT OR MARKET SUPPORT SERVICES LICENSEE

- 4.1.1 Provided that the *market participant* has requested that the *EMC* cancel or transfer the registration of any applicable *registered facility*, *generation settlement facility* or *non-exporting embedded intermittent generation facility* pursuant to section 6, a *market participant* that wishes to cease being a *market participant* shall provide a written notice to the *EMC* to that effect. The notice shall specify the date of the *trading day* upon which the *market participant* intends to cease to participate in the *wholesale electricity markets* or to cause or permit any *physical service* to be conveyed into, through or out of the *transmission system*. The *trading day* specified shall not be earlier than the *trading day* on which:
- 4.1.1.1 the registration of the last of the *market participant's* applicable *registered facilities*, *generation settlement facilities* or *non-exporting embedded intermittent generation facility* is to be cancelled by the *EMC*, determined in accordance with section 6.1; or
 - 4.1.1.2 the registration of the last of the *market participant's* applicable *registered facilities*, *generation settlement facilities* or *non-exporting embedded intermittent generation facilities* is to be transferred by the *EMC*, determined in accordance with section 6.2.
- 4.1.2 Upon receipt of the notice referred to in section 4.1.1, the *EMC* shall *publish* a notice stating that:
- 4.1.2.1 the *EMC* has received a notice under section 4.1.1; and
 - 4.1.2.2 the *market participant* that gave the notice has stated that, from the end of the *trading day* specified in the notice, it intends to cease participating in the *wholesale electricity markets* or causing or permitting any *physical service* to be conveyed into, through or out of the *transmission system*.
- 4.1.3 A *market participant* that has given notice pursuant to section 4.1.1 shall cease to participate in the *wholesale electricity markets* and to cause or permit any *physical service* to be conveyed into, through or out of the *transmission system* no later than the end of the *trading day* specified in such notice.
- 4.1.4 The registration of a *market participant* that has given notice under section 4.1.1 shall expire on the date of the *trading day*:
- 4.1.4.1 specified in the notice referred to in section 4.1.1;

- 4.1.4.2 referred to in section 4.1.1.1;
- 4.1.4.3 referred to in section 4.1.1.2; or
- 4.1.4.4 on which all payments due to be paid by it or to it under the *market rules* have been made,
- whichever is the later.
- 4.1.5 A person whose registration as a *market participant* expires pursuant to section 4.1.4 shall remain subject to and liable for all of its obligations and liabilities as a *market participant*, including a liability under section 9 of this Chapter or a liability in respect of adjustments arising from *metering errors* under Chapter 7, which were incurred or arose under the *market rules*, a *market manual* or the *system operation manual* prior to or on the *trading day* on which such registration so expires regardless of the date on which any claim relating thereto may be made, subject only to any applicable provisions of the Limitation Act (Cap. 163).
- 4.1.6 Once the *EMC* is satisfied that a person whose registration as a *market participant* has expired pursuant to section 4.1.4 has no remaining financial obligations or liabilities under the *market rules*, including a liability under section 9 of this Chapter or an actual, contingent or prospective liability in respect of adjustments arising from *metering errors* under Chapter 7, the *EMC* shall return to the person all *credit support* held by the *EMC* in respect of such person.
- 4.1.7 The *EMC* shall establish, maintain, update as required and *publish* a list of all *market participants* that will cease to be *market participants* and the date, determined in accordance with section 4.1.4, on which the registration of each listed *market participant* expired.
- 4.1.8 The *EMC* shall notify each *market support services licensee* of the date on which the registration of any *market participant* that is a contestable *consumer* expires.
- 4.1.9 Sections 4.1.1 to 4.1.6 shall apply to each *market support services licensee* that has been granted authorisation to participate by the *EMC* pursuant to section 3 and that intends to cease participating in the *wholesale electricity markets* and, for such purposes, references in those sections to:
- 4.1.9.1 a *market participant* shall be deemed to include references to a *market support services licensee*; and
- 4.1.9.2 registration shall be deemed to include references to authorisation.

5 FACILITIES REGISTRATION

5.1 REQUIREMENT FOR REGISTRATION

5.1.1 No person, other than a *market support services licensee*, shall participate in the *real-time markets* or cause or permit any *physical service* to be conveyed into, through or out of the *transmission system* unless:

5.1.1.1 that person is registered as a *market participant* pursuant to section 1.2 and section 3; and

5.1.1.2 subject to sections 5.1.2 to 5.1.9, the facility to or from which the *physical service* is to be so conveyed has been registered by the *EMC* as a *registered facility*, as a *commissioning generation facility*, as a *generation settlement facility* or as a *non-exporting embedded intermittent generation facility* pursuant to section 5.2, 5.3, 5.4, 5.4B or 5.4C, as the case may be.

5.1.2 A person that intends to participate in the *real-time markets* or cause or permit a *physical service* to be conveyed into, through or out of the *transmission system* from a *load facility* shall not be required to register the *load facility* as a *registered facility* unless:

5.1.2.1 the person wishes to provide a *physical service* from such *load facility* to the *real-time markets*, or withdraw a *physical service* through such *load facility* from the *real-time markets*; and

5.1.2.2 the *EMC* has *published* a notice indicating that *load facilities* may be registered as *registered facilities* for the purpose of providing or withdrawing that *physical service*.

Where the *EMC* has *published* a notice pursuant to section 5.1.2.2 in respect of a *physical service*, a person wishing to provide that *physical service* from, or withdraw that *physical service* through, a *load facility* shall be required to register that *load facility* as a *registered facility*. No *load facility* shall be registered as a *registered facility* or subject to *dispatch* by the *PSO* other than a *load facility* that is registered to provide or withdraw a *physical service* in respect of which a notice has been *published* pursuant to section 5.1.2.2.

Explanatory Note: Pursuant to section 5.1.2.2, the EMC has published a notice on 15 December 2003 stating that, from 1 January 2004, all interested parties can register their load facilities to provide reserve to the Singapore Wholesale Electricity Market. Pursuant to section 5.1.2.2, the EMC has also published a notice on 21 April 2016 stating that, from 28 April 2016, all interested parties can register their load

facilities to be scheduled for energy withdrawal for the purposes of load curtailment in the Singapore Wholesale Electricity Market, as contemplated in the Authority’s final determination paper titled “Implementing Demand Response in the National Electricity Market of Singapore” dated 28 October 2013.

- 5.1.3 Unless otherwise provided in section 5.1.4, 5.1.5 or 5.1.6, a person that intends to participate in the *real-time markets* or cause or permit a *physical service* to be conveyed into, through or out of the *transmission system* from a *generation facility* having a name-plate rating of less than 1 MW shall not be required to register that *generation facility* as a *registered facility* or a *generation settlement facility*. No such *generation facility* shall be subject to *dispatch* by the *PSO*, unless that *generation facility* is registered as a *generation registered facility*.

Explanatory Note: The name-plate rating of each given facility (including that of an intermittent generation facility) shall be its alternating current output capacity.

- 5.1.4 A person that intends to participate in the *real-time markets* or cause or permit a *physical service* to be conveyed into, through or out of the *transmission system* from any *generation facility* that is not an *intermittent generation facility*, which together with all other *generation facilities* that are not *intermittent generation facilities* at the same *generating station* (if any) have an aggregate name-plate rating of 10 MW or more, shall register all the *generation facilities* of such *generating station* as one or more *generation registered facilities* in accordance with Appendix 2B.
- 5.1.5 Unless otherwise provided in section 5.1.6 or 5.1.10, a person that intends to participate in the *real-time markets* or cause or permit a *physical service* to be conveyed into, through or out of the *transmission system* from any *generation facility* that is not an *intermittent generation facility*, which together with all other *generation facilities* that are not *intermittent generation facilities* at the same *generating station* (if any) have an aggregate name-plate rating of 1 MW or more but less than 10 MW, shall register all the *generation facilities* of such *generating station* as one or more *generation settlement facilities* in accordance with Appendix 2B.
- 5.1.6 Notwithstanding section 5.1.5, if a person intends that any one or more of the *generation facilities* at a *generating station* described in section 5.1.5 be subject to *dispatch* by the *PSO*, that person shall register such *generation facilities* as one or more *generation registered facilities* in accordance with Appendix 2B.
- 5.1.7 A person that intends to participate in the *real-time markets* or cause or permit a *physical service* to be conveyed into, through or out of the *transmission system* from one or more *intermittent generation facilities*

shall register such *intermittent generation facilities* as one or more *generation settlement facilities*, unless such registration requirements are waived by the *Authority*, not required pursuant to section 5.1.3, or if section 5.1.9, 5.1.9A or 5.1.10 applies.

Explanatory Note: The Authority has waived the above registration requirements for certain generation facilities of non-contestable consumers pursuant to the Authority's Assessment and Decision on Review of Policy on Generation with less than 1MW in Installed Capacity published on 28 February 2011.

5.1.8 Notwithstanding sections 5.1.3 to 5.1.7, a person, other than a *market support services licensee*, that intends to participate in the *real-time markets* or cause or permit a *physical service* to be conveyed into, through or out of the *transmission system* from a *generation facility* may first register such *generation facility* as a *commissioning generation facility* under section 5.3 in pursuance of the subsequent registration of the *generation facility* as a *generation registered facility* or a *generation settlement facility*.

5.1.9 A person that intends to participate in the *real-time markets* or cause or permit a *physical service* to be conveyed into, through or out of the *transmission system* from an embedded *intermittent generation facility* having a name-plate rating of less than 10 MW, may register such *generation facility* as a *non-exporting embedded intermittent generation facility*.

Explanatory Note: For the purposes of this section 5.1.9, intermittent generation facilities are embedded intermittent generation facilities only if they meet the eligibility conditions for embedded intermittent generation sources as specified in the Authority's Clarification Paper on Enhancements to the Regulatory Framework for Intermittent Generation Sources in the National Electricity Market of Singapore dated 24 February 2015.

5.1.9A A person that intends to participate in the *real-time markets* or cause or permit a *physical service* to be conveyed into, through or out of the *transmission system* from one or more *intermittent generation facilities* that are not embedded *intermittent generation facilities* having individual name-plate rating of less than 10 MW may register such *generation facilities* as a *generation settlement facility* pursuant to section 5.4C.

5.1.10 Notwithstanding section 5.1.5, but subject always to section 5.1.6, a *generation facility* (that is not an *intermittent generation facility*) referred to in section 5.1.5 or an *intermittent generation facility* referred to in section 5.1.7 may be comprised in a *generation settlement facility* that is registered by the *market support services licensee* in accordance with section 5.4A in

lieu of being registered as a *generation settlement facility* by a *market participant*.

5.1A REGISTRATION PROCESS

5.1A.1 Each applicable *market participant* shall apply for:

5.1A.1.1 the registration of its facility as a *registered facility* and the registration of a *market participant* as the *dispatch coordinator* for such facility in accordance with section 5.2;

5.1A.1.2 the registration of its facility as a *generation settlement facility* in accordance with section 5.4;

5.1A.1.2A the registration of its facility as a *generation settlement facility* in accordance with section 5.4C;

5.1A.1.3 the registration of its facility as a *commissioning generation facility* and, if the facility is required or intended to be registered as a *generation registered facility*, the registration of a *market participant* as the *dispatch coordinator* for such facility, in accordance with section 5.3; or

5.1A.1.4 the registration of its facility as a *non-exporting embedded intermittent generation facility* in accordance with section 5.4B,

as the case may be, and in accordance with the process described in the applicable *market manual*.

5.1A.2 A *market support services licensee* shall apply for the registration of

5.1A.2.1 one or more *intermittent generation facilities*; or

5.1A.2.2 one or more *generation facilities* (that are not *intermittent generation facilities*),

as a *generation settlement facility* in accordance with section 5.4A and the process described in the applicable *market manual*.

5.2 REGISTRATION OF GENERATION REGISTERED FACILITIES AND LOAD REGISTERED FACILITIES

5.2.1 [Deleted and Intentionally Left Blank]

- 5.2.2 The process referred to in section 5.1A.1.1 shall include the obligation to provide the certifications referred to in sections 5.2.4.5 and 5.2.4.6 and the testing and inspection obligations referred to in section 5.2.4.7.
- 5.2.3 A *market participant* may apply to register a facility as a *registered facility* for the delivery or withdrawal of specific *physical services* pursuant to the provisions of this section 5.2.
- 5.2.4 The *EMC* shall register a facility as a *registered facility* if:
- 5.2.4.1 the applying *market participant* submits:
- a. the registration information required by section 5.2;
 - b. a copy of the *connection agreement* entered into with the *transmission licensee* for the facility, unless the facility is an aggregation of multiple installations as described under section 1.1.3 of Chapter 4 (where applicable);
 - c. identification of the *physical services* intended to be provided from or withdrawn through the facility; and
 - d. a *standing offer* or *standing bid* for each *physical service* intended to be provided from or withdrawn through the facility as required under sections 5.1.1 to 5.1.3 or section 5.1A.1 of Chapter 6, respectively;
- 5.2.4.2 the *PSO*, upon referral of the application for registration by the *EMC*, advises the *EMC* that the facility for which registration is sought poses no threat to the *reliability* or *security* of the *PSO controlled system*;
- 5.2.4.3 the *EMC* is satisfied on reasonable grounds that the applying *market participant* has operational control and authority over the *registered facility*;
- 5.2.4.4 the *EMC*, after consulting with the *PSO*, is satisfied on reasonable grounds that the facility is capable of operating as described in the registration information or as otherwise provided by the *market rules*, any applicable *market manual* or the *system operation manual* or any additional requirements imposed pursuant to section 5.2.4.8 in respect of the relevant *physical service*;
- 5.2.4.5 the applying *market participant* certifies to the *EMC* that all of the facilities and equipment to which its application for registration relates comply with all applicable technical requirements, other than those referred to in section 8.2:

- a. set forth in these *market rules*, any applicable *market manual* or the *system operation manual* applicable to all *market participants*, the class of *market participant* of which the applying *market participant* forms part and the *wholesale electricity market* in which the applying *market participant* wishes to participate; and
 - b. imposed pursuant to section 5.2.4.8;
- 5.2.4.6 the applying *market participant* certifies to the *EMC* that it has adequate qualified employees or other personnel and organisational and other arrangements that are sufficient to enable the applying *market participant* to perform all of the functions and obligations applicable to *market participants* under:
- a. these *market rules*, any applicable *market manual* or the *system operation manual*, the class of *market participant* of which the applying *market participant* forms part and the *wholesale electricity market* in which the applying *market participant* wishes to participate; and
 - b. imposed pursuant to section 5.2.4.8,
- in respect of all of the facilities and equipment to which its application for registration relates;
- 5.2.4.7 the applying *market participant* successfully completes such testing and permits such inspection as the *EMC* may reasonably require for the purposes of testing or inspecting whether all of the facilities and equipment to which its application for registration relates meet all applicable technical requirements, other than those referred to in section 8.2:
- a. set forth in these *market rules*, any applicable *market manual* or the *system operation manual* applicable to all *market participants*, the class of *market participant* of which the applying *market participant* forms part and the *wholesale electricity market* in which the applying *market participant* wishes to participate; and
 - b. imposed pursuant to section 5.2.4.8; and
- 5.2.4.8 where the facility to which the application for registration relates is located outside of Singapore, the *EMC* is satisfied on reasonable grounds that the facility meets such additional requirements as may be imposed by the *EMC*.

- 5.2.5 The *market participant* designated in the registration information as the *market participant* authorised to submit *dispatch data* with respect to a *registered facility* shall be the *dispatch coordinator* for that *registered facility*. The *dispatch coordinator* designated for a *registered facility* may not be changed without the prior approval of the *EMC*.
- 5.2.6 The information required for registration as a *registered facility* shall, subject to any lesser information requirements that may be specified in the applicable *market manual* in respect of the registration of a given class or size of facility, include:
- 5.2.6.1 the identity of the owner and the operator of the facility;
 - 5.2.6.2 the identity of the proposed *dispatch coordinator* for the facility;
 - 5.2.6.3 information demonstrating that the proposed *dispatch coordinator* for the facility has the operational control necessary to assure delivery or withdrawal of the relevant *physical services* as described in the registration information;
 - 5.2.6.4 information demonstrating that the facility meets the *connection-related* requirements and the *metering-related* requirements set forth or referred to in Chapter 4;
 - 5.2.6.5 the location of the facility and the identity of the *RQM* that will measure the flow of energy between the facility and the *transmission system*; and
 - 5.2.6.6 such data as may be required by the *PSO* so as to satisfy the *PSO* that the operation of the facility will not have an unacceptable impact on the *reliability* or *security* of the *PSO controlled system* and that the *PSO* can *dispatch* the facility for the services that facility is registering to provide during both normal and emergency situations including, but not limited to, *standing capability data* for the facility.
- 5.2.7 The *EMC* shall, in addition to referring each application for registration of a facility as a *registered facility* to the *PSO*, provide the *PSO* with such additional technical information associated with any such application for registration as the *EMC* may determine appropriate or as the *PSO* may request for the purpose of the fulfilment by the *PSO* of its obligations under these *market rules*. The *EMC* shall provide the applicable *market support services licensee* with such metering-related information contained in or associated with any such application for registration as the *EMC* may determine appropriate or as the *market support services licensee* may request for the purpose of the fulfilment by the *market support services licensee* of its obligations under these *market rules* or the *metering code*.

5.3 REGISTRATION OF COMMISSIONING GENERATION FACILITIES

- 5.3.1 A *market participant* shall apply to register a *commissioning generation facility*:
- 5.3.1.1 if the facility is required or intended to be registered as a *generation registered facility* under section 5.1; or
- 5.3.1.2 if the facility is required or intended to be registered as a *generation settlement facility* under section 5.1, and is required to cause or permit any *physical service* to be conveyed into, through or out of the *transmission system*,
- on a transitional basis in accordance with the applicable *market manual* for the purpose of being permitted to convey a *physical service* into, through or out of the *transmission system* or of participating in the *real-time markets* during the period in which the *commissioning generation facility* is undergoing the commissioning tests referred to in section 5.3.4.
- 5.3.2 The *EMC* shall register a facility as a *commissioning generation facility* on a transitional basis if the *EMC* is satisfied that the requirements of the *market rules* and the applicable *market manual* have been met and shall issue to the *market participant* a notification of transitional registration. Each such registration shall expire on the earlier of:
- 5.3.2.1 the expected date of completion by the *commissioning generation facility* of the final commissioning test, being the later of:
- a. the date specified by the *market participant* in its commissioning test plans that have been submitted to and approved by the *PSO* pursuant to section 5.3.4; or
- b. such later date as may be requested by the *market participant* in accordance with the applicable *market manual* and approved by the *PSO* for completing the final commissioning test,
- in each case as communicated by the *PSO* to the *EMC*; or
- 5.3.2.2 upon the registration of the facility as a *generation registered facility* or *generation settlement facility*.
- 5.3.3 Upon expiry of the registration referred to in section 5.3.2, a *market participant* shall not participate in the *real-time markets* nor cause or permit any *physical service* to be conveyed into, through or out of the *transmission system* in respect of a former *commissioning generation facility* unless such

former *commissioning generation facility* has been registered in accordance with section 5.2 or 5.4.

5.3.4 Where a *commissioning generation facility* has been registered by the *EMC* pursuant to section 5.3.2, the *market participant* for that *commissioning generation facility* shall, while such registration is in effect:

5.3.4.1 ensure that the *commissioning generation facility*:

- a. except as may otherwise be provided in the notification of transitional registration applicable to the *commissioning generation facility*, complies with all of the provisions of the *market rules* applicable to *registered facilities*; and
- b. complies with any applicable *connection*-related requirements.

5.3.4.2 submit to the *PSO*, for approval and in accordance with section 5.3.5, information detailing the commissioning test plans for the *commissioning generation facility*.

5.3.5 The detailed commissioning test plans referred to in section 5.3.4.2 shall be submitted to the *PSO* for approval and shall, if determined by the *PSO* to be required, include:

5.3.5.1 the time required for the *commissioning generation facility* to *synchronise* to and *desynchronise* from the *PSO controlled grid*;

5.3.5.2 *energy* and reactive power output levels;

5.3.5.3 the timing of and ramp rates associated with changes in *energy* and reactive power output levels; and

5.3.5.4 run-back or trip tests for the *commissioning generation facility*.

5.3.6 Except as otherwise provided in this section 5.3 or in the notification of transitional registration applicable to the *commissioning generation facility*, where a *commissioning generation facility* has been registered by the *EMC* pursuant to section 5.3.2, the *EMC* shall, while such registration is in effect, other than for the purposes of section 3.7.3 of Chapter 5 and Appendix 5D, treat the *commissioning generation facility* as a:

5.3.6.1 *generation registered facility* for all purposes under these *market rules*, including with respect to the submission of *dispatch data* and *settlement*, where the application for the registration of such *commissioning generation facility* is made under section 5.3.1.1; or

5.3.6.2 *generation settlement facility* for all purposes under these *market rules*, where the application for the registration of such *commissioning generation facility* is made under section 5.3.1.2.

5.4 REGISTRATION OF GENERATION SETTLEMENT FACILITIES BY MARKET PARTICIPANTS

5.4.1 The process referred to in section 5.1A.1.2 shall include the obligation to provide the certifications referred to in sections 5.4.3.5 and 5.4.3.6 and the testing and inspection obligations referred to in section 5.4.3.7.

5.4.2 A *market participant* may apply to register a facility as a *generation settlement facility* for the delivery of *energy* only.

5.4.3 The *EMC* shall register a facility as a *generation settlement facility* if:

5.4.3.1 the applying *market participant* submits:

- a. the registration information required by this section 5.4; and
- b. a copy of the *connection agreement* entered into with the *transmission licensee* with respect to the facility;

5.4.3.2 the *PSO*, upon referral of the application for registration by the *EMC*, advises the *EMC* that the facility for which registration is sought poses no threat to the *reliability* or *security* of the *PSO controlled system*;

5.4.3.3 the *EMC* is satisfied on reasonable grounds that the applying *market participant* has operational control and authority over the *generation settlement facility*;

5.4.3.4 the *EMC*, after consulting with the *PSO*, is satisfied on reasonable grounds that the facility is capable of operating as described in the registration information or as otherwise provided by the *market rules*, any applicable *market manual* or the *system operation manual*;

5.4.3.5 the applying *market participant* certifies to the *EMC* that all of the facilities and equipment to which its application for registration relates comply with all applicable technical requirements, other than those referred to in section 8.2, set forth in these *market rules*, any applicable *market manual* or the *system operation manual* applicable to all *market participants*, the class of *market participant* of which the applying *market*

participant forms part and the *wholesale electricity market* in which the applying *market participant* wishes to participate;

- 5.4.3.6 the applying *market participant* certifies to the *EMC* that it has adequate qualified employees or other personnel and organisational and other arrangements that are sufficient to enable the applying *market participant* to perform all of the functions and obligations applicable to *market participants* under these *market rules*, any applicable *market manual* or the *system operation manual*, the class of *market participant* of which the applying *market participant* forms part and the *wholesale electricity market* in which the applying *market participant* wishes to participate in respect of all of the *facilities* and equipment to which its application for registration relates; and
 - 5.4.3.7 the applying *market participant* successfully completes such testing and permits such inspection as the *EMC* may reasonably require for the purposes of testing or inspecting whether all of the *facilities* and equipment to which its application for registration relates meet all applicable technical requirements, other than those referred to in section 8.2, set forth in these *market rules*, any applicable *market manual* or the *system operation manual* applicable to all *market participants*, the class of *market participant* of which the applying *market participant* forms part and the *wholesale electricity market* in which the applying *market participant* wishes to participate.
- 5.4.4 The information required for registration as a *generation settlement facility* shall, subject to any lesser information requirements that may be specified in the applicable *market manual* in respect of the registration of a given class or size of facility, include:
- 5.4.4.1 the identity of the owner and the operator of the facility;
 - 5.4.4.2 information demonstrating that the facility meets the *connection*-related requirements and the metering-related requirements set forth or referred to in Chapter 4;
 - 5.4.4.3 the location of the facility and the identity of the *RQM* that will measure the flow of energy between the facility and the *transmission system*; and
 - 5.4.4.4 such data as may be required by the *PSO* so as to satisfy the *PSO* that the operation of the facility will not have an unacceptable impact on the *reliability* or *security* of the *PSO controlled system*.

5.4.5 The *EMC* shall, in addition to referring each application for registration of a facility as a *generation settlement facility* to the *PSO*, provide the *PSO* with such additional technical information associated with any such application for registration as the *EMC* may determine appropriate or as the *PSO* may request for the purpose of the fulfilment by the *PSO* of its obligations under these *market rules*. The *EMC* shall provide the applicable *market support services licensee* with such metering-related information contained in or associated with any such application for registration as the *EMC* may determine appropriate or as the *market support services licensee* may request for the purpose of the fulfilment by the *market support services licensee* of its obligations under these *market rules* or the *metering code*.

5.4A REGISTRATION OF GENERATION SETTLEMENT FACILITIES BY A MARKET SUPPORT SERVICES LICENSEE

5.4A.1 The process referred to in section 5.1A.2 shall include the obligation to provide the relevant representations, warranties and undertakings referred to in section 5.4A.3 or 5.4A.3A, as applicable.

5.4A.2 A *market support services licensee* may apply to register a *generation facility* as a *generation settlement facility* for the delivery of *energy* only.

5.4A.3 The *EMC* shall register one or more *intermittent generation facilities* as a *generation settlement facility* if the applying *market support services licensee* represents, warrants and undertakes (as continuing representations, warranties and undertakings) to the *EMC* in writing that, at all times:

5.4A.3.1 such *generation settlement facility* shall be comprised only of embedded *intermittent generation facilities*;

Explanatory Note: For the purposes of this section 5.4A.3.1, intermittent generation facilities are embedded intermittent generation facilities only if they meet the eligibility conditions for embedded intermittent generation sources as specified in the Authority's Clarification Paper on Enhancements to the Regulatory Framework for Intermittent Generation Sources in the National Electricity Market of Singapore dated 24 February 2015.

5.4A.3.2 every *intermittent generation facility* as may from time to time be comprised in such *generation settlement facility* is for the purpose of *supplying electricity* to a contestable *consumer*;

- 5.4A.3.3 such *generation settlement facility* shall not be comprised of any *intermittent generation facility* directly or indirectly *connected* to a given substation of the *transmission licensee* (if any) for the purposes of *supplying electricity* to a given contestable consumer, if such *intermittent generation facility* together with all other *intermittent generation facilities* directly or indirectly *connected* to that given substation for the purposes of *supplying electricity* to that given contestable consumer, have an aggregate name-plate rating of 10 MW or more; and
- 5.4A.3.4 a *connection agreement* has been entered into (and remains in full force and effect) in respect of each *intermittent generation facility* as may from time to time be comprised in such *generation settlement facility*.
- 5.4A.3A The EMC shall register one or more *generation facilities* as a *generation settlement facility* if the applying *market support services licensee* represents, warrants and undertakes (as continuing representations, warranties and undertakings) to the EMC in writing that, at all times:
- 5.4A.3A.1 such *generation settlement facility* shall be comprised only of *generation facilities* that are not *intermittent generation facilities*;
- 5.4A.3A.2 such *generation settlement facility* shall be comprised only of *generation facilities* which are embedded *generation facilities*;
- Explanatory Note: For the purposes of this section 5.4A.3A.2, generation facilities are embedded generation facilities only if they meet the eligibility conditions for embedded generation facilities as specified in the Authority's Information Guide for Embedded Generation dated February 2014.**
- 5.4A.3A.3 every *generation facility* as may from time to time be comprised in such *generation settlement facility* is for the purpose of *supplying electricity* to a contestable consumer;
- 5.4A.3A.4 such *generation settlement facility* shall not be comprised of any *generation facility*, which together with all other *generation facilities* that are not *intermittent generation facilities* at the same *generating station* (if any), have an aggregate name-plate rating of 10 MW or more; and
- 5.4A.3A.5 a *connection agreement* has been entered into (and remains in full force and effect) in respect of each *generation facility* as may from time to time be comprised in such *generation settlement facility*.

- 5.4A.4 A *generation settlement facility* that is registered pursuant to section 5.4A.3 or 5.4A.3A shall be classified by the EMC as a *pseudo generation settlement facility*.

Explanatory Note: A generation facility is classified as a pseudo generation settlement facility by the EMC on the successful application by a market support services licensee for registration of a) one or more embedded intermittent generation facilities referred to in section 5.4A.3.1, or b) one or more embedded generation facilities referred to in section 5.4A.3A.2 (that are not intermittent generation facilities), as a generation settlement facility in accordance with section 5.4A.3 or 5.4A.3A respectively, where such generation settlement facility registration is sought for the purpose of the market support services licensee facilitating contestable consumers (who do not wish to participate directly in the wholesale electricity market as market participants) to supply energy produced from their generation facilities through the market support services licensee in the wholesale electricity market. The market energy price to be paid to the pseudo generation settlement facility will be the volume-weighted average market energy price of all generation registered facilities, calculated in accordance with section D.24.1.3 of Appendix 6D.

- 5.4A.5 A *market support services licensee* may, at any time and from time to time, add or remove one or more *generation facilities* to or from a *generation settlement facility* that is registered pursuant to section 5.4A.3 or 5.4A.3A. The *market support services licensee* shall ensure that all of its representations and warranties as set out in section 5.4A.3 or 5.4A.3A (as the case may be) remain true, accurate and complete, and that it continues to be in full compliance with all its undertakings as set out in section 5.4A.3 or 5.4A.3A (as the case may be), in respect to such *generation settlement facility* and all *generation facilities* for the time being comprised therein consequent to such addition or removal. For the purposes of sections 5.1.7, 5.1.7, 5.4A.3 and 5.4A.3A, a *generation facility* shall:

- 5.4A.5.1 upon its addition by the *market support services licensee* to such *generation settlement facility*, be deemed to be comprised in and duly registered as a part of such *generation settlement facility*; and
- 5.4A.5.2 upon its removal by the *market support services licensee* from such *generation settlement facility*, be deemed to cease being comprised in and duly registered as a part of such *generation settlement facility*.

5.4B REGISTRATION OF NON-EXPORTING EMBEDDED INTERMITTENT GENERATION FACILITIES

Explanatory note: A market participant may apply for its embedded intermittent generation facility with name-plate rating of less than 10MW to be registered as a non-exporting embedded intermittent generation facility, instead of a generation settlement facility which entails daily settlement. The market participant of a non-exporting embedded intermittent generation facility is allowed to pay the relevant market-related charges (“fixed market-related charge”) in advance. This charge is intended to reflect the charges that would have been payable if such facility were to be a non-exporting generation settlement facility that is classified as an embedded generation facility.

The methodology to determine the fixed market-related charge, together with the payment schedule, shall be approved by the Authority and published by the EMC.

- 5.4B.1 A *market participant* may apply to register a *generation facility* as a *non-exporting embedded intermittent generation facility*, if such facility is an embedded *intermittent generation facility* with name-plate rating of less than 10 MW. It shall be understood by the applying *market participant* that there will be no payment to *market participants* in respect of any *non-exporting embedded intermittent generation facility*, whether or not any *electricity* is injected into the *transmission system*.
- 5.4B.2 The *EMC* shall register a *generation facility* as a *non-exporting embedded intermittent generation facility* if:
- 5.4B.2.1 the applying *market participant* submits:
- a. the registration information required by this section 5.4B; and
 - b. a copy of the *connection agreement* entered into with the *transmission licensee* with respect to the facility;
- 5.4B.2.2 the applying *market participant* confirms that the facility is an embedded *intermittent generation facility* with name-plate rating of less than 10 MW;
- 5.4B.2.3 the *PSO*, upon referral of the application for registration by the *EMC*, advises the *EMC* that the facility for which registration is sought poses no threat to the *reliability* or *security* of the *PSO controlled system*;
- 5.4B.2.4 the *EMC* is satisfied on reasonable grounds that the applying *market participant* has operational control and authority over the *generation facility*;

- 5.4B.2.5 the *EMC*, after consulting with the *PSO*, is satisfied on reasonable grounds that the facility is capable of operating as described in the registration information or as otherwise provided by the *market rules*, any applicable *market manual* or the *system operation manual*;
- 5.4B.2.6 the applying *market participant* certifies to the *EMC* that all of the facilities and equipment to which its application for registration relates comply with all applicable technical requirements (other than those referred to in section 8.2) set forth in these *market rules*, any applicable *market manual* or the *system operation manual* applicable to all *market participants*, the class of *market participant* of which the applying *market participant* forms part and the *wholesale electricity market* in which the applying *market participant* wishes to participate;
- 5.4B.2.7 the applying *market participant* certifies to the *EMC* that it has adequate qualified employees or other personnel and organisational and other arrangements that are sufficient to enable the applying *market participant* to perform all of the functions and obligations applicable to *market participants* under these *market rules*, any applicable *market manual* or the *system operation manual*, the class of *market participant* of which the applying *market participant* forms part and the *wholesale electricity market* in which the applying *market participant* wishes to participate in respect of all of the facilities and equipment to which its application for registration relates;
- 5.4B.2.8 the applying *market participant* successfully completes such testing and permits such inspection as the *EMC* may reasonably require for the purposes of testing or inspecting whether all of the facilities and equipment to which its application for registration relates meet all applicable technical requirements (other than those referred to in section 8.2) set forth in these *market rules*, any applicable *market manual* or the *system operation manual* applicable to all *market participants*, the class of *market participant* of which the applying *market participant* forms part and the *wholesale electricity market* in which the applying *market participant* wishes to participate; and
- 5.4B.2.9 the applying *market participant* has paid the *fixed market-related charge* applicable to such *generation facility* to the *EMC* in accordance with the payment schedule approved by the *Authority* and published by the *EMC*.
- 5.4B.3 The information required for registration as a *non-exporting embedded intermittent generation facility* shall, subject to any lesser information requirements that may be specified in the applicable *market manual* in respect of the registration of a given class or size of facility, include:

- 5.4B.3.1 the identity of the owner and the operator of the facility;
 - 5.4B.3.2 information demonstrating that the facility meets the *connection*-related requirements;
 - 5.4B.3.3 the location of the facility; and
 - 5.4B.3.4 such data as may be required by the *PSO* so as to satisfy the *PSO* that the operation of the facility will not have an unacceptable impact on the *reliability* or *security* of the *PSO controlled system*.
- 5.4B.4 A *market participant* shall pay the *fixed market-related charge* applicable to each of its *non-exporting embedded intermittent generation facility* to the *EMC* in accordance with the payment schedule approved by the *Authority* and published by the *EMC*.

5.4C REGISTRATION OF PSEUDO GENERATION SETTLEMENT FACILITIES BY MARKET PARTICIPANTS

- 5.4C.1 The process referred to in section 5.1A.1.2A shall include the obligation to provide the relevant representations, warranties and undertakings referred to in section 5.4C.3.2, the certifications referred to in sections 5.4C.3.6 and 5.4C.3.7 and the testing and inspection obligations referred to in section 5.4C.3.8.
- 5.4C.2 A *market participant* may apply to register one or more facilities as a *generation settlement facility* in accordance with this section 5.4C for the delivery of *energy* only.
- 5.4C.3 The *EMC* shall register one or more *intermittent generation facilities* as a *generation settlement facility* in accordance with this section 5.4C if:
- 5.4C.3.1 the applying *market participant* submits the registration information required by this section 5.4C;
 - 5.4C.3.2 the applying *market participant* represents, warrants and undertakes (as continuing representations, warranties and undertakings) to the *EMC* in writing that, at all times:
 - a. such *generation settlement facility* shall be comprised only of *intermittent generation facilities* that are not embedded *intermittent generation facilities*;

Explanatory Note: For the purposes of this section 5.4C.3.2.a, intermittent generation facilities are embedded intermittent generation facilities only if they meet the eligibility conditions for embedded intermittent generation sources as specified in the Authority's Clarification Paper on Enhancements to the Regulatory Framework for Intermittent Generation Sources in the National Electricity Market of Singapore dated 24 February 2015.

- b. every *intermittent generation facility* as may from time to time be comprised in such *generation settlement facility* is directly connected to a *generating station*;
- c. such *generation settlement facility* shall not be comprised of any *intermittent generation facility* having a name-plate rating of 10 MW or more; and
- d. every *intermittent generation facility* as may from time to time be comprised in such *generation settlement facility* meets the *connection-related* requirements and the *metering-related* requirements set forth or referred to in Chapter 4;

5.4C.3.3 the *PSO*, upon referral of the application for registration by the *EMC*, advises the *EMC* that the facility for which registration is sought poses no threat to the *reliability* or *security* of the *PSO controlled system*;

5.4C.3.4 the *EMC* is satisfied on reasonable grounds that the applying *market participant* has operational control and authority over the *generation settlement facility*;

5.4C.3.5 the *EMC* is satisfied on reasonable grounds that the facility is capable of operating as described in the registration information or as otherwise provided by the *market rules*, any applicable *market manual* or the *system operation manual*;

5.4C.3.6 the applying *market participant* certifies (as continuing certifications) to the *EMC* in writing that, at all times, all of the facilities and equipment to which its application for registration relates comply with all applicable technical requirements, other than those referred to in section 8.2, set forth in these *market rules*, any applicable *market manual* or the *system operation manual* applicable to all *market participants*, the class of *market participant* of which the applying *market participant* forms part and the *wholesale electricity market* in which the applying *market participant* wishes to participate;

5.4C.3.7 the applying *market participant* certifies (as continuing certifications) to the *EMC* in writing that, at all times, it has adequate qualified employees or other personnel and organisational and other arrangements that are sufficient to enable the applying *market participant* to perform all of the functions and obligations applicable to *market participants* under these *market rules*, any applicable *market manual* or the *system operation manual*, the class of *market participant* of which the applying *market participant* forms part and the *wholesale electricity market* in which the applying *market participant* wishes to participate in respect of all of the facilities and equipment to which its application for registration relates; and

5.4C.3.8 the applying *market participant* successfully completes such testing and permits such inspection as the *EMC* may reasonably require for the purposes of testing or inspecting whether all of the facilities and equipment to which its application for registration relates meet all applicable technical requirements, other than those referred to in section 8.2, set forth in these *market rules*, any applicable *market manual* or the *system operation manual* applicable to all *market participants*, the class of *market participant* of which the applying *market participant* forms part and the *wholesale electricity market* in which the applying *market participant* wishes to participate.

- 5.4C.4 The information required for registration as a *generation settlement facility* in accordance with this section 5.4C shall, subject to any lesser information requirements that may be specified in the applicable *market manual* in respect of the registration of a given class or size of facility, include:
- 5.4C.4.1 the identity of the owner and the operator of the facility; and
 - 5.4C.4.2 such data as may be required by the *PSO* so as to satisfy the *PSO* that the operation of the facility will not have an unacceptable impact on the *reliability* or *security* of the *PSO controlled system*.
- 5.4C.5 The applying *market participant* shall provide the *PSO* with such additional technical information associated with any such application for registration as the *PSO* may request for the purpose of the fulfilment by the *PSO* of its obligations under these *market rules*. The applying *market participant* shall provide the applicable *market support services licensee* with such metering-related information contained in or associated with any such application for registration as the *market support services licensee* may request for the purpose of the fulfilment by the *market support services licensee* of its obligations under these *market rules* or the *metering code*.
- 5.4C.6 A *generation settlement facility* that is registered pursuant to this section 5.4C shall be classified by the *EMC* as a *pseudo generation settlement facility*.
- 5.4C.7 A *market participant* may, at any time and from time to time, apply to the *market support services licensee* to add or remove one or more *intermittent generation facilities* to or from a *generation settlement facility* that is registered in accordance with this section 5.4C. The *market support services licensee* shall add or remove such *intermittent generation facilities* to or from the *generation settlement facility* provided that:
- 5.4C.7.1 for additions or removals of an *intermittent generation facility* with name-plate rating of more than 1MW, the *market participant* submits the approved *standing capability data* of that *intermittent generation facility* by the *PSO* to the *market support services licensee*; and

5.4C.7.2 the *market support services licensee* is satisfied that such addition or removal will not have an unacceptable impact on the fulfilment by the *market support services licensee* of its obligations under the *market rules* or the *metering code*.

The *market participant* shall ensure that all of its representations and warranties as set out in section 5.4C.3.2 remain true, accurate and complete, and that it continues to be in full compliance with all its undertakings as set out in section 5.4C.3.2, in respect to such *generation settlement facility* and all *intermittent generation facilities* for the time being comprised therein consequent to such addition or removal. For the purposes of sections 5.1.9A and 5.4C, an *intermittent generation facility* shall:

5.4C.7.3 upon its addition by the *market support services licensee* to such *generation settlement facility*, be deemed to be comprised in and duly registered as a part of such *generation settlement facility*; and

5.4C.7.4 upon its removal by the *market support services licensee* from such *generation settlement facility*, be deemed to cease being comprised in and duly registered as a part of such *generation settlement facility*.

5.4C.8 The *market participant* shall notify the *EMC* and the *PSO* in writing in respect of such additions and removals made pursuant to section 5.4C.7, and provide the *EMC* and the *PSO* with the latest maximum *generation capacity* of such *generation settlement facility* in a timely manner.

5.5 CLASSIFICATION OF GENERATION FACILITIES REGISTERED BY MARKET PARTICIPANTS AS EMBEDDED GENERATION FACILITIES

Explanatory Note:

- (1) An electricity licensee holding a relevant electricity licence, or a person exempt from the obligation to hold a relevant electricity licence, under the Electricity Act who intends to install a generation facility principally to generate and supply electricity to its load facilities, or such other load facilities, as the Authority may permit may apply to the Authority for approval for that generation facility to be classified by the EMC as an embedded generation facility and to be assigned to an EGF group. Guidance on when the Authority will grant such approval may be found in the Authority's Information Guide for Embedded Generation dated February 2014. If the EMC is notified by the Authority that such approval is granted by the Authority, the EMC shall classify that generation facility as an embedded generation facility and effect such assignment in accordance with the market rules. When so classified and assigned, that generation facility will be eligible to receive net treatment on certain non-reserve charges (i.e. MEUC, the PSO's fees and the EMC's fees) under Chapter 7 of the market rules.**
- (2) An electricity licensee holding a relevant electricity licence, or a person exempt from the obligation to hold a relevant electricity licence, under the Electricity Act may also apply to the Authority for approval for a group of one or more generation facilities to be granted price neutralisation. If the EMC is notified by the Authority that such approval is granted by the Authority, the EMC shall grant price neutralisation to that group in accordance with the market rules.**
- (3) All of the foregoing applications to the Authority for its approvals will be subject to such procedures, requirements, terms and conditions as the Authority may from time to time impose or prescribe.**
- (4) The EMC will cease the classification of a generation facility as an embedded generation facility and its assignment to an EGF group, and/or the grant of price neutralisation to that EGF group, if conditions set out in section 5.5.10.1 and/or section 5.5.11.1 (as the case may be) cease to be satisfied or if the Authority notifies the EMC of the Authority's approval(s) for such cessation(s).**

- 5.5.1 If the *EMC* receives notification from the *Authority* of the *Authority's* approval for a *generation facility* to be classified as an *embedded generation facility* and assigned to an *EGF group*, the *EMC* shall, subject to sections 5.5.2, 5.5.3 and 5.5.4, effect such classification and assignment of that *generation facility* as stated in such notification from the *Authority*:

- 5.5.1.1 upon the registration of that *generation facility* as a *commissioning generation facility*, a *generation registered facility* or a *generation settlement facility*, if at the date of the *EMC's* receipt of such notification from the *Authority*:
- a. an application had been submitted for that *generation facility* to be so registered; and
 - b. such application was then still pending; or
- 5.5.1.2 within ten *business days* from the date of the *EMC's* receipt of such notification from the *Authority*, if at the date of the *EMC's* receipt of such notification from the *Authority*, the *generation facility* is already registered as a *commissioning generation facility*, a *generation registered facility* or a *generation settlement facility*.
- 5.5.1A Notwithstanding section 5.5.1, the *EMC* may, subject to sections 5.5.2 and 5.5.3, classify an *intermittent generation facility* as an *embedded generation facility* and assign it to an *EGF group* upon the registration of that *intermittent generation facility* as a *generation settlement facility*, if that *intermittent generation facility* comprises only of embedded *intermittent generation facilities*, and such *generation settlement facility* is not one which is registered as such under section 5.4A.3.
- Explanatory Note: For the purposes of this section 5.5.1A, intermittent generation facilities are embedded intermittent generation facilities only if they meet the eligibility conditions for embedded intermittent generation sources as specified in the Authority's Clarification Paper on Enhancements to the Regulatory Framework for Intermittent Generation Sources in the National Electricity Market of Singapore dated 24 February 2015.**
- 5.5.2 Notwithstanding section 5.5.1 or 5.5.1A, the classification and assignment in respect of a *generation facility* of any person under sections 5.5.1 or 5.5.1A shall be subject to:
- 5.5.2.1 that person at all times being a *market participant*; and
 - 5.5.2.2 that *generation facility* at all times being either a *commissioning generation facility*, a *generation registered facility* or a *generation settlement facility* of such *market participant*.
- 5.5.3 Notwithstanding any other provision in this section 5.5, the *EMC* shall not put into effect any classification, assignment or grant under sections 5.5.1, 5.5.1A, 5.5.6 or 5.5.7 earlier than the date notified by the *market support services licensee* to the *EMC* as being the date by which the *market support services licensee* will be ready to provide the *EMC* with all relevant

settlement data as may be required, if and when such classification, assignment or grant (as the case may be) is effective, under the *market rules*.

5.5.4 Notwithstanding section 5.5.1, the *EMC* shall only effect the classification and assignment in respect of a *generation facility* under section 5.5.1 if, in the *Authority's* notification to the *EMC* referred to in section 5.5.1 in respect of that *generation facility*:

5.5.4.1 that *generation facility* is to be assigned to a group which contains only *embedded generation facilities*; and

5.5.4.2 all *generation facilities* assigned or to be assigned to that group are all *generation facilities* of the same *market participant*.

5.5.5 Upon the classification of a *market participant's generation facility* as an *embedded generation facility* and its assignment to an *EGF group* under section 5.5.1 or 5.5.1A:

5.5.5.1 consumption of *electricity* by that *market participant's load facilities*, or such other *load facilities*, as the *Authority* may permit shall be assigned as the associated *load* of that *EGF group*; and

5.5.5.2 the associated *load* of that *EGF group* shall be associated with the *settlement account* of that *market participant* for that *EGF group*, another *market participant's settlement account*, or a combination of two or more such *settlement accounts*.

5.5.6 If the *EMC* receives notification from the *Authority* of the *Authority's* approval for a group of one or more *generation facilities* to be granted *price neutralisation*, and if an *EGF group* has not yet been created for all such *generation facilities* at the date of the *EMC's* receipt of such notification from the *Authority*, the *EMC* shall, subject to section 5.5.3, grant *price neutralisation* to that group with effect on and from the date of creation of that *EGF group*.

5.5.6A Notwithstanding section 5.5.6, the *EMC* may grant *price neutralisation* to an *EGF group* created under section 5.5.1A with effect on and from the date of creation of that *EGF group*.

5.5.7 If the *EMC* receives notification from the *Authority* of the *Authority's* approval for an existing *EGF group* to be granted *price neutralisation*, the *EMC* shall, subject to section 5.5.3, grant *price neutralisation* to that *EGF group* with effect on and from a date falling within ten *business days* from the date of the *EMC's* receipt of such notification from the *Authority*.

- 5.5.8 In this section 5.5, the reference to the creation of an *EGF group* is a reference to the assignment of the first *embedded generation facility* to such *EGF group*.
- 5.5.9 A *market participant* shall, as long as its *generation facility* is classified by the *EMC* as an *embedded generation facility* and assigned to an *EGF group*, ensure that the associated *load* of that *EGF group* in each successive 12-month period (the first of such 12-month periods shall commence from the day that the first *embedded generation facility* in that *EGF group* is classified by the *EMC* as an *embedded generation facility* and assigned to that *EGF group*) is at least half of the *generation* of that *EGF group* in the same 12-month period.
- 5.5.9A This section 5.5.9 does not apply to *generation facilities* that are classified by the *EMC* as *embedded generation facilities* under section 5.5.1A.
- 5.5.10 The *EMC* shall cease the classification of a *generation facility* as an *embedded generation facility* and its assignment to an *EGF group*:
- 5.5.10.1 if any of the conditions in section 5.5.2 ceases to be met; or
- 5.5.10.2 no later than ten *business days* after the *EMC* receives a notification from the *Authority* of the *Authority's* approval for such cessation.

Explanatory Note: If the registration of an embedded generation facility is transferred from a market participant to another market participant, the EMC will cease to classify that facility as an embedded generation facility and its assignment to its then assigned EGF group. This does not prevent the transferee market participant from seeking fresh approval from the Authority for that facility to be classified as an embedded generation facility of the transferee or assignment to an EGF group.

- 5.5.11 The *EMC* shall cease the grant of *price neutralisation* to an *EGF group*:
- 5.5.11.1 if there ceases to be any *embedded generation facility* assigned to that *EGF group*; or
- 5.5.11.2 no later than ten *business days* after the *EMC* receives a notification from the *Authority* of the *Authority's* approval for such cessation.

Explanatory Note: If the registration of an embedded generation facility is transferred from a market participant to another market participant, the EMC will cease to classify that facility as an embedded generation facility and its assignment to its then assigned EGF group.

If that EGF group has been granted price neutralisation, the cessation of assignment of that generation facility to that EGF group will also mean that any price neutralisation which may be granted to the EGF group will no longer include such generation facility. The foregoing does not prevent the transferee market participant from seeking fresh approvals from the Authority for that facility to be classified as an embedded generation facility of the transferee, and assigned to an EGF group, and for the grant of price neutralisation to that EGF group.

- 5.5.12 To the extent that a *generation facility* had been classified as a *non-injecting generation facility* (as defined in the *market rules* effective immediately before 28 June 2011) effective immediately before 28 June 2011, such *generation facility* shall be deemed to be classified as an *embedded generation facility* and assigned to an *EGF group* under section 5.5.1 with effect on and from 28 June 2011 until cessation of classification and assignment is required under section 5.5.10.
- 5.5.13 To the extent that a *generation facility* had been classified as an embedded *generation facility* and authorised and assigned to a group for the purposes of price neutralisation under the *market rules* effective immediately before 28 June 2011, then with effect on and from 28 June 2011:
- 5.5.13.1 that *generation facility* shall be deemed to be an *embedded generation facility* to which the *EMC* has assigned to the aforementioned group as an *EGF group* until cessation of classification and assignment is required under section 5.5.10; and
- 5.5.13.2 that *EGF group* shall be granted *price neutralisation* until cessation of grant of *price neutralisation* is required under section 5.5.11.

5.5A CLASSIFICATION OF PSEUDO GENERATION SETTLEMENT FACILITIES AS EMBEDDED GENERATION FACILITIES

- 5.5A.1 Notwithstanding the provisions in section 5.5, the *EMC* shall classify a *pseudo generation settlement facility* as an *embedded generation facility* and assign it to an *EGF group* upon the classification of that *generation facility* as a *pseudo generation settlement facility*.
- 5.5A.2 Upon the classification of a *pseudo generation settlement facility* as an *embedded generation facility* and its assignment to an *EGF group* under section 5.5A.1:
- 5.5A.2.1 consumption of *electricity* by the *load facilities* of the contestable *consumers* who are owners or lessees of the *generation facilities* comprising the *pseudo generation*

settlement facility shall be assigned as the associated *load* of that *EGF group*; and

- 5.5A.2.2 the associated *load* of that *EGF group* shall be associated with either the *settlement account* of that *market support services licensee* for that *EGF group*, a *settlement account of a market participant*, or a combination of two or more such *settlement accounts*.
- 5.5A.3 Upon the classification of a *pseudo generation settlement facility* as an *embedded generation facility* and its assignment to an *EGF group* under section 5.5A.1, the *EMC* shall grant *price neutralisation* to that *EGF group*.
- 5.5A.4 Upon the classification of a *pseudo generation settlement facility* as an *embedded generation facility* and its assignment to an *EGF group* under section 5.5A.1, the *EMC* shall grant *net AFP treatment* to that *EGF group* if the *market support services licensee* for that *EGF group* represents, warrants and undertakes (as continuing representations, warranties and undertakings) to the *EMC* in writing that, at all times:
- 5.5A.4.1 every *intermittent generation facility* as may from time to time be comprised in such *pseudo generation settlement facility* is for the purpose of *supplying electricity to residential premises*; and
- 5.5A.4.2 such *pseudo generation settlement facility* shall not be comprised of any *intermittent generation facility* directly or indirectly *connected* to a given substation of the *transmission licensee* (if any) for the purposes of *supplying electricity* to a given contestable *consumer*, if such *intermittent generation facility* together with all other *intermittent generation facilities* directly or indirectly *connected* to that given substation for the purposes of *supplying electricity* to that given contestable *consumer*, have an aggregate name-plate rating of 1 MW or more.

5.6 PUBLICATION OF FACILITY DATA

- 5.6.1 The *EMC* shall establish, maintain, update and *publish* a list containing the information specified in sections 5.6.2 and 5.6.3.
- 5.6.2 The list referred to in section 5.6.1 shall contain the following information most currently available to the *EMC* in respect of each *generation facility* registered with the *EMC* under sections 5.2, 5.3, 5.4, 5.4A and 5.4C:
- 5.6.2.1 the identity of the *market participant* or *market support services licensee* in respect of which such *generation facility* is registered;

- 5.6.2.2 the identity of such *generation facility*;
 - 5.6.2.3 the type of registration of such *generation facility*, that is whether such *generation facility* is registered as a:
 - a. *generation registered facility*;
 - b. *commissioning generation facility*; or
 - c. *generation settlement facility*;
 - 5.6.2.4 whether such *generation facility* is classified as an *embedded generation facility*;
 - 5.6.2.5 the type of *generation facility*;
 - 5.6.2.6 the maximum *generation capacity* of such *generation facility*;
 - 5.6.2.7 the maximum *reserve capacity* for each *reserve class* that such *generation facility* is registered to provide;
 - 5.6.2.8 the maximum *regulation capacity* that such *generation facility* is registered to provide;
 - 5.6.2.9 whether such *generation facility* is frequency responsive, that is, whether it has a positive maximum *reserve capacity* for primary *reserve*; and
 - 5.6.2.10 the minimum stable load level registered for such *generation facility*, if any.
- 5.6.3 The list referred to in section 5.6.1 shall contain the following information (where applicable) most currently available to the *EMC* in respect of each *load registered facility*:
- 5.6.3.1 the identity of the *market participant* under which such *load registered facility* is registered;
 - 5.6.3.2 the identity of such *load registered facility*;
 - 5.6.3.3 the maximum *reserve capacity* for each *reserve class* that such *load registered facility* is registered to provide; and
 - 5.6.3.4 the maximum *load curtailment capacity* in respect of such *load registered facility* if it is an *LRF with REB*.

Explanatory Note: Load curtailment, in respect of an LRF with REB, refers to the reduction in the withdrawal of energy (from the transmission system and/or from an embedded generation facility otherwise than through the transmission system) in a dispatch period

by such load registered facility based on the load registered facility's restricted energy bid submission to the EMC for that same dispatch period. It is generally calculated as the difference between the quantity in the load registered facility's restricted energy bid submitted and the quantity of energy scheduled to be withdrawn as aforesaid by such load registered facility in a dispatch period.

- 5.6.4 The *EMC* shall establish, maintain, update and *publish* a list containing the following information in respect of each *non-exporting embedded intermittent generation facility*:
- 5.6.4.1 the identity of the *market participant* under which such *non-exporting embedded intermittent generation facility* is registered;
 - 5.6.4.2 the identity of such *non-exporting embedded intermittent generation facility*; and
 - 5.6.4.3 the name-plate rating of such *non-exporting embedded intermittent generation facility*.

6 CANCELLATION AND TRANSFER OF REGISTRATION OF FACILITIES

6.1 CANCELLATION OF REGISTRATION

- 6.1.1 If a *market participant* wishes to cancel the registration of a *registered facility*, it shall:
- 6.1.1.1 file with the *EMC* a request to cancel the registration of the facility in the form specified in the applicable *market manual*; and
 - 6.1.1.2 at the same time provide a copy of the request to each of the *transmission licensee* and the *PSO*.
- 6.1.2 The *PSO* shall determine if a technical assessment of the impact of the cancellation of the registration of a *registered facility* on the *reliability* or *security* of the *PSO controlled system* is required. Such determination shall be made within ten *business days* of the *PSO's* receipt of a request to cancel the registration of the *registered facility*. The *PSO* shall notify the relevant *market participant* of its determination.
- 6.1.3 If the *PSO* determines that a *technical assessment* of a *market participant's registered facility* is required and notifies the *market participant* of its determination, it shall also indicate the expected completion date of the *technical assessment*. This date shall be no later than 45 days from the date that the *PSO* notifies that *market participant* of the determination, or such later date that the *PSO* and the *market participant* may agree.
- 6.1.4 If the *PSO* conducts a *technical assessment* of a *market participant's registered facility* and concludes that the cancellation of the registration of that *registered facility*:
- 6.1.4.1 will not, or is unlikely to, have an unacceptable impact on the *reliability* or *security* of the *PSO controlled system*, it shall notify the *market participant* of this conclusion; or
 - 6.1.4.2 will, or is likely to, have an unacceptable impact on the *reliability* or *security* of the *PSO controlled system*, the *PSO* and the *market participant* shall begin the process described in section 8.5 of Chapter 5 with a view to concluding a *reliability must-run service* contract for that *registered facility*. The registration of that *registered facility* shall not be cancelled during this process.

- 6.1.5 A *market participant* shall file with the *EMC* a notice stating the date that it wishes the *EMC* to cancel the registration of its *registered facility* if:
- 6.1.5.1 the *PSO* notifies that *market participant* that a *technical assessment* of that *registered facility* is not required under section 6.1.2; or
 - 6.1.5.2 the *PSO* conducts a *technical assessment* and notifies that *market participant* under section 6.1.4.1 that the cancellation of the registration of that relevant *registered facility* will not, or is not likely to, have an unacceptable impact on the *reliability* or *security* of the *PSO controlled system*.
- The date stated shall be at least five *business days* after the date of the *market participant's* receipt of the notice described in section 6.1.5.1 or 6.1.5.2.
- 6.1.6 The *EMC* shall cancel the registration of a *market participant's registered facility* if that *market participant* files a notice in respect of that *registered facility* with the *EMC* in accordance with section 6.1.5. The date of such cancellation shall be the date stated in such notice.
- 6.1.7 The *EMC* shall notify a *market participant*, the *market support services licensee*, the *transmission licensee* and the *PSO* of the cancellation of registration of the *market participant's registered facility*.

6.2 TRANSFER OF REGISTRATION

- 6.2.1 A *market participant* that wishes to transfer the registration of a *registered facility* ("transferor") to another person shall file with the *EMC* a request to transfer the registration of that *registered facility*, and shall at the same time provide a copy of that request to the *transmission licensee* and the *PSO*. That request shall:
- 6.2.1.1 be filed with the *EMC* at least ten *business days* before the transfer is proposed to take effect;
 - 6.2.1.2 be in the form required by the applicable *market manual*;
 - 6.2.1.3 state the identity of the proposed transferee which shall, as at the date of that request, be either:
 - (a) a *market participant*, and not a *suspended market participant*; or

- (b) a *participation applicant* which, to the *EMC*'s satisfaction, is likely to be able to meet, on or before the date that the transfer is proposed to take effect, all the requirements in section 1.2.2 and the applicable *market manual*, for registration by the *EMC* as a *market participant*;
- 6.2.1.4 state the date that the transfer is proposed to take effect; and
- 6.2.1.5 be accompanied by a written declaration and undertaking by the proposed transferee, in such form as may be prescribed by the *EMC*, stating (among other things) that, with effect on and from the date of the transfer of the registration under section 6.2.2 of the *registered facility* to which that request relates:
- (a) it is willing and able to assume, and will assume, control of the *registered facility*; and
- (b) it will comply with all provisions of these *market rules*, and any *contracted ancillary services* contract, as applicable to the *registered facility*, as if the proposed transferee is the transferor.
- 6.2.2 If the conditions in section 6.2.3 are satisfied, the *EMC* shall, on the effective date of transfer, transfer the registration of a *registered facility* for which a request has been filed under section 6.2.1.
- For the purposes of sections 6.2.2 and 6.2.3, "effective date of transfer", in relation to the transfer of the registration of a *registered facility* for which a request has been filed under section 6.2.1, means the later of:
- 6.2.2.1 the date referred to in section 6.2.1.4; or
- 6.2.2.2 the 10th *business day* from when the *EMC* is satisfied that the request satisfies all the requirements of section 6.2.1 and of the applicable *market manual* (other than the conditions referred to in section 6.2.3),
- unless the *EMC* has agreed with the transferor and the proposed transferee to effect such transfer on a different date, in which case "effective date of transfer" shall mean such agreed date.
- 6.2.3 Notwithstanding section 6.2.2, the *EMC* shall only transfer the registration of a registered facility if, on the effective date of transfer, the *EMC* is satisfied that the proposed transferee:
- (a) is a *market participant* and is not a *suspended market participant*; and

(b) has satisfied all other conditions prescribed in the applicable *market manual*, being conditions which are required to be satisfied by the proposed transferee on the effective date of transfer.

6.2.4 The *EMC's* communication regarding its satisfaction of the matters referred to in section 6.2.1.3 (b) shall be regarded merely as a statement of its own belief, and the *EMC* shall have no liability whatsoever to any person for any reliance upon such communication. No communication by the *EMC* regarding its satisfaction of the matters referred to in section 6.2.1.3(b) shall be regarded as (i) the *EMC's* endorsement of the proposed transferee; (ii) a representation, warranty or assurance that the proposed transferee will fulfill the requirements referred to in section 6.2.1.3(b); or (iii) a representation, warranty or assurance that the proposed transferee will be registered as a *market participant*.

6.3 APPLICABILITY TO GENERATION SETTLEMENT FACILITY AND NON-EXPORTING EMBEDDED INTERMITTENT GENERATION FACILITY

6.3.1 All references in section 6 to a *registered facility* shall also include references to a *generation settlement facility* and a *non-exporting embedded intermittent generation facility*.

7 PRUDENTIAL REQUIREMENTS

7.1 PURPOSE AND GENERAL MARKET PARTICIPANT OBLIGATION

- 7.1.1 This section 7 sets forth the nature and amount of *credit support* that must be provided by *market participants* as a condition of participation in the *real-time markets* or of causing or permitting a *physical service* to be conveyed into, through or out of the *transmission system* and the manner in which *market participants* must provide and maintain such *credit support* on an on-going basis in order to protect the *EMC* and other *market participants* from payment defaults.
- 7.1.2 Each *market participant* shall initially and continually satisfy the obligations set forth in this section 7 with regard to the provision of *credit support* as a condition of transacting in the *real-time markets* or of causing or permitting a *physical service* to be conveyed into, through or out of the *transmission system*.
- 7.1.3 This section 7 does not apply to the *transmission licensee*.
- 7.1.4 This section 7 applies to a *market support services licensee* that has been granted authorisation to participate by the *EMC* pursuant to section 3 and, for such purposes, all references in this section 7 to a *market participant* shall be deemed to include references to a *market support services licensee*, provided that specific provisions in respect of a *market support services licensee* shall prevail if there is any conflict with such deemed references.

7.2 CURRENT EXPOSURE AND ESTIMATED NET EXPOSURE

- 7.2.1 A *market participant's* current exposure shall be determined by the *EMC* each *business day* and shall be a dollar amount determined in accordance with the procedure specified in the *market manual*.
- 7.2.2 A *market participant's* estimated net exposure shall be determined by the *EMC* each *business day* and shall be a dollar amount determined in accordance with the procedure specified in the *market manual*.

7.3 ESTIMATED AVERAGE DAILY EXPOSURE AND CREDIT SUPPORT VALUE

- 7.3.1 Each *participation applicant* shall provide to the *EMC*, in or with its *participant registration application* or as may otherwise be required by the *EMC*, the estimated average daily exposure (as defined in the applicable

market manual) and any other information as the *EMC* may reasonably require, for the purpose of determining the *participation applicant's credit support value* that will apply immediately when it begins participating in the *wholesale electricity market*.

- 7.3.2 A *market participant* who intends to participate in the *wholesale electricity market* shall determine and provide *credit support* to the *EMC* in accordance with the form as specified in section 7.6.2 that is thirty-eight (or in the case of a *market support services licensee*, thirty-three) times the estimated average daily exposure (as defined in the applicable *market manual*) of the *market participant*. For the avoidance of doubt, the *credit support value* of a *market participant* shall be calculated in accordance with the following formula:

Credit Support Value = Estimated Average Daily Exposure x38 days (or 33 days, in the case of a *market support services licensee*)

Explanatory Note: The increased duration in the calculation of a market participant's credit support value, as compared to a market support services licensee, is to account for customer transfer lead time if a market participant loses its ability to participate in the wholesale electricity market without making prior arrangements for continuity of supply. Such lead time does not apply to a market support services licensee.

- 7.3.3 As and when necessary in the sole and absolute discretion of the *EMC*, the *EMC* will review and revise the *credit support value* required of each *market participant* in accordance with section 7.3.2. The *EMC* shall promptly notify the *market participant* of any such revision in its *credit support value*. Any revision to a *market participant's credit support value* shall apply with effect from such time, not being earlier than the time of notification to the *market participant* of the revised *credit support value*, as the *EMC* may specify in the notice.
- 7.3.4 Unless otherwise provided in section 7.3.5, a *market participant* who has received notification from the *EMC* that its *credit support value* has been revised as a result of an increase in the *market participant's credit support value* pursuant to section 7.3.3, shall, within 5 *business days* of the time when the revised *credit support value* becomes effective in accordance with section 7.3.3, provide to the *EMC* revised *credit support* in accordance with the form as specified in section 7.6.2.
- 7.3.5 A *market participant*:

7.3.5.1 who has received notification from the *EMC* that its *credit support value* has been revised as a result of an increase in the *market participant's credit support value* pursuant to section 7.3.3; and

7.3.5.2 whose estimated net exposure reaches a value equal to or greater than fifty-five (or sixty, in the case of a *market support services licensee*) percent of the value of the *credit support* currently provided by that *market participant*,

shall, by the close of banking business of the bank at which the *EMC's bank accounts* are held on the second *business day* following the date of the notification issued under section 7.3.3, provide to the *EMC* revised *credit support* in accordance with the form as specified in section 7.6.2, without prejudice to its obligations under sections 7.4 and 7.5.

7.4 **MARGIN CALLS**

7.4.1 The *EMC* shall notify a *market participant* when the estimated net exposure of the *market participant* reaches forty-five (or fifty, in the case of a *market support services licensee*) percent of the value of the *credit support* currently provided by that *market participant*.

7.4.2 The *EMC* shall issue a margin call to a *market participant* when the estimated net exposure of the *market participant* reaches a value equal to or greater than fifty-five (or sixty, in the case of a *market support services licensee*) percent of the value of the *credit support* currently provided by that *market participant*.

7.4.3 Upon a *market participant's* receipt of a margin call under section 7.4.2, if such *market participant* has a reasonable basis for believing that there is a manifest error in the determination of its estimated net exposure by the *EMC* for the purposes of section 7.4.2 and that such error if absent,

7.4.3.1 would not have required the issuance of such margin call by the *EMC* under section 7.4.2; and/or

7.4.3.2 would have resulted in its estimated net exposure (if correctly determined) to be either greater than 110%, or lesser than 90%, of its estimated net exposure originally determined for the purposes of section 7.4.2,

that *market participant* may request the *EMC* to reassess its estimated net exposure. Such request for reassessment shall be made in such form as may be specified in the applicable *market manual* and shall clearly state, with supporting material, the nature of such error and the proposed correction to the relevant estimated net exposure. All requests for reassessments shall be made to the *EMC* no later than 12pm on the first *business day* following the date of such margin call issued by the *EMC* under section 7.4.2.

Explanatory Note: Manifest errors in the determination of a market participant's estimated net exposure can be caused by metering, human input or system calculation errors.

- 7.4.4 The *EMC* shall consider the merits of each request for reassessment of estimated net exposure made to the *EMC* in accordance with section 7.4.3, and notify the *market participant* to which such request relates, by no later than the end of the first *business day* following the date of the relevant margin call issued by the *EMC* under section 7.4.2 to which such request for reassessment relates, that:
- 7.4.4.1 such margin call is revoked, if the *market participant's* reassessed estimated net exposure is less than fifty-five (or sixty, in the case of a *market support services licensee*) percent of the value of the *credit support* currently provided by the *market participant*. In this case, if the *market participant* has received notification from the *EMC* that its *credit support value* has been revised as a result of an increase in the *market participant's credit support value* pursuant to section 7.3.3, section 7.3.4 shall apply in relation to its obligation to provide to the *EMC* revised *credit support* in accordance with the form as specified in section 7.6.2;
- 7.4.4.2 (except where section 7.4.4.1 applies) such margin call is to be revised (together with the particulars of such revision) if the *market participant's* reassessed estimated net exposure is either greater than 110%, or lesser than 90%, of its estimated net exposure originally determined for the purposes of section 7.4.2; or
- 7.4.4.3 the *EMC* will take no further action and such margin call shall continue to apply if neither section 7.4.4.1 nor section 7.4.4.2 applies. In this case, the *EMC* shall not be obliged to carry out any further reassessment of such estimated net exposure.
- 7.4.5 Where the *market participant's* estimated net exposure is reassessed, and consequently, its margin call is also revised by the *EMC*, under section 7.4.4.2, then all references in section 7.5.1 to “estimated net exposure” and “estimated net exposure, determined at the time the margin call was issued”

in respect of that *market participant* shall be deemed to be references to the estimated net exposure as so reassessed under section 7.4.4.

7.5 MARGIN CALL REQUIREMENTS

7.5.1 Subject to section 7.4.5, a *market participant* must satisfy a margin call (if not revoked by the *EMC*) within the time prescribed in section 7.5.2 by:

7.5.1.1 providing to the *EMC credit support* or additional *credit support* in the form as specified in section 7.6.2 such that the *market participant's* estimated net exposure determined at the time the margin call was issued is no greater than thirty-five (or forty, in the case of a *market support services* licensee) percent of the total value of the *credit support* provided to the *EMC* by the *market participant*; or

7.5.1.2 prepaying such amount to the *EMC* as would be sufficient to reduce the *market participant's* estimated net exposure to a value no greater than thirty-five (or forty, in the case of a *market support services* licensee) percent of the value of the *credit support* provided to the *EMC* by that *market participant*.

7.5.2 The time within which a margin call (unless revoked by the *EMC*) must be satisfied under section 7.5.1 shall be the close of banking business of the bank at which the *EMC's bank accounts* are held on the second *business day* following the date of the margin call issued under section 7.4.2 (whether or not such margin call is subsequently revised under section 7.4.4.2).

7.6 OBLIGATION TO PROVIDE CREDIT SUPPORT

7.6.1 Each *market participant* shall provide to the *EMC* and shall at all times maintain adequate *credit support* in a form permitted by section 7.6.2 by ensuring that the value of *credit support* shall not be less than the *market participant's credit support value*, which obligation shall be determined in accordance with the relevant provision of the *market manual*. For this purpose, the total value of the *credit support* available at any one moment in time shall be the sum equivalent of the value of the undrawn or unclaimed amounts of *credit support* provided by the *market participant*.

7.6.2 A *market participant's credit support value* must be met through the provision to the *EMC* and the maintenance of *credit support* in one or more of the following forms:

7.6.2.1 a guarantee or irrevocable standby letter of credit that must be in the form defined in section 7.6.3.1 (d) and section 7.6.3.1 (c)

respectively and provided by a financial institution which satisfies such criteria as prescribed by the *EMC* in the applicable *market manual*;

7.6.2.2 [Deleted and Intentionally Left Blank]

7.6.2.3 cash deposits made with or assigned to the *EMC* by or on behalf of the *market participant*; or

7.6.2.4 Singapore Government Treasury bills assigned to *EMC* by or on behalf of the *market participant*. Such Treasury bills shall be valued as cash at their current market value less than 2 percent to take into account the potential eroding effects of interest rate increases.

7.6.3 The following terms and conditions shall apply in respect of the *credit support* provided by a *market participant* pursuant to section 7.6.2:

7.6.3.1 *credit support* provided in accordance with section 7.6.2.1 shall:

- a. be an obligation in writing;
- b. be governed by the laws of Singapore;
- c. where the *credit support* is in the form of an irrevocable standby letter of credit:
 - i. be valid for a term of at least one year or provide for automatic renewal, subject only to the right of the issuing financial institution to advise the *EMC* at least thirty-eight (or thirty-three, in the case of a *market support services licensee*) days prior to the date of renewal that the letter of credit will not be renewed;
 - ii. name the *EMC* as beneficiary and constitute valid and binding obligations to pay to the *EMC* amounts in accordance with its terms which relate to the obligations of the relevant *market participant* under the *market rules*;

- iii. not include any conditions on the ability of the *EMC* to draw or make claims thereon other than the condition that the *EMC* deliver a certificate of an officer of the *EMC* indicating that a specified amount is owing by the *market participant* to the *EMC* and that, in accordance with these *market rules*, the *EMC* is entitled to payment of that specified amount as of the date of delivery of such certificate;
 - iv. not prohibit partial draws and permit drawings or claims by the *EMC* on demand up to the amount stated in the *credit support*; and
 - v. be executed in the manner as set out in the applicable *market manual*; and
- d. where the *credit support* is in the form of a guarantee, be executed as a deed and in the manner as set out in the applicable *market manual*, permit drawings or claims by the *EMC* and provide for payment by the guarantor on demand up to the amount stated in the *credit support*.

7.6.3.2 [Deleted and Intentionally Left Blank]

7.6.3.3 *credit support* provided in accordance with section 7.6.2.3 and section 7.6.2.4 shall:

- a. constitute valid and binding unsubordinated obligations to pay to the *EMC* amounts in accordance with its terms which relate to the obligations of the relevant *market participant* under the *market rules*;
- b. be accompanied by an assignment by the *market participant* to the *EMC* of all of the *market participant's* present and future right, title and interest in and to such *credit support* as general and continuing security and as a pledge to secure all indebtedness, obligations and liabilities of any kind, direct or indirect, absolute or contingent, joint or several, of the *market participant* to the *EMC* in respect of the *market participant's* transactions in the *real-time markets*;
- c. if cash, be reflected in a written instrument; and
- d. if Treasury Bills, permit drawings or claims by the *EMC* on demand up to the amount of the Treasury Bills.

- 7.6.4 [Deleted and Intentionally Left Blank]
- 7.6.5 [Deleted and Intentionally Left Blank]
- 7.6.6 If *credit support* for the time being held by the *EMC* in respect of a *market participant* pursuant to this section 7 (the *existing support*) is due to expire or terminate and, upon expiry or termination of the *existing support* the total *credit support* held by the *EMC* in respect of that *market participant* will be less than the *market participant's credit support value* then, at least thirty-five (or thirty, in the case of a *market support services licensee*) prior to the time at which the *existing support* is due to expire or terminate, the *market participant* must provide to the *EMC* a replacement *credit support* as defined in accordance with section 7.6.2, which will become effective no later than the expiry or termination of the *existing support*, such that the total *credit support* provided is at least equal to the *market participant's credit support value*.
- 7.6.7 Where:
- 7.6.7.1 any part of the *existing support* held by the *EMC* in respect of a *market participant* otherwise ceases to be or shall cease to be current or valid for any reason,
- 7.6.7.2 it becomes unlawful for a *market participant's credit support provider* to comply with any of its obligations under the *credit support* supplied by it or any other obligation owed to the *EMC*, or it is claimed to have become so by the *credit support provider*;
- 7.6.7.3 a licence, permit or other authorisation necessary to enable a *market participant's credit support provider* to carry on its principal business or activities is suspended, revoked or otherwise ceases to be in full force and effect;
- 7.6.7.4 the *market participant's credit support provider* ceases or threatens to cease to carry on its business or a substantial part of its business;
- 7.6.7.5 the *market participant's credit support provider* enters into or takes any action to enter into an arrangement, composition or compromise with, or an assignment for the benefit of, all or any class of its creditors or members or a moratorium involving any of them;
- 7.6.7.6 the *market participant's credit support provider* states that it is unable to pay from its own money its debts when they fall due for payment;

- 7.6.7.7 a receiver, receiver and manager, judicial manager or person having a similar or analogous function under the laws of any relevant jurisdiction is appointed in respect of any property of a *market participant's credit support provider* which is used in or relevant to the performance by the *market participant* or the *market participant's credit support provider* of their respective obligations under the *market rules*, a *market manual*, the *system operation manual*, an *electricity licence* issued to the *market participant* or *credit support provider* by the *market participant* or the *market participant's credit support provider*, as the case may be;
- 7.6.7.8 an administrator, liquidator, trustee in bankruptcy or person having a similar or analogous function under the laws of any relevant jurisdiction is appointed in respect of a *market participant's credit support provider*, or any action is taken to appoint such person;
- 7.6.7.9 an application is made for the winding up or dissolution or a resolution is passed or any steps are taken to pass a resolution for the winding up or dissolution of a *market participant's credit support provider*;
- 7.6.7.10 the *market participant's credit support provider* is wound up or dissolved, unless the notice of winding up or dissolution is discharged; or
- 7.6.7.11 the *market participant's credit support provider* is taken to be insolvent or unable to pay its debts under any applicable legislation,

the *market participant* must immediately so notify the *EMC*. The *market participant* shall provide to the *EMC*, (i) within two *business days* of the date on which the *EMC* is notified, or (ii) at least thirty-five (or thirty, in the case of a *market support services licensee*) days prior to the date on which the *existing support* or any part thereof ceases or shall cease to be current or valid, whichever is later, a replacement *credit support* as defined in accordance with section 7.6.2, such that the total *credit support* provided is at least equal to the *market participant's credit support value*.

7.7 EXERCISE OF RIGHTS TO CREDIT SUPPORT

- 7.7.1 Subject to section 9.2.2 of this chapter and to section 7.3.3, 7.3.3A and 7.3.3B of Chapter 3, upon the occurrence of an *event of default* by or in relation to a *market participant*, the *EMC* shall, without prejudice to any other rights and remedies that the *EMC* may have under these *market rules* or *applicable law* or in equity, be entitled to:

- 7.7.1.1 make demand under any guarantee provided pursuant to section 7.6.2.1 and pursue all rights and remedies under *applicable law* or in equity against any such guarantor; and
 - 7.7.1.2 draw on any letter of credit issued to the *EMC* pursuant to section 7.6.2.1; and
 - 7.7.1.3 set off and apply any and all *credit support* held in the form of cash or Treasury Bills against the indebtedness, obligations and liabilities referred to in section 7.6.3.3(b).
- 7.7.2 Each of the rights and remedies referred to in section 7.7.1 is intended to be a separate right and remedy and in no way is a limitation on or substitute for any one or more of the other rights and remedies otherwise available to the *EMC*. The rights and remedies referred to in section 7.7.1 shall be cumulative and not exclusive, and such rights and remedies may be exercised concurrently or individually without the necessity of any election.
- 7.7.3 A *market participant* shall pay to the *EMC* forthwith on demand all costs, charges, expenses and fees, including legal fees on a solicitor and client basis, of or incurred by or on behalf of the *EMC* in:
- 7.7.3.1 the enforcement or recovery of payment of any amounts owing to the *EMC* by the *market participant* in respect of its transactions in the *real-time markets*; and
 - 7.7.3.2 the realisation of the *credit support* provided by the *market participant*.
- 7.7.4 The costs, charges, expenses and fees referred to in section 7.7.3 shall be secured by the *credit support* provided by the *market participant*.
- 7.7.5 Except as may otherwise be provided in section 9.8, all monies received by the *EMC* in respect of the realisation of the *credit support* provided by a *market participant* may, notwithstanding any appropriation by the *market participant* or any other person, be appropriated by the *EMC* to such parts of the component parts of the *market participant's* estimated net exposure, any interest thereon owing pursuant to these *market rules* or any costs, charges, expenses and fees referred to in section 7.7.3 and in such order as the *EMC* determines appropriate.
- 7.7.6 If, as a result of the *EMC* exercising its rights under *credit support* provided by a *market participant* in accordance with this section 7.7 and section 7.3.3 of Chapter 3, the remaining *credit support* held by the *EMC* in respect of that *market participant* is less than the *market participant's credit support value*, the *market participant* must, unless otherwise provided in

section 7.7.6A, within five *business days* of receiving notice of the exercise by the *EMC* of such rights, provide the *EMC* with additional *credit support* such that the total *credit support* provided is at least equal to the *market participant's credit support value*.

7.7.6A If, as a result of the *EMC* exercising its rights under *credit support* provided by a *market participant* in accordance with this section 7.7 and section 7.3.3 of Chapter 3, the remaining *credit support* held by the *EMC* in respect of that *market participant* is less than the *market participant's credit support value* and the estimated net exposure of that *market participant* reaches a value equal to or greater than fifty-five (or sixty, in the case of a *market support services licensee*) percent of the value of the *credit support* currently provided by that *market participant*, the *market participant* must, by the close of banking business of the bank at which the *EMC's bank accounts* are held on the second *business day* following the date on which the *market participant* receives notice of the exercise by the *EMC* of such rights, provide the *EMC* with additional *credit support* such that the total *credit support* provided is at least equal to the *market participant's credit support value*.

7.7.7 For the avoidance of doubt, the *EMC* shall be entitled to all rights, in respect of any and all *credit support* previously provided by a person, whose registration as a *market participant* has expired pursuant to section 4.1.4 or who is a *terminated market participant*, and retained by the *EMC* in accordance with the *market rules* after the expiration or termination of such person's registration as a *market participant*. In this regard, a non-payment by such person of any sums due and payable by it under section 9 of this Chapter or under section 5.8.6 of Chapter 7 shall for the purposes of the *market rules* be deemed to be an *event of default* by or of that person as a *market participant* notwithstanding the expiration or termination of its registration as a *market participant*.

7.8 RETURN OF CREDIT SUPPORT

7.8.1 Where a *market participant's credit support value* has been reduced pursuant to section 7.3.3 and the *EMC* is holding *credit support* that is in excess of that *market participant's credit support value*, the *EMC* shall, provided that the *market participant* is not then in default of its obligations or liabilities under these *market rules*:

7.8.1.1 where the *credit support* is in a form described in sections 7.6.2.3 and 7.6.2.4, return to the *market participant*, within two *business days* a portion of the cash deposit or Treasury Bills equal to the reduction in the *market participant's credit support value*; and

- 7.8.1.2 in all other cases, return to the *market participant* the *credit support* as soon as possible following receipt by the *EMC* of the replacement *credit support* that complies with section 7.6.2.
- 7.8.2 Subject to section 4.1.6 of this Chapter and section 7.4.14 of Chapter 3 as applicable, the *EMC* shall be entitled to retain the whole or part of the *credit support* previously provided by a person, whose registration as a *market participant* has expired pursuant to section 4.1.4 or who is a *terminated market participant*, to such extent as the *EMC* reasonably determines to be necessary to secure all financial obligations and liabilities of such person under the *market rules*, including a liability under section 9 of this Chapter or an actual, contingent or prospective liability under section 5.8.6 of Chapter 7. In determining an appropriate amount of *credit support* to be retained by the *EMC* in respect of any actual, contingent or prospective liability of that person under section 5.8.6 of Chapter 7, the *EMC* shall take into account, among other things, the previous transactions of that person as a *market participant* on the *wholesale electricity markets* and previous instances of *metering errors* known to the *EMC*.

8 TECHNICAL REQUIREMENTS

8.1 TECHNICAL REQUIREMENTS

8.1.1 Each *market participant* shall, in addition to ensuring that its facilities and equipment meet all other applicable technical requirements set forth in these *market rules*, any *market manual* or the *system operation manual*, ensure that its facilities:

8.1.1.1 meet the applicable technical requirements of Appendix 2A; and

8.1.1.2 are capable of meeting the technical requirements necessary for *connection* contained or referred to in any applicable *connection agreement* and the *transmission code*.

8.2 CERTIFICATION, TESTING AND INSPECTION FOR AUTHORISATION

8.2.1 Each *participation applicant* shall, as a condition of obtaining registration as a *market participant* pursuant to section 3, certify to the *EMC* that its:

8.2.1.1 voice communication facilities and equipment;

8.2.1.2 monitoring and control facilities and equipment; and

8.2.1.3 electronic communication facilities and equipment,

comply with the applicable technical requirements of Appendix 2A.

8.2.2 Each *participation applicant* shall, as a condition of obtaining registration as a *market participant* pursuant to section 3, successfully complete such testing and permit such inspection as the *EMC* may reasonably require for the purposes of testing or inspecting whether the *participation applicant's* facilities and equipment referred to in sections 8.2.1.1 to 8.2.1.3 meet all applicable technical requirements set forth in Appendix 2A.

8.2.3 Each *market support services licensee* that applies for authorisation to participate shall, as a condition of obtaining authorisation pursuant to section 3:

8.2.3.1 certify to the *EMC* that its facilities and equipment meet all applicable technical requirements set forth in the applicable *market manual*; and

8.2.3.2 successfully complete such testing and permit such inspection as the *EMC* may reasonably require for the purposes of testing or

inspecting whether the *market support services licensee's* facilities and equipment meet all applicable technical requirements set forth in the applicable *market manual*.

8.3 CERTIFICATION, TESTING AND INSPECTION FOR REGISTRATION OF FACILITIES

- 8.3.1 Each *market participant* shall, as a condition of obtaining the registration of a facility as a *registered facility* pursuant to section 5.2:
- 8.3.1.1 provide the certifications referred to in sections 5.2.4.5 and 5.2.4.6; and
 - 8.3.1.2 successfully complete the testing and permit the inspection referred to in section 5.2.4.7.
- 8.3.2 Each *market participant* shall, as a condition of obtaining the registration of a facility as a *generation settlement facility* pursuant to section 5.4:
- 8.3.2.1 provide the certifications referred to in sections 5.4.3.5 and 5.4.3.6; and
 - 8.3.2.2 successfully complete the testing and permit the inspection referred to in section 5.4.3.7.
- 8.3.3 Each *market participant* shall, as a condition of obtaining the registration of a facility as a *non-exporting embedded intermittent generation facility* pursuant to section 5.4B:
- 8.3.3.1 provide the certifications referred to in sections 5.4B.2.6 and 5.4B.2.7; and
 - 8.3.3.2 successfully complete the testing and permit the inspection referred to in section 5.4B.2.8.
- 8.3.4 Each *market participant* shall, as a condition of obtaining the registration of a facility as a *generation settlement facility* pursuant to section 5.4C:
- 8.3.4.1 provide the certifications referred to in sections 5.4C.3.6 and 5.4C.3.7; and
 - 8.3.4.2 successfully complete the testing and permit the inspection referred to in section 5.4C.3.8.

9 DEFAULT LEVY

9.1 POWER TO IMPOSE DEFAULT LEVY

- 9.1.1 The *EMC* shall be entitled to recover, by means of the imposition of a *default levy* on *non-defaulting market participants* in accordance with this section 9, the aggregate of any amounts owing to the *EMC* under the *market rules* which have not been paid in full by a *defaulting market participant* and the costs and expenses reasonably incurred by the *EMC* in investigating the default in payment, in realising on any applicable *credit support* and in implementing the *default levy*.
- 9.1.2 The imposition of a *default levy* or a *multiple default levy* pursuant to this section 9 shall in no way waive, excuse or relieve a *defaulting market participant* of its obligations under the *market rules* and shall be without prejudice to:
- 9.1.2.1 such rights or remedies which the *EMC* may otherwise have to recover all amounts owing by the *defaulting market participant*; and
- 9.1.2.2 the right of the *EMC* to take such other action, including but not limited to the issuance of a *suspension order*, as may be provided for in these *market rules* in respect of the *defaulting market participant's* default in payment.

For the avoidance of doubt, a *defaulting market participant* shall not be excused or relieved of its obligations with respect to a default in payment by any other *market participant* (including, without limitation, the obligation to make payment of a *default levy* or a *multiple default levy*).

Explanatory Note: A market participant, which is a defaulting market participant for its default in payment with respect to a particular trading day, would be considered a non-defaulting market participant for purposes of a default in payment by another defaulting market participant in respect of the same trading day.]

- 9.1.3 The provisions of this section 9 apply only to a default in payment by a *defaulting market participant* in respect of its *settlement amount*.
- 9.1.4 For the purposes of this section 9, the *transmission licensee* shall not be a *non-defaulting market participant*.
- 9.1.5 This section 9 applies to a *market support services licensee* that has been granted authorisation to participate by the *EMC* pursuant to section 3 and, for such purposes, all references in this section 9 to:

- 9.1.5.1 a *defaulting market participant* shall be deemed to include references to a *defaulting market support services licensee*;
- 9.1.5.2 a *non-defaulting market participant* shall be deemed to include references to a *non-defaulting market support services licensee*; and
- 9.1.5.3 a *market participant payment date* shall be interpreted in accordance with section 5.2.6 of Chapter 7.

9.1.6 [Deleted and Intentionally Left Blank]

9.2 NOTICE OF FIRST DEFAULT LEVY

9.2.1 Where a *market participant* has failed to remit to the *EMC settlement clearing account* the full amount due by that *market participant* by the *close of banking business* of the bank at which the *EMC settlement clearing account* is held on a *market participant payment date*:

9.2.1.1 the *EMC* shall, within one *business days* of the *market participant payment date*, issue a *default notice* to the *defaulting market participant* in accordance with section 7.3.3 of Chapter 3;

9.2.1.2 the *EMC* shall take such steps as may be required to enable the *EMC* to realise, under section 9.2.2.2, any *credit support* held in respect of the *defaulting market participant*; and

9.2.1.3 the *EMC* may take such steps as may be permitted by section 5.12.4 of Chapter 7.

9.2.2 Where a *defaulting market participant* has failed to remit to the *EMC settlement clearing account* the full amount due by that *market participant* within the time specified in the *default notice*, the *EMC* shall:

9.2.2.1 issue a *first notice of default levy* in accordance with section 9.2.3; and

9.2.2.2 take such steps as may be required to realise any *credit support* held in respect of the *defaulting market participant*,

within the same *business day*.

9.2.3 A *first notice of default levy* shall be issued to each *non-defaulting market participant* that transacted in the *real-time markets* during the *trading day* to which such default relates and shall identify:

9.2.3.1 the name of the *defaulting market participant*;

- 9.2.3.2 the *trading day* in respect of which the default in payment by the *defaulting market participant* has occurred;
 - 9.2.3.3 the *defaulting market participant's default amount*, calculated in accordance with section 9.3.1;
 - 9.2.3.4 the amount of the first *default levy* calculated in accordance with section 9.3.2;
 - 9.2.3.5 the value of all *credit support* held in respect of the *defaulting market participant*;
 - 9.2.3.6 the estimated amount of any second *default levy* that may have to be imposed pursuant to section 9.4 in the event of the inability by the *EMC* to realise all of the *credit support* referred to in section 9.2.3.5 prior to the time noted in section 9.4.1;
 - 9.2.3.7 the *non-defaulting market participant's* share of the first *default levy*, calculated in accordance with section 9.6.1; and
 - 9.2.3.8 the *non-defaulting market participant's* share of the estimated amount of any second *default levy* referred to in section 9.2.3.6.
- 9.2.4 The first *notice of default levy* shall be issued at least ten days prior to the date on which the invoice imposing the first *default levy* on *non-defaulting market participants* is issued by the *EMC* in accordance with section 9.6.2.

9.3 CALCULATION OF DEFAULT AMOUNT AND FIRST DEFAULT LEVY

- 9.3.1 The *defaulting market participant's default amount* shall be the aggregate of:
- 9.3.1.1 the net *invoice* amount payable by the *defaulting market participant* (for the *trading day* to which the default in payment relates) in respect of which payment has not been received within the time specified in section 9.2.2, exclusive of any amounts payable on account of financial penalties or damages; and
 - 9.3.1.2 any *default interest* payable in respect of the amount referred to in section 9.3.1.1 that has accrued since the *market participant payment date* referred to in section 9.2.1 in accordance with section 5.12 of Chapter 7.
- 9.3.2 The amount of the first *default levy* shall be:
- 9.3.2.1 the aggregate of:

- a. the *defaulting market participant's default amount*, calculated in accordance with section 9.3.1; and
- b. any costs and expenses reasonably incurred to the date of issuance of the first *notice of default levy* by the *EMC* in investigating the default in payment to which the *default levy* relates, in realising on any applicable *credit support* held in respect of the *defaulting market participant* and in implementing the *default levy*;

9.3.2.2 less the aggregate of:

- a. claimed or drawn dollar amount of all *credit support* held in respect of the default in payment of the *defaulting market participant*; and
- b. unclaimed or undrawn dollar amount of all *credit support* held in respect of the *defaulting market participant*.

9.3.2A If the amount of the first *default levy* calculated in accordance with section 9.3.2 is negative, the amount of the first *default levy* shall be considered as zero.

9.3.3 The first *default levy* shall be apportioned amongst and invoiced to *non-defaulting market participants* in accordance with sections 9.6.1 and 9.6.2.

9.4 NOTICE OF SECOND DEFAULT LEVY

9.4.1 The *EMC* shall, on the seventh *business day* following the issuance of invoices imposing the first *default levy*, issue a second *notice of default levy* in accordance with section 9.4.2 if:

9.4.1.1 the *EMC* has failed to realise the unclaimed or undrawn dollar amount of the *credit support* referred to in section 9.3.2.2(b) within seven *business days* following the issuance of invoices imposing the first *default levy*; and/or

9.4.1.2 any costs and expenses have been reasonably incurred by the *EMC* after the issuance of the first *notice of default levy* in investigating the default in payment to which the *default levy* relates, in realising any applicable *credit support* held in respect of the *defaulting market participant* and in implementing the *default levy*.

- 9.4.2 The second *notice of default levy* shall be issued to each *non-defaulting market participant* on whom a first *default levy* has been imposed and shall identify:
- 9.4.2.1 the name of the *defaulting market participant*;
 - 9.4.2.2 the *trading day* in respect of which the default in payment by the *defaulting market participant* has occurred;
 - 9.4.2.3 the *defaulting market participant's residual default amount*, calculated in accordance with section 9.5.1;
 - 9.4.2.4 the amount of the first *default levy*;
 - 9.4.2.5 the amount of any *credit support* held in respect of the *defaulting market participant* that has been realised;
 - 9.4.2.6 the amount of any *credit support* held in respect of the *defaulting market participant* that remains to be realised;
 - 9.4.2.7 the amount of the second *default levy*, calculated in accordance with section 9.5.2; and
 - 9.4.2.8 the *non-defaulting market participant's* share of the second *default levy*, calculated in accordance with section 9.6.1.
- 9.4.3 The second *notice of default levy* shall be issued at least ten days prior to the date on which the invoice imposing the second *default levy* on *non-defaulting participants* is issued by the *EMC* in accordance with section 9.6.2.

9.5 CALCULATION OF RESIDUAL DEFAULT AMOUNT AND SECOND DEFAULT LEVY

- 9.5.1 The *defaulting market participant's residual default amount* shall be:
- 9.5.1.1 the aggregate of:
 - a. the net *invoice* amount payable by the *defaulting market participant* (for the *trading day* to which the default in payment relates) in respect of which payment has not been received as of the date of issuance of the second *notice of default levy*, exclusive of any amounts payable on account of financial penalties or damages; and

- b. any *default interest* payable in respect of the amount referred to in section 9.5.1.1(a) that has accrued since the *market participant payment date* referred to in section 9.2.1 in accordance with section 5.12 of Chapter 7;
- 9.5.1.2 less the aggregate of:
 - a. the amount of the first *default levy*; and
 - b. any claimed or drawn dollar amount of all *credit support* held in respect of the default in payment of the *defaulting market participant* since the *market participant payment date* referred to in section 9.2.1.
- 9.5.2 The amount of the second *default levy* shall be the aggregate of:
 - 9.5.2.1 the *defaulting market participant's residual default amount*, calculated in accordance with section 9.5.1; and
 - 9.5.2.2 any costs and expenses reasonably incurred by the *EMC* in investigating the default in payment to which the *default levy* relates, in realising any applicable *credit support* and in implementing the *default levy* since the *market participant payment date* referred to in section 9.2.1.
- 9.5.2A If the amount of the second *default levy* calculated in accordance with section 9.5.2 is negative, the amount of the second *default levy* shall be considered as zero.
- 9.5.3 The second *default levy* shall be apportioned and invoiced to *non-defaulting market participants* in accordance with sections 9.6.1 and 9.6.2.

9.6 APPORTIONMENT AND INVOICING OF DEFAULT LEVY

- 9.6.1 The amount of a *default levy* shall be apportioned amongst all *non-defaulting market participants* to whom a *notice of default levy* has been issued in accordance with section 9.2.3 or 9.4.2 by allocating to each *non-defaulting market participant* a share of the *default levy* calculated as follows:

[the amount of the first <i>default levy</i> or the amount of the second <i>default levy</i> (as the case may be) x (absolute value of the <i>non-defaulting market participant's</i> net invoice amount, exclusive of any amounts payable on account of financial penalties or damages, for the <i>trading day</i> to which the default in payment by the <i>defaulting market participant</i> relates)]	divided by	the net transaction dollar amount
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where the net transaction dollar amount is:

Σ the absolute value, in dollars, of each <i>market participant's</i> and each <i>market support services licensee's</i> net invoice amount, exclusive of any amounts payable on account of financial penalties or damages, for the <i>trading day</i> to which the default in payment by the <i>defaulting market participant</i> relates	minus	the absolute value, in dollars, of the <i>defaulting market participant's</i> net invoice amount, exclusive of any amounts payable on account of financial penalties or damages, for such <i>trading day</i>
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9.6.2 Subject to sections 9.2.4 and 9.4.3, within ten *business days* from the date on which a *notice of default levy* is issued to a *non-defaulting market participant*, the *EMC* shall issue an invoice to each *non-defaulting market participant* comprising the amount of that *non-defaulting market participant's* share of the *default levy*. Each *non-defaulting market participant* shall pay to the *EMC* the invoice amount by the fourth *business day* following issuance of the invoice. If a *non-defaulting market participant's* share of the *default levy* is zero, the *EMC* shall not be required to issue any invoice imposing the *default levy* to that *non-defaulting market participant*.

9.6.3 [Deleted and Intentionally Left Blank]

9.7 ALLOCATION OF DEFAULT LEVY

- 9.7.1 The *EMC* shall allocate amounts received from *non-defaulting market participants* in respect of a *default levy* within two *business days* of receipt of the amounts from *non-defaulting market participants*:
- 9.7.1.1 first, to pay the reasonable costs and expenses referred to in section 9.3.2.1(b) and 9.5.2.2;
 - 9.7.1.2 second, to pay the *EMC* the amount of short-term funds borrowed by the *EMC* pursuant to section 5.12.4 of Chapter 7 on account of the *defaulting market participant's* default in payment, including interest thereon at the *default interest rate*;
 - 9.7.1.3 third, to replenish any funds transferred from the *EMC settlement reserve account* pursuant to section 5.12.6 of Chapter 7 on account of the *defaulting market participant's* default in payment, including interest thereon at the *default interest rate*;
 - 9.7.1.4 fourth, to the payment of amounts owed by the *defaulting market participant* to the *EMC* on account of the *EMC's* and the *PSO's* administrative costs referred to in section 4.2 of Chapter 7, including interest thereon at the *default interest rate*; and
 - 9.7.1.5 fifth, to the payment of all other *settlement amounts* owed by the *defaulting market participant* to the *EMC*, including interest thereon at the *default interest rate*.

9.8 OTHER RECOVERY OF DEFAULT AMOUNTS

- 9.8.1 Notwithstanding the imposition of a *default levy*, the *EMC* shall subject to section 9.9 take all reasonable steps to recover from the *defaulting market participant*, including by means of the realisation of any *credit support* held in respect of a *defaulting market participant* that has not been realised as at the date of calculation of a second *default levy*, all amounts owing to the *EMC* under the *market rules* in respect of the *defaulting market participant's* default in payment and any costs and expenses incurred by the *EMC* in connection with or in relation to the recovery of such amounts owing by the *defaulting market participant* (including but not limited to costs and expenses incurred by the *EMC* in investigating the default in payment, in realising any applicable *credit support*, in implementing the *default levy* or *multiple default levy*, and in taking any steps under this section 9.8.1). The *EMC* may, but shall not be obliged to, follow the dispute resolution process set forth in section 3 of Chapter 3 for the purpose of obtaining such recovery.

- 9.8.2 Subject to section 9.8.3 and section 9.11.4, any full or partial recovery of the *default amount*, *default interest* and costs or expenses made by the *EMC* pursuant to section 9.8.1 shall be distributed to each *non-defaulting market participant* that remitted payment to the *EMC* on account of a *default levy* or a *multiple default levy* (as the case may be) on a prorated basis according to the amount so remitted by the *non-defaulting market participant*. Where the *non-defaulting market participant* is, at the relevant time, still a *market participant*, any such amount shall be paid by the *EMC* to that *non-defaulting market participant* within two *business days* of the date on which the *EMC* receives the recovered amount pursuant to section 9.8.1. Where the *non-defaulting market participant* is no longer a *market participant* at the relevant time, any such amount shall be paid to the *non-defaulting market participant* in such manner as the *EMC* determines appropriate.
- 9.8.3 In the event that the *EMC* cannot, after taking all reasonable steps to do so, locate a *non-defaulting market participant* that has remitted payment to the *EMC* on account of a *default levy* or a *multiple default levy* (as the case may be), any amount that would otherwise be distributed to such *non-defaulting market participant* under section 9.8.2 shall:
- 9.8.3.1 be allocated and distributed to other *non-defaulting market participants* in the manner described in section 9.8.2; or
- 9.8.3.2 where other *non-defaulting market participants* have already been fully reimbursed in respect of a *default levy* or a *multiple default levy* (as the case may be) and are therefore not entitled to payment of any amounts under section 9.8.2, be used to offset the *EMC*'s administrative costs referred to in section 4.2 of Chapter 7.
- 9.8.4 Any costs and expenses reasonably incurred by the *EMC* in recovering amounts from a *defaulting market participant* under section 9.8.1 that have not been included in a *default levy* under section 9.3.2.1(b) or 9.5.2.2 shall subject to section 9.9.5 be recovered by the *EMC* from the *non-defaulting market participants* through one or more *multiple default levies* as the *EMC* deems fit.

9.9 APPROVAL OF COSTS FOR RECOVERY OF DEFAULT AMOUNTS

- 9.9.1 The provisions of this section 9.9 apply only for the purposes of the implementation of *multiple default levies* for the recovery (to the extent permitted under section 9.9.5) of costs and expenses incurred by the *EMC* in connection with or in respect of *default recovery measures*. The provisions of this section 9.9 shall not:

- 9.9.1.1 restrict the power, authority or discretion of the *EMC* to effect any *default recovery measures* under section 9.8.1 in its absolute discretion;
 - 9.9.1.2 affect the validity of any *default recovery measures* taken by the *EMC* under section 9.8.1; or
 - 9.9.1.3 require any *default recovery measures* to be taken only with the approval of the *rule change panel*.
- 9.9.2 The *EMC* shall submit in writing for the approval of the *rule change panel* an estimate of the costs and expenses which it anticipates incurring in connection with or in relation to the *EMC* effecting any *default recovery measures*. Such estimate of costs and expenses shall be accompanied by a brief description or summary in writing of the *default recovery measures* which the *EMC* proposes to effect in respect of which such costs and expenses may be incurred.
- 9.9.3 The *rule change panel* shall consider each estimate of costs and expenses submitted for its approval by the *EMC* under section 9.9.2 and shall either:
- 9.9.3.1 approve such estimate of costs and expenses submitted by the *EMC* under section 9.9.2; or
 - 9.9.3.2 decline to approve such estimate of costs and expenses submitted by the *EMC* under section 9.9.2; or
 - 9.9.3.3 approve a lesser amount of costs and expenses than that stated in such estimate of costs and expenses submitted by the *EMC* under section 9.9.2;
- and shall inform the *EMC* in writing of its decision.
- 9.9.4 If the *rule change panel* declines to approve any estimate, the *EMC* shall be released and discharged from its obligations to effect *default recovery measures* under section 9.8.1. If the *rule change panel* approves a lesser amount of costs and expenses pursuant to section 9.9.3.3, the *EMC* shall be obliged to effect *default recovery measures* under section 9.8.1 only to the extent of such lesser amount of costs and expenses so approved and shall be released and discharged from its obligation to take any further action to effect, pursue or complete any *default recovery measures* to the extent that the same would result in the *EMC* incurring any costs or expenses in excess of the amount of costs and expenses so approved.
- 9.9.5 The *EMC* may recover from the *non-defaulting market participants* the costs and expenses for the time being incurred by the *EMC* in effecting any *default recovery measures* by way of one or more *multiple default levies* under section 9.10 as the *EMC* deems fit provided that, and only to the extent

that, such costs and expenses have been approved by the *rule change panel* under section 9.9.3.

- 9.9.6 If the estimate of costs and expenses (and its accompanying description or summary of the proposed *default recovery measures*) submitted by the *EMC* under section 9.9.2 relates to a *defaulting market participant* whose representative is a member of the *rule change panel*, the *EMC* and the other members of the *rule change panel* shall not disclose to that member of the *rule change panel* who is a representative of the relevant *defaulting market participant* any information relating to the *default recovery measures* proposed to be taken by the *EMC*. Such member of the *rule change panel* who is a representative of the relevant *defaulting market participant* shall not be entitled to attend, speak or vote at any meeting of the *rule change panel* convened for the purposes of this section 9.9.

9.10 MULTIPLE DEFAULT LEVY

- 9.10.1 Subject to section 9.8.4 and section 9.9, the *EMC* shall be entitled to recover, by means of the imposition of a *multiple default levy* on *non-defaulting market participants* in accordance with this section 9.10, the aggregate of any costs and expenses for the time being incurred by the *EMC* in connection with or in relation to the effecting of *default recovery measures* by the *EMC*.
- 9.10.2 Where costs and expenses have been incurred by the *EMC* in connection with or in relation to any *default recovery measures* and such costs and expenses have not been recovered from the *defaulting market participant*, the *EMC* may issue a notice of *multiple default levy* to the *non-defaulting market participants*, and in such notice shall identify:
- 9.10.2.1 the name of the *defaulting market participant*;
 - 9.10.2.2 all the *trading day(s)* in respect of which the default(s) in payment by the *defaulting market participant* has occurred;
 - 9.10.2.3 the amount of the *multiple default levy*, being (subject to section 9.9.5) the aggregate sum of the costs and expenses for the time being incurred by the *EMC* in connection with or in relation to such *default recovery measures*; and
 - 9.10.2.4 the *non-defaulting market participant's* share of the *multiple default levy*, calculated in accordance with section 9.10.4.
- 9.10.3 The notice of *multiple default levy* shall be issued at least ten days prior to the date on which the invoice imposing the *multiple default levy* on *non-defaulting market participants* is issued by the *EMC* in accordance with section 9.10.5.

9.10.4 The amount of a *multiple default levy* shall be apportioned amongst all *non-defaulting market participants* to whom a notice of *multiple default levy* has been issued in accordance with section 9.10.2 by allocating to each *non-defaulting market participant* a share of the *multiple default levy* calculated as follows:

[the amount of the <i>multiple default levy</i> x (the sum of the absolute value(s) of all of the <i>non-defaulting market participant's net invoice amount(s)</i> , exclusive of any amounts payable on account of financial penalties or damages, for the <i>trading day(s)</i> to which the default(s) in payment by the <i>defaulting market participant</i> relates)]	divided by	the net transaction dollar amount
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where the net transaction dollar amount is:

Σ the absolute value, in dollars, of each <i>market participant's</i> and each <i>market support services licensee's net invoice amount(s)</i> , exclusive of any amounts payable on account of financial penalties or damages, for the <i>trading day(s)</i> to which the default(s) in payment by the <i>defaulting market participant</i> relates	minus	the absolute value, in dollars, of the <i>defaulting market participant's net invoice amount(s)</i> , exclusive of any amounts payable on account of financial penalties or damages, for all such <i>trading day(s)</i> on which the default(s) occurred
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9.10.5 Subject to section 9.10.3, within ten *business days* from the date on which a notice of *multiple default levy* is issued to a *non-defaulting market participant*, the *EMC* shall issue an invoice to each *non-defaulting market participant* comprising the amount of that *non-defaulting market participant's* share of the *multiple default levy*. Each *non-defaulting market participant* shall pay to the *EMC* the invoice amount by the fourth *business day* following issuance of the invoice. If a *non-defaulting market participant's* share of the *multiple default levy* is zero, the *EMC* shall not be required to issue any invoice imposing the *multiple default levy* to that *non-defaulting market participant*.

9.10.6 [Deleted and Intentionally Left Blank]

9.11 VOLUNTARY FINANCIAL ASSISTANCE FOR DEFAULT RECOVERY MEASURES

- 9.11.1 If the *rule change panel* declines to approve any estimate of costs and expenses submitted for its approval pursuant to section 9.9.3.2, any one or more *non-defaulting market participants*, who is or are liable to pay any amount under any *default levy* or *multiple default levy*, may request the *EMC* to effect, pursue and/or complete the *default recovery measures* proposed to be effected by the *EMC* as referred to in section 9.9.2.
- 9.11.2 If a *non-defaulting market participant* requests the *EMC*, and the *EMC* agrees, to effect, pursue and/or complete any *default recovery measures* under section 9.11.1, all costs and expenses which may be incurred by the *EMC* in effecting, pursuing and/or completing any such *default recovery measures* (other than any costs or expenses which may be recovered by way of *multiple default levies*) shall be borne by that *non-defaulting market participant* and the *non-defaulting market participant* shall pay to the *EMC* such amounts as the *EMC* may from time to time require to enable the *EMC* to meet all such costs and expenses which the *EMC* may incur or anticipates incurring. For the avoidance of doubt, the *EMC* may require all payments to be made by the *non-defaulting market participant* under this section, and such *non-defaulting market participant* shall make such payments, prior to the *EMC* effecting, or incurring any such costs or expenses in relation to effecting, any *default recovery measures* under section 9.11.1.
- 9.11.3 If two or more *non-defaulting market participants* request, and the *EMC* agrees, to effect, pursue and/or complete any *default recovery measures* under section 9.11.1, all costs and expenses which may be incurred by the *EMC* in effecting, pursuing and/or completing any such *default recovery measures* (other than any costs or expenses which may be recovered by way of *multiple default levies*) shall be borne by those *non-defaulting market participants* in such proportions as such *non-defaulting market participants* and the *EMC* may agree and such *non-defaulting market participants* shall pay to the *EMC* in their respective agreed proportions such amounts as the *EMC* may from time to time require to enable the *EMC* to meet all such costs and expenses which the *EMC* may incur or anticipates incurring. For the avoidance of doubt, the *EMC* may require all payments to be made by the *non-defaulting market participants* under this section, and such *non-defaulting market participants* shall make such payments, prior to the *EMC* effecting, or incurring any such costs or expenses in relation to effecting, any *default recovery measures* under section 9.11.1.
- 9.11.4 If the *EMC* effects any *default recovery measures* pursuant to the request of any *non-defaulting market participant* under this section 9.11, then notwithstanding section 9.8.2, any full or partial recovery of the *default amount*, *default interest*, and costs and expenses incurred by the *EMC* in respect of such *default recovery measures* shall:

- 9.11.4.1 first be applied towards the reimbursement of the *non-defaulting market participant* referred to in section 9.11.2 who effected payment to the *EMC* pursuant to section 9.11.2 to the extent of such payment or each of the *non-defaulting market participants* referred to in section 9.11.3 who effected payment to the *EMC* pursuant to section 9.11.3 to the extent of, and in proportion to, their respective payments; and
- 9.11.4.2 any remaining amounts shall thereafter be distributed amongst the *non-defaulting market participants* in accordance with section 9.8.2.

10 EMC BUDGET

- 10.1.1 Subject to sections 10.1.2 and 10.1.8, the *EMC* shall, no less than 100 days prior to the beginning of each *EMC* fiscal year that commences after the *market commencement date*:
 - 10.1.1.1 submit in such form and detail as may required by section 11 its proposed expenditure and revenue requirements for, and a schedule of the fees that it proposed to charge during, the following *EMC* fiscal year to the *rules change panel* for review; and
 - 10.1.1.2 *publish* notice of its proposed expenditure and revenue requirements for, and a schedule of the fees that it proposed to charge during, the following *EMC* fiscal year, inviting interested persons to make submissions with respect thereto to the *rules change panel* within the time prescribed in the notice.
- 10.1.2 Sections 10.1.1 and 11.1.1 shall not apply in respect of the first fiscal year of the *EMC* that commences after the *market commencement date* if:
 - 10.1.2.1 the *EMC* has, prior to the *market commencement date*, obtained the approval of the *Authority* for its proposed expenditure and revenue requirements and of the schedule of fees that it proposes to charge; and
 - 10.1.2.2 the *Authority* has approved the proposed expenditure and revenue requirements and the schedule of fees referred to in section 10.1.2.1 and has consented to their being in effect for such first fiscal year.
- 10.1.3 The *rules change panel* shall review the *EMC*'s proposed statement of expenditure and revenue requirements for, and a schedule of the fees that it proposed to charge during, the applicable fiscal year:

- 10.1.3.1 using such procedures;
 - 10.1.3.2 in consultation with such persons; and
 - 10.1.3.3 by means of such meetings,
as it considers appropriate.
- 10.1.4 Following the conclusion of the review referred to in section 10.1.3, the *rules change panel* shall, within the time referred to in section 10.1.5, submit a written report to the *EMC Board* indicating:
- 10.1.4.1 the views of the *rules change panel* with respect to the subject-matter of the review; and
 - 10.1.4.2 a summary of any material submissions filed pursuant to section 10.1.1.2.
- 10.1.5 The report referred to in section 10.1.4 shall be submitted to the *EMC Board* no later than the date that is 75 days before the beginning of the applicable *EMC* fiscal year.
- 10.1.6 The *EMC* shall *publish* and consider, but shall not be bound by, the contents of the report referred to in section 10.1.4 in finalising its proposed expenditure and revenue requirements for, and a schedule of the fees that it proposed to charge during, the fiscal year to which the report relates.
- 10.1.7 Where the *EMC* is required by its *electricity licence* to seek the approval of the *Authority* in respect of its proposed expenditure and revenue requirements for, or a schedule of the fees that it proposed to charge during, a given fiscal year, or both, the *EMC* shall provide the *Authority* with a copy of the report referred to in section 10.1.4 that relates to such fiscal year at the same time as it files with the *Authority* its proposed expenditure and revenue requirements for, or a schedule of the fees that it proposed to charge during, that fiscal year, or both.
- 10.1.8 Nothing in this section 10 or in section 11 shall be construed as requiring the *EMC* to submit to the *rules change panel* for review or to the *Authority* for approval any fees levied by the *EMC* that are:
- 10.1.8.1 calculated on the basis of a formula set forth in these *market rules*, including the price of any *physical service* and monthly *energy uplift* charges, but excluding the *EMC's* administrative costs;
 - 10.1.8.2 levied to recover the *PSO's* administrative costs in accordance with section 4.2 of Chapter 7;

10.1.8.3 levied to recover amounts paid under *contracted ancillary services* contracts; or

10.1.8.4 levied in respect of *vesting contracts*.

11 APPROVAL AND PUBLICATION OF EMC BUDGET

11.1.1 Subject to sections 10.1.2 and 10.1.8, the *EMC* shall, no less than sixty days prior to the beginning of each *EMC* fiscal year that commences after the *market commencement date*, submit, in accordance with the requirements of this section 11:

11.1.1.1 it's proposed expenditure and revenue requirements for; and

11.1.1.2 either:

- a. a schedule of the fees that it proposes to charge during; or
- b. a statement of the methodology that it proposed to use to determine the fees that it proposes to charge during,

the following *EMC* fiscal year to the *Authority* for approval.

11.1.2 Subject to the provisions of the *EMC's electricity licence* and to any direction issued to the *EMC* by the *Authority*, the *EMC's* proposed expenditure and revenue requirements referred to in section 11.1.1(a) shall include the following:

11.1.2.1 a statement of the revenues anticipated to be earned by the *EMC* in the applicable *EMC* fiscal year;

11.1.2.2 a statement of the costs anticipated to be incurred by the *EMC* in the applicable *EMC* fiscal year, in the aggregate;

11.1.2.3 a statement of the costs anticipated to be incurred by the *EMC* in the applicable *EMC* fiscal year for each of the *EMC's* activities or services, classified into such categories as may be required or permitted by the *Authority*; and

11.1.2.4 an identification of the sources that are driving each of the costs referred to in section 11.1.2.3.

- 11.1.3 The proposed schedule of fees or statement of methodology referred to in section 11.1.1.2 shall be accompanied by the *EMC's* assessment of the impact of the schedule of fees or methodology on:
- 11.1.3.1 each class of *market participant*;
 - 11.1.3.2 *market support services licensees* as a class; and
 - 11.1.3.3 any other classes of persons on whom the *EMC* proposes to levy fees.
- 11.1.4 The *Authority* shall notify the *EMC* of its approval or non-approval of the *EMC's* proposed schedule of fees or statement of methodology, and shall provide reasons for any non-approval. Where the *Authority* does not grant its approval, the *EMC* shall submit revised proposed schedule of fees or statement of methodology until such time as the approval of the *Authority* is granted.
- 11.1.5 Where the *Authority* approves the *EMC's* proposed schedule of fees or statement of methodology:
- 11.1.5.1 such schedule of fees or methodology shall apply and supersede any previous schedule of fees or methodology as of the date specified by the *Authority* when granting its approval; and
 - 11.1.5.2 the *EMC* shall:
 - a. where the *Authority* has approved a statement of methodology rather than a schedule of fees, prepare where feasible a statement of fees determined on the basis and in accordance with the statement of methodology;
 - b. *publish* the proposed schedule of fees or statement of methodology, as the case may be, approved by the *Authority* and the statement of fees referred to in section 11.1.5.2(a);
 - c. make a copy of the documents referred to in section 11.1.5.2(b) available to any person on request; and
 - d. not, on or after the date referred to in section 11.1.5.1, charge to any person any fees other than fees that have been approved as part of a proposed schedule of fees approved by the *Authority* or that have been determined on the basis of and in accordance with a proposed statement of methodology approved by the *Authority*, as the case may be, without the further approval of the *Authority*.

- 11.1.6 Where section 10.1.2 applies, the *EMC* shall *publish* the schedule of fees referred to in that section, as approved by the *Authority*, as soon as reasonably practicable following the receipt of the *Authority's* approval.

12 PSO BUDGET

- 12.1.1 The *PSO* shall, at least once every 3 fiscal years of the *Authority* (each fiscal year of the *Authority* referred to as “*Authority* fiscal year”, in this section 12 and in section 4.2.3 of Chapter 7), review the fees that the *PSO* proposes to charge for the recovery of the *PSO's* administrative costs in respect of a period of no more than the next 3 consecutive *Authority* fiscal years (each such period referred to as “relevant fiscal period”). The *PSO* shall, no less than 60 days before the beginning of each relevant fiscal period, publish on the *Authority's* web site:
- 12.1.1.1 the *PSO's* proposed expenditure and revenue requirements, and a schedule of the fees that the *PSO* proposes to charge for the recovery of the *PSO's* administrative costs, in respect of that relevant fiscal period, and
- 12.1.1.2 an invitation to all interested persons to make written submissions to the *PSO* in respect of such proposed expenditure and revenue requirements and schedule of fees, within a reasonable period specified in the invitation.
- 12.1.2 The *PSO* and the *Authority* shall consider, but shall not be bound by, the written submissions made pursuant to in section 12.1.1 in finalising the *PSO's* expenditure and revenue requirements and schedule of fees for any relevant fiscal period to which the written submissions relates.
- 12.1.3 Once the *Authority* has finalised the *PSO's* expenditure and revenue requirements and schedule of fees for a given relevant fiscal period, the *PSO* shall, prior to the start of that relevant fiscal period, publish on the *Authority's* web site such finalised expenditure and revenue requirements and schedule of fees and provide a copy of such published schedule of fees to the *EMC*.
- 12.1.4 As soon as reasonably practicable after the end of each *Authority* fiscal year, the *PSO* shall determine whether, due to events, circumstances or factors not anticipated by the *Authority* or the *PSO* at the time that the *PSO's* expenditure and revenue requirements and schedule of fees applicable to such *Authority* fiscal year were published pursuant to section 12.1.3, the *PSO's* actual expenditure for such *Authority* fiscal year is:

- 12.1.4.1 more than the *PSO's* published expenditure requirements applicable to such *Authority* fiscal year (referred to in this section 12 as “under-recovery”); or
 - 12.1.4.2 less than the *PSO's* published expenditure requirements applicable to such *Authority* fiscal year (referred to in this section 12 as “over-recovery”).
- 12.1.5 If there is any under-recovery or over-recovery as described in section 12.1.4, the *PSO* shall seek recovery of the under-recovery through increased *PSO's* fees, or seek to apply the over-recovery towards reduction of *PSO's* fees, over the remainder of the current relevant fiscal period, or such other longer period of time as the *Authority* may approve. If the prevailing schedule of fees for the remainder of the current relevant fiscal period is required to be revised for this purpose, the *PSO* shall, as soon as reasonably practicable, with the *Authority's* approval, revise and publish on the *Authority's* web site, the *PSO's* revised expenditure and revenue requirements and schedule of fees. The *PSO* shall provide a copy of such published revised schedule of fees to the *EMC*. Each such revised schedule of fees shall, when published by the *PSO*, take effect with respect to the remainder of the current relevant fiscal period and shall, for the remainder of the current relevant fiscal period, supersede any prior schedule of fees published by the *PSO* in respect of the remainder of the current relevant fiscal period.

APPENDIX A – TECHNICAL REQUIREMENTS FOR REGISTRATION AS A MARKET PARTICIPANT

A.1 FOR PERSONS NOT PARTICIPATING THROUGH A REGISTERED FACILITY

A.1.1 The electronic communication facilities and equipment required by any person seeking to obtain registration as a *market participant* shall include a personal computer that is equipped with and capable of using:

A.1.1.1 a version of Microsoft Windows Operating System software acceptable to the *EMC*;

A.1.1.2 an internet browser application (and of such version) acceptable to the *EMC*; and

A.1.1.3 a connection to the internet.

A.2 FOR PERSONS PARTICIPATING THROUGH A REGISTERED FACILITY

A.2.1 The electronic communication facilities and equipment required by a person seeking to obtain registration as a *market participant* and that intends to convey a *physical service* into, through or out of the *transmission system* through a *registered facility* shall include at least one personal computer that is equipped with and capable of using:

A.2.1.1 a version of Microsoft Windows Operating System software, and an internet browser application (and of such version), acceptable to the *EMC* that are functionally capable of being used for the exchange of information pertaining to *standing offers*, *offer variations*, and of interfacing with the *electronic communications system*, in both cases in accordance with any requirements set forth in an applicable *market manual*; and

A.2.1.2 a connection to the internet

A.2.2 The voice communication facilities and equipment required by a person seeking to obtain registration as a *market participant* and that intends to convey a *physical service* into, through or out of the *transmission system* through a *registered facility* shall include at least one telephone line that meets any requirements set forth in an applicable *market manual* and that

is dedicated exclusively to voice communications with the *PSO's* control centre.

APPENDIX B – TECHNICAL REQUIREMENTS FOR REGISTRATION OF FACILITIES

B.1 SINGLE-UNIT & MULTI-UNIT GENERATION FACILITIES

- B.1.1 For the purpose of registration of *generation facilities* in accordance with section 5 of this Chapter, a *market participant* may seek to either register all the *generating unit(s)* of a given *generating station* as a single combined *generation registered facility* or *generation settlement facility* (as the case may be), or register such *generating units* of that given *generating station*, singly and/or jointly in any combination, as two or more separate *generation registered facilities* or *generation settlement facilities* (as the case may be). This section B.1 sets out the criteria which the *EMC* and the *PSO* shall use, in addition to the other requirements set out in section 5 of this Chapter, to decide whether to allow the registration of such *generation facilities* as one or more *generation registered facilities* and/or *generation settlement facilities* (as the case may be).
- B.1.2 In making the decision described in section B.1.1 regarding *generation registered facilities* or *generation settlement facilities*, the factors that the *EMC* shall consider, in addition to the other requirements set out in section 5 of this Chapter, shall include:
- B.1.2.1 Whether the arrangements for metering of the *generation facility* allow the *MSSL* to meter the *generation facility* separately from other *generation facilities*.
- B.1.3 In making the decision described in section B.1.1 regarding *generation registered facilities*, the factors that the *PSO* shall consider, in addition to the other requirements set out in section 5.2 of this Chapter, shall include:
- B.1.3.1 Whether the arrangements for *AGC* control of the proposed *generation registered facilities* allow the *PSO* to send signals to individual *generation registered facilities*;
- B.1.3.2 Whether the arrangements for *SCADA* monitoring of the proposed *generation registered facilities* allow the *PSO* to monitor individual *generation registered facilities*;
- B.1.3.3 Whether simultaneous or consecutive *forced outage* of multiple *generating units* in a *multi-unit facility* is reasonably likely to occur so that the failure of the entire group of *generating units* must be considered a single contingency; and,

- B.1.3.4 Whether the *market participant* is seeking to provide *ancillary services* from each proposed *generation facility* in a manner consistent with the proposed grouping of *generating units* into those *generation facilities*;
- B.1.4 To enable the *EMC* and the *PSO* to make the decision in section B.1.1, it shall be the responsibility of the *market participant* to demonstrate to the *EMC*'s and the *PSO*'s satisfaction that the relevant criteria and factors set out in this appendix and the other requirements set out in section 5 of this Chapter will be met.

Explanatory Note: Reserved for any technical requirements that are required to be met as a condition of obtaining registration for facilities that are not in the transmission code. Most technical requirements will be contained in the transmission code, but this appendix can contain any additional requirements considered necessary.

Singapore Electricity Market Rules

Chapter 3

Administration, Supervision & Enforcement

Energy Market Authority

1 January 2022

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1 INTRODUCTION

1.1 SCOPE OF CHAPTER AND INTERPRETATION

1.1.1 This Chapter sets forth:

1.1.1.1 the composition of the *rules change panel* and the *market surveillance and compliance panel* and the manner in which the members of each shall be appointed and may be removed;

1.1.1.2 the dispute resolution mechanism applicable to certain disputes arising under the *market rules*, including the appointment of a *dispute resolution counsellor*;

1.1.1.3 the manner in which the *market assessment unit* and the *market surveillance and compliance panel* will fulfil their respective market monitoring, surveillance, and investigation responsibilities;

1.1.1.4 the procedures pursuant to which the *market rules* may be *modified*;

1.1.1.5 the procedures which govern the protection, use and disclosure of *confidential information* by the *EMC*, the *PSO*, *market participants* and *market support services licensees*;

1.1.1.6 the manner in which the *market assessment unit* will monitor and enforce compliance with the *market rules* and *market manuals*;

1.1.1.7 the manner in which the *PSO* will monitor compliance with the system operation manual; and

1.1.1.8 the circumstances that are considered to be *events of default* and warrant the imposition of a *suspension, termination or revocation order* by the *market surveillance and compliance panel*.

1.1.2 Any reference in this Chapter to a *market support services licensee* shall be deemed to be a reference only to a *market support services licensee* that has been authorised to participate by the *EMC* pursuant to section 3 of Chapter 2.

1.1.3 Any reference in this Chapter to a *registered facility* shall be deemed to include a reference to a *generation settlement facility* that has been registered by the *EMC* pursuant to section 5.4 of Chapter 2 and a *non-exporting embedded intermittent generation facility* that has been registered by the *EMC* pursuant to section 5.4B of Chapter 2.

2 CREATION AND MEMBERSHIP OF PANELS

2.1 DISQUALIFICATION, REMOVAL, CEASING TO HOLD OFFICE AND OTHER MATTERS

2.1.1 Every person who is or is to be appointed as a member of the *rules change panel* or the *market surveillance and compliance panel* shall meet the following eligibility requirements:

2.1.1.1 be at least twenty-one years of age;

2.1.1.2 not be of unsound mind as determined by a court in Singapore or elsewhere;

2.1.1.3 be a natural person;

2.1.1.4 not have been adjudicated a bankrupt;

2.1.1.5 not be an employee of the Government of Singapore which, for the purposes of section 2.3.1.3, shall not include employees of the *Authority* responsible for fulfilling the functions referred to in section 5.1 of Chapter 1;

2.1.1.6 meet the applicable qualification requirements contained in:

a. section 2.3.2, if a member of the *rules change panel*; or

b. sections 2.7.1 and 2.7.2, if a member of the *market surveillance and compliance panel*.

2.1.2 A member of the *rules change panel* or the *market surveillance and compliance panel* shall cease to hold office when he:

2.1.2.1 dies or resigns;

2.1.2.2 is removed in accordance with section 2.1.3; or

2.1.2.3 ceases to meet any of the eligibility requirements in section 2.1.1.

2.1.3 The *EMC Board* may, by resolution passed by at least two-thirds of the directors then in office, excluding those who abstain voluntarily or are required under the *constituent documents* to abstain, remove any member of the *rules change panel*, or of the *market surveillance and compliance panel* for cause.

- 2.1.4 Except as may otherwise be provided in the *market rules*, in any *market manual* or in the *constituent documents*, the *EMC Board* may from time to time by resolution prescribe:
- 2.1.4.1 with respect to the *dispute resolution counsellor* and each member of the *rules change panel*, the *dispute resolution and compensation panel* and the *market surveillance and compliance panel*:
- a. the remuneration to be paid to each of them;
 - b. conflict of interest guidelines or codes of conduct to be observed by each of them;
 - c. the terms of any confidentiality agreement to be entered into by each of them; and
- 2.1.4.2 with respect to the *dispute resolution counsellor*, the *rules change panel*, the *dispute resolution and compensation panel* and the *market surveillance and compliance panel*:
- a. the terms and conditions upon which each of them may hire external consulting assistance or expert advisory services;
 - b. the time and place of, and the procedures to be followed at, their respective meetings; and
 - c. the manner in which their respective activities may be audited.
- 2.1.5 Subject to section 2.1.3, all decisions required to be made by the *EMC Board* under this section 2 shall be made by majority vote.

2.2 ESTABLISHMENT AND FUNCTIONS OF RULES CHANGE PANEL

- 2.2.1 The *EMC Board* shall establish and maintain a *rules change panel* in accordance with sections 2.3 and 2.4.
- 2.2.2 The *rules change panel* shall have the functions and duties assigned to it in or under the authority of:
- 2.2.2.1 these *market rules* or a *market manual*;
 - 2.2.2.2 the *constituent documents*; and
 - 2.2.2.3 any resolution of the *EMC Board*,

provided that in no event shall any functions or duties referred to in section 2.2.2.2 or 2.2.2.3 conflict or be inconsistent with, or hinder the ability of the *rules change panel* to perform, the functions and duties referred to in section 2.2.2.1.

2.3 COMPOSITION OF RULES CHANGE PANEL AND QUALIFICATION OF MEMBERS

2.3.1 The *rules change panel* shall consist of up to fifteen members as follows, each having met the eligibility requirements in section 2.1.1:

- 2.3.1.1 the Chief Executive of the *EMC*;
- 2.3.1.2 one employee of the *EMC* not being the Chief Executive;
- 2.3.1.3 one representative of the *PSO*;
- 2.3.1.4 three representatives of the *generation licensee* class of *market participants*;
- 2.3.1.5 one representative of the *transmission licensee* class of *market participants*;
- 2.3.1.6 three representatives of the *retail electricity licensee* class of *market participants*;
- 2.3.1.7 one representative of all *market support services licensees* as a class;
- 2.3.1.8 one representative of the class of *market participants* referred to in section 2.1.1.3 of Chapter 2;
- 2.3.1.9 a person who is experienced in financial matters in Singapore; and
- 2.3.1.10 two persons to represent the interests of the *consumers* of electricity in Singapore generally.

2.3.2 Members of the *rules change panel* shall:

- 2.3.2.1 have a level of technical or commercial knowledge and expertise in the operation of power systems and electricity markets that is acceptable to the *EMC Board*;
- 2.3.2.2 in the case of members that are representatives of a class of *market participants*, be a director, officer, employee or agent of a *market participant* in the class of *market participant* which such member represents;

- 2.3.2.3 in the case of members that are representatives of a class of *market participants*, not:
- a. be, or have a spouse or relative that is, a director, officer, employee or agent of; or
 - b. have, or have a spouse or relative that has, a direct or indirect legal or beneficial interest in or commercial affiliation with,

a *market participant* in another class of *market participant* other than the class which such member represents or a *market support services licensee*, or of an *affiliate* of such *market participant* or *market support services licensee*;
- 2.3.2.4 in the case of a member that is the representative of *market support services licensees*, be a director, officer, employee or agent of a *market support services licensee*;
- 2.3.2.5 in the case of a member that is the representative of *market support services licensees*, not:
- a. be, or have a spouse or relative that is, a director, officer, employee or agent of; or
 - b. have, or have a spouse or relative that has, a direct or indirect legal or beneficial interest in or commercial affiliation with

a *market participant* or an affiliate of a *market participant*;
- 2.3.2.6 in the case of a member that is referred to in section 2.3.1.9, be a member of the Institute of Singapore Chartered Accountants; and
- 2.3.2.7 in the case of a member that is the Chief Executive of the *EMC*, the employee of the *EMC* not being the Chief Executive, the representative of the *PSO*, or a person referred to in section 2.3.1.9 or 2.3.1.10, not:
- a. be, or have a spouse or relative that is, a director, officer, employee or agent of; or
 - b. have, or have a spouse or relative that has, a direct or indirect legal or beneficial interest in or commercial affiliation with

a *market participant*, a *market support services licensee* or an *affiliate* of a *market participant* or *market support services licensee*.

Sections 2.3.2.3, 2.3.2.5 and 2.3.2.7 shall be interpreted in accordance with section 2.7.3.

2.3.3 [Intentionally Left Blank]

2.3.4 No *market participant* except the *transmission licensee* may, alone or in combination with its *affiliates*, have more than one of its directors, officers, employees or agents appointed as a member of the *rules change panel*.

2.3.5 The Chair of the *rules change panel* shall be the Chief Executive of the *EMC*.

2.3.6 The Chief Executive of the *EMC* may, from time to time and subject to such conditions or restrictions as he or the *EMC Board* may specify, appoint a director or officer of the *EMC* as a delegate to participate in his stead in the work of, and assume the responsibilities of the Chief Executive as a member of, the *rules change panel*.

2.4 APPOINTMENT, TERM AND REAPPOINTMENT OF MEMBERS OF RULES CHANGE PANEL

2.4.1 Members of the *rules change panel*, other than the members referred to in sections 2.3.1.1 to 2.3.1.3, shall be selected by the *EMC Board* from among a list of nominees (who are eligible under the *market rules* for appointment to the *rules change panel*) submitted to the *EMC Board* by :

2.4.1.1 the *market participants* of the classes referred to in sections 2.3.1.4 to 2.3.1.6 and 2.3.1.8;

2.4.1.2 *market support services licensees*, in the case of the member referred to in section 2.3.1.7;

2.4.1.3 the Institute of Singapore Chartered Accountants, in the case of the member referred to in section 2.3.1.9; or

2.4.1.4 the organisations listed in Appendix 3C, in the case of the members referred to in section 2.3.1.10.

2.4.2 At the request of the *EMC Board*, the *market participants* and the *market support services licensees* referred to in section 2.4.1 shall provide the *EMC Board* with one or more list or lists of nominees for appointment to the *rules change panel* (being persons who are eligible under the *market rules* for appointment to the *rules change panel*).

- 2.4.3 Subject to section 2.4.4, a member of the *rules change panel*:
- 2.4.3.1 referred to in section 2.3.1.2 shall be appointed by the *EMC Board* in accordance with the nomination submitted for such purpose by the Chairman of the *EMC Board* at his discretion; and,
 - 2.4.3.2 referred to in section 2.3.1.3 shall be appointed by the *EMC Board* in accordance with the nomination submitted for such purpose by the *PSO* at the *PSO*'s discretion,
- provided in each case that the nominee meets the eligibility requirements under section 2.1.1.
- 2.4.4 No person (other than the Chief Executive of the *EMC*) shall be considered for appointment to the *rules change panel* unless the *EMC Board* has received a signed declaration in the form set forth in Appendix 3A from such person.
- 2.4.5 Subject to sections 2.1.3 and 2.4.7, the term of office of each member of the *rules change panel*, other than the Chief Executive of the *EMC*, shall be no more than three years. A member of the *rules change panel* whose term of office has expired shall be eligible for reappointment by the *EMC Board* for one or more additional terms of no more than three years each, provided that such re-appointment does not result in a violation of sections 2.3.1 and 2.3.4.
- 2.4.6 Subject to sections 2.3.1 and 2.3.4 (where applicable), the *EMC Board* shall promptly fill the vacancies on the *rules change panel* as follows:
- 2.4.6.1 in respect of a vacancy in the office of the Chief Executive of the *EMC*, any successor Chief Executive of the *EMC*;
 - 2.4.6.2 in respect of a vacancy in the member of the *rules change panel* referred to in section 2.3.1.2, a person nominated by the Chief Executive of the *EMC* to fill such vacancy provided that such person meets the requirements of sections 2.1.1 and 2.4.4;
 - 2.4.6.3 in respect of a vacancy in the member of the *rules change panel* referred to in section 2.3.1.3, a person nominated by the *PSO* to fill such vacancy provided that such person meets the requirements of sections 2.1.1 and 2.4.4; and
 - 2.4.6.4 in respect of any other vacancy in the *rules change panel* a nominee referred to in sections 2.4.1 and 2.4.2, provided that such person meets the requirements of sections 2.1.1 and 2.4.4.

- 2.4.7 The term of office of a member appointed to fill a vacancy on the *rules change panel* shall be the unexpired term of office of the member who had vacated office.

2.5 QUORUM, VOTING AND PROCEDURES

- 2.5.1 The quorum for the transaction of business at a meeting of the *rules change panel* shall be a majority of the members then in office. Where there is a vacancy on the *rules change panel*, the remaining members of the *rules change panel* may perform all of the functions and duties of the *rules change panel* at any meeting of the *rules change panel* subject to there being a quorum at that meeting.
- 2.5.2 At all meetings of the *rules change panel*, every question shall be decided by a majority of votes. Each member of the *rules change panel* shall be entitled to one vote, except that the Chair of the *rules change panel* shall not be entitled to a vote.
- 2.5.3 The *rules change panel* shall perform the functions and duties referred to in section 2.2.2 in accordance with all applicable procedures set forth in these *market rules* and in any applicable *market manuals*.

2.6 ESTABLISHMENT AND FUNCTIONS OF MARKET SURVEILLANCE AND COMPLIANCE PANEL

- 2.6.1 The *EMC Board* shall establish and maintain a *market surveillance and compliance panel* in accordance with sections 2.7 and 2.8.
- 2.6.2 The *market surveillance and compliance panel* shall have the functions and duties assigned to it in or under the authority of:
- 2.6.2.1 these *market rules* or a *market manual*;
 - 2.6.2.2 the *constituent documents*; and
 - 2.6.2.3 any resolution of the *EMC Board*,
- provided that in the event that any functions or duties referred to in section 2.6.2.2 or 2.6.2.3 shall conflict or be inconsistent with, or hinder the ability of the *market surveillance and compliance panel* to perform, the functions and duties referred to in section 2.6.2.1, the functions and duties as referred to in section 2.6.2.1 shall prevail.

2.7 COMPOSITION OF MARKET SURVEILLANCE AND COMPLIANCE PANEL AND QUALIFICATION OF MEMBERS

2.7.1 The *market surveillance and compliance panel* shall consist of at least three persons, each having sufficient relevant experience in one or more of the following areas:

2.7.1.1 competitive wholesale electricity markets or financial or commodity markets;

2.7.1.2 Singapore laws and/or electricity regulations;

2.7.1.3 competition laws and policies;

2.7.1.4 *power system* operations; and/or

2.7.1.5 economics.

The *EMC Board* shall endeavour, in making appointments to the *market surveillance and compliance panel*, to appoint persons with the expertise necessary to ensure that the combined expertise of the members of the *market surveillance and compliance panel* covers the areas specified in sections 2.7.1.1 to 2.7.1.5.

2.7.2 No person shall be appointed to the *market surveillance and compliance panel* if that person:

2.7.2.1 is, or has a spouse that is, a director, officer, employee or agent of the *EMC*, the *PSO*, or the respective *affiliates* of the *EMC* or the *PSO*;

2.7.2.2 is, or has a spouse that is, a director, officer, employee or agent of a *market participant* or *market support services licensee* or an *affiliate* of a *market participant* or *market support services licensee*;

2.7.2.3 has, or has a spouse that has, a direct or indirect legal or beneficial interest in or substantial and meaningful commercial affiliation with the *EMC*, the *PSO*, a *market participant*, a *market support services licensee* or any of their respective *affiliates*;

2.7.2.4 has a relative, or a relationship with any other person, that has a substantial and meaningful commercial affiliation with the *EMC*, the *PSO*, a *market participant*, a *market support services licensee* or any of their respective *affiliates*; or

2.7.2.5 in the opinion of the *EMC Board*, has any other real or potential conflict of interest, or there exists any other

circumstance which may prevent that person from independently and impartially carrying out his duties as a member of the *market surveillance and compliance panel*.

- 2.7.3 For the purposes of sections 2.3.2, 2.4.3, 2.7.2, 2.7.3A, 2.7.6, 2.7.7, 3.4.2 and 3.5.4:
- 2.7.3.1 a person has a commercial affiliation with another person if the person supplies goods or services to or receives goods or services from the other person, other than goods or services received in the ordinary course of being a customer of a *transmission licensee*, a *retail electricity licensee*, a person described in section 2.1.1.3 of Chapter 2 or a *market support services licensee*;
 - 2.7.3.2 an interest held as the beneficiary of a trust that does not permit the beneficiary to have any knowledge of the holdings of the trust is not a legal or beneficial interest;
 - 2.7.3.3 an interest in a mutual fund is not a legal or beneficial interest;
 - 2.7.3.4 an interest in shares is not a legal or beneficial interest if the interest is in one or more voting shares in a corporation which are quoted on a securities exchange in Singapore or elsewhere and the nominal amount of that share, or the aggregate of the nominal amounts of those shares, is equal to or less than 5% of the aggregate of the nominal amount of all the voting shares in the corporation;
 - 2.7.3.5 spouse, in respect of a person, includes another person with whom that person is living in a conjugal relationship outside of marriage; and
 - 2.7.3.6 relative, in respect of a person, means a parent, step-parent, child, step-child, sibling or step-sibling of such person, including where such relationship is pursuant to adoption.
- 2.7.3A A commercial affiliation that a person has with another person under section 2.7.3.1 shall be a substantial and meaningful commercial affiliation:
- a. if the *EMC Board* determines for the purposes of either section 2.7.2.3 or section 2.7.2.4; or
 - b. if the members of the *market surveillance and compliance panel* (other than the notifying member) determine for the purposes of section 2.7.6.2,

that the aggregate value of goods or services supplied or received in connection with that commercial affiliation is substantial and material relative to that first-mentioned person's circumstances.

- 2.7.4 No person shall be considered for appointment as a member of the *market surveillance and compliance panel* unless the *EMC Board* has received a signed declaration in the form set forth in Appendix 3D from such person.
- 2.7.5 The *EMC Board* shall from time to time appoint a Chair of the *market surveillance and compliance panel* from among the members of the *market surveillance and compliance panel*, provided that no person shall be appointed as Chair of the *market surveillance and compliance panel* unless he or she has a degree in law from a recognised university and has held a certificate to practise as an advocate and solicitor of the Supreme Court of Singapore for a period of not less than seven years.
- 2.7.6 The following provisions of this section 2.7.6 shall apply in respect of each matter (referred to in this section 2.7.6 as the "relevant matter") for the time being before, or dealt with by, the *market surveillance and compliance panel*:
- 2.7.6.1 if a member of the *market surveillance and compliance panel* (referred to in this section 2.7.6 as the "notifying member") has any real or potential conflict of interest, or there exists any circumstance that may prevent him from acting independently and impartially, he shall immediately notify the other members of the *market surveillance and compliance panel* of such conflict or circumstance;
- 2.7.6.2 upon notification under section 2.7.6.1:
- a. the notifying member may voluntarily elect to cease all involvement in the relevant matter; and
 - b. failing the election of the notifying member as stated in section 2.7.6.2(a), the other members of the *market surveillance and compliance panel* shall, by a simple majority vote, determine if the conflict or circumstance notified by the notifying member may prevent him from acting independently and impartially in respect of the relevant matter, in which event the notifying member shall cease all involvement in the relevant matter. The notifying member shall be deemed to have a conflict or a circumstance that prevents him from acting independently and impartially in respect of the relevant matter if he has a relative, or a relationship with any other person, that has a substantial and meaningful commercial affiliation with the *EMC*, the *PSO*, a *market participant*, a *market support services licensee* or any of their respective *affiliates*;

2.7.6.3 if the notifying member voluntarily elects, or is required, to cease all involvement in the relevant matter, he shall cease all involvement in the relevant matter by excusing himself from the relevant part of each meeting of the *market surveillance and compliance panel* in which the relevant matter is to be discussed or dealt with, and abstaining from participating in any discussion, voting on, or any further involvement in relation to the relevant matter.

For the avoidance of doubt, this section 2.7.6 shall be subject to, and without prejudice to, section 2.1.2.

2.7.7 Without prejudice to the generality of section 2.7.6, a notification must be made under section 2.7.6 by a member of the *market surveillance and compliance panel* if the member has a relative who:

2.7.7.1 is a director, officer, employee or agent of; or

2.7.7.2 has a direct or indirect legal or beneficial interest in or commercial affiliation with,

any party, against which any monitoring or investigation, or against which any proceeding, procedure, action or step in connection with any enforcement action or the issuance of a *suspension order, termination order or revocation order*, is or is to be conducted or taken by the *market surveillance and compliance panel* under either or both of sections 4 and 7, or any of such party's *affiliates*.

2.8 TERM AND REAPPOINTMENT OF MEMBERS OF MARKET SURVEILLANCE AND COMPLIANCE PANEL

2.8.1 Subject to section 2.1.3, the term of office of each member of the *market surveillance and compliance panel* shall be no more than three years. A member of the *market surveillance and compliance panel* whose term has expired shall be eligible for reappointment by the *EMC Board* for one or more additional terms of no more than three years each.

2.8.2 The term of office of a member of the *market surveillance and compliance panel* appointed to replace a member whose term had not yet expired shall be the unexpired term of the predecessor member.

2.8.3 Where the term of a member of the *market surveillance and compliance panel* is due to expire on a date falling within the period of time when the member is involved in an investigation referred to in section 4.6, the member shall be deemed re-appointed on such expiry date only for such time as may be necessary to enable the member to complete the investigation and any related reports.

2.9 QUORUM, VOTING AND PROCEDURES

- 2.9.1 The quorum for the transaction of any business at a meeting of the *market surveillance and compliance panel* shall be a simple majority of the members then appointed, excluding any one or more member who voluntarily elects to cease, or who is required to cease, all involvement in respect of a relevant matter under section 2.7.6 to which such business relates.
- 2.9.1A Where there is any vacancy in the *market surveillance and compliance panel*, the remaining members of the *market surveillance and compliance panel* shall perform all of the functions and duties of the *market surveillance and compliance panel* provided that there shall be at least three members of the *market surveillance and compliance panel* remaining in office.
- 2.9.1B In the event that the Chair of the *market surveillance and compliance panel* is a notifying member and voluntarily elects, or is required, to cease all involvement in respect of a relevant matter pursuant to section 2.7.6, the remaining members of the *market surveillance and compliance panel* who may vote in respect of that relevant matter may, by a simple majority, elect one member from among themselves (who meets the eligibility criteria under section 2.7.5) to act as the chairman only in respect of that part of the meeting of the *market surveillance and compliance panel* at which business in respect of that relevant matter is transacted.
- 2.9.2 At all meetings of the *market surveillance and compliance panel*, every question shall be decided by a simple majority of the votes cast on the question, by members of the *market surveillance and compliance panel*, excluding the vote of a member who voluntarily elects, or is required, to cease all involvement in respect of a relevant matter under section 2.7.6 to which such question relates.
- 2.9.2A Subject to section 2.9.2, each member of the *market surveillance and compliance panel* shall be entitled to one vote, provided that in the case of an equality of votes, the Chair of the *market surveillance and compliance panel*, if entitled to vote as aforesaid, shall be entitled to a second or casting vote. For avoidance of doubt, if a member is a notifying member in respect of a relevant matter under section 2.7.6, he shall not have any vote (and, if he is the Chair, he shall also not have any second or casting vote) in respect of the determination under section 2.7.6.2(b) in respect of that matter.
- 2.9.2B If the Chair of the *market surveillance and compliance panel* is not entitled to vote in respect of a question, the person, if any, who is elected as the chairman of the *market surveillance and compliance panel*, under

section 2.9.1B in respect of a matter to which that question relates, shall, in the case of an equality of votes, be entitled to a second or casting vote.

- 2.9.3 The *market surveillance and compliance panel* shall perform the functions and duties referred to in section 2.6.2 in accordance with any applicable procedures set forth in these *market rules* and in any applicable *market manuals*.

3 DISPUTE RESOLUTION AND COMPENSATION

Explanatory Note: Section 3 sets out how disputes under the market rules are resolved.

Generally the process is:

- **First, the parties are expected to resolve their dispute by negotiation using their dispute management systems.**
- **Second, if negotiation fails, a party submits the dispute to mediation which is carried out by a mediator.**
- **Third, if mediation fails, a party submits the dispute to arbitration which is carried out by an arbitration tribunal.**

Section 3 also sets out how a mediator is selected from a mediation panel and an arbitration tribunal is selected from an arbitration panel. The members of both panels are appointed by the dispute resolution counsellor.

3.1 GUIDELINES FOR SECTION 3

3.1.1 Section 3 should, as far as possible:

- 3.1.1.1 be interpreted to secure outcomes that are fast, just and cost-efficient on the merits of each case;
- 3.1.1.2 preserve and enhance relationships between parties to a dispute;
- 3.1.1.3 be applied in the observance of the principles of natural justice;
- 3.1.1.4 emphasize the avoidance of conflicts; and
- 3.1.1.5 encourage minimal reliance on legal representation and formal legal procedures.

3.2 OTHER REQUIREMENTS ARE NOT SUSPENDED

3.2.1 Any money to be paid under the *market rules* shall be paid by the time specified even if the dispute resolution process has been initiated under section 3.

3.2.2 Every order or direction made by the *EMC*, the *PSO* or the *market surveillance and compliance panel* shall be complied with even if the dispute resolution process has been initiated under section 3.

3.3 SCOPE

3.3.1 Disputes that shall be resolved by the dispute resolution process in section 3 are shown in the table below:

	Disputes between	Dispute in respect of
3.3.1.1	<ul style="list-style-type: none"> - <i>EMC</i> and a <i>market participant</i> - <i>EMC</i> and a <i>market support services licensee</i> - <i>PSO</i> and a <i>market participant</i> - <i>PSO</i> and a <i>market support services licensee</i> 	<ul style="list-style-type: none"> - <i>market rules</i> - <i>market manual</i> - <i>system operation manual</i> - agreement referred to in any of the above 3 to which the relevant disputants are parties
3.3.1.2	<ul style="list-style-type: none"> - <i>EMC</i> and a <i>participation applicant</i> 	<ul style="list-style-type: none"> - <i>EMC's</i> denial to register the <i>participation applicant</i> as a <i>market participant</i>
3.3.1.3	<ul style="list-style-type: none"> - <i>EMC</i> and a <i>participation applicant</i> 	<ul style="list-style-type: none"> - <i>EMC's</i> denial to authorise the <i>participation applicant</i> to participate as a <i>market support services licensee</i>
3.3.1.3A	<ul style="list-style-type: none"> - <i>EMC</i> and a <i>participation applicant</i> 	<ul style="list-style-type: none"> - <i>EMC's</i> denial of a request to transfer the registration of a <i>registered facility</i> to the <i>participation applicant</i>
3.3.1.4	<ul style="list-style-type: none"> - a <i>market participant</i> and a <i>market participant(s)</i> 	<ul style="list-style-type: none"> - <i>market rules</i> - <i>market manual</i>

	<ul style="list-style-type: none"> - a market participant(s) and a market support services licensee(s) 	<ul style="list-style-type: none"> - system operation manual - market participant – market support services licensee agreement - market support services agreement - vesting contract - connection agreement - retailer UoS agreement - any other agreement to which the relevant disputants are parties and where parties agree to apply the dispute resolution process in section 3
3.3.1.5	<ul style="list-style-type: none"> - EMC and a market participant - EMC and a market support services licensee - PSO and a market participant - PSO and a market support services licensee 	<ul style="list-style-type: none"> - request for compensation made under any of the following: <ul style="list-style-type: none"> - section 4.7.3 of Chapter 5 - section 5.4.3 of Chapter 5 - section 5.6.2 of Chapter 5 - section 7.7.3 of Chapter 5 - section 8.4.3 of Chapter 5 - section 8.6.2 of Chapter 5 - section 9.1.7 of Chapter 5 - section 9.3.7 of Chapter 5 - section 9.7.3 of Chapter 5 - section 10.4.1 of Chapter 5 - section 10.2.10 of Chapter 6
3.3.1.6	<ul style="list-style-type: none"> - EMC and PSO 	<ul style="list-style-type: none"> - market rules

		<ul style="list-style-type: none"> - <i>market manual</i> - <i>system operation manual</i> - agreement to which the disputants are parties and relates to the functions, powers and duties of the <i>EMC</i> or the <i>PSO</i> in any of the 3 above
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3.3.2 Section 3 does not apply to:

3.3.2.1 a dispute where an *electricity licence*, the *market rules*, a *market manual* or the *system operation manual*:

- a. specifies a different dispute resolution mechanism for it; or
- b. states that section 3 does not apply to it.

3.3.2.2 a dispute over a decision to modify or not modify the *market rules*, made by the *EMC Board* or the *urgent rule modification committee*;

3.3.2.3 a dispute over *EMC*'s fees which were approved by the *Authority* under section 10 or 11 of Chapter 2, but does apply if the dispute is over the calculation of those fees;

3.3.2.4 a dispute over *PSO*'s fees which were finalised by the *Authority* under section 12 of Chapter 2, but does apply if the dispute is over the calculation of those fees;

3.3.2.5 a dispute over a determination of an *arbitration tribunal*; and

3.3.2.6 a dispute arising under or in connection with:

- a. any *ancillary service funding agreement*, which shall be resolved in accordance with its terms;
- b. any *tripartite agreement*, which shall be resolved in accordance with its terms;
- c. any *ancillary service contract* which is concluded at or about the same time as an *ancillary service funding agreement* pursuant to section 8.2B.2 of Chapter 5, which shall be resolved in accordance with its terms; and

- d. the *framework agreement*, which shall be resolved in accordance with its terms.

3.3.3 Section 3 does not prevent a party to a dispute from seeking interim injunctive relief from a Singapore court.

3.4 EMC BOARD APPOINTS THE DISPUTE RESOLUTION COUNSELLOR

3.4.1 The *EMC Board* shall appoint a *dispute resolution counsellor*, on terms that the *EMC Board* considers appropriate.

3.4.2 Every person appointed as the *dispute resolution counsellor* shall meet the following eligibility requirements:

- 3.4.2.1 be at least 21 years of age;
- 3.4.2.2 not be of unsound mind as determined by a court in Singapore or elsewhere;
- 3.4.2.3 be a natural person;
- 3.4.2.4 not have been adjudicated a bankrupt;
- 3.4.2.5 never have been convicted of an offence involving dishonesty or fraud;
- 3.4.2.6 never have been found guilty of misconduct in any professional capacity;
- 3.4.2.7 not be an employee of the Government of Singapore or the *Authority*;
- 3.4.2.8 not be a director, officer, employee or agent of a *market entity* or any of its *affiliates*;
- 3.4.2.9 not have a spouse or relative who is a director, officer, employee or agent in a *market entity* or any of its *affiliates*;
- 3.4.2.10 not have a direct or indirect legal or beneficial interest in or a commercial affiliation with a *market entity* or any of its *affiliates*; or
- 3.4.2.11 not have a spouse or relative who has a direct or indirect legal or beneficial interest in or a commercial affiliation with a *market entity* or any of its *affiliates*.

- 3.4.3 Any person that the *EMC Board* appoints as the *dispute resolution counsellor* shall:
- 3.4.3.1 have a degree in law;
 - 3.4.3.2 have held a certificate to practise as an advocate and solicitor of the Supreme Court of Singapore for at least seven years;
 - 3.4.3.3 hold a current certificate to practice law in Singapore;
 - 3.4.3.4 have substantial experience in dispute resolution (including mediation and arbitration) rules, practices and procedures applicable in Singapore or elsewhere; and
 - 3.4.3.5 have an understanding of the Singapore electricity industry or the ability to acquire such an understanding within a reasonable time.
- 3.4.4 Before the *EMC Board* considers a person for appointment as the *dispute resolution counsellor*, that person shall sign and deliver to the *EMC Board* a declaration in the form set out in Appendix 3B.
- 3.4.5 Once appointed, the *dispute resolution counsellor* shall sign a confidentiality agreement. The *EMC Board* shall prescribe the form of the agreement which shall include provisions consistent with section 6.4 and 6.5.
- 3.4.6 The *EMC Board*:
- 3.4.6.1 shall appoint the *dispute resolution counsellor* for a term of up to three years;
 - 3.4.6.2 may re-appoint the *dispute resolution counsellor* for further terms of up to three years each; and
 - 3.4.6.3 may remove the *dispute resolution counsellor* only if it resolves that, in its opinion, the *dispute resolution counsellor* is unsuitable for office. A majority of two-thirds of the *EMC* directors (excluding those who abstain from voting or those who are required to abstain from voting under the constitution documents) voting in favour of such removal shall be required for such a resolution.
- 3.4.7 The *dispute resolution counsellor*'s appointment ends if he:
- 3.4.7.1 dies or resigns;
 - 3.4.7.2 is removed under section 3.4.6.3; or

- 3.4.7.3 no longer meets the requirements of section 3.4.2 or 3.4.3.
- 3.4.8 If the *dispute resolution counsellor's* appointment ends, the new *dispute resolution counsellor* shall have the same powers and duties as him.
- 3.4.9 Besides any other responsibilities assigned by section 3, the *dispute resolution counsellor* is generally responsible for effective operation of the dispute resolution and compensation regime in section 3. His general duties include:
- 3.4.9.1 assisting *market entities* to:
- a. become familiar with the dispute resolution and compensation regime;
 - b. develop their *dispute management systems*; and
- 3.4.9.2 monitoring disputes and guiding parties to resolve their disputes through the dispute resolution and compensation regime in section 3.
- 3.4.10 The *dispute resolution counsellor* may vary the period for carrying out an act that is required or authorised by section 3 if a party to the dispute applies and either;
- 3.4.10.1 the parties consent; or
- 3.4.10.2 the *dispute resolution counsellor* believes it is in the interest of fairness or justice.

The *dispute resolution counsellor* may apply conditions to a variation or may order a variation even if the application is made out of time.

- 3.4.11 The *dispute resolution counsellor* shall consult all relevant parties directly affected by his decisions under section 3. The *dispute resolution counsellor's* decisions under section 3 shall be final and binding and shall not be subject to appeal.

3.5 THE DISPUTE RESOLUTION COUNSELLOR APPOINTS THE DISPUTE RESOLUTION AND COMPENSATION PANEL

- 3.5.1 The *dispute resolution counsellor* shall appoint:
- 3.5.1.1 a *mediation panel*; and
 - 3.5.1.2 an *arbitration panel*,
- collectively called a *dispute resolution and compensation panel*.

- 3.5.2 The *dispute resolution counsellor* shall decide how many persons to appoint to the *dispute resolution and compensation panel*, and the terms of appointment.
- 3.5.3 In order to resolve a particular dispute, the *dispute resolution counsellor* may appoint a person to be on the *mediation panel* or the *arbitration panel*.
- 3.5.4 Every person that the *dispute resolution counsellor* appoints to the *dispute resolution and compensation panel* shall:
- 3.5.4.1 meet the same eligibility requirements that apply to the *dispute resolution counsellor* under section 3.4.2;
 - 3.5.4.2 have an understanding of dispute resolution practices and procedures in Singapore or elsewhere including mediation and arbitration rules, practices and procedures applicable in or outside of Singapore;
 - 3.5.4.3 have the ability to determine the most appropriate dispute resolution procedures in particular circumstances; and
 - 3.5.4.4 have an understanding of the Singapore electricity industry or the ability to acquire such an understanding within a reasonable time.
- 3.5.5 Each member of the *dispute resolution and compensation panel* shall have at least one of the following:
- 3.5.5.1 knowledge of the operation of *wholesale electricity markets*;
 - 3.5.5.2 qualification and experience in economics;
 - 3.5.5.3 experience in energy or money market trading or any other commodity market trading;
 - 3.5.5.4 experience in *power system* operation; or
 - 3.5.5.5 a degree in law and practiced as an advocate and solicitor of the Supreme Court of Singapore for at least five years; or
 - 3.5.5.6 a degree in law and has acted as an arbitrator or mediator in the resolution of disputes.
- 3.5.6 Before the *dispute resolution counsellor* considers a person for appointment to the *dispute resolution and compensation panel*, that person shall sign and deliver to the *dispute resolution counsellor* a declaration in the form set out in Appendix 3B.

- 3.5.7 Once appointed, each appointee to the *dispute resolution and compensation panel* shall sign a confidentiality agreement. The *EMC Board* shall prescribe the form of the agreement which shall include provisions consistent with section 6.4 and 6.5.
- 3.5.8 The *dispute resolution counsellor*:
- 3.5.8.1 shall appoint each member of the *dispute resolution and compensation panel* for a term of up to two years;
- 3.5.8.2 may re-appoint each member of the *dispute resolution and compensation panel* for further terms of up to two years each; and
- 3.5.8.3 may remove a member of the *dispute resolution and compensation panel* only if he determines, in his opinion, that the member is unsuitable for office.
- 3.5.9 If the appointment of a member of the *dispute resolution and compensation panel* ends while he is involved in the resolution of an ongoing dispute, he shall be automatically re-appointed. The *dispute resolution counsellor* shall decide how long the appointment will last based on the time needed to complete the proceedings.
- 3.5.10 The appointment of a *dispute resolution and compensation panel* member ends if the member:
- 3.5.10.1 dies or resigns;
- 3.5.10.2 is removed under section 3.5.8.3; or
- 3.5.10.3 no longer meets the requirements of section 3.5.4 or 3.5.5.
- 3.5.11 If a member of the *dispute resolution and compensation panel's* appointment ends, the new member of the *dispute resolution and compensation panel* shall have the same powers and duties as him.
- 3.5.12 The *EMC* shall publish the address for service of the *dispute resolution counsellor, mediators and arbitration tribunals*.
- 3.5.13 Where a document has to be served or filed, only one copy is required unless:
- 3.5.13.1 section 3 provides otherwise; or
- 3.5.13.2 directed differently by the *dispute resolution counsellor, a mediator or an arbitration tribunal*.

3.6 DISPUTE MANAGEMENT SYSTEMS

- 3.6.1 Each *market entity* shall implement a *dispute management system*. The *dispute management system* shall:
- 3.6.1.1 nominate a *DMS contact* to be the first point of contact for the notification of disputes;
 - 3.6.1.2 set out that party's procedures for responding to requests for information from another of these parties in relation to a dispute; and
 - 3.6.1.3 be consistent with guidance notes of the *dispute resolution counsellor* on the *dispute management system*.
- 3.6.2 Each *market entity* shall supply a copy of its *dispute management system* to any other *market entity* or the *dispute resolution counsellor* if they ask for a copy.

3.7 NEGOTIATION

- 3.7.1 Parties to a dispute shall complete the following steps before taking any other action (except for seeking interim injunctive relief from a Singapore court):
- 3.7.1.1 serve a *notice of dispute* on the other parties and give a copy to the *dispute resolution counsellor*, and
 - 3.7.1.2 attempt to resolve the dispute in good faith using their *dispute management systems*.
- 3.7.2 The steps in section 3.7.1 do not apply to:
- 3.7.2.1 a dispute over a request for compensation referred to in section 3.3.1.5. Section 3.11 shall apply to that dispute instead;
 - 3.7.2.2 a dispute over a *final settlement statement* referred to in section 5.6.6 of Chapter 7. Section 5.6.6 of Chapter 7 shall apply to that dispute instead;
 - 3.7.2.3 a dispute over a final financial penalty statement referred to in section D.4.12 of Appendix 5D. Section D.4.12 of Appendix 5D shall apply to that dispute instead;
 - 3.7.2.4 a dispute over a final minimum stable load compensation statement or as to whether such a statement should have been issued to a *market participant* referred to in section K.4.13 of

Appendix 6K. Section K.4.13 of Appendix 6K shall apply to that dispute instead; or

- 3.7.2.5 a dispute over a final financial penalty statement referred to in section E.4.13 of Appendix 5E. Section E.4.13 of Appendix 5E shall apply to that dispute instead.
- 3.7.3 A party shall serve a *notice of dispute* within 120 *business days* from the date when it knew or should have reasonably known of the events giving rise to the cause of action. However:
 - 3.7.3.1 for a dispute in respect of a *connection agreement*, a party shall serve the *notice of dispute* within 750 *business days* from the date it knew or should have reasonably known of the events giving rise to the cause of action; and
 - 3.7.3.2 for a dispute in respect of a retailer UoS agreement, a party shall serve the *notice of dispute* within 370 *business days* from the date when the events giving rise to the cause of action occurred.
- 3.7.4 Section 3.7.3 does not apply where the *market rules* say differently.
- 3.7.5 If a party fails to comply with the time limit set out in section 3.7.3 or section 3.11 of this Chapter, in section D.4.13 or section D.4.14 of Appendix 5D, in section E.4.14 or section E.4.15 of Appendix 5E, in section K.4.14 of Appendix 6K or in section 5.6.7 of Chapter 7 (as the case may be), that party is deemed to waive its right:
 - 3.7.5.1 to use the dispute resolution process in the *market rules* to resolve the dispute; or
 - 3.7.5.2 to start any other proceeding about the subject-matter of the dispute.

3.8 MEDIATION

- 3.8.1 Once a *notice of dispute* has been served under section 3.7.1, the parties have 40 *business days* to resolve the dispute by themselves. After that, either of them (the “*mediation complainant*”) may submit the matter to the *dispute resolution counsellor* for mediation. They do this by serving a *notice of mediation*. The parties may agree in writing to extend this 40-*business day* period.
- 3.8.2 The *notice of mediation* shall contain a brief history and description of the dispute which includes:
 - 3.8.2.1 the names of the parties to the dispute;

- 3.8.2.2 the grounds of the dispute;
 - 3.8.2.3 the remedy sought; and
 - 3.8.2.4 the contested amount if there is one.
- 3.8.3 Any other party to the dispute may respond to a *notice of mediation* by providing its own written account of the dispute to the *dispute resolution counsellor*.
- 3.8.4 The *dispute resolution counsellor* shall send:
- 3.8.4.1 the *notice of mediation* to the other parties to the dispute; and
 - 3.8.4.2 any response from the other parties to the dispute to the *mediation complainant*.
- 3.8.5 Before taking any action, the *dispute resolution counsellor* shall decide if all the following conditions are met:
- 3.8.5.1 section 3 applies to the dispute;
 - 3.8.5.2 the *notice of dispute* was served within the time limit in section 3.7.3;
 - 3.8.5.3 where the *notice of dispute*:
 - a. relates to a dispute to which section 13.1.4.3, 13.2.4.3 or 13.3.4.3 of Chapter 1 applies (whether because of any of those sections or section 13.5 of Chapter 1 or by agreement); and
 - b. includes a claim for damages,

the aggregate of that claim for damages (exclusive of claims for costs) in respect of a given event and a given person, exceeds \$5,000; and
 - 3.8.5.4 mediation is an appropriate means of resolving the dispute.
- 3.8.6 If the *dispute resolution counsellor* decides that any of the conditions in section 3.8.5 are not met, he shall notify the parties in writing and shall not take any further action under section 3.
- 3.8.7 If the *dispute resolution counsellor* decides that all the conditions in section 3.8.5 are met, he shall notify the parties to the dispute in writing.
- 3.8.8 The *dispute resolution counsellor* shall select a person from the *mediation panel* to mediate the dispute (the “*mediator*”) and notify the

parties to the dispute of his selection in writing. The *dispute resolution counsellor* shall make the selection within 20 *business days* of the notice referred to in section 3.8.7. The *mediator*'s appointment takes effect from the date of the written notice informing the parties to the dispute of the selection.

3.8.9 The *dispute resolution counsellor* shall:

3.8.9.1 be satisfied that the *mediator* has no conflict of interest; and

3.8.9.2 select the *mediator* on a fair and objective basis.

A person who has served as a *mediator* in a dispute is eligible for appointment as a *mediator* in another dispute.

3.8.10 A *mediator* shall be independent and act impartially. A *mediator* who has any real or potential conflict of interest or a circumstance that may prevent him from acting independently and impartially shall immediately notify the *dispute resolution counsellor* and the parties to the dispute of this conflict or circumstance.

3.8.11 If the *mediator* gives notice of a conflict under section 3.8.10, the *dispute resolution counsellor* shall replace the *mediator* with another person from the *mediation panel*. The replacement *mediator* shall also meet the requirements in section 3.8.9. The *dispute resolution counsellor* need not replace the *mediator* if the parties agree that a replacement is not necessary.

3.8.12 The *mediator* shall conduct a mediation session within 20 *business days* of being appointed or within a longer period if the parties and the *mediator* agree.

3.8.13 If as a result of mediation, the parties to a dispute enter into a settlement agreement in writing where the parties agree that monies are due and payable by one party to another under the *market rules*, such agreement shall be considered to create an obligation under the *market rules* to pay the amount agreed and such amount may, without prejudice to any other recovery available at law, be recovered accordingly.

3.8.14 Failure to comply with a settlement agreement is a breach of the *market rules*.

3.8.15 Unless the parties to a dispute agree differently;

3.8.15.1 each party shall pay its own costs and legal expenses for the mediation; and

- 3.8.15.2 the parties shall share equally any costs charged by the *mediator*.
- 3.8.16 Section 3.8 does not apply to:
- 3.8.16.1 a dispute over a request for compensation in section 3.3.1.5. Section 3.11 shall apply to the dispute instead;
- 3.8.16.2 a dispute over a *final settlement statement* in section 5.6.6 of Chapter 7. Section 5.6.6 of Chapter 7 shall apply to the dispute instead;
- 3.8.16.3 a dispute over a final financial penalty statement in section D.4.12 of Appendix 5D. Section D.4.12 of Appendix 5D shall apply to that dispute instead;
- 3.8.16.4 a dispute over a final minimum stable load compensation statement or as to whether such a statement should have been issued to a *market participant* referred to in section K.4.13 of Appendix 6K. Section K.4.13 of Appendix 6K shall apply to that dispute instead; or
- 3.8.16.5 a dispute over a final financial penalty statement in section E.4.13 of Appendix 5E. Section E.4.13 of Appendix 5E shall apply to that dispute instead.

3.9 ARBITRATION

- 3.9.1 Either party (the “*arbitration complainant*”) may submit the matter to the *dispute resolution counsellor* for arbitration if:
- 3.9.1.1 the *dispute resolution counsellor* informs the parties in writing that mediation is not an appropriate means of resolving their dispute;
- 3.9.1.2 the parties fail to resolve their dispute after attending a mediation session;
- 3.9.1.3 the dispute is not resolved within 20 *business days* after the *mediator* is appointed (or longer if the parties agree in writing);
- 3.9.1.4 the dispute is over a request for compensation in section 3.3.1.5 that is not resolved under section 3.11;
- 3.9.1.5 the dispute is over a *final settlement statement* in section 5.6.6 that is not resolved under section 5.6.6 of Chapter 7;

- 3.9.1.6 the dispute is over a final financial penalty statement referred to in section D.4.12 of Appendix 5D;
 - 3.9.1.7 the dispute is over a final minimum stable load compensation statement or as to whether such a statement should have been issued to a *market participant* referred to in section K.4.13 of Appendix 6K; or
 - 3.9.1.8 the dispute is over a final financial penalty statement referred to in section E.4.13 of Appendix 5E.
- 3.9.2 An *arbitration complainant* submits a dispute to the *dispute resolution counsellor* for arbitration by filing a *notice of arbitration*.
- 3.9.3 The *notice of arbitration* shall contain a brief history and description of the dispute which includes:
- 3.9.3.1 the names of the parties;
 - 3.9.3.2 the grounds of dispute;
 - 3.9.3.3 the remedy sought; and
 - 3.9.3.4 the contested amount, if there is one,
- unless this information has already been provided in a *notice of mediation* under section 3.8.2.
- 3.9.4 Any other party to the dispute may respond to a *notice of arbitration* by providing its own written account to the *dispute resolution counsellor*.
- 3.9.5 The *dispute resolution counsellor* shall send:
- 3.9.5.1 the *notice of arbitration* to the other parties to the dispute; and
 - 3.9.5.2 any responses from these other parties to the *arbitration complainant*.
- 3.9.6 Before taking any further action, the *dispute resolution counsellor* shall decide if all the following conditions (where applicable) are met:
- 3.9.6.1 section 3 applies to the dispute;
 - 3.9.6.2 the *notice of dispute* was served within the time limit in section 3.7.3 of this Chapter ;
 - 3.9.6.3 where the *notice of dispute*:

- a. relates to a dispute to which section 13.1.4.3, 13.2.4.3 or 13.3.4.3 of Chapter 1 applies (whether because of any of those sections or section 13.5 of Chapter 1 or by agreement); and
 - b. includes a claim for damages,

the aggregate of that claim for damages (exclusive of claims for costs) in respect of a given event and a given person, exceeds \$5,000;
- 3.9.6.4 where the *notice of arbitration* relates to a dispute over a request for compensation to which section 3.11 applies, the request was made within the time limit in section 3.11.2 and such *notice of arbitration* was submitted to the *dispute resolution counsellor* within the time limit in section 3.11.5;
- 3.9.6.5 where the *notice of arbitration* relates to a dispute on a *final settlement statement*, such *notice of arbitration* was submitted within the time limit in section 5.6.7 of Chapter 7;
- 3.9.6.6 where the *notice of arbitration* relates to a dispute on a final financial penalty statement pursuant to section D.4.12 of Appendix 5D:
- a. such *notice of arbitration* was submitted within the time limit in sections D.4.13, D.4.14.1 or D.4.14.2 of Appendix 5D, as applicable;
 - b. where such *notice of arbitration* was submitted pursuant to section D.4.14.1 of Appendix 5D, a copy of the notification referred to in section D.4.14.1 of Appendix 5D is submitted together with such *notice of arbitration*;
 - c. where such *notice of arbitration* was submitted pursuant to section D.4.14.2 of Appendix 5D, a copy of the court order or judgement which is final and conclusive as between the parties referred to in section D.4.14.2 of Appendix 5D is submitted together with such *notice of arbitration*; and
 - d. such *notice of arbitration* is not required to be dismissed under section D.4.15 of Appendix 5D;
- 3.9.6.7 where the *notice of arbitration* relates to a dispute over a final minimum stable load compensation statement or as to whether such a statement should have been issued to a *market participant* pursuant to section K.4.13 of Appendix 6K:

- a. such *notice of arbitration* was submitted within the time limit in section K.4.14 of Appendix 6K; and
 - b. such *notice of arbitration* is not required to be dismissed under section K.4.15 of Appendix 6K; and
- 3.9.6.8 where the *notice of arbitration* relates to a dispute on a final financial penalty statement pursuant to section E.4.13 of Appendix 5E:
- a. such *notice of arbitration* was submitted within the time limit in section E.4.14, E.4.15.1 or E.4.15.2 of Appendix 5E;
 - b. where such *notice of arbitration* was submitted pursuant to section E.4.15.1 of Appendix 5E, a copy of the notification referred to in section E.4.15.1 of Appendix 5E is submitted together with such *notice of arbitration*;
 - c. where such *notice of arbitration* was submitted pursuant to section E.4.15.2 of Appendix 5E, a copy of the court order or judgment which is final and conclusive as between the parties referred to in section E.4.15.2 of Appendix 5E is submitted together with the *notice of arbitration*; and
 - d. such *notice of arbitration* is not required to be dismissed under section E.4.16 of Appendix 5E.
- 3.9.7 If the *dispute resolution counsellor* decides that any condition in section 3.9.6 is not met, he shall notify the parties in writing and shall not take any further action under Chapter 3.
- 3.9.8 If the *dispute resolution counsellor* decides that all conditions in section 3.9.6 are met, he shall notify the parties in writing.
- 3.9.9 Once the *dispute resolution counsellor* has notified the parties, he shall file a summary of the dispute with the *EMC* for *publication*. However, if after consulting the parties, he decides that:
- 3.9.9.1 the dispute falls within section 3.3.1.4 (excluding disputes under *market rules*, *market manuals* or the *system operation manual*); and
 - 3.9.9.2 the resolution of the dispute is unlikely to directly affect any *market entity* who is not a party to the dispute,
- he shall not file the summary unless all the parties to the dispute consent.

- 3.9.10 The *EMC* shall *publish* the summary filed with the *EMC* under section 3.9.9.
- 3.9.11 The parties to the dispute shall select one or three persons from the *arbitration panel* to act as the *arbitration tribunal*. The parties to the dispute shall try in good faith to agree on this selection within 20 *business days* of the notification in section 3.9.8.
- 3.9.12 Once the parties agree on the selection of the *arbitration tribunal* members, they shall notify the *dispute resolution counsellor* in writing. The *dispute resolution counsellor* shall then advise the selected members of the *arbitration tribunal* of their appointment. The appointments take effect from the date of that advice.
- 3.9.13 If the parties fail to select an *arbitration tribunal* within the time limit in section 3.9.11 the *dispute resolution counsellor* shall:
- 3.9.13.1 select a person from the *arbitration panel* to be the *arbitration tribunal*. If any party requests, the *dispute resolution counsellor* shall select three persons to be the *arbitration tribunal*;
 - 3.9.13.2 notify the parties in writing of his selection; and
 - 3.9.13.3 advise the members of the *arbitration tribunal* of their appointment. These appointments take effect from the date of that advice.
- 3.9.14 The *dispute resolution counsellor* shall:
- 3.9.14.1 be satisfied that the members of the *arbitration tribunal* have no conflict of interest; and
 - 3.9.14.2 select the members of the *arbitration tribunal* on a fair and objective basis.
- A person who has served on an *arbitration tribunal* in a dispute is eligible for appointment to another *arbitration tribunal* in another dispute.
- 3.9.15 If an *arbitration tribunal* is made up of three persons, the *dispute resolution counsellor* shall nominate one of them as chairperson.

- 3.9.16 All members of an *arbitration tribunal* shall be independent and act impartially. A member of an *arbitration tribunal* who has any real or potential conflict of interest shall immediately notify the *dispute resolution counsellor* and the parties to the dispute.
- 3.9.17 If a member of the *arbitration tribunal* gives notice of a conflict under section 3.9.16, the *dispute resolution counsellor* shall replace that member with another person from the *arbitration panel*. The replacement shall also meet the requirements in section 3.9.14. The *dispute resolution counsellor* need not replace the member who gave the notice if the parties agree that a replacement is not necessary.
- 3.9.18 Once an *arbitration tribunal* has been appointed, the *dispute resolution counsellor* shall file the notice of the appointment with the *EMC*. However, if the consent of the parties was required before filing the summary of the dispute under section 3.9.9, the *dispute resolution counsellor* shall get the consent of the parties before filing the notice of appointment.
- 3.9.19 The *EMC* shall:
- 3.9.19.1 *publish* the notice of appointment in section 3.9.18;
 - 3.9.19.2 invite persons who might be directly affected by the resolution of the dispute to apply to the *arbitration tribunal*, to intervene in the arbitration;
 - 3.9.19.3 allow affected persons 10 *business days* of the date the notice is *published* to apply; and
 - 3.9.19.4 request affected persons to notify the parties of any application to intervene.
- 3.9.20 The *arbitration tribunal* may allow a person to intervene on terms it thinks appropriate, if that person demonstrates that:
- 3.9.20.1 they have an interest in the subject-matter of the dispute; and
 - 3.9.20.2 they may be directly affected by the determination of the *arbitration tribunal*.
- 3.9.21 Once the application period to intervene in section 3.9.19.3 has expired, the *arbitration tribunal* shall consider the applications received. Then, taking into account the urgency of the matter, it shall decide:
- 3.9.21.1 where and when it will hold the arbitration; and
 - 3.9.21.2 what procedures it will follow.

- 3.9.22 The *arbitration tribunal* may require the parties to exchange submissions, documents and information.
- 3.9.23 All parties to a dispute will be given an opportunity to present their case to the *arbitration tribunal*. The *arbitration tribunal* may appoint assessors who will assist with technical issues, if all parties to the dispute consent.
- 3.9.24 The *arbitration tribunal* may consolidate two or more disputes for resolution in the same arbitration, if appropriate and if all parties consent.
- 3.9.25 The *arbitration tribunal* shall complete arbitration as soon as reasonably practicable.
- 3.9.26 The *arbitration tribunal* has the power to:
- 3.9.26.1 direct a party to do anything or not do anything, and to specify a time limit;
 - 3.9.26.2 assess damages against a party. In doing so, the *arbitration tribunal* shall take into account any limits on liability in the *market rules* or any relevant contract; and
 - 3.9.26.3 determine if a *market participant* or *market support services licensee* is to receive any compensation under the provisions listed in section 3.3.1.5.
- 3.9.27 If the *arbitration tribunal* is made up of three persons, it makes determinations by majority. The dissenting person may deliver written reasons for his dissent.
- 3.9.28 The *arbitration tribunal* shall refer a matter to the *market surveillance and compliance panel* if it considers or if the parties agree, that there has been a breach of the *market rules*, a *market manual* or the *system operation manual* by a *market entity*.
- 3.9.29 Where an *arbitration tribunal* determines or the parties agree during the course of the resolution of a dispute following the appointment of an *arbitration tribunal* that monies are due and payable by one party to another under the *market rules* other than by way of damages, such determination or agreement shall be considered to create an obligation under the *market rules* to pay the amount agreed or determined by the *disputes resolution and compensation panel* and such amount may, without prejudice to any other manner of recovery available at law, be recovered accordingly.

- 3.9.30 Until the *arbitration tribunal* makes a determination, the parties shall share equally the costs charged by the *arbitration tribunal* and any assessors appointed by the *arbitration tribunal*.
- 3.9.31 An *arbitration tribunal* determination may, on a just and reasonable basis, allocate amongst the parties and/or the interveners under section 3.9.20:
- 3.9.31.1 each party's costs and legal expenses associated with participating in the arbitration;
- 3.9.31.2 the costs charged, by the *arbitration tribunal*; and
- 3.9.31.3 the costs of any assessors.
- 3.9.32 An agreement by the parties or a determination of the *arbitration tribunal* is binding and is not subject to appeal except under the Arbitration Act (Cap 10).
- 3.9.33 A determination of an *arbitration tribunal* may with the leave of a Singapore court be enforced as if it were a judgment or order of a Singapore court.
- 3.9.34 Failure to comply with a determination of the *arbitration tribunal* is a breach of the *market rules*.
- 3.9.35 The *arbitration tribunal* shall record the details of how a dispute is resolved under section 3.9. The record shall include a summary of the determination or the settlement between the parties. The *arbitration tribunal* shall send a copy of the record to the *dispute resolution counsellor*.
- 3.9.36 The *dispute resolution counsellor* shall send the record in section 3.9.35 to the *EMC*. The *EMC* shall *publish* the summary after removing all *confidential information*.
- 3.9.37 The *EMC* shall obtain the consent of the parties before it *publishes* the summary in section 3.9.36, where consent was required under section 3.9.9.
- 3.9.38 Each *market entity* agrees that section 3 is an arbitration agreement for the purposes of the Arbitration Act (Cap.10) when a dispute is referred to the *dispute resolution counsellor* for arbitration under the *market rules*.

3.10 CONFIDENTIALITY

- 3.10.1 All matters relating to an arbitration are confidential. Disclosure to third parties requires the written consent of the parties to the dispute. Consent is not required:
- 3.10.1.1 if section 3 says differently;
 - 3.10.1.2 for the conduct of the arbitration;
 - 3.10.1.3 when applying to any court in Singapore or elsewhere;
 - 3.10.1.4 if a court in Singapore or elsewhere orders disclosure;
 - 3.10.1.5 in order to comply with the laws of Singapore or other laws that apply to the party making the disclosure; or
 - 3.10.1.6 in order to comply with the request or requirement of any regulatory authority.

3.11 APPLICATION FOR COMPENSATION

Explanatory Note: Section 3.11 deals with the process where a market participant or market support services licensee seeks compensation from the PSO or the EMC based on section 3.3.1.5. Section 3.11 does not apply if a party seeks compensation for damage based on other sections.

- 3.11.1 If a *market participant* or a *market support services licensee* (the "*claimant*") seeks compensation under section 3.3.1.5, the *claimant* shall submit its request to the *EMC* or the *PSO*. The request shall:
- 3.11.1.1 meet the requirements of the relevant *market manual* or the *system operation manual*;
 - 3.11.1.2 refer to the section of the *market rules* that the request is based on;
 - 3.11.1.3 specify the amount of compensation sought; and
 - 3.11.1.4 where applicable, the amount of compensation sought by a *market participant* or a *market support services licensee*, as specified in the request pursuant to section 3.11.1.3, shall be determined based on the applicable guidelines for compensation *published* by the *EMC*, with respect to the specific circumstances under which a request for compensation may be sought under the *market rules*.

Explanatory Note: The guidelines for compensation published by EMC are intended to assist: (1) the market participant or market support services licensee in determining the compensation amount

requested, with respect to the specific circumstances under which a request for compensation may be made under the market rules; and (2) the EMC or the PSO in evaluating the compensation amount requested, with respect to the specific circumstances under which a request for compensation may be made under the market rules.

3.11.2 A *claimant* shall make its request for compensation within 10 *business days* of the date that:

3.11.2.1 the events giving rise to the potential entitlement to compensation occurred; or

3.11.2.2 the *claimant* knew or should have reasonably known of the events giving rise to the potential entitlement to compensation.

whichever is later.

3.11.3 If the *EMC* or the *PSO* requires any further information or clarification to support a request for compensation from a *claimant* on the basis that the information already provided is incomplete or unclear, it shall advise the *claimant* within 5 *business days* of the date the *claimant* makes its request for compensation, or longer if the *EMC* or *PSO* and the *claimant* agree.

3.11.4 Within 20 *business days* of receiving (i) a compensation request referred to in section 3.11.1, or (ii) any further information or clarification requested under section 3.11.3, whichever is later, the *EMC* or the *PSO* shall notify the *claimant* of their view on whether the *claimant* is eligible for compensation sought and the amount of compensation, if any.

3.11.5 Within 20 *business days* of the notification referred to in section 3.11.4,

3.11.5.1 if the *claimant* agrees with the amount of compensation decided by the *EMC* or the *PSO* under section 3.11.4, it shall notify the *EMC* or the *PSO* of its agreement and the *EMC* shall pay the agreed compensation amount according to section 3.12; or

3.11.5.2 if the *claimant* disagrees with the determination of the *EMC* or the *PSO* under section 3.11.4, it shall submit the matter to the *dispute resolution counsellor* under section 3.9.1.4.

3.12 COMPENSATION PAYABLE BY THE EMC

- 3.12.1 The *EMC* shall pay all compensation amounts due under section 10.5 of Chapter 6 and all compensation claims due under the *market rules* as soon as practicable after it has recovered the same through the monthly energy uplift charge under section 4.1 of Chapter 7.
- 3.12.2 Notwithstanding section 3.12.1, the *EMC* shall pay all compensation amounts due under section 10.5 of Chapter 6 and all compensation claims, in such manner as the *EMC* deems appropriate, as soon as practicable but no later than 90 days after:
- 3.12.2.1 the date the *claimant* notifies its agreement to the amount of compensation determined by the *EMC* or *PSO*;
 - 3.12.2.2 the date the *arbitration tribunal* makes the determination against the *EMC*;
 - 3.12.2.3 the date the parties resolve their dispute; or
 - 3.12.2.4 the issuance of the final minimum stable load compensation invoice referred to in Appendix 6K.

3.13 COMPENSATION PAYABLE BY THE PSO

- 3.13.1 The *PSO* shall pay all compensation claims as soon as practicable after receiving the corresponding sums from the *EMC* but no later than 90 days after:
- 3.13.1.1 the date the *arbitration tribunal* makes the determination against the *PSO*; or
 - 3.13.1.2 the date the parties resolve their dispute.

3.14 PUBLICATION

- 3.14.1 Where the *PSO* is obliged to pay compensation or damages under section 3, it shall notify the *Authority* and the *EMC*. Where the *EMC* is obliged to pay compensation or damages under section 3, it shall notify the *Authority*. The *EMC* shall *publish* such notices.
- 3.14.2 The notice referred to in section 3.14.1 shall contain a summary of the subject-matter of the dispute, the amount of money to be paid, but not the name of any other party to the dispute.
- 3.14.3 The *EMC* shall *publish* a summary of all payments referred to in section 3.14.2 for each year by 31 March of the next year.

3.15 EMC REVIEW OF DISPUTE RESOLUTION PROCEDURES

- 3.15.1 The *EMC Board* shall conduct a review of the dispute resolution procedures in section 3 by 31 December 2020.
- 3.15.2 The review shall consider:
- 3.15.2.1 whether the procedures in section 3 are fair and effective;
 - 3.15.2.2 whether any additional procedures are necessary; and
 - 3.15.2.3 any other matter that the *EMC* considers appropriate.
- 3.15.3 The *EMC Board* initiates the review by *publishing* a notice. The notice shall:
- 3.15.3.1 contain the terms of reference for the review, including the matters in sections 3.15.2.1 and 3.15.2.2; and
 - 3.15.3.2 invite *market participants*, *market support services licensees* and other interested persons to file written submissions in respect of the review within a specified time.
- 3.15.4 The *rules change panel* shall conduct the review, in consultation with the *dispute resolution counsellor* and other persons that the *EMC Board* or the *rules change panel* decides are appropriate.
- 3.15.5 Once the *rules change panel* has completed its review, it shall consult with the *dispute resolution counsellor* to prepare and submit a report to the *EMC Board*. The report shall contain:
- 3.15.5.1 a summary of any material submissions received;

- 3.15.5.2 any changes that the *rules change panel* recommends in respect of the submissions received;
 - 3.15.5.3 a summary of issues that the *dispute resolution counsellor* has raised in respect of the *rules change panel*'s recommendations;
 - 3.15.5.4 the *rules change panel*'s replies to the issues raised by the *dispute resolution counsellor* in respect of their recommendations; and
 - 3.15.5.5 the *rules change panel*'s final recommendations on the changes to be made to the dispute resolution process in section 3.
- 3.15.6 The *EMC* shall *publish* the report in section 3.15.5. The *EMC Board* shall decide which of the final recommendation(s) in the report should be adopted and implemented, if any.

4 MARKET SURVEILLANCE

4.1 INTRODUCTION

- 4.1.1 This section 4 sets forth the rules pursuant to which activities in the *wholesale electricity markets* and the conduct of *market participants*, *market support services licensees*, the *PSO* and the *EMC* will be monitored and/or investigated to:
- 4.1.1.1 identify breaches of the *market rules*, any *market manual* or *system operation manual*;
 - 4.1.1.2 assess whether the underlying structure of the *wholesale electricity markets* is consistent with the efficient and fair operation of a competitive market; and
 - 4.1.1.3 recommend remedial actions to mitigate the conduct and inefficiencies referred to above.
- 4.1.2 The monitoring and investigation activities described in this section 4 shall be carried out by the *market assessment unit* of the *EMC* established in accordance with section 4.2.1 and by the *market surveillance and compliance panel*.
- 4.1.3 The *EMC* shall ensure that the *market assessment unit* and the *market surveillance and compliance panel* have, subject to any condition of the *EMC's electricity licence* imposed pursuant to subsection 9(7)(b) of the *Electricity Act*, adequate resources, and have full access to records, information or data in the ownership, possession or control of the *EMC* and the full cooperation of its directors, officers, employees or agents, of members of the *rules change panel* and of the *dispute resolution counsellor* for purposes of the fulfilment of their respective functions and duties under this section 4.
- 4.1.4 The *PSO* shall ensure that the *market assessment unit* and the *market surveillance and compliance panel* have full access to records, information or data pertaining to the operation of the *PSO* controlled system in the ownership, possession or control of the *PSO* and the full cooperation of its officers, employees or agents for the purposes of the fulfilment of their respective functions and duties under this section 4.

4.2 ESTABLISHMENT AND STAFFING OF MARKET ASSESSMENT UNIT

- 4.2.1 A *market assessment unit* shall be established by the *EMC* and composed of an adequate number of full-time *EMC* staff with the experience and qualifications necessary to fulfil the functions and duties assigned to the *market assessment unit* in this section 4. Such qualifications may include professional training pertinent to and experience in the operation of markets analogous to *wholesale electricity markets*, in the electric power industry, and in the field of competition law, economics and public policy.
- 4.2.2 The *market assessment unit* shall report to and be under the management and administration of the *EMC*. The *market assessment unit* shall also report to and take direction from the Chair of the *market surveillance and compliance panel* on all matters pertaining to the responsibilities of the *market assessment unit* pursuant to this section 4.

4.3 MARKET MONITORING FUNCTIONS AND CATALOGUES

- 4.3.1 The *market surveillance and compliance panel* shall, with the assistance of the *market assessment unit*, monitor and investigate the conduct of *market participants*, *market support services licensees*, *EMC* and the *PSO* and the structure and performance of, and activities in, the *wholesale electricity markets*, including conduct or activities that provide indications of the following phenomena:
- 4.3.1.1 breaches of the market rules, a market manual or system operation manual;
 - 4.3.1.2 actual or potential design or other flaws and inefficiencies in the *market rules*, *market manuals*, the *system operation manual* and other rules and procedures of the *EMC* or the *PSO*; and
 - 4.3.1.3 actual or potential design or other flaws in the overall structure of the *wholesale electricity markets*.
- 4.3.2 The *market assessment unit* shall, under the supervision and direction of the *market surveillance and compliance panel*, develop an information requirements system and criteria for evaluation that will enable it and the *market surveillance and compliance panel* to effectively carry out the monitoring functions referred to in section 4.3.1. To this end, the *market assessment unit* shall, under the supervision and direction of the *market surveillance and compliance panel*, develop:
- 4.3.2.1 a detailed catalogue of all of the data or categories of data it will have the need or means of acquiring; and

- 4.3.2.2 a catalogue of the monitoring indices that it will use to evaluate the data so acquired.
- 4.3.3 The catalogue referred to in section 4.3.2.1 shall be *published* by the *EMC* for public comment prior to its adoption. The catalogue referred to in section 4.3.2.2 shall be *published* by the *EMC* for public comment prior to its adoption unless the *EMC Board*, by majority vote and on the recommendation of the *market surveillance and compliance panel*, determines that publication of such catalogue is likely to compromise the work of the *market assessment unit* or the *market surveillance and compliance panel*. Where the *EMC Board* determines not to *publish* the catalogue referred to in section 4.3.2.2, it shall report such determination to the *Authority*.
- 4.3.4 The *market surveillance and compliance panel* retains the sole discretion to adopt the catalogues referred to in section 4.3.2 notwithstanding any comments received in opposition thereto. Where the *market surveillance and compliance panel* adopts a catalogue notwithstanding comments received in opposition thereto, it shall so notify the *EMC*.
- 4.3.5 Once the catalogue referred to in:
- 4.3.5.1 section 4.3.2.1 has been adopted by the *market surveillance and compliance panel*, it shall be *published* by the *EMC*; and
- 4.3.5.2 once the catalogue referred to in section 4.3.2.2 has been adopted by the *market surveillance and compliance panel*, it shall be *published* by the *EMC* unless the *EMC Board*, by majority vote and on the recommendation of the *market surveillance and compliance panel*, determines that *publication* of such catalogue is likely to compromise the work of the *market assessment unit* or the *market surveillance and compliance panel*. Where the *EMC Board* determines not to *publish* such catalogue, it shall report such determination to the *Authority*.
- 4.3.6 Each such catalogue shall be the subject of such re-evaluation and *modification* by the *market assessment unit*, under the supervision and direction of the *market surveillance and compliance panel*, as the *market surveillance and compliance panel* deems appropriate. The procedures set forth in sections 4.3.3, 4.3.4 and 4.3.5 and in this section 4.3.6 apply equally to all *modifications* to such catalogues.
- 4.3.7 *Market participants, market support services licensees, the EMC and the PSO*, as specified in the catalogue, shall provide the *market assessment unit* with the data referred to in the catalogue described in section 4.3.2.1 within or at the time or times specified in such catalogue once *publication* of such catalogue has been effected pursuant to section 4.3.5.

- 4.3.8 A *market participant* or *market support services licensee*, or the *PSO* may request that the *market assessment unit* or the *market surveillance and compliance panel* provide data to it, other than *confidential information*, collected or created in the course of the monitoring activities described in section 4.3.1 and which is not data otherwise required to be *published* by the *EMC* pursuant to the *market rules*, a *market manual* or the *system operation manual*. Such data may, with the approval of the *market surveillance and compliance panel* and the *EMC*, and subject to such constraints as may exist on the resources of the *market assessment unit* or the *market surveillance and compliance panel*, be provided. Where the provision of data imposes a significant burden or expense on *EMC*, the data may be provided on payment of a reasonable fee to be determined by the *EMC*.
- 4.3.9 Nothing in this section 4.3 shall preclude the *market surveillance and compliance panel* from conducting such monitoring, evaluation or analyses as it deems appropriate at any given time
- 4.3.10 The *market assessment unit* shall, under the supervision and direction of the *market surveillance and compliance panel*, consult with the *Authority* on and develop a set of information requirements to assist the *Authority* to fulfil its obligations with respect to competition and abuse of a dominant position under sections 50 and 51 of the *Electricity Act* respectively. In connection with the foregoing:
- 4.3.10.1 the *market assessment unit* shall make reasonable endeavours to have developed and made available for *publication* an initial set of information requirements to assist the *Authority* within 3 calendar months of *market commencement date*;
- 4.3.10.2 the *market assessment unit* shall, from time to time and as necessary, and in accordance with the procedures set out in sections 4.3.10.2A to 4.3.10.2D, modify the set of information requirements established pursuant to section 4.3.10;
- 4.3.10.2A before the *market assessment unit* modifies the set of information requirements pursuant to section 4.3.10.2, the *EMC* shall *publish* the details of the proposed modifications to the set of information requirements, and invite all interested persons to make written submissions on the proposed modifications to the set of information requirements to the *market assessment unit* within a reasonable time specified in the invitation;
- 4.3.10.2B all written submissions referred to in section 4.3.10.2A must be made within the time specified in the relevant invitation *published* by the *EMC*;

- 4.3.10.2C all written submissions referred to in section 4.3.10.2A that are received by the *market assessment unit*, within the time specified for making such written submissions in the relevant invitation published by the *EMC*, shall be considered by the *market assessment unit*;
- 4.3.10.2D the *market assessment unit* shall, under the supervision and direction of the *market surveillance and compliance panel*, consult with the *Authority* on the proposed modifications to the set of information requirements referred to in section 4.3.10.2A, taking into consideration the written submissions referred to in section 4.3.10.2C;
- 4.3.10.3 the set of information requirements established in accordance with section 4.3.10, and any modifications made pursuant to section 4.3.10.2, shall be *published* by the *EMC* as soon as practicable after receipt;
- 4.3.10.4 *market participants, market support services licensees* and the *EMC*, as specified in the information requirements, shall provide the *market assessment unit* with the data referred to in the information requirements established in accordance with section 4.3.10 and modified by any modifications thereto pursuant to section 4.3.10.2, within or at the time or times specified in such information requirements, once *publication* of such information requirements has been effected pursuant to section 4.3.10.3. In addition to the foregoing, upon request by the *Authority* for any data referred to in such information requirements, a *market participant, market support services licensee* or the *EMC* to whom such request is made shall also provide directly to the *Authority* the requested data;
- 4.3.10.5 the *market assessment unit* shall, under the supervision and direction of the *market surveillance and compliance panel*, and on a frequency to be determined by the *market surveillance and compliance panel* in consultation with the *Authority*, collect such market information as referred to in the information requirements established in accordance with section 4.3.10 and modified by any modifications thereto pursuant to section 4.3.10.2;
- 4.3.10.6 subject to section 4.3.10.7, the *market assessment unit* shall, under the supervision and direction of the *market surveillance and compliance panel*, and on a frequency to be determined by the *market surveillance and compliance panel* in consultation with the *Authority*, provide to the *Authority* the market information collected by the *market assessment unit* pursuant to section 4.3.10.5; and

4.3.10.7 upon receipt by the *market assessment unit* of a copy of the request of the *Authority* referred to in section 4.3.10.4, the *market assessment unit* shall be released from its obligations under section 4.3.10.6 to provide to the *Authority* the same data that the *Authority* had requested under section 4.3.10.4.

4.4 ANALYSIS AND REPORTING ON MONITORING FUNCTIONS

4.4.1 The *market assessment unit* shall monitor daily market behaviour in the *wholesale electricity markets* and shall, under the supervision and direction of the *market surveillance and compliance panel*, evaluate and analyse information that it collects in such manner as the *market surveillance and compliance panel* deems necessary for the fulfilment of the monitoring activities described in section 4.3.1 or for the purpose of assisting the *Authority* pursuant to section 4.3.10.

4.4.2 The *market assessment unit* shall report to the *market surveillance and compliance panel* any evidence of the phenomena referred to in section 4.3.1 which may be revealed by the monitoring, evaluations and analyses conducted by the *market assessment unit*. Where the *market assessment unit's* evaluation and analyses reveal that:

4.4.2.1 a *modification* to the *market rules* may be required;

4.4.2.2 a *market participant* or *market support services licensee* or the *EMC* or the *PSO* is or may be breaching a provision of the *market rules*, a *market manual* or the *system operation manual*; or

4.4.2.3 a *market participant* or *market support services licensee* or the *EMC* or the *PSO* is or may be acting contrary to or in non-compliance with statutory authority falling within the jurisdiction of a person, board, agency, authority or tribunal, including the *Authority* but excluding the *PSO*, or in non-compliance with an order, direction, *electricity licence* or *code of practice* issued by such person, board, agency, authority or tribunal,

the *market assessment unit* shall prepare and submit a report to that effect to the *market surveillance and compliance panel*. The *market surveillance and compliance panel* may, as it considers necessary or desirable for the efficient operation of the *wholesale electricity markets*, forward such reports to the *EMC*.

4.4.3 Where the *market surveillance and compliance panel* or the *market assessment unit*, in their investigative and monitoring activities conducted pursuant to section 4.4.1 and/or section 4.3.10, receive any complaint or uncover any information that may indicate the possibility of

anti-competitive agreements or the abuse of a dominant position contrary to sections 50 or 51 of the *Electricity Act*, the *market surveillance and compliance panel* or the *market assessment unit* shall inform the *Authority* and provide the *Authority* with a copy of the complaint received, and/or any relevant information.

4.4.4 For the avoidance of doubt, where the *market surveillance and compliance panel* or the *market assessment unit* in any investigative and monitoring activities conducted outside of the scope of the information requirements referred to in section 4.3.10, receive any complaint or uncover any information that may indicate the possibility of anti-competitive agreements or the abuse of a dominant position contrary to sections 50 or 51 of the *Electricity Act*, the *market surveillance and compliance panel* or the *market assessment unit* shall inform the *Authority* and provide the *Authority* with a copy of the complaint received, and/or any relevant information.

4.4.5 The *market assessment unit* shall, no less than quarterly and more frequently if so requested by the *market surveillance and compliance panel* prepare and submit to the *market surveillance and compliance panel* routine reports describing its day-to-day monitoring, cataloguing and evaluation activities and analyses. Such reports shall contain such information and be in such form as may be specified by the *market surveillance and compliance panel*.

4.4.6 The *market surveillance and compliance panel* shall, no less than annually and more frequently if so requested by the *EMC*, prepare and submit to the *EMC* routine reports on the conduct of its monitoring and investigation activities, including a summary of the reports of the *market assessment unit* referred to in sections 4.4.3 and 4.4.5, a summary of all complaints or referrals filed and investigations commenced under section 4.6 and a summary of any investigations conducted by the *market surveillance and compliance panel* in respect of *offer variations* reported to it by the *EMC* pursuant to section 10.4 of Chapter 6. Once annually, such reports shall contain the *market surveillance and compliance panel's* general assessment as to the state of competition and compliance within, and the efficiency of, the *wholesale electricity markets* in relation to the matters referred to in section 4.1.1.

4.4.7 The *EMC* shall provide the reports referred to in section 4.4.6 to the *Authority* as and when the *EMC* receives them.

4.5 CONFIDENTIALITY

4.5.1 The *market assessment unit* shall, under the supervision and direction of the *market surveillance and compliance panel*, establish procedures it and the *market surveillance and compliance panel* shall use to handle the

records, information and data they will have the need or means of acquiring and creating, including procedures for protecting *confidential information*. Such procedures shall not conflict or be inconsistent with the provisions of section 6 and shall be included in the internal measures referred to in section 6.4.6.

- 4.5.2 Nothing in this section 4 shall preclude the disclosure or reproduction of *confidential information* as an unidentifiable component of an aggregate sum.

4.6 INVESTIGATIONS

- 4.6.1 The *market surveillance and compliance panel* may in accordance with section 4.8 initiate an investigation into any activities in the *wholesale electricity* markets or the conduct of a *market participant*, *market support services licensee*, the *EMC* or the *PSO*:

4.6.1.1 that is brought to the attention of the *market surveillance and compliance panel* by way of referral or complaint from any source, including a report of the *market assessment unit* made under this section 4; or

4.6.1.2 that the *market surveillance and compliance panel* determines as warranting an investigation.

- 4.6.2 An investigation initiated by the *market surveillance and compliance panel* shall be carried out by the *market assessment unit* at the direction of the *market surveillance and compliance panel*. If the investigation involves the *EMC* as the party who may be in breach of the rules, the *market surveillance and compliance panel* may instruct an alternative group of persons who are independent, qualified and possess appropriate expertise and skills, to conduct the investigation.

- 4.6.3 Subject to section 7.1.6, for the purpose of conducting an investigation concerning a section of the *market rules* that relates to a function, power or duty of the *PSO*, the *system operation manual* or any *market manual* that is referred to in or relates to a section of the market rules concerning a function, power or duty of the *PSO*, the *market surveillance and compliance panel* may instruct the *PSO* to carry out such investigation, or may instruct an independent investigator where the *PSO* is the subject of the investigation.

- 4.6.4 Any person that wishes the *market surveillance and compliance panel* to initiate an investigation into any matter referred to in section 4.6.1, or any board, agency, authority or tribunal, including the *Authority* and the *PSO*, wishing to refer any such matter to the *market surveillance and*

compliance panel for investigation, shall make a complaint or referral in writing setting out:

- 4.6.4.1 the name and address of the person submitting the complaint or referring the matter;
- 4.6.4.2 the particulars of the complaint or referral;
- 4.6.4.3 any information or facts supporting the complaint or referral; and
- 4.6.4.4 the signature of the person submitting the complaint or making the referral or, where that person is not an individual, the signature of an officer or duly authorised representative of the person.

4.6.5 The *market surveillance and compliance panel* may refuse to commence or may terminate an investigation where the *market surveillance and compliance panel* is of the view that a complaint, referral or investigation is:

- 4.6.5.1 frivolous, vexatious, immaterial or unjustifiable, or not directly related to the operation of the *wholesale electricity markets*; or
- 4.6.5.2 within the jurisdiction of another person, board, agency, authority or tribunal, including the *Authority* but excluding the *PSO*.

- 4.6.6 The *market surveillance and compliance panel* may, prior to making a determination pursuant to section 4.6.5, request that a person filing a complaint or making a referral associated with the investigation provide additional information relating thereto.
- 4.6.7 Where section 4.6.5 is invoked, the *market surveillance and compliance panel* shall so advise the person that filed the complaint or made the referral associated with the investigation and give its reasons for its determination.
- 4.6.8 The *market surveillance and compliance panel* shall, upon initiating an investigation in respect of the conduct of a *market participant*, *market support services licensee*, the *EMC* or the *PSO*, inform or cause the person under investigation to be informed of the investigation and of its progress. On the written request of a person that filed a complaint or made a referral associated with such investigation, the *market surveillance and compliance panel* shall inform or cause that person to be informed as to the progress of the investigation
- 4.6.9 For the purposes of carrying out an investigation, the *market surveillance and compliance panel* may request any *market participant*, *market support services licensee*, the *EMC* or the *PSO*, or any other person to provide records or information relevant to the investigation. Any such request shall:
- 4.6.9.1 be in writing;
 - 4.6.9.2 specify the particulars of the complaint or referral if the investigation was initiated in response to a complaint or referral;
 - 4.6.9.3 specify the records or information required; and
 - 4.6.9.4 specify a reasonable time within which the records or information is to be provided to the *market surveillance and compliance panel*.
- 4.6.10 Records or information sought pursuant to section 4.6.9 and provided to the *market surveillance and compliance panel* by an officer or representative of the *market participant*, *market support services licensee*, the *EMC* or the *PSO* or other person as the case may be, shall be assumed to be true, correct and complete to the best of that person's knowledge, information and belief at the time it is provided. Failure, without good cause, by any *market participant*, *market support services licensee*, the *EMC* or the *PSO* to provide the information specified by the due date specified shall constitute a breach of the *market rules* and may be subject to enforcement under the *market rules*. For the purpose of

this section, good cause is to be determined by the *market surveillance and compliance panel*.

- 4.6.11 Where a *market participant, market support services licensee, the EMC* or the *PSO* fails to respond to a request for records or information, the *market surveillance and compliance panel* may request that the *Authority* designate the Chair or one or more other members of the *market surveillance and compliance panel* as an authorised officer for the purposes of section 4 of the *Electricity Act*. Where the Chair or one or more other members of the *market surveillance and compliance panel* has been so designated, he or she may:
- 4.6.11.1 submit a further request to the *market participant, market support services licensee, the EMC* or the *PSO*, requesting that person to provide the records or information in accordance with subsection 4(1) of the *Electricity Act*; and
 - 4.6.11.2 where the *market participant, market support services licensee, the EMC* or the *PSO* fails to comply with such further request, take any action in accordance with the *Electricity Act*.
- 4.6.12 For the purpose of assisting the *market surveillance and compliance panel* to carry out an investigation under these *market rules*, any *market participant, or market support services licensee, the EMC* or the *PSO*, upon a request given in writing, shall make any specified personnel available for interview, and shall make any premises used in the conduct of business related to the *wholesale electricity markets* available for inspection, and shall make any relevant records, documents or information available for inspection, copying or removal, provided that any such request for inspection of premises (i) must state the subject matter and purpose of the investigation (including the alleged breach), and the nature of the records, documents or information or the name of the interviewee that are directly relevant to the investigation and which are to be made available to the *market surveillance and compliance panel*; and (ii) must have the prior written approval of the Chairperson of the *market surveillance and compliance panel*, as long as the Chairperson is satisfied that there are reasonable grounds for suspecting that there are on any premises, documents the production of which has not been made under section 4.6.10 and that if such documents were required to be produced, they would be concealed, tampered with or destroyed; and (iii) is valid for only one month after the date of approval of the Chairperson.
- 4.6.13 The *market assessment unit* or independent investigator if applicable, may request the subject of any investigation, including any *market participant, market support services licensee, the EMC* or the *PSO* as the case may be, to advise whether it agrees with the investigator's

conclusion as to whether any breach or breaches of the *market rules*, *market manuals* or *system operation manual* has or have occurred. The subject of the investigation shall respond to such investigator's request within such reasonable time as may be specified by the investigator.

- 4.6.14 Where any party disputes any such allegation, or fails within a reasonable time as specified by the investigator to respond to the allegation, the matter shall be reported to the *market surveillance and compliance panel* and section 7.2.3 shall apply.

4.7 EXPERT AND OTHER ASSISTANCE

- 4.7.1 The *market surveillance and compliance panel* may, subject to the budgetary approval of the *EMC*, hire such consulting assistance and seek such expert external advice as may be necessary for the purpose of the conduct by it or by the *market assessment unit* of the monitoring or investigative activities described in this section 4.

- 4.7.2 Consultants and expert external advisors hired pursuant to section 4.7.1 shall enter into such confidentiality agreement in such form as may be prescribed by the *EMC*. Such confidentiality agreement shall contain provisions relating to the protection of *confidential information* that are consistent with the provisions of sections 6.4 and 6.5.

4.8 REFERRAL TO AND RELATIONSHIP WITH OTHER ENTITIES

- 4.8.1 Where it appears to the *market surveillance and compliance panel* that:
- 4.8.1.1 a *modification* to the actual or potential design or overall structure of the *wholesale electricity market*, *market rules*, *market manuals*, the *system operation manual* and/or other rules and procedures of the *EMC* or the *PSO* may be required;
 - 4.8.1.2 a *market participant*, a *market support services licensee*, the *EMC* or the *PSO* is or may be breaching a provision of the *market rules*, a *market manual* or the *system operation manual*; or
 - 4.8.1.3 a *market participant*, *market support services licensee*, the *EMC* or the *PSO* is or may be acting contrary to or in non-compliance with statutory authority falling within the jurisdiction of a person, board, agency, authority or tribunal, including the *Authority* but excluding the *PSO*,

the *market surveillance and compliance panel* shall initiate an investigation into the relevant defects or activities, and may report any findings to the *EMC*, the *PSO* or the *Authority*.

- 4.8.2 In carrying out its responsibilities under this section 4, the *market surveillance and compliance panel* may consult or cooperate with governmental or regulatory bodies, authorities or agencies, including the *Authority* but excluding the *PSO*, having jurisdiction over the conduct of a *market participant*, *market support services licensee*, *the EMC* or *the PSO*.

4.9 PROCEDURE AND ENFORCEMENT

- 4.9.1 Neither the *market assessment unit* nor the *market surveillance and compliance panel* shall use the dispute resolution procedures set forth in section 3 in carrying out their respective functions and duties under this section 4.
- 4.9.2 Nothing in this section 4 shall prevent any person from asserting any rights they may have under any *applicable law* or under the *market rules*, save that any order of the *market surveillance and compliance panel* shall be final and binding on the person(s) subjected to such order and shall not be subject to any appeal except an appeal to a court of competent jurisdiction in Singapore only on issues of law, jurisdiction or natural justice. For the avoidance of doubt, all findings of fact by the *market surveillance and compliance panel* shall not be the subject matter of any appeal to any court of competent jurisdiction in Singapore unless such findings were made in breach of law, jurisdiction or natural justice.
- 4.9.3 Failure by a person, who is subject to any order of the *market surveillance and compliance panel*, to comply with such order shall constitute a breach of the *market rules* and shall entitle the *market surveillance and compliance panel* to enforce such order by invoking or applying any applicable manner of enforcement available at law or equity or under the *market rules*.

5 MODIFICATION OF THE RULES

5.1 INTRODUCTION

- 5.1.1 This section 5 contains the procedure for *modifying* the *market rules*, as provided for in subsection 46(3) of the *Electricity Act*.
- 5.1.2 The *market rules* may be *modified* by the *EMC Board* under section 5.1.3 or by the *urgent rule modification committee* under section 5.10.
- 5.1.3 The *EMC Board* may *modify* the *market rules* by a resolution passed by at least two-thirds of the *EMC* directors in office at the time, excluding any who abstain voluntarily or who are required by the *constituent document* to abstain.

5.2 REQUESTS TO REVIEW OR MODIFY MARKET RULES

- 5.2.1 The *EMC Board*, the *EMC*, the *Authority*, the *PSO*, a *market participant*, a *market support services licensee* or any other interested person (each of whom is referred to in the *market rules* as a *proposer*), who considers that a *modification* or review of the *market rules* may be necessary or desirable, may submit a *modification proposal*.
- 5.2.2 A *modification proposal* by a *proposer* shall be made in writing, stating the reasons for the *modification proposal* and be sent to the *rules change panel* at the address that is *published* by the *EMC* for that purpose. The *rules change panel* may ask a *proposer* to give further particulars concerning its *modification proposal*.
- 5.2.3 Where the *rules change panel* determines on its own initiative that a *modification* or review of the *market rules* may be necessary or desirable, it shall notify the *EMC Board* of its intention to consider such *modification* or review, giving reasons for its determination.
- 5.2.4 Where the *EMC Board* determines on its own initiative, or at the request of any person, that a *modification* (other than an *urgent modification*) or review of the *market rules* may be necessary or desirable, it shall submit a *modification proposal* in accordance with sections 5.2.1 and 5.2.2.

5.3 DUTIES OF RULES CHANGE PANEL WHEN CONSIDERING A MODIFICATION PROPOSAL

- 5.3.1 Before the *rules change panel* considers any *modification proposal*, the *EMC* shall *publish* the details of the *modification proposal*, with any comments from the *rules change panel* and invite all interested persons to make written submissions on the *modification proposal* to the *rules change panel* within a reasonable period specified in the invitation.
- 5.3.2 All submissions referred to in section 5.3.1 must be made within the period specified in the relevant invitation *published* by the *EMC*. Anyone who makes such a submission may at the same time indicate that a meeting in connection with the *modification proposal* is necessary or desirable, giving his reasons therefor.
- 5.3.3 The *rules change panel* may invite interested persons to make additional submissions in respect of a *modification proposal*. All such invitations and submissions shall be in writing. All such submissions shall be made within the reasonable period specified by the *rules change panel*.
- 5.3.4 All submissions that are received by the *rules change panel* within the time specified for making submissions shall be considered by the *panel*. The *rules change panel* may decide to hold one or more public meetings if it thinks that it is necessary or desirable to do so.
- 5.3.5 The *rules change panel* shall advise the *EMC Board* of the date, time and place scheduled for any public meeting. The *EMC* shall *publish* this information at least seven days before the date of the meeting. Any interested person may attend and, at the discretion of the *rules change panel*, take part in the meeting.
- 5.3.6 If any *modification proposal* relates to:
- 5.3.6.1 a provision of section 3, the *rules change panel* shall consult with the *dispute resolution counsellor* about the *modification proposal*; or
 - 5.3.6.2 a provision of sections 2.6 to 2.9 or section 4, the *rules change panel* shall consult with the Chair of the *market surveillance and compliance panel* about the *modification proposal*.

The *rules change panel* shall carry out this consultation before it holds any public meeting on the *modification proposal* or, if no meeting is held, then before it votes on the *modification proposal*.

5.4 RULES CHANGE PANEL TO CONSIDER A MODIFICATION PROPOSAL AND TO REPORT TO EMC BOARD

- 5.4.1 As soon as reasonably practicable after all meetings and consultations have been completed under section 5.3, and after any further meetings or consultations that the *rules change panel* considers appropriate, the *rules change panel* shall consider and vote on the *modification proposal*.
- 5.4.2 Once it has voted on any *modification proposal*, the *rules change panel* shall send a written report to the *EMC Board*. The report shall contain the following:
- 5.4.2.1 the recommendations of the *rules change panel* together with reasons for the recommendations. The *rules change panel* may recommend:
 - a. that the *modification proposal* does not warrant consideration;
 - b. that the *modification proposal* only requires clarification or interpretation of a section of the *market rules*. In that case the *modification proposal* will be dealt with under section 15 of Chapter 1;
 - c. that the *market rules* not be *modified*; or
 - d. that the *market rules* be *modified*.
 - 5.4.2.2 the text of any *modification* proposed by the *rules change panel*, and a summary of any objections the *panel* received on it or brought to its attention;
 - 5.4.2.3 whether the proposed *modification* has the support of:
 - a. the *dispute resolution counsellor* (for a *modification* to section 3); or
 - b. the Chair of the *market surveillance and compliance panel* (for a *modification* to section 2.6 to 2.9 or section 4);
 - 5.4.2.4 a record of how each member of the *rules change panel* voted; and
 - 5.4.2.5 a summary of any *panel* member's objections to the *panel's* recommendation.

5.5 EMC TO PUBLISH RULES CHANGE PANEL'S REPORT

- 5.5.1 The *EMC* shall *publish* each report referred to in section 5.4.2 unless the *rules change panel* has decided that publication is inappropriate in a particular case.
- 5.5.2 If the *rules change panel's* report recommends that the *market rules* should be *modified*, and that its report should not be *published*, the *EMC* shall still *publish* the text of the proposed *modification*.
- 5.5.3 If the *rules change panel's* text of the proposed *modification* differs materially from the text that was originally proposed, the *proposer* of the original text may object to the *panel's* proposed text. Every objection shall be made in writing, stating the reasons for the objection, to the *EMC Board* within five *business days* of the date that the *EMC publishes* the text of the proposed *modification*.

5.6 EMC BOARD TO CONSIDER RULES CHANGE PANEL'S REPORT

- 5.6.1 As soon as reasonably practicable after the *EMC Board* has received a report referred to in section 5.4.2 or the expiry of any period allowed for making objections under section 5.5.3, the *EMC Board* shall consider the report and any objections under section 5.5.3, and shall vote on the matter.
- 5.6.2 The *rules change panel* shall provide the *EMC Board* with copies of all submissions received on any recommendation in its report that the *EMC Board* asks for.
- 5.6.3 Where the *rules change panel* has made a recommendation that the *modification proposal* does not warrant consideration or that the *modification proposal* only requires clarification or interpretation, the *EMC Board* may require the *rules change panel* to reconsider the *modification proposal*.
- 5.6.4 Where the *rules change panel* recommends that the *market rules* should be *modified*, the *EMC Board* may:
- 5.6.4.1 decline to adopt the recommendation if the test in section 5.7.1 is met;
 - 5.6.4.2 adopt the recommendation, either in the form proposed by the *rules change panel* or as amended by the *EMC Board* as it considers appropriate; or

- 5.6.4.3 refer the matter back to the *rules change panel* for reconsideration.

5.7 EMC BOARD MAY DECLINE TO ADOPT A MODIFICATION

- 5.7.1 The *EMC Board* may only decline to adopt a recommendation of the *rules change panel* to *modify* the *market rules* if the *EMC Board* determines that the *modification* would:
- 5.7.1.1 materially threaten the ability of the *PSO* to direct the operation or maintain the *reliability* of the *PSO controlled system*, and the *PSO* consents to this determination;
 - 5.7.1.2 materially affect the ability of the *EMC* to operate the *wholesale electricity markets* in an efficient manner;
 - 5.7.1.3 give a *market participant*, a class of *market participants* or one or more *market support services licensees* an undue preference in the *wholesale electricity markets*;
 - 5.7.1.4 materially increase the opportunity for *market participants*, any class of *market participant* or *market support services licensees* to engage in inappropriate or anomalous market conduct, including the misuse or possible misuse of market power, gaming or collusion;
 - 5.7.1.5 impose, without due justification, significant extra costs on *market participants*, any class of *market participants* or *market support services licensees*; or
 - 5.7.1.6 impose, without due justification, significant extra costs on the *EMC* or the *PSO*.
- 5.7.2 If the *EMC Board* declines to adopt a *modification* to the *market rules*, the *EMC* shall:
- 5.7.2.1 *publish* its decision with reasons;
 - 5.7.2.2 give a copy of its decision, and the associated report of the *rules change panel*, to the *Authority*; and
 - 5.7.2.3 if the decision relates to a provision of Chapter 5 or 6, provide a copy of the decision to the *PSO*.

5.8 EMC BOARD MAY DECIDE TO ADOPT A MODIFICATION

5.8.1 If the *rules change panel* recommends that the *market rules* should not be *modified*, the *EMC Board* shall not *modify* the *market rules* without first referring the *modification proposal* back to the *rules change panel* for reconsideration.

5.8.2 If the *rules change panel* has reconsidered a *modification proposal*, and still recommends that the *market rules* should not be *modified*, the *EMC Board* shall not *modify* the *market rules* unless the *EMC Board* determines that the *modification* would:

5.8.2.1 materially enhance the ability of the *PSO* to direct the operation or maintain the *reliability* of the *PSO controlled system*, and the *PSO* consents to the determination;

5.8.2.2 materially enhance the ability of the *EMC* to operate the *wholesale electricity markets* in an efficient manner;

5.8.2.3 eliminate or materially reduce an undue preference that a *market participant*, a class of *market participants* or one or more *market support services licensees* may have in the *wholesale electricity markets*;

5.8.2.4 eliminate or materially reduce the opportunity for *market participants*, any class of *market participant* or *market support services licensees* to engage in inappropriate or anomalous market conduct, including the misuse or possible misuse of market power, gaming and collusion;

5.8.2.5 eliminate or materially reduce the costs of *market participants*, any class of *market participants* or *market support services licensees*; or

5.8.2.6 eliminate or materially reduce the costs of the *EMC* or the *PSO*,

and that the benefit outweighs the objections of the *rules change panel* to the *modification*.

5.8.3 Where the *EMC Board* adopts a *modification* to the *market rules*, the *EMC* shall:

5.8.3.1 *publish* its decision, together with the copy of the *modification*;

5.8.3.2 give a copy of each of the decision and the *modification* to the *PSO*; and

- 5.8.3.3 file a copy of each of the decision, the *modification* and the associated report of the *rules change panel*, and a summary of any objections to the *modification* received by the *EMC Board* or brought to its attention, with the *Authority* for approval under subsection 46(4) of the *Electricity Act*.

5.9 EMC BOARD MAY REFER A MODIFICATION PROPOSAL BACK TO RULES CHANGE PANEL

- 5.9.1 The *EMC Board* shall give reasons for referring any *modification proposal* back to the *rules change panel*. The *EMC* shall *publish* such decision of the *EMC Board*.
- 5.9.2 If the *EMC Board* has referred any *modification proposal* back to the *rules change panel* for reconsideration, the *panel* shall reconsider it as soon as reasonably practicable. The *panel* may consult any person, and conduct any meeting, that it thinks is appropriate in the circumstances.
- 5.9.3 Sections 5.4.2 to 5.9 (but excluding section 5.8.1) apply, with appropriate modifications as the context may require, to the *rules change panel's* reconsideration of any *modification proposal*.

5.10 URGENT MODIFICATIONS

- 5.10.1 The *EMC Board* may establish an *urgent rule modification committee* and delegate to this committee the authority to make an *urgent modification*. The committee will be made up of the Chair of the *rules change panel*, a representative of the *PSO* and one director of the *EMC*.
- 5.10.2 *Urgent modifications* will apply for no longer than a period of one year. As soon as reasonably practicable during the one-year period, the *EMC* shall submit the *urgent modification* to the *rules change panel* for its consideration as a *modification proposal* under section 5.3.
- 5.10.3 The *EMC Board* or the *urgent rule modification committee* can make *urgent modifications* to the *market rules* after consulting any person they consider appropriate.
- 5.10.4 Where the *urgent rule modification committee* makes an *urgent modification*, it shall:
- 5.10.4.1 report its decision with reasons to the *EMC Board* and include a copy of the text of the *urgent modification*; and

- 5.10.4.2 file its decision with reasons with the *Authority* together with a copy of the text of the *urgent modification* for the *Authority* to approve under subsection 46(4) of the *Electricity Act*.
- 5.10.5 If the *EMC Board* receives a report from the *urgent rule modification committee*, the *EMC Board* shall meet, within five days of its receipt, to consider the report and vote either:
- 5.10.5.1 to confirm the *urgent modification*, in the form proposed by the *urgent rule modification committee* or some other form that the *EMC Board* determines is appropriate; or
- 5.10.5.2 to reject the *urgent modification* and stay its implementation, and in either case shall notify the *Authority* accordingly.
- 5.10.6 Where the *EMC Board* confirms an *urgent modification*, the *EMC* shall forthwith *publish* a notice of the *urgent modification*.

5.11 MODIFICATION PROCESS GENERALLY

- 5.11.1 In formulating any *modification* to the *market rules*, the *EMC Board*, the *urgent rule modification committee* and the *rules change panel* shall consider the functions and duties of the *Authority* in subsection 3(3) of the *Electricity Act*, where those functions and duties relate to the operation of the *wholesale electricity markets* and the *reliable* operation of the *power system*.
- 5.11.2 Nothing in this section 5 shall prohibit the *EMC Board* from reviewing the work and proceedings of the *rules change panel*, or giving procedural directions to the *rules change panel* that the *EMC Board* considers appropriate. The *rules change panel* shall comply with those directions.

5.12 ASSISTANCE AND WORKING GROUPS

- 5.12.1 The *EMC Board* may at any time call on the *rules change panel* to help the *Board* fulfil its responsibilities under this section 5.
- 5.12.2 The *rules change panel* may, through the Chief Executive of the *EMC*, seek the help of any director, officer or employee of the *EMC* and may use the facilities of the *EMC* to fulfil its responsibilities under this section 5.
- 5.12.3 The *rules change panel* may also establish working groups to help it fulfil its responsibilities under this section 5. The working groups shall operate according to the terms and conditions set by the *rules change*

panel, including the scope of their work and participation. If the *rules change panel* intends to establish any working group, it shall notify the *EMC Board* and the *EMC* shall *publish* a notice of the *panel's* intention.

5.13 AUTHORITY APPROVAL AND WHEN MODIFIED RULES COME INTO FORCE

5.13.1 If a *modification* to the *market rules* is filed with the *Authority* for approval, the *Authority* shall give that approval under subsection 46(4) of the *Electricity Act*, unless the *Authority* is satisfied that the *modification*:

5.13.1.1 unjustly discriminates in favour of or against a *market participant* or a class of *market participants*; or

5.13.1.2 is inconsistent with the functions and duties of the *Authority* under subsection 3(3) of the *Electricity Act*.

5.13.2 The *Authority* shall notify the *EMC* and the *PSO* of its decision concerning a *modification* to the *market rules*:

5.13.2.1 within 5 *business days* of receiving any *urgent modification*; or

5.13.2.2 within 15 *business days* of receiving any other *modification*, unless that period has been extended under section 5.13.3,

and the *EMC* shall promptly *publish* a notice of that decision, with a copy of any approved *modification*.

5.13.3 The *Authority* may, after taking into account its resources or the complexity of any *modification* extend the period of time referred to in section 5.13.2.2 by up to 10 *business days*. The *Authority* shall notify the *EMC* if it extends such period of time.

5.13.4 *Modifications* approved by the *Authority* under section 5.13.1 come into force on:

5.13.4.1 the first *business day* after the *EMC publishes* the notice of the *Authority's* decision; or

5.13.4.2 any later date that the *EMC* specifies when it *publishes* the notice of the *Authority's* decision.

5.13.5 The *EMC* shall not delay the coming into force of any *modification* to the *market rules* more than is reasonable.

6 RECORD RETENTION, INFORMATION DISCLOSURE, ACCESS AND CONFIDENTIALITY

6.1 RECORD RETENTION

6.1.1 The *EMC*, the *PSO*, each *market participant*, each *market support services licensee* and each *derogation applicant* shall retain records or classes of records prepared for or in connection with the *market rules*, any *market manual* or the *system operation manual* for such period of time as may be specified in the *market rules*, the applicable *market manual* or the *system operation manual* in respect of each such record or class of records.

6.1.2 Subject to section 6.1.3, where no period of time is specified in the *market rules*, the applicable *market manual* or the *system operation manual* in respect of a given record or class of records, the record or class of records shall be retained for a period of six years:

6.1.2.1 in the case of the person that created the record, calculated from the date on which the record was created; and

6.1.2.2 in the case of the person that received the record, calculated from the date on which the record was received.

6.1.3 Where a record referred to in section 6.1.1 or 6.1.2 is:

6.1.3.1 prepared in one or more draft forms;

6.1.3.2 not circulated in any such draft form by the person preparing it; and

6.1.3.3 subsequently prepared in final form,

only the final form of the record is required to be retained in accordance with section 6.1.1 or 6.1.2.

6.2 INFORMATION DISCLOSURE

6.2.1 Where a person is required by the *market rules*, a *market manual* or the *system operation manual* to disclose or provide a record or information to another person, such record or information shall be disclosed or provided within the time specified in, and in the form and manner required by, the applicable provisions of the *market rules*, the applicable *market manual* or the *system operation manual*. Where no time is specified in relation to the disclosure or provision of a specific record or

specific information, the information shall be disclosed or provided within a reasonable time.

- 6.2.2 A record or information disclosed or provided in accordance with section 6.2.1 shall be, to the best of the disclosing or providing person's knowledge, true, correct and complete at the time at which such disclosure or provision is made. No person shall knowingly or recklessly disclose or provide a record or information in accordance with section 6.2.1 that, at the time and in light of the circumstances in which such disclosure or provision is made, is misleading or deceptive or does not state a fact that is required to be stated or that is necessary to make the statement not misleading or deceptive.
- 6.2.3 Where a person discovers that a record or any information previously disclosed or provided by it to any other person in accordance with section 6.2.1 was, at the time at which it was disclosed or provided, or becomes untrue, incorrect, incomplete, misleading or deceptive, the disclosing or providing person shall immediately rectify the situation and disclose or provide the true, correct, complete, not misleading or not deceptive record or information to the person to whom the original or currently untrue, incorrect, incomplete, misleading or deceptive record or information had been disclosed or provided.
- 6.2.4 Subject to section 6.4, the *EMC*, the *PSO*, the *rules change panel* and the *market surveillance and compliance panel* are entitled to use any information obtained pursuant to the *market rules*, a *market manual* or the *system operation manual* in furtherance of the performance of their respective functions or duties under the *market rules*, applicable *market manuals*, the *system operation manual*, applicable law or, in the case of the *EMC*, its *electricity licence*.

6.3 ACCESSIBILITY

- 6.3.1 Subject to sections 6.3.3 and 6.3.4, all persons shall have an equal opportunity for non-discriminatory access to all records and information, other than *confidential information*, required by the *market rules*, a *market manual* or the *system operation manual* to be made available by the *EMC* or the *PSO* to *market participants*, *market support services licensees* or other persons.
- 6.3.2 Any person accessing, retrieving or storing a record or information *published* or otherwise made available by the *EMC* or the *PSO* shall be responsible for its own costs of accessing, retrieving or storing such record or information.

- 6.3.3 Where a request for access to or disclosure of a record or information in the possession or control of the *EMC* or the *PSO* is made by a person pursuant to these *market rules*, a *market manual* or the *system operation manual*, the *EMC* or the *PSO*, as the case may be, shall only provide such access or disclosure if:
- 6.3.3.1 it is satisfied that it is not precluded by *applicable law*, these *market rules*, a *market manual* or the *system operation manual* from providing such access or disclosure to the person; and
 - 6.3.3.2 the provision of such access or disclosure would not impose a significant burden on it having regard to its resources.
- 6.3.4 Nothing in this section 6.3 shall prevent a record or information that is made available by means of electronic communications from being provided on a read-only basis.

6.4 CONFIDENTIALITY

- 6.4.1 Each *market participant*, *market support services licensee*, the *EMC* and the *PSO* shall use all reasonable endeavours to keep confidential any *confidential information* that comes into its possession or control or of which it becomes aware.
- 6.4.2 Neither a *market participant* nor a *market support services licensee*, nor either of the *EMC* or the *PSO* shall:
- 6.4.2.1 disclose *confidential information* to any person except as permitted by the *market rules*, a *market manual* or the *system operation manual*;
 - 6.4.2.2 permit access to *confidential information* by any person not authorised to have such access pursuant to the *market rules*, a *market manual* or the *system operation manual*; or
 - 6.4.2.3 use or reproduce *confidential information* for a purpose other than the purpose for which it was disclosed or another purpose contemplated by the *market rules*, a *market manual* or the *system operation manual*.
- 6.4.3 Each *market participant*, *market support services licensee*, the *EMC* and the *PSO* shall use all reasonable endeavours to:
- 6.4.3.1 prevent access to *confidential information* which is in its possession or control by any person not authorised to have such access pursuant to the *market rules*, a *market manual* or the *system operation manual*, including by appropriate means

of destruction or disposal in cases where the *confidential information* is not required or is at the relevant time no longer required to be retained by it pursuant to the *market rules*, a *market manual* or the *system operation manual*; and

- 6.4.3.2 ensure that any person to whom it discloses *confidential information* observes the provisions of this section 6.4 in relation to that *confidential information*.
- 6.4.4 Each *market participant*, *market support services licensee*, the *EMC* and the *PSO* shall, promptly upon becoming aware of a breach or a threatened breach of the provisions of this section 6.4 with respect to an item of *confidential information*:
- 6.4.4.1 so notify any person to whom the *confidential information* relates or by whom it was provided or disclosed;
- 6.4.4.2 if a *market participant* or *market support services licensee*, so notify the *EMC*; and
- 6.4.4.3 take such reasonable steps as may be required to prevent or assist in the prevention of, as the case may be, the unauthorised disclosure, access to, use or reproduction of *confidential information* that may result from such breach or threatened breach.
- 6.4.5 Each *market participant* and *market support services licensee* shall maintain internal measures relating to the protection of *confidential information* that enable the *market participant* or *market support services licensee* to comply and monitor compliance with its obligations under this section 6.4 and section 6.5.
- 6.4.6 Each of the *EMC* and the *PSO* shall maintain internal measures relating to the protection of *confidential information* that enable it to comply and monitor compliance with its obligations under this section 6.4 and section 6.5. Such measures shall include:
- 6.4.6.1 the protocols referred to in section 6.4.7; and
- 6.4.6.2 a security clearance policy pursuant to which a person within its organisation shall only be given access to *confidential information* to the extent:
- a. required to permit that person to duly perform his or her functions and duties; and
 - b. permitted by the security clearance assigned to him or her.

- 6.4.7 Where the *EMC* or the *PSO* makes *confidential information* accessible by means of electronic communications, it shall implement access control protocols that differentiate between *market participants* or *market support services licensees* but that need not differentiate between individuals, whether within the same *market participant* or *market support services licensee* or otherwise.
- 6.4.8 Sections 13.1.1, 13.2.1 and 13.3.1 of Chapter 1 shall not apply to limit the liability of any person that acts in a manner contrary to or that fails to comply with any one or more of sections 6.4.1 to 6.4.4 or 6.5.2 to 6.5.7.
- 6.4.9 Sections 13.1.4, 13.2.4 and 13.3.4 of Chapter 1 shall not apply to limit the liability of any person that acts in a manner contrary to or that fails to comply with any one or more of sections 6.4.1 to 6.4.4 or 6.5.2 to 6.5.7.

6.5 **EXCEPTIONS**

- 6.5.1 Nothing in section 6.4 shall prevent:
- 6.5.1.1 the disclosure, use or reproduction of information if the information is, at the time of disclosure, generally and publicly available other than as a result of a breach of confidence by the *market participant*, the *market support services licensee*, the *EMC* or the *PSO*, as the case may be, who wishes to disclose, use or reproduce the information or by any person to whom the *market participant*, the *market support services licensee*, the *EMC* or the *PSO* has disclosed the information;
- 6.5.1.2 the disclosure of *confidential information* by a *market participant*, a *market support services licensee*, the *EMC* or the *PSO* to:
- a. one of its directors, officers or employees where such person requires the *confidential information* for the due performance of that person's functions and duties and, in the case of the *EMC* or the *PSO*, where the person has the required security clearance assigned by the *EMC* or the *PSO*, as the case may be; or
 - b. its legal or other professional advisor, auditor or other consultant where such person requires the information for purposes of the *market rules*, a *market manual*, a *system operation manual* or an agreement entered into pursuant to the *market rules*, a *market manual*, or the *system operation manual*, or for the purpose of advising it in relation thereto;

- 6.5.1.3 the disclosure, use or reproduction of *confidential information*:
- a. by the *market participant* or *market support services licensee* that provided the confidential information pursuant to the *market rules*, a *market manual* or a *system operation manual*;
 - b. with the consent of the *market participant* or *market support services licensee* that provided the confidential information pursuant to the *market rules*, a *market manual* or the *system operation manual*; or
 - c. in the case of *settlement data* or *metering data*, by or with the consent of the *market participant* or *market support services licensee* to whom such data relates;
- 6.5.1.4 the disclosure, use or reproduction of *confidential information* to the extent required by *applicable law* or by a lawful requirement of:
- a. any government or governmental body, regulatory body, authority or agency having jurisdiction over a *market participant*, a *market support services licensee*, the *EMC* or the *PSO* or an *affiliate* of a *market participant*, a *market support services licensee*, the *EMC* or the *PSO*; or
 - b. any stock exchange having jurisdiction over a *market participant*, a *market support services licensee*, the *EMC*, the *PSO* or an *affiliate* of a *market participant*, a *market support services licensee*, the *EMC* or the *PSO*;
- 6.5.1.5 except as otherwise provided in section 3, the disclosure, use or reproduction of *confidential information* if required in connection with legal proceedings, arbitration, expert determination or other dispute resolution mechanism relating to the *market rules*, a *market manual*, or the *system operation manual* or an agreement entered into pursuant to the *market rules*, a *market manual* or the *system operation manual* or for the purpose of advising a person in relation thereto;
- 6.5.1.6 the disclosure, use or reproduction of confidential information by or on behalf of a *market participant* or *market support services licensee* to the extent reasonably required in connection with the *market participant's* or *market support services licensee's* financing arrangements, investment in that *market participant* or *market support services licensee* or a transfer, sale, lease or other disposal of the *market participant's* or *market support services licensee's* assets;

- 6.5.1.7 the disclosure of *confidential information* if required to protect the health or safety of personnel, equipment or the environment;
- 6.5.1.8 the disclosure by the *PSO* of *confidential information* to the *transmission licensee*, to the extent that *confidential information* is required pursuant to the terms of the *operating agreement* between the *PSO* and the *transmission licensee* to be disclosed to the *transmission licensee* for the purposes of the safe and *reliable* management, operation and maintenance of the *PSO controlled grid*;
- 6.5.1.9 the disclosure by the *EMC* or the *PSO* of confidential information to a market participant or *market support services licensee*:
- a. during an emergency or where the *PSO controlled system* is in a *high-risk operating state* or an *emergency operating state*; or
 - b. where an emergency, a *high-risk operating state* or an *emergency operating state* is anticipated by the *EMC* or the *PSO*;
- to the extent that such disclosure would, in the *EMC's* or the *PSO's* opinion:
- c. assist the *market participant* or *market support services licensee* in responding to the conditions referred to in section 6.5.1.9(a) or 6.5.1.9(b); or
 - d. assist the *EMC* or the *PSO* in restoring the *PSO controlled system* to a *normal operating state*;
- 6.5.1.10 the disclosure by the *EMC* or the *PSO* of *confidential information* to a *standards authority* or an *interconnected system operator*.
- 6.5.1.11 the disclosure by the *PSO* of *confidential information* to the *market assessment unit* or the *market surveillance and compliance panel* pursuant to section 4.1.4;
- 6.5.1.12 the disclosure of *confidential information* contained in a report of the *market surveillance and compliance panel* or the *market assessment unit* disseminated in accordance with section 7.2.19; or
- 6.5.1.13 the disclosure, use or reproduction of *confidential information* as an unidentifiable component of an aggregate sum.

- 6.5.2 Prior to making any disclosure pursuant to section 6.5.1.2 or 6.5.1.6, the person wishing to disclose the information shall inform the proposed recipient of the confidential nature of the *confidential information* to be disclosed and shall use all reasonable endeavours, including the execution of an appropriate confidentiality agreement, to ensure that the recipient keeps the *confidential information* confidential in accordance with the provisions of section 6.4 and does not use the *confidential information* for any purpose other than that permitted under section 6.5.1.2 or 6.5.1.6, as the case may be.
- 6.5.3 Prior to making any disclosure pursuant to section 6.5.1.4 or 6.5.1.5, a person being requested or demanded to disclose the *confidential information* shall advise the person affected by the request or demand as soon as reasonably practicable so as where possible to permit the affected person to challenge such request or demand or seek terms and conditions in respect of any such disclosure.
- 6.5.4 In making any disclosure pursuant to section 6.5.1.7, the disclosing person shall advise the person affected by the disclosure as soon as is reasonably practicable and shall use all reasonable endeavours to protect the confidentiality of the *confidential information* insofar as may be reasonably practicable in the circumstances.
- 6.5.5 Where the *PSO* makes any disclosure pursuant to section 6.5.1.8:
- 6.5.5.1 it shall advise the *market participant* or *market support services licensee* affected by the disclosure as soon as is reasonably practicable in the circumstances; and
- 6.5.5.2 the *transmission licensee* shall use the *confidential information* so disclosed solely for the purposes referred to in section 6.5.1.8 and shall use all reasonable endeavours to protect the confidentiality of such *confidential information*.
- 6.5.6 Where the *EMC* or the *PSO* makes any disclosure pursuant to section 6.5.1.9:
- 6.5.6.1 it shall advise the *market participant* or *market support services licensee* affected by the disclosure as soon as is reasonably practicable in the circumstances; and
- 6.5.6.2 the *market participant* or *market support services licensee* to whom the disclosure is made shall use the *confidential information* so disclosed solely for the purposes referred to in section 6.5.1.9 and shall use all reasonable endeavours to protect the confidentiality of such *confidential information* as may be reasonably practicable in the circumstances.

- 6.5.7 Where the *EMC* or the *PSO* makes any disclosure pursuant to section 6.5.1.10, it shall:
- 6.5.7.1 advise the *market participant* or *market support services licensee* affected by the disclosure as soon as is reasonably practicable in the circumstances; and
 - 6.5.7.2 subject to the terms of any agreement which it may have with the applicable *standards authority*, or *interconnected system operator*, use such reasonable endeavours as may be reasonably practicable in the circumstances to ensure that the recipient protects the confidentiality of the *confidential information*.

6.6 APPLICATION TO PANELS

- 6.6.1 Sections 6.1 to 6.5 shall apply:
- 6.6.1.1 to the *rules change panel*;
 - 6.6.1.2 subject to section 3, to the *dispute resolution counsellor* and the *dispute resolution and compensation panel*; and
 - 6.6.1.3 subject to section 4, to the *market surveillance and compliance panel*.
- 6.6.2 For the purposes of section 6.6.1:
- 6.6.2.1 all references to the *EMC* in sections 6.1 to 6.5 shall be deemed to include references to the *rules change panel*, the *market surveillance and compliance panel*, the *dispute resolution counsellor* and the *dispute resolution and compensation panel*; and
 - 6.6.2.2 all references to an employee in sections 6.1 to 6.5 shall be deemed to include references to a member of the *rules change panel*, the *market surveillance and compliance panel* or the *dispute resolution and compensation panel*.

7 ENFORCEMENT

7.1 INTRODUCTION

- 7.1.1 This section sets forth the rules pursuant to which the:
- 7.1.1.1 *market surveillance and compliance panel* shall monitor and enforce, compliance with the *market rules*, *market manuals* and the *system operation manual*.
 - 7.1.1.2 the *PSO* shall monitor compliance with the *system operation manual*; and
 - 7.1.1.3 the *market assessment unit* shall monitor compliance with the *market rules* and *market manuals*.
- 7.1.2 The *market surveillance and compliance panel* shall enforce compliance with the *market rules*, *market manuals* and the *system operation manual* by means of the imposition of financial penalties, the issuance of non-compliance letters, *suspension orders*, *termination orders*, and *revocation orders* and any other enforcement actions as provided for in the *market rules*.
- 7.1.3 All enforcement actions under these market rules shall be administered by the *EMC* at the direction of the *market surveillance and compliance panel*.
- 7.1.4 The *market surveillance and compliance panel* shall ensure that appropriate and adequate monitoring necessary to determine whether *market participants*, the *EMC* and the *PSO* are complying with the *market rules* and *market manuals*, other than the provisions of the *market rules* and the *market manuals* referred to in section 7.1.6, is being undertaken at all material times.
- 7.1.5 The *market assessment unit* shall undertake such monitoring as it considers necessary and as directed by the *market surveillance and compliance panel* to determine whether *market participants*, the *PSO* and the *EMC* are complying with the *market rules* and *market manuals*. For the avoidance of doubt, should any monitoring activity conducted by the *market assessment unit* reveal any activity of the *EMC* warranting any investigation under the *market rules*, section 4.6.2 shall immediately apply.

- 7.1.6 The *PSO* shall undertake such monitoring as it considers necessary to determine whether *market participants*, the *EMC* and the *PSO* are complying with:
- 7.1.6.1 a section of the *market rules* that relates to a function, power or duty of the *PSO*;
 - 7.1.6.2 the *system operation manual*; or
 - 7.1.6.3 any *market manual* that is referred to in or relates to a section of the *market rules* referred to in section 7.1.6.1.
- 7.1.7 Where the *PSO* believes or becomes aware, either through its own monitoring activities or following an investigation directed by the *market surveillance and compliance panel*, that a *market participant* or the *EMC* or the *PSO* has breached, is breaching or may be breaching the relevant section of the *market rules*, a *market manual* or the *system operation manual* as referred to in section 7.1.6, the *PSO* shall:
- 7.1.7.1 so notify the *market surveillance and compliance panel* in writing, which notice shall set forth details of such belief or alleged past, present or potential breach, including evidence in respect thereof; and
 - 7.1.7.2 provide to the *market surveillance and compliance panel* all information in its ownership, possession or control relating to such belief or alleged past, present or potential breach.
- 7.1.8 Where the *EMC* believes or becomes aware that a *market participant* or the *EMC* or *PSO* has breached, is breaching or may be breaching the *market rules* or a *market manual*, or where the group of persons referred to in section 4.6.2 believes or becomes aware that the *EMC* has breached, is breaching or may be breaching the *market rules* or a *market manual*, the *EMC* or the said group, as the case may be, shall:
- 7.1.8.1 so notify the *market surveillance and compliance panel* in writing, which notice shall set forth details of such belief or the alleged past, present or potential breach, including evidence in respect thereof; and
 - 7.1.8.2 provide to the *market surveillance and compliance panel* all information in their respective ownership, possession or control relating to such belief or alleged past, present or potential breach.

- 7.1.9 Where a *market participant* believes or becomes aware that it, a *market support services licensee*, another *market participant*, the *EMC* or the *PSO* has breached, is breaching or may be breaching the *market rules*, a *market manual* or the *system operation manual*, the *market participant* shall:
- 7.1.9.1 so notify the *market surveillance and compliance panel* in writing, which notice shall set forth details of such belief or the alleged past, present or potential breach, including evidence in respect thereof; and
 - 7.1.9.2 provide to the *market surveillance and compliance panel* all information in its ownership, possession or control relating to such belief or alleged past, present or potential breach.
- 7.1.10 The *market assessment unit*, the *EMC*, the *PSO* and a *market participant* shall provide any relevant information to the *market surveillance and compliance panel* as may be requested by the *market surveillance and compliance panel* in order for the *market surveillance and compliance panel* to perform its functions and duties under these *market rules*.
- 7.1.11 Nothing in sections 7.1.5, 7.1.7, 7.1.8 or 7.1.9 shall be construed as limiting any right which a *market participant*, the *PSO* or the *EMC* may have to initiate the dispute resolution process described in section 3 in respect of a breach in relation to the *market rules*, a *market manual* or the *system operation manual*.
- 7.1.12 References in this section 7 to:
- 7.1.12.1 a *market participant* shall be deemed to include references to a *market support services licensee*; and
 - 7.1.12.2 registration shall be deemed to include references to authorisation.

7.2 PROCEDURES CONCERNING ALLEGED BREACHES OF THE MARKET RULES

- 7.2.1 This section 7.2 shall not apply to:
- 7.2.1.1 the issuance by the *market surveillance and compliance panel* of a *suspension order* or *termination order*, which shall be governed by the provisions of sections 7.3 and 7.4, respectively; or
 - 7.2.1.2 the issuance by the *market surveillance and compliance panel* of a *revocation order* revoking the registration of a *registered facility*, which shall be governed by the applicable provisions

of section 7.4 and 7.5, unless specifically referenced in sections 7.4 to 7.5 inclusive and only to the extent of the context so referenced.

- 7.2.2 Where the *market rules*, a *market manual* or the *system operation manual* provide for consequences, sanctions or enforcement actions in respect of a breach by a *market participant*, the *EMC* or the *PSO*, of the *market rules*, a *market manual* or the *system operation manual*, those consequences, sanctions or enforcement actions shall apply in the circumstances and in the manner provided for in the relevant section of the *market rules*, *market manual* or *system operation manual* in addition to such enforcement actions as may be taken pursuant to this section 7. In the event of any inconsistency between those consequences, sanctions or enforcement actions and the enforcement actions as may be taken under this section 7, the latter provisions shall prevail.
- 7.2.3 If the *market surveillance and compliance panel* considers, on its own initiative or upon receipt of written information from any person, or upon information received from the *market assessment unit* or the *PSO*, that a *market participant*, the *EMC* or the *PSO* may have breached, is breaching or may be breaching the *market rules*, a *market manual* or the *system operation manual* and that, in the circumstances, it may be appropriate for an enforcement action to be taken against that *market participant*, the *EMC* or the *PSO*, the *market surveillance and compliance panel* shall notify the *market participant*, the *EMC* or the *PSO*, as the case may be, of:
- 7.2.3.1 details of the alleged past, present or potential breach and of the time within which such breach must be remedied or prevented, as the case may be;
 - 7.2.3.2 details of the evidence on the basis of which the *market surveillance and compliance panel* considers that the *market participant*, the *EMC* or the *PSO* may have breached, is breaching or may be breaching the *market rules*, a *market manual* or the *system operation manual*;
 - 7.2.3.3 details of the enforcement actions that may be taken if the breach is established, and/or persists or is not prevented from happening;
 - 7.2.3.4 the time within which the *market participant*, the *EMC* or the *PSO* shall make written representations in response to any allegation; and
 - 7.2.3.5 the right of the *market participant*, the *EMC* or the *PSO* to request a hearing before the *market surveillance and compliance panel* to determine the matter, provided that there

are written representations made within the requisite time in pursuance of section 7.2.3.4.

- 7.2.4 Following expiry of the time noted in section 7.2.3.4, and after consideration of any representations made by the *market participant*, the *EMC* or the *PSO* pursuant to that section, whether or not at any hearing held in pursuance of section 7.2.3.5, the *market surveillance and compliance panel* may do one or more of the following where appropriate:
- 7.2.4.1 determine that the *market participant*, the *EMC* or the *PSO* has not breached the *market rules*, a *market manual* or the *system operation manual*;
 - 7.2.4.2 subject to section 7.2.6, determine that the *market participant*, the *EMC* or the *PSO* is in breach of the *market rules*, a *market manual* or the *system operation manual*;
 - 7.2.4.3 request that the *market participant*, the *EMC* or the *PSO* provide further relevant information in relation to the alleged breach; or
 - 7.2.4.4 conduct or direct the *market assessment unit* or the *PSO*, as the case may be, to conduct such further investigation into the matter as the *market surveillance and compliance panel* determines appropriate.
- 7.2.5 Where the *market surveillance and compliance panel* initiates a further investigation pursuant to section 7.2.4.4 in respect of the alleged breach of a section of the *market rules* referred to in section 7.1.6.1, the *system operation manual* or a *market manual* referred to in section 7.1.6.3, the *PSO* shall provide the *market surveillance and compliance panel* with such assistance as the *market surveillance and compliance panel* may reasonably require in respect of the conduct of such investigation.
- 7.2.6 Where a *market participant*, the *EMC* or the *PSO* has requested the hearing referred to in section 7.2.3.5:
- 7.2.6.1 the *market surveillance and compliance panel* shall provide the *market participant*, the *EMC* or the *PSO*, as the case may be, with a reasonable opportunity to appear before the *market surveillance and compliance panel* to determine the allegations, subject to the following:

where the allegations relate to the alleged breach of a section of the *market rules* referred to in section 7.1.6.1, the *system operation manual* referred to in section 7.1.6.2 or a *market manual* referred to in section 7.1.6.3, by a *market participant* or the *EMC*, one or more representatives of the *PSO* may attend at any meeting convened pursuant to this section 7.2.6.

The *market surveillance and compliance panel* shall not make the determination noted in section 7.2.4.2 until and unless the provisions of this section 7.2.6 are fully satisfied where applicable.

7.2.7 A *market participant*, the *EMC* or the *PSO* shall comply with any request for information made by the *market surveillance and compliance panel* pursuant to section 7.2.4.3.

7.2.8 Where the *market surveillance and compliance panel* determines that a *market participant*, the *EMC* or the *PSO* has breached the *market rules*, a *market manual* or the *system operation manual*, the *market surveillance and compliance panel* may, subject to section 7.2.9, take any one or more of the following enforcement actions:

7.2.8.1 direct the *market participant*, the *EMC* or the *PSO*, as the case may be, to do within a specified period of time, such things as may be necessary to comply with the *market rules*, the *market manual* or the *system operation manual*;

7.2.8.2 direct the *market participant*, the *EMC* or the *PSO*, as the case may be, to cease within a specified period of time, the act, activity or practice constituting the breach;

7.2.8.3 direct that the *market participant*, the *EMC* or the *PSO* comply with additional or more stringent record-keeping or reporting requirements;

7.2.8.4 issue a non-compliance letter to the *market participant*, the *EMC* or the *PSO*;

7.2.8.5 direct that the *market participant* or the *EMC* pay a financial penalty determined in accordance with section 7.2.11 within such time as may be specified in the direction, provided that the *market surveillance and compliance panel* is satisfied that the breach could have been avoided by the exercise of due diligence by the *market participant* or the *EMC* or that the *market participant* or the *EMC* acted intentionally; and/or

7.2.8.6 make an award for costs arising from the breach.

- 7.2.9 Where the *market surveillance and compliance panel* determines that a *market participant* or the *EMC* has breached a section of the *market rules* referred to in section 7.1.6.1, the *system operation manual* referred to in section 7.1.6.2 or a *market manual* referred to in section 7.1.6.3, the *market surveillance and compliance panel* may consult with the *PSO* as to the appropriate enforcement action, if any, to be taken in the circumstances, including as to the amount of any financial penalty to be imposed.
- 7.2.10 The *market surveillance and compliance panel* may, in the determination of any matter brought before it under these *market rules*, allocate the costs associated with the investigation or consideration of the matter for payment by one or more parties to the matter as the *market surveillance and compliance panel* deems just and reasonable.
- 7.2.11 Where the *market surveillance and compliance panel* determines, in consultation with the *PSO* pursuant to section 7.2.9 where applicable, that the appropriate enforcement action in respect of a breach of the *market rules*, a *market manual* or the *system operation manual* by a *market participant* or the *EMC* is the imposition of a financial penalty, the *market surveillance and compliance panel* shall determine the amount of the financial penalty having regard to:
- 7.2.11.1 the circumstances in which the breach occurred;
 - 7.2.11.2 the severity of the breach;
 - 7.2.11.3 the extent to which the breach was negligent, deliberate or otherwise;
 - 7.2.11.4 the length of time the breach remained unresolved;
 - 7.2.11.5 the actions of the *market participant* or the *EMC* on becoming aware of the breach;
 - 7.2.11.6 whether the *market participant* or the *EMC* as the case may be, disclosed the matter to the *market surveillance and compliance panel*, the *market assessment unit* or the *PSO* on its own accord or only when prompted to do so;
 - 7.2.11.7 any benefit that the *market participant* or the *EMC* obtained or expected to obtain as a result of the breach;
 - 7.2.11.8 any previous breach by the *market participant* or the *EMC* of the *market rules*, a *market manual*, the *system operation manual* or the conditions of its *electricity licence* where applicable;
 - 7.2.11.9 the rate of recurrence of non-compliance by the *market participant* or the *EMC* with the *market rules*, *market*

- manuals* and the *system operation manual* in terms of frequency or duration;
- 7.2.11.10 the impact of the breach on other *market participants*, *market support services licensees*, the *EMC* and the *PSO*;
- 7.2.11.11 the impact of the breach on the *wholesale electricity markets* as a whole;
- 7.2.11.12 whether the breach occurred while a declaration that the *PSO controlled system* is in a *high-risk operating state* or an *emergency operating state* was in effect;
- 7.2.11.13 whether the breach occurred while a declaration that the *real time markets* and the *procurement markets* have been suspended was in effect;
- 7.2.11.14 whether the behaviour constituting the breach is or can be the subject of investigation under *applicable law* by a person other than the *market surveillance and compliance panel*, the *market assessment unit* or the *PSO*;
- 7.2.11.15 whether the behaviour constituting the breach is or can be the subject of a financial penalty imposed under *applicable law* by the *market surveillance and compliance panel*; and
- 7.2.11.16 any submissions made by the party in breach and such other factors as the *market surveillance and compliance panel* considers appropriate.
- 7.2.12 A direction imposing financial penalties on a *market participant*, the *EMC* made pursuant to section 7.2.8.5 shall be considered to create an obligation under the *market rules* to pay the amount stated in the direction and such amount may, without prejudice to any other manner of recovery available under *applicable law*, be recovered accordingly.
- 7.2.13 Nothing in this section 7.2 shall prevent the *market surveillance and compliance panel* from imposing a financial penalty for failure by a *market participant*, the *EMC* to remedy a breach in respect of which a financial penalty has already been imposed or if there is any repetition or continuation of such breach.
- 7.2.14 Failure to comply with a direction of the *market surveillance and compliance panel* made pursuant to section 7.2.8 constitutes a breach of the *market rules* and may be sanctioned as such by enforcement action in accordance with these *market rules*.
- 7.2.15 The *EMC* shall administer any such order(s) and/or recommendation(s) of the *market surveillance and compliance panel*.

- 7.2.16 Where the *market surveillance and compliance panel* determines that the *PSO* has breached or is breaching the *market rules*, a *market manual* or the *system operation manual*, it shall provide to the *PSO* and the *Authority* a report recording the facts and circumstances of the breach.
- 7.2.17 Following the provision of any such report referred to in section 7.2.16, the *PSO* shall, within the time specified by the *market surveillance and compliance panel*, provide a report to the *market surveillance and compliance panel* setting out its explanation for the breach, and a plan detailing how it intends to reduce the likelihood of, or prevent, such breaches in the future.
- 7.2.18 Following the provision of any such report referred to in section 7.2.17, where the *market surveillance and compliance panel* remains dissatisfied with the response provided or the plan proposed by the *PSO*, the *market surveillance and compliance panel* may forward the reports to the Minister responsible for the *Electricity Act* for review.
- 7.2.19 Where the *market surveillance and compliance panel* determines that a *market participant*, the *EMC* or the *PSO* has breached or is breaching the *market rules*, a *market manual* or the *system operation manual*, it shall provide to the *EMC* a report recording the facts and circumstances of the breach and details of any sanctions imposed, and *EMC* shall so notify the *Authority* and *publish* the report subject to sections 6.4 and 6.5.

7.3 SUSPENSION ORDERS

- 7.3.1 Each of the following is an *event of default* in relation to a *market participant*:
- 7.3.1.1 the *market participant* does not pay money due for payment by it under the *market rules* by the appointed time on the due date;
- 7.3.1.2 the *EMC* does not receive payment in full of any amount claimed by the *EMC* under any *credit support* submitted by or on behalf of the *market participant* within one *business day* in the jurisdiction of the *market participant* after the due time for payment of that claim;
- 7.3.1.3 the *market participant* fails to :
- a. notify the *EMC* as required under section 7.6.7 of Chapter 2; or
 - b. provide all requisite *credit support* to the *EMC* as required under any provision of the *market rules*;
- within the relevant time required for the same;

- 7.3.1.4 it becomes unlawful for the *market participant* to comply with any of its obligations under the *market rules*, a *market manual* or the *system operation manual* or any other obligation owed to the *EMC* or the *PSO*, or it is claimed to have become so by the *market participant*;
- 7.3.1.5 [Deleted and Intentionally Left Blank]
- 7.3.1.6 a licence (including an *electricity licence*), permit or other authorisation necessary to enable the *market participant* to carry on its principal business or activities is suspended, revoked or otherwise ceases to be in full force and effect, provided that where a *market participant* holds more than one *electricity licence* and only one such *electricity licence* has been suspended, revoked or otherwise ceases to be in full force and effect, the *event of default* and any action taken by the *EMC* with respect thereto shall relate only to such *electricity licence*;
- 7.3.1.7 the *market participant* ceases or threatens to cease to carry on its business or a substantial part of its business;
- 7.3.1.8 the *market participant* enters into or takes any action to enter into an arrangement, composition or compromise with, or an assignment for the benefit of, all or any class of its creditors or members or a moratorium involving any of them;
- 7.3.1.9 the *market participant* states that it is unable to pay from its own money its debts when they fall due for payment;
- 7.3.1.10 a receiver, receiver and manager, judicial manager or person having a similar or analogous function under the laws of any relevant jurisdiction is appointed in respect of any property of the *market participant* which is used in or relevant to the performance by it or its *credit support provider* of their respective obligations under the *market rules*, a *market manual*, the *system operation manual*, an *electricity licence* issued to it or *credit support* provided by it, as the case may be;
- 7.3.1.11 an administrator, liquidator, trustee in bankruptcy or person having a similar or analogous function under the laws of any relevant jurisdiction is appointed in respect of the *market participant* or any action is taken to appoint such person;
- 7.3.1.12 an application is made for the winding up or dissolution or a resolution is passed or any steps are taken to pass a resolution for the winding up or dissolution of the *market participant*;

- 7.3.1.13 the *market participant* is wound up or dissolved, unless the notice of winding up or dissolution is discharged;
- 7.3.1.14 the *market participant* is taken to be insolvent or unable to pay its debts under any applicable legislation;
- 7.3.1.15 the *market participant* ceases to satisfy any material requirement imposed upon it as a condition of its registration as a *market participant*; or
- 7.3.1.16 the *market participant* fails to comply with a direction or order of the *market surveillance and compliance panel* made pursuant to section 7.2.8.

The issuance of a special administration order in respect of a *market participant* pursuant to section 29 of the *Electricity Act* shall not constitute an *event of default* in respect of that *market participant*.

7.3.2 A *market participant* shall immediately notify the *EMC*, the *market surveillance and compliance panel*, and the *Authority* and, where the *market participant* is a contestable *consumer* or *retail electricity licensee*, the applicable *market support services licensee* immediately upon the earlier of becoming aware of any circumstance that may give rise to or of the occurrence of:

- 7.3.2.1 an *event of default* referred to in sections 7.3.1.4 to 7.3.1.15; or
- 7.3.2.2 a receiver, receiver and manager, judicial manager or person having a similar or analogous function under the laws of any relevant jurisdiction being appointed in respect of any property of the *market participant*.

7.3.3 Where an *event of default* (other than an *event of default* referred to in sections 7.3.1.4, 7.3.1.6, 7.3.1.15 and 7.3.1.16) has occurred in relation to a *market participant*, the *EMC* shall take one or more of the following actions:

- 7.3.3.1 issue to the *market participant* a *default notice* specifying the alleged *event of default* and if the *EMC* deems appropriate of necessary, requiring the *market participant* to remedy the *event of default* within such time as may be specified in the *default notice*, which time shall not be more than 1 *business day*; and/or
- 7.3.3.2 make claim upon any *credit support* held in respect of the obligations of the *market participant* for such amount as the *EMC* determines represents the amount of any money actually or contingently owing by the *market participant* to the *EMC* under the *market rules*; and/or

7.3.3.3 request the *market surveillance and compliance panel* to issue a *suspension order* to the *market participant* suspending or restricting all or any of the *market participant's* rights to participate in the *wholesale electricity markets* or to cause or permit a *physical service* to be conveyed into, through or out of the *transmission system*, and shall provide a copy of such request to the *market participant*, the *PSO*, the *transmission licensee*, the *Authority* and, where the *market participant* is a contestable *consumer* or *retail electricity licensee*, the applicable *market support services licensee*.

7.3.3A Where an *event of default* referred to in sections 7.3.1.4, 7.3.1.6 or 7.3.1.16 has occurred in relation to a *market participant*, the *EMC* shall:

7.3.3A.1 issue to the *market participant* a *default notice* specifying the alleged *event of default*; and

7.3.3A.2 request the *market surveillance and compliance panel* to issue a *suspension order* to the *market participant* suspending or restricting all or any of the *market participant's* rights to participate in the *wholesale electricity markets* or to cause or permit a *physical service* to be conveyed into, through or out of the *transmission system*, and shall provide a copy of such request to the *market participant*, the *PSO*, the *transmission licensee*, the *Authority* and, where the *market participant* is a contestable *consumer* or *retail electricity licensee*, the applicable *market support services licensee*.

7.3.3B Where an *event of default* referred to in section 7.3.1.15 has occurred in relation to a *market participant*, the *EMC* shall take one or more of the following actions:

7.3.3B.1 issue to the *market participant* a *default notice* specifying the alleged *event of default* and requiring the *market participant* to remedy the *event of default* within such time as may be specified in the *default notice*, which time shall not be more than 5 *business days*; and/or

7.3.3B.2 request the *market surveillance and compliance panel* to issue a *suspension order* to the *market participant* suspending or restricting all or any of the *market participant's* rights to participate in the *wholesale electricity markets* or to cause or permit a *physical service* to be conveyed into, through or out of the *transmission system*, and shall provide a copy of such request to the *market participant*, the *PSO*, the *transmission licensee*, the *Authority* and, where the *market participant* is a *contestable consumer* or *retail electricity licensee*, the applicable *market support services licensee*.

7.3.4 Where the *EMC* issues a *default notice* to a *market participant* pursuant to sections 7.3.3.1, 7.3.3A.1 or 7.3.3B.1 in respect of an *event of default*, the *EMC* shall notify the *market surveillance and compliance panel* and the *PSO*, the *Authority* and, where the *market participant* is a *contestable consumer* or *retail electricity licensee*, the applicable *market support services licensee*:

7.3.4.1 of the issuance of the *default notice*;

7.3.4.2 where applicable, of the time within which the *market participant* may remedy the *event of default* as specified in the *default notice*; and

7.3.4.3 where the *event of default* specified in the *default notice* has been remedied by the *market participant*, of the fact and outcome of such remedy.

7.3.5 [Deleted and Intentionally Left Blank]

7.3.6 A *market participant* may remedy an *event of default* referred to in sections 7.3.1.1 to 7.3.1.3, and 7.3.1.7 to 7.3.1.14 by:

7.3.6.1 paying all monies due for payment by it under the *market rules*, together with any *default interest* calculated in accordance with Chapter 7 and any costs and expenses determined by the *EMC* to have been incurred by it by reason of the *event of default*; and

- 7.3.6.2 providing *credit support* which complies with the requirements of section 7 of Chapter 2.
- 7.3.7 A *market participant* may remedy an *event of default* referred to in section 7.3.1.4 by obtaining from the *EMC*, in accordance with section 14 of Chapter 1, a derogation in respect of the obligation in the *market rules*, the applicable *market manual* or the *system operation manual* with respect to which compliance by the *market participant* has become unlawful.
- 7.3.8 A *market participant* may remedy an *event of default* referred to in section 7.3.1.6 by demonstrating to the satisfaction of the *EMC* that:
- 7.3.8.1 the applicable licence, permit or authorisation referred to in that section has been reinstated or re-issued to the *market participant* or *credit support provider*; or
- 7.3.8.2 the *market participant* or *credit support provider* has obtained from the issuing authority an exemption from the requirement to hold such licence, permit or authorisation.
- 7.3.9 A *market participant* may remedy an *event of default* referred to in section 7.3.1.15 by demonstrating to the satisfaction of the *EMC* that the material requirement referred to in that section is no longer required to be imposed on the *market participant* as a condition of its registration as a *market participant* in order to preserve the financial integrity of the *wholesale electricity markets*.
- 7.3.10 Notwithstanding that an *event of default* may have been remedied by the *market participant*, the *EMC* may, where it considers that it is in the interests of preserving the integrity of the *wholesale electricity markets*, impose such conditions on the *market participant's* registration as a *market participant* as the *EMC* deems appropriate, including the conditions noted in sections 7.3.15.1 and 7.3.15.2.

If an *event of default* is not remedied within the time specified in the *default notice*, the *EMC* shall take one or more of the following actions:

- 7.3.10.1 if it has not already done so, make claim upon all *credit support* held in respect of the *market participant*; and/or
- 7.3.10.2 request the *market surveillance and compliance panel* to issue a *suspension order* to the *market participant* suspending or restricting all or any of the *market participant's* rights to participate in the *wholesale electricity markets* or to cause or permit a *physical service* to be conveyed into, through or out of the *transmission system*, and shall provide a copy of such request to the *market participant*, the *PSO*, the *transmission*

licensee, the Authority and, where the market participant is a contestable consumer or retail electricity licensee, the applicable market support services licensee.

7.3.11 The *market surveillance and compliance panel* shall, within 4 *business days* of the date of receipt of the request for a *suspension order* to be issued to a *market participant*, conduct and conclude a hearing providing the *market participant* with a reasonable opportunity to show cause as to why the *suspension order* should not be issued against it. In such case, the *market surveillance and compliance panel* shall not issue the *suspension order* until such reasonable opportunity has been provided.

7.3.12 Upon conclusion of the hearing referred to in section 7.3.11, the *market surveillance and compliance panel* may:

7.3.12.1 subject to section 7.3.13 or 7.3.14, issue a *suspension order* to the *market participant* suspending or restricting all or any of the *market participant's* rights to participate in the *wholesale electricity markets* or to cause or permit a *physical service* to be conveyed into, through or out of the *transmission system*;

7.3.12.2 make such other order as the *market surveillance and compliance panel* considers appropriate in order to preserve the financial integrity of the *wholesale electricity markets* in the event that the *market participant's* rights to participate in the *wholesale electricity markets* or to cause or permit a *physical service* to be conveyed into, through or out of the *transmission system* are not suspended or restricted; or

7.3.12.3 issue a *suspension order* under section 7.3.12.1 and make such other order as the *market surveillance and compliance panel* considers appropriate under section 7.3.12.2,

and shall notify the *market participant*, the *EMC*, the *PSO*, the *transmission licensee*, the *Authority* and, where the *market participant* is a contestable *consumer* or *retail electricity licensee*, the applicable *market support services licensee* accordingly.

7.3.13 Where, upon conclusion of the hearing referred to in section 7.3.11, the *market surveillance and compliance panel* intends to issue a *suspension order* to a *market participant* that is a *generation licensee* the *market surveillance and compliance panel* shall request that the *Authority* take action, which may include applying to the Minister responsible for the *Electricity Act* for the issuance of a special administration order under section 29(1)(a) of the *Electricity Act* in relation to the *market participant*, to ensure that all outstanding and future financial and other obligations and liabilities of the *market participant* under the *market rules*, *market manuals* and the *system operation manual* will be met. The *Authority* shall promptly, following receipt of such request:

7.3.13.1 issue to the *market surveillance and compliance panel* a direction prohibiting the *market surveillance and compliance panel* from issuing a *suspension order* to the *market participant*, and notify the *market surveillance and compliance panel* of the action that the *Authority* proposes to take or to have taken in respect of the *market participant*; or

7.3.13.2 issue to the *market surveillance and compliance panel* a direction authorising the *market surveillance and compliance panel* to proceed with the issuance of a *suspension order* to the *market participant*.

Where section 7.3.13.1 applies, the *market surveillance and compliance panel* shall so notify the *market participant*, the *EMC*, and the *PSO* and shall not issue a *suspension order* to the *market participant* unless another *event of default* arises in respect of the *market participant*, in which case the provisions of this section 7.3 shall apply in respect of such *event of default*, or the *Authority* directs the *market surveillance and compliance panel* to issue a *suspension order* to the *market participant*. Where section 7.3.13.2 applies, the *market surveillance and compliance panel* may issue a *suspension order* to the *market participant* and shall notify the *market participant*, the *EMC*, the *PSO* and the *Authority* accordingly.

7.3.14 Where, upon conclusion of the hearing referred to in section 7.3.11, the *market surveillance and compliance panel* intends to issue a *suspension order* to the *transmission licensee* or a *market support services licensee* (as the case may be), the *market surveillance and compliance panel* shall request that the *Authority* take action, which may include applying to the Minister responsible for the *Electricity Act* for the issuance of a special administration order under section 29(1)(a) of the *Electricity Act* in relation to the *transmission licensee* or the *market support services licensee*, as the case may be, to ensure that all outstanding and future financial and other obligations of the *transmission licensee* or the *market support services licensee* under the *market rules*, *market manuals* and the *system operation manual* will be met. The *Authority* shall promptly, following receipt of such request:

7.3.14.1 issue to the *market surveillance and compliance panel* a direction prohibiting the *market surveillance and compliance panel* from issuing a *suspension order* to the *transmission licensee* or the *market support services licensee*, as the case may be, and notify the *market surveillance and compliance panel* of the action that it proposes to take or to have taken in respect of the *transmission licensee* or the *market support services licensee*, as the case may be; or

7.3.14.2 issue to the *market surveillance and compliance panel* a direction authorising the *market surveillance and compliance panel* to proceed with the issuance of a *suspension order* to the *transmission licensee* or the *market support services licensee*, as the case may be.

Where section 7.3.14.1 applies, the *market surveillance and compliance panel* shall so notify the *transmission licensee* or the *market support services licensee*, as the case may be, the *EMC* and the *PSO* and shall not issue a *suspension order* to the *transmission licensee* or the *market support services licensee* unless another *event of default* arises in respect of the *transmission licensee* or the *market support services licensee*, in which case the provisions of this section 7.3 shall apply in respect of such *event of default*, or the *Authority* directs the *market surveillance and compliance panel* to issue a *suspension order* to the *transmission licensee* or the *market support services licensee*. Where section 7.3.14.2 applies, the *market surveillance and compliance panel* may issue a *suspension order* to the *transmission licensee* or the *market support services licensee*, as the case may be, and shall notify the *transmission licensee* or the *market support services licensee*, the *EMC*, the *PSO* and the *Authority* accordingly.

7.3.15 The *market surveillance and compliance panel* may lift a *suspension order* if the event that triggered its issuance is remedied and there are no other *events of default* in existence with respect to the *suspended market participant* and may, as a condition of lifting a *suspension order*, impose

such conditions on the *suspended market participant's* registration as a *market participant* as the *market surveillance and compliance panel* determines appropriate, including:

7.3.15.1 establishing a lower percentage of *estimated net exposure* for the purpose of notifying a *market participant* or issuing a *margin call* to a *market participant* than would otherwise be the case under section 7.4 of Chapter 2; and

7.3.15.2 imposing more stringent prudential requirements than would otherwise be the case under section 7 of Chapter 2,

and shall notify the *market participant*, the *EMC*, the *PSO*, the *Authority* and, where the *market participant* is a contestable *consumer* or *retail electricity licensee*, the applicable *market support services licensee* accordingly.

7.3.16 Following the issuance of a *suspension order*, the *market surveillance and compliance panel* may, notwithstanding any other provisions of these *market rules*, do one or more of the following to give effect to the *suspension order*:

7.3.16.1 instruct *EMC* to reject any *offer* or *bilateral contract data* submitted by the *suspended market participant*;

7.3.16.2 instruct *EMC* to withhold the payment of any amounts otherwise due to the *suspended market participant* under the *market rules*; or

7.3.16.3 make such further order or issue such directions to the *suspended market participant*, other *market participants*, a *market support services licensee*, *EMC* or the *PSO* as the *market surveillance and compliance panel* determines appropriate in order to preserve the financial integrity of the *wholesale electricity markets*.

7.3.17 Where section 7.3.16.2 applies in respect of a *suspended market participant* that is a *generation licensee*, any amounts that may be owing to the *suspended market participant* on account of injections by any of the *suspended market participant's* affected *generation facilities* while the *suspension order* is in effect shall be dealt with by the *market surveillance and compliance panel* in such manner as the *market surveillance and compliance panel* deems appropriate.

7.3.18 Where the *market surveillance and compliance panel* issues a *suspension order* against a *selling market participant*, such *suspension order* shall be deemed to constitute a revision to any *bilateral contract* quantities that relate to the period during which the *suspension order* is in effect, including any period during which its operation is stayed pursuant to

section 7.3.19, such that the *bilateral contract* quantities that relate to such period shall be considered by the *EMC* to be zero.

- 7.3.19 The *market surveillance and compliance panel* may at any time and upon notice to the *suspended market participant*, extend, stay the operation of or lift a *suspension order* or modify the conditions of any *suspension order*, and shall notify the *PSO*, the *EMC*, the *Authority* and, where the *suspended market participant* is a contestable *consumer* or *retail electricity licensee*, the applicable *market support services licensee* accordingly.
- 7.3.20 The *market surveillance and compliance panel* shall, immediately following the issuance of a *suspension order*, *publish* a notice to the effect that the rights of the *suspended market participant* to participate in the *wholesale electricity markets* or to cause or permit a *physical service* to be conveyed into, through or out of the *transmission system* have been suspended or restricted, including details of the suspension. The *market surveillance and compliance panel* shall *publish* a notice promptly after a *suspension order* is lifted, extended, modified or stayed.
- 7.3.21 From the time the *market surveillance and compliance panel* issues a *suspension order* to a *market participant*, the *suspended market participant* is ineligible to trade or enter into any transaction in the *wholesale electricity markets* or to cause or permit a *physical service* to be conveyed into, through or out of the *transmission system* to the extent specified in the *suspension order*, until such time that the *market surveillance and compliance panel* notifies the *suspended market participant* that the *suspension order* has been lifted or stayed and *publishes* a notice to that effect under section 7.3.20.
- 7.3.22 A *suspended market participant* shall comply with the terms of the *suspension order* issued to it. A *suspended market participant* shall also comply with any order relating to it, including any directions or arrangements that may be made for the purpose of giving effect to the *suspension order* pursuant to section 7.3.16.
- 7.3.23 A *suspended market participant* shall remain liable for all of its obligations as a *market participant* other than as expressly provided in its *suspension order*, including but not limited to the payment of any monies to the *EMC* in respect of any energy withdrawn from the *transmission system* by the *suspended market participant* while the *suspension order* is in effect. Issuance of a *suspension order* shall not affect any liability or obligation of a *suspended market participant* for the payment of any monies to the *EMC* or any other person, including a liability under section 9 of Chapter 2, which was incurred or arose under the *market rules*:
- 7.3.23.1 prior to the date on which the *suspension order* was issued; or

7.3.23.2 during any period in which the operation of the *suspension order* has been stayed,

regardless of the date on which any claim relating thereto may be made, subject only to any applicable provisions of the Limitation Act (Cap. 163).

7.3.24 All decisions, directions and orders of the *market surveillance and compliance panel* shall be final and binding on the person(s) subjected thereto and shall not be subject to any appeal to any court of competent jurisdiction in Singapore except on issues of law, jurisdiction or natural justice.

7.4 TERMINATION ORDERS

7.4.1 The *market surveillance and compliance panel* may by *termination order* terminate a *suspended market participant's* right to participate in the *wholesale electricity markets* or to cause or permit a *physical service* to be conveyed into, through or out of the *transmission system* where the *suspended market participant* is the subject of a *suspension order* that provides for the suspension of all of the *suspended market participant's* rights to participate in the *wholesale electricity markets* or to cause or permit a *physical service* to be conveyed into, through or out of the *transmission system* if the *suspended market participant*:

7.4.1.1 has not remedied the *event of default* which triggered the issuance of the *suspension order* to the satisfaction of the *market surveillance and compliance panel* within twenty *business days* of the date of issuance of the *suspension order*;
or

7.4.1.2 has notified the *market surveillance and compliance panel* in writing that it is not likely to remedy such *event of default*.

7.4.2 The *market surveillance and compliance panel* may:

7.4.2.1 by *termination order* terminate a *market participant's* right to participate in the *wholesale electricity markets* or to cause or permit a *physical service* to be conveyed into, through or out of the *transmission system*; or

7.4.2.2 by *revocation order* revoke the registration of one or more of a *market participant's registered facilities* under section 7.5.1,

if the *market participant* has been found by the *market surveillance and compliance panel* to be in breach of the *market rules, market manuals* or the *system operation manual* on a persistent basis.

- 7.4.3 Where the *market surveillance and compliance panel* intends to issue a *termination order*, the *market surveillance and compliance panel* shall give the *market participant* notice of its intention to do so. The notice, which shall be given no less than 5 *business days* prior to the intended date of issuance of the *termination order*, shall specify:
- 7.4.3.1 the grounds upon which the *termination order* is proposed to be issued and details of any evidence on which the *market surveillance and compliance panel* is relying in support of its intention to issue the *termination order*;
 - 7.4.3.2 the time within which the *market participant* may make written representations as to why the *termination order* should not be issued; and
 - 7.4.3.3 the right of the *market participant* to request a hearing before the *market surveillance and compliance panel* to show cause why the *termination order* should not be issued.
- 7.4.4 Where the *market surveillance and compliance panel* gives to a *market participant* the notice referred to in section 7.4.3, it shall notify the *PSO*, the *EMC*, the *Authority* and, where the *market participant* is a contestable *consumer* or *retail electricity licensee*, the applicable *market support services licensee* of the giving of the notice.
- 7.4.5 Following expiry of the time noted in section 7.4.3.2, and after consideration of any representations made by the *market participant* pursuant to that section, the *market surveillance and compliance panel* may:
- 7.4.5.1 subject to section 7.4.6 and to section 7.4.8 or 7.4.9, issue the *termination order*; or
 - 7.4.5.2 make such order, including the order referred to in section 7.4.2.2, where applicable, as the *market surveillance and compliance panel* determines appropriate in order to preserve the financial integrity of the *wholesale electricity markets* or to safeguard the *reliability* of the *PSO controlled system*, including restricting all or any of the *market participant's* rights to participate in the *wholesale electricity markets* or to cause or permit a *physical service* to be conveyed into, through or out of the *transmission system*,
- and shall notify the *market participant*, the *EMC*, the *PSO*, the *Authority* and, where the *market participant* is a contestable *consumer* or *retail electricity licensee*, the applicable *market support services licensee* accordingly.

- 7.4.6 Where the *market participant* has requested the hearing referred to in section 7.4.3.3, the *market surveillance and compliance panel* shall conduct a hearing providing the *market participant* with a reasonable opportunity to show cause as to why a *termination order* should not be issued against it. In such case, the *market surveillance and compliance panel* shall not issue the *termination order* until such hearing has been held and, where section 7.4.8 or 7.4.9 applies, the direction of the *Authority* referred to in section 7.4.8 or 7.4.9, as the case may be, authorising or directing the issuance of a *termination order* has been received.
- 7.4.7 Where the *market participant* requesting the hearing referred to in section 7.4.3.3 is alleged to have breached a section of the *market rules* referred to in section 7.1.6.1, the *system operation manual* or a *market manual* referred to in section 7.1.6.3, one or more representatives of the *PSO* shall attend at any meeting convened pursuant to section 7.4.6.
- 7.4.8 Where the *market surveillance and compliance panel* intends to issue a *termination order* to a *market participant* that is a *generation licensee*, the *market surveillance and compliance panel* shall, at the time at which it provides the notice to the *Authority* referred to in section 7.4.4, request that the *Authority* take action, which may include applying to the Minister responsible for the *Electricity Act* for the issuance of a special administration order under section 29(1)(a) of the *Electricity Act* in relation to the *market participant*, to ensure that all outstanding and future financial and other obligations and liabilities of the *market participant* under the *market rules*, *market manuals* and the *system operation manual* will be met. The *Authority* shall promptly following receipt of such request:
- 7.4.8.1 notify the *market surveillance and compliance panel* of the action that the *Authority* proposes to take or to have taken in respect of the *market participant*, and issue to the *market surveillance and compliance panel* a direction prohibiting the *market surveillance and compliance panel* from issuing a *termination order* to the *market participant*; or

7.4.8.2 issue to the *market surveillance and compliance panel* a direction authorising the *market surveillance and compliance panel* to proceed with the issuance of a *termination order* to the *market participant*.

Where section 7.4.8.1 applies, the *market surveillance and compliance panel* shall so notify the *market participant*, the *EMC* and the *PSO* and shall not issue a *termination order* to the *market participant* unless the *market participant* is again in breach of the *market rules*, *market manuals* or the *system operation manual* on a persistent basis, in which case the provisions of this section 7.4 shall apply, or the *Authority* directs the *market surveillance and compliance panel* to issue a *termination order* to the *market participant*. Where section 7.4.8.2 applies, the *market surveillance and compliance panel* may issue a *termination order* to the *market participant* and shall notify the *market participant*, the *EMC*, the *PSO* and the *Authority* accordingly.

7.4.9 Where the *market surveillance and compliance panel* intends to issue a *termination order* to the *transmission licensee* or a *market support services licensee*, the *market surveillance and compliance panel* shall, at the time at which it provides the notice to the *Authority* referred to in section 7.4.4, request that the *Authority* take action, which may include applying to the Minister responsible for the *Electricity Act* for the issuance of a special administration order under section 29(1)(a) of the *Electricity Act* in relation to the *transmission licensee* or the *market support services licensee*, as the case may be, to ensure that all outstanding and future financial and other obligations of the *transmission licensee* or the *market support services licensee* under the *market rules*, *market manuals* and the *system operation manual* will be met. The *Authority* shall promptly following receipt of such request:

7.4.9.1 notify the *market surveillance and compliance panel* of the action that the *Authority* proposes to take or to have taken in respect of the *transmission licensee* or the *market support services licensee*, as the case may be, and issue to the *market surveillance and compliance panel* a direction prohibiting the *market surveillance and compliance panel* from issuing a *termination order* to the *transmission licensee* or the *market support services licensee*; or

7.4.9.2 issue to the *market surveillance and compliance panel* a direction authorizing the *market surveillance and compliance panel* to proceed with the issuance of a *termination order* to the *transmission licensee* or the *market support services licensee*, as the case may be.

Where section 7.4.9.1 applies, the *market surveillance and compliance panel* shall so notify the *transmission licensee* or the *market support services licensee*, as the case may be, the *EMC* and the *PSO* and shall not

issue a *termination order* to the *transmission licensee* or the *market support services licensee* unless the *transmission licensee* or the *market support services licensee* is again in breach of the *market rules*, *market manuals* or the *system operation manual* on a persistent basis, in which case the provisions of this section 7.4 shall apply, or the *Authority* directs the *market surveillance and compliance panel* to issue a *termination order* to the *transmission licensee* or the *market support services licensee*. Where section 7.4.9.2 applies, the *market surveillance and compliance panel* may issue a *termination order* to the *transmission licensee* or the *market support services licensee*, as the case may be, and shall notify the *transmission licensee* or the *market support services licensee*, the *EMC*, the *PSO* and the *Authority* accordingly.

- 7.4.10 Upon a *termination order* being made in respect of a *market participant*, all of the rights of the *terminated market participant* to participate in the *wholesale electricity markets* or to cause or permit a *physical service* to be conveyed into, through or out of the *transmission system* shall be terminated. Without prejudice to section 7.4.13, the registration of the *terminated market participant* shall be revoked as of the date of issuance of the *termination order*.
- 7.4.11 Where a *termination order* has been issued to a terminated market participant that is a *generation licensee*, any amounts that may be owing to the terminated *market participant* on account of injections by any of the terminated *market participant's generation facilities* after the date on which the *termination order* was issued shall be dealt with by the *market surveillance and compliance panel* in such manner as the *market surveillance and compliance panel* deems appropriate.
- 7.4.12 The *market surveillance and compliance panel* shall, immediately following the issuance of a *termination order*, *publish* a notice to the effect that the rights of the *terminated market participant* to participate in the *wholesale electricity markets* or to cause or permit a *physical service* to be conveyed into, through or out of the *transmission system* have been terminated.
- 7.4.13 A *terminated market participant* shall remain subject to and liable for all of its obligations and liabilities as a *market participant*, including a liability under section 9 of Chapter 2 or a liability in respect of adjustments arising from *metering errors* under Chapter 7, which were incurred or arose under the *market rules*, a *market manual* or the *system operation manual* prior to the date on which it ceases to be a *market participant* regardless of the date on which any claim relating thereto may be made, subject only to any applicable provisions of the Limitation Act (Cap. 163).
- 7.4.14 Once the *EMC* is satisfied that a *terminated market participant* has no remaining financial obligations or liabilities under the *market rules*,

including a liability under section 9 of Chapter 2 or an actual, contingent or prospective liability in respect of adjustments arising from *metering errors* under Chapter 7, the *EMC* shall return to the person all remaining *credit support*, if any, held by the *EMC* in respect of such person.

- 7.4.15 A *terminated market participant* that wishes to be readmitted as a *market participant* shall be required to re-apply for registration as a *market participant* in accordance with the provisions of section 3 of Chapter 2, and shall so notify the *market surveillance and compliance panel* in writing. The *market surveillance and compliance panel* may instruct the *EMC* to impose such terms and conditions on the right of the *market participant* to participate in the *wholesale electricity markets* or to cause or permit a *physical service* to be conveyed into, through or out of the *transmission system* as the *market surveillance and compliance panel* determines appropriate in the circumstances, whether or not such terms and conditions are otherwise applicable to other *market participants*.

7.5 REVOCATION OF REGISTRATION OF FACILITIES

- 7.5.1 Where a *market participant* has been found to be in breach of the *market rules*, *market manuals* or the *system operation manual* on a persistent basis by the *market surveillance and compliance panel*, the *market surveillance and compliance panel* may, subject to section 7.5.7 or 7.5.8, pursuant to section 7.4.2.2 or section 7.4.5.2 and in lieu of issuing a *termination order* to the *market participant*, issue a *revocation order* revoking the registration of such of the *market participant's registered facilities* as the *market surveillance and compliance panel* determines appropriate.
- 7.5.2 Where the *market surveillance and compliance panel* intends to issue a *revocation order* pursuant to section 7.4.2.2 or section 7.4.5.2, the *market surveillance and compliance panel* shall give the *market participant* notice of its intention to do so. The notice, which shall be given no less than 5 *business days* prior to the intended date of issuance of the *revocation order*, shall specify:
- 7.5.2.1 the grounds upon which the *revocation order* is proposed to be issued and details of any evidence on which the *market surveillance and compliance panel* is relying in support of its intention to issue the *revocation order*;
 - 7.5.2.2 the time within which the *market participant* may make written representations as to why a *revocation order* should not be issued; and
 - 7.5.2.3 the right of the *market participant* to request a hearing before the *market surveillance and compliance panel* to show cause why a *revocation order* should not be issued.

- 7.5.3 Where the *market surveillance and compliance panel* gives to a *market participant* the notice referred to in section 7.5.2, it shall notify the *PSO*, the *EMC*, the *Authority* and, where the *market participant* is a *contestable consumer*, the applicable *market support services licensee* of the giving of the notice.
- 7.5.4 Following expiry of the time noted in section 7.5.2.2, and after consideration of any representations made by the *market participant* pursuant to that section, the *market surveillance and compliance panel* may:
- 7.5.4.1 subject to section 7.5.5 and to section 7.5.7 or 7.5.8, issue a *revocation order* cancelling the registration of such of the *market participant's registered facilities* as the *market surveillance and compliance panel* determines appropriate; or
 - 7.5.4.2 make such order as the *market surveillance and compliance panel* determines appropriate in order to preserve the financial integrity of the *wholesale electricity markets* or to safeguard the *reliability* of the *PSO controlled system*, including restricting all or any of the *market participant's* rights to participate in the *wholesale electricity markets* or to cause or permit a *physical service* to be conveyed into, through or out of the *transmission system*,
- and shall notify the *PSO*, the *EMC*, the *Authority* and, where the *market participant* is a *contestable consumer*, the applicable *market support services licensee* accordingly.
- 7.5.5 Where the *market participant* has requested the hearing referred to in section 7.5.2.3, the *market surveillance and compliance panel* shall conduct a hearing providing the *market participant* with a reasonable opportunity to show cause as to why a *revocation order* should not be issued against it. In such case, the *market surveillance and compliance panel* shall not issue the *revocation order* until such hearing has been held and, where section 7.5.7 or 7.5.8 applies, the direction from the *Authority* referred to in section 7.5.7 or 7.5.8, as the case may be, authorising or directing the issuance of a *revocation order* has been received.
- 7.5.6 Where the *market participant* requesting the hearing referred to in section 7.5.2.3 is alleged to have breached a section of the *market rules* referred to in section 7.1.6.1, the *system operation manual* or a *market manual* referred to in section 7.1.6.3, one or more representatives of the *PSO* shall attend at any meeting convened pursuant to section 7.5.5.
- 7.5.7 Where the *market surveillance and compliance panel* intends to issue a *revocation order* to a *market participant* that is a *generation licensee*, the *market surveillance and compliance panel* shall, at the time at which it

provides the notice to the *Authority* referred to in section 7.5.3, request that the *Authority* take action, which may include applying to the Minister responsible for the *Electricity Act* for the issuance of a special administration order under section 29(1)(a) of the *Electricity Act* in relation to the *registered facilities* of the *market participant* that would be the subject of the *revocation order*, to ensure that all outstanding and future financial and other obligations and liabilities of the *market participant* under the *market rules*, *market manuals* and the *system operation manual* in respect of such *registered facilities* will be met. The *Authority* shall promptly following receipt of such request:

7.5.7.1 notify the *market surveillance and compliance panel* of the action that the *Authority* proposes to take or to have taken in respect of the *registered facilities* of the *market participant* that would be the subject of the *revocation order*, and issue to the *market surveillance and compliance panel* a direction prohibiting the *market surveillance and compliance panel* from issuing a *revocation order* to the *market participant* in respect of such *registered facilities*; or

7.5.7.2 issue to the *market surveillance and compliance panel* a direction authorising the *market surveillance and compliance panel* to proceed with the issuance of a *revocation order* to the *market participant* in respect of such *registered facilities*

Where section 7.5.7.1 applies, the *market surveillance and compliance panel* shall so notify the *market participant*, the *EMC* and the *PSO* and shall not issue a *revocation order* to the *market participant* in respect of the applicable *registered facilities* unless the *market participant* is again in breach of the *market rules*, *market manuals* or the *system operation manual* on a persistent basis, in which case the provisions of this section 7.5 shall apply, or the *Authority* directs the *market surveillance and compliance panel* to issue a *revocation order* to the *market participant* in respect of such *registered facilities*. Where section 7.5.7.2 applies, the *market surveillance and compliance panel* may issue a *revocation order* to the *market participant* in respect of the applicable *registered facilities* and shall notify the *market participant*, the *EMC*, the *PSO* and the *Authority* accordingly.

7.5.8 Where the *market surveillance and compliance panel* intends to issue a *revocation order* to the *transmission licensee*, the *market surveillance and compliance panel* shall, at the time at which it provides the notice to the *Authority* referred to in section 7.5.3, request that the *Authority* take action, which may include applying to the Minister responsible for the *Electricity Act* for the issuance of a special administration order under section 29(1)(a) of the *Electricity Act* in relation to the *registered facilities* of the *transmission licensee* that would be the subject of the *revocation order*, to ensure that all outstanding and future financial and other obligations and liabilities of the *transmission licensee* under the *market*

rules, market manuals and the system operation manual in respect of such *registered facilities* will be met. The *Authority* shall promptly following receipt of such request:

- 7.5.8.1 notify the *market surveillance and compliance panel* of the action that the *Authority* proposes to take or to have taken in respect of the *registered facilities* of the *transmission licensee* that would be the subject of the *revocation order*, and issue to the *market surveillance and compliance panel* a direction prohibiting the *market surveillance and compliance panel* from issuing a *revocation order* to the *transmission licensee* in respect of such *registered facilities*; or
- 7.5.8.2 issue to the *market surveillance and compliance panel* a direction authorising the *market surveillance and compliance panel* to proceed with the issuance of a *revocation order* to the *transmission licensee* in respect of such *registered facilities*.

Where section 7.5.8.1 applies, the *market surveillance and compliance panel* shall so notify the *transmission licensee*, the *EMC* and the *PSO* and shall not issue a *revocation order* to the *transmission licensee* in respect of the applicable *registered facilities* unless the *transmission licensee* is again in breach of the *market rules, market manuals or the system operation manual* on a persistent basis, in which case the provisions of this section 7.5 shall apply, or the *Authority* directs the *market surveillance and compliance panel* to issue a *revocation order* to the *transmission licensee* in respect of such *registered facilities*. Where section 7.5.8.2 applies, the *market surveillance and compliance panel* may issue a *revocation order* to the *transmission licensee* in respect of the applicable *registered facilities* and shall notify the *transmission licensee*, the *EMC*, the *PSO* and the *Authority* accordingly.

- 7.5.9 Upon a *revocation order* being issued revoking the registration of one or more of a *market participant's registered facilities*, all of the rights of the *market participant* to participate in the *wholesale electricity markets* or to cause or permit a *physical service* to be conveyed into, through or out of the *transmission system* in respect of the *registered facilities* referred to in such *revocation order* shall be terminated.
- 7.5.10 Where a *revocation order* has been issued to a *market participant* that is a *generation licensee*, any amounts that may be owing to the *market participant* on account of injections by any of the *market participant's generation facilities* that are the subject of the *revocation order* after the date on which the *revocation order* was issued shall be dealt with by the *market surveillance and compliance panel* in such manner as the *market surveillance and compliance panel* deems appropriate.
- 7.5.11 The *market surveillance and compliance panel* shall, immediately following the issuance of a *revocation order*, *publish* a notice to the effect

that the rights of the *market participant* to participate in the *wholesale electricity markets* or to cause or permit a *physical service* to be conveyed into, through or out of the *transmission system* have been terminated in respect of the *registered facilities* referred to in such *revocation order*.

7.5.12 A *market participant* to whom a *revocation order* has been issued shall remain subject to and liable for:

7.5.12.1 all of its obligations and liabilities as a *market participant* in respect of any of its *registered facilities* that are not the subject of the *revocation order*;

7.5.12.2 the payment of any monies to the *EMC* in respect of any *energy* withdrawn from the *transmission system* by the *registered facilities* that are the subject of the *revocation order* subsequent to the issuance of the *revocation order*; and

7.5.12.3 its obligations and liabilities to the *EMC* or any other person, including a liability under section 9 of Chapter 2, which was incurred or arose under the *market rules*, a *market manual* or the *system operation manual*:

a. in respect of the *registered facilities* that are the subject of the *revocation order*; and

b. prior to the date of issuance of the *revocation order*,

regardless of the date on which any claim relating thereto may be made, subject only to any applicable provisions of the Limitation Act (Cap. 163).

7.5.13 A *market participant* that wishes to re-register *registered facilities* the registration of which has been revoked pursuant to a *revocation order* shall be required to re-apply for their registration in accordance with the provisions of section 5 of Chapter 2, and shall so notify the *market surveillance and compliance panel* in writing. The *market surveillance and compliance panel* may instruct the *EMC* to impose such terms and conditions on the right of the *market participant* to participate in the *wholesale electricity markets* or to cause or permit a *physical service* to be conveyed into, through or out of the *transmission system* in respect of such *registered facilities* as the *market surveillance and compliance panel* determines appropriate in the circumstances, whether or not such terms and conditions are otherwise applicable to other *registered facilities*.

7.6 OFFICERS AND AGENTS

7.6.1 If any director, officer, employee, partner, service provider or agent of a *market participant*, the *EMC* or the *PSO*, does any act or refrains from doing any act which if done or omitted to be done, as the case may be, by

a *market participant*, the *EMC* or the *PSO*, would constitute a breach of the *market rules*, a *market manual* or the *system operation manual*, such act or omission shall be deemed for the purposes of this section 7 to be the act or omission of the *market participant*, the *EMC* or the *PSO* as the case may be.

APPENDIX A – DECLARATION OF NOMINEE FOR MEMBERSHIP ON THE RULES CHANGE PANEL

In support of my nomination as a candidate for membership on the *rules change panel* of the *EMC*, I hereby declare, to the best of my knowledge and belief after due inquiry:

1. That except as noted below:

I am not, and neither my spouse nor any relative (i.e., parent, step-parent, child, step-child, or sibling or step-sibling, including where such relationship is pursuant to adoption) of myself or my spouse is, a director, officer, employee or agent of

- 1.1 the *EMC*;
- 1.2 the *PSO*;
- 1.3 a *market participant*;
- 1.4 a *market support services licensee*;
- 1.5 a person required to hold an *electricity licence* pursuant to section 6 of the *Electricity Act*; or
- 1.6 a person that is an *affiliate* of any person referred to in items 1.1 to 1.5 above.

2. That except as noted below, I do not have, and neither my spouse nor any of relative (i.e., parent, step-parent, child, step-child, or sibling or step-sibling, including where such relationship is pursuant to adoption) of myself or my spouse has, any direct or indirect legal or beneficial interest in or commercial affiliation with any person referred to in items 1.1 to 1.6 above.

3. That I understand that:
 - 3.1 terms italicised in this declaration shall have the meanings ascribed thereto in Chapter 8 of the *market rules*; and
 - 3.2 this declaration shall be interpreted in accordance with section 2.7.3 of Chapter 3 of the *market rules*.
4. That I shall promptly disclose any circumstance which does or is likely to result in any of the declarations made above ceasing to be complete or accurate.

Dated: _____

Signed: _____

Name: _____

APPENDIX B – DECLARATION FOR APPOINTMENT AS DISPUTE RESOLUTION COUNSELLOR OR AS A MEMBER OF A DISPUTE RESOLUTION AND COMPENSATION PANEL

In support of my appointment as the *dispute resolution counsellor* or as a member of a *dispute resolution and compensation panel*, I hereby declare, to the best of my knowledge and belief after due inquiry:

1. That except as noted below, I am not, and neither my spouse nor any relative (i.e., parent, step-parent, child, step-child or sibling or step-sibling, including where such relationship is pursuant to adoption) of myself or of my spouse is, a director, officer, employee or agent of:
 - 1.1 the *EMC*;
 - 1.2 the *PSO*;
 - 1.3 a *market participant*;
 - 1.4 a *market support services licensee*; or
 - 1.5 a person that is an *affiliate* of any person referred to in items 1.1 to 1.4 above.

2. That except as noted below, I do not have, and neither my spouse nor any relative (i.e., parent, step-parent, child, step-child or sibling or step-sibling, including where such relationship is pursuant to adoption) of myself or of my spouse has, any direct or indirect legal or beneficial interest in or commercial affiliation with any person referred to in items 1.1 to 1.5 above.

3. That I understand that:
 - 3.1 terms italicised in this declaration shall have the meanings ascribed thereto in Chapter 8 of the *market rules*; and
 - 3.2 this declaration shall be interpreted in accordance with section 2.7.3 of Chapter 3 of the *market rules*.
4. That I shall promptly disclose any circumstance which does or is likely to result in any of the declarations made above ceasing to be complete or accurate.

Dated: _____

Signed: _____

Name: _____

APPENDIX C – LIST OF ORGANISATIONS ELIGIBLE TO SUBMIT A LIST OR FURTHER LISTS OF NOMINEES FOR APPOINTMENT TO THE RULES CHANGE PANEL

1. Consumers Association of Singapore (CASE)
2. Association of Small & Medium Enterprises (ASME)
3. Singapore International Chamber of Commerce (SICC)
4. Singapore Chemical Industry Council (SCIC)

APPENDIX D – DECLARATION FOR APPOINTMENT AS A MEMBER OF THE MARKET SURVEILLANCE AND COMPLIANCE PANEL

In support of my appointment for membership on the *market surveillance and compliance panel*, I hereby declare, to the best of my knowledge and belief after due inquiry:

1. That I am not, and my spouse is not, a director, officer, employee or agent of:
 - 1.1 the *EMC*;
 - 1.2 the *PSO*;
 - 1.3 a *market participant*;
 - 1.4 a *market support services licensee*; or
 - 1.5 a person that is an *affiliate* of any person referred to in items 1.1 to 1.4 above.

2. That except as noted below, I do not have, and my spouse does not have, any direct or indirect legal or beneficial interest in or commercial affiliation with any person referred to in items 1.1 to 1.5 above.

3. That except as noted below, no relative (i.e. parent, step-parent, child, step-child or sibling or step-sibling, including where such relationship is pursuant to adoption) of mine or of my spouse is, a director, officer, employee or agent of any person referred to in items 1.1 to 1.5 above.

4. That except as noted below, no relative (i.e., parent, step-parent, child, step-child or sibling or step-sibling, including where such relationship is pursuant to adoption) of mine or of my spouse has, any direct or indirect legal or beneficial interest in or commercial affiliation with any person referred to in items 1.1 to 1.5 above.

5. That except as stated above, or noted below, I do not have any real or potential conflict of interest or any circumstance, that may prevent me from acting independently and impartially when carrying out my duties as a member of the *market surveillance and compliance panel* if I am appointed.

6. That I understand that:

- 6.1 terms italicised in this declaration shall have the meanings ascribed thereto in Chapter 8 of the *market rules*; and
- 6.2 this declaration shall be interpreted in accordance with section 2.7.3 of Chapter 3 of the *market rules*.

7. That I shall promptly disclose any circumstance which does or is likely to result in any of the declarations made above ceasing to be complete or accurate.

8. That I shall provide any and all information which may from time to time be required by the *EMC* Board (including at any time before or after my appointment to the *market surveillance and compliance* panel) to confirm or verify any of my declarations herein and any information which I have stated above.

Dated: _____

Signed: _____

Name: _____

Singapore Electricity Market Rules

Chapter 4 Connection and Metering

Energy Market Authority

1 January 2022

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1 TRANSMISSION CONNECTION

1.1 TRANSMISSION CODE

- 1.1.1 Each *market participant* for a *generation facility* or *load facility* that is *connected* to the *transmission system* shall enter into and maintain a *connection agreement* with the *transmission licensee*, in such form as may be required by the *transmission code*, in respect of such *generation facility* or *load facility*.
- 1.1.2 As provided in the *transmission code*, the *transmission licensee* shall not allow any person to *connect* any equipment that injects or withdraws a *physical service* to or from the *transmission system* unless that person first enters into and then maintains a *connection agreement* with the *transmission licensee*, in such form as may be required by the *transmission code*, in respect of the equipment.
- 1.1.3 Notwithstanding section 1.1.1, a *market participant* for an *LRF with REB*, which facility is comprised of more than one installation and as may be permitted under the *system operation manual*, shall ensure that a separate *connection agreement* is entered into and maintained for each such individual installation (as may from time to time be comprised in such *LRF with REB*) with the *transmission licensee*, in such form as may be required by the *transmission code*.
- 1.1.4 A *market participant* for an *LRF with REB* which facility is comprised of more than one installation shall represent, warrant and undertake (as continuing representations, warranties and undertakings) to the *EMC* in writing that, at all times, a *connection agreement* has been entered into (and remains in full force and effect) in respect of each such individual installation as may from time to time be comprised in such *LRF with REB*.

2 METERING CODE AND RELATED AGREEMENTS

2.1 METERING CODE

- 2.1.1 The *EMC*, the *transmission licensee* and each *market participant*, and *market support services licensee* shall comply with the requirements of the *metering code* applicable to it, including the requirements set forth in sections 2.1.2 to 2.1.4.
- 2.1.2 The following obligations shall apply in respect of the installation and maintenance of meters and metering equipment:
- 2.1.2.1 each *generation licensee* shall install and maintain meters and metering equipment in accordance with the *metering code* in respect of each of its *generation facilities*.
 - 2.1.2.2 the *transmission licensee* shall install and maintain meters and metering equipment for *load facilities*, *interties* and shall install and maintain *pool meters* in accordance with the *metering code*.
 - 2.1.2.3 each *market support services licensee* shall maintain a register of meters and meter information in accordance with the *metering code*.
- 2.1.3 Every *market participant* for a *generation facility* or a *load facility* shall enter into an agreement with a *market support services licensee* to obtain meter reading services.
- 2.1.4 The *EMC* shall enter into an agreement with each *market support services licensee* to obtain meter reading services for *pool meters* and meters for *interties*.

Singapore Electricity Market Rules

Chapter 5 System Operation

Energy Market Authority

1 January 2022

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1 PURPOSES, INTERPRETATION AND GENERAL PRINCIPLES

1.1 PURPOSES OF CHAPTER AND INTERPRETATION

- 1.1.1 This Chapter of the *market rules* sets forth:
- 1.1.1.1 rules governing maintenance of the *reliability* of the *power system*;
 - 1.1.1.2 rules governing the *secure* operation of the *transmission system* and the operation of *registered facilities*;
 - 1.1.1.3 the conditions under which the *PSO* shall have authority to intervene in the *wholesale electricity markets* and issue directions to *market participants* so as to maintain the *reliability* of the *PSO controlled system* and of electricity service;
 - 1.1.1.4 the procedures to be used by the *PSO*, including the issuance of directions and demand control, in the event of an emergency or an *emergency operating state*;
 - 1.1.1.5 the minimum requirements for communications and the exchange of information between the *EMC*, the *PSO* and *market participants* relating to the *reliability* of the *PSO controlled system*;
 - 1.1.1.6 the *PSO's* forecasting and reporting obligations associated with its responsibility for maintaining the *reliability* of the *PSO controlled system*;
 - 1.1.1.7 the responsibilities of the *PSO* and of *market participants* in coordinating the *outage* of facilities; and
 - 1.1.1.8 the responsibilities of the *PSO* and *market participants* in respect of the *dispatch* process.
- 1.1.2 For the purposes of this Chapter, “maintaining” *reliability* or *security* shall include re-establishing or restoring *reliability* or *security* and “maintain” and “maintenance” shall be interpreted accordingly.
- 1.1.3 In the event of a contradiction or inconsistency between the provisions of this Chapter and any other provision of the *market rules*, the provisions of this Chapter shall govern to the extent of the contradiction or

inconsistency. In performing any function, power, or duty under the *market rules*, the *PSO*, the *EMC* and *market participants* shall have due regard to and, when necessary to ensure the *reliability* of the *power system*, give precedence to, the provisions of this Chapter.

1.2 GENERAL PRINCIPLES

- 1.2.1 To the fullest extent possible consistent with maintaining the *reliability* of the *PSO controlled system*, the *PSO* shall apply the *market rules* relating to *reliability* so as to minimise the *PSO's* intervention into the operation of the *wholesale electricity markets*. However, maintaining the *reliability* of the *PSO controlled system* shall be considered of paramount importance under these *market rules*, and the *PSO* shall have authority to intervene in the *wholesale electricity markets* to the extent necessary to maintain the *reliability* of the *PSO controlled system*.
- 1.2.2 In all cases where the *PSO* takes action under this Chapter, it shall attempt to co-ordinate its actions with affected *market participants* and, if affected, the *EMC*, unless, in the *PSO's* opinion, conditions dictate the need for immediate action.
- 1.2.3 Nothing in this Chapter is intended to prevent *market participants* from acting to protect their assets or the environment from substantial physical damage or to protect the safety of their employees or the public, provided that any such actions that may affect the *reliability* of the *PSO controlled system* are co-ordinated with the *EMC* and the *PSO* to the fullest extent practicable and are, in any event, reported or notified to the *EMC* or the *PSO* where required by these *market rules* to be so reported or notified.
- 1.2.4 Section 7.5 of Chapter 1 does not apply to this Chapter and any action or event that is required to occur on or by a stipulated time or day under this Chapter, or under a direction, instruction or order of the *PSO* issued pursuant to this Chapter, shall occur on or by that time, whether or not a business hour, or on or by that day, whether or not a *business day*, unless otherwise specified in this Chapter.
- 1.2.5 Unless a direction, instruction or order of the *PSO* provides otherwise, wherever this Chapter specifies that an action is to be taken "promptly" or "immediately", such action shall be taken as soon as possible after receiving the direction, instruction or order from the *PSO* or after becoming aware that an action is to be taken or is required not to be taken, but in any event action shall be commenced to be taken within five minutes and shall be continually progressed in an expeditious manner and sustained for so long as may be required, subject only to delay necessitated by concerns for the safety of employees or the public or the prevention of substantial damage to equipment or the environment.

Where such delay occurs, the *market participant* shall promptly report such delay to the *PSO* and shall provide justification and reasons for the delay.

2 OPERATING STATES

Explanatory Note: The normal, high-risk, and emergency operating states described here serve to delineate conditions under which the PSO can exercise different powers to respond to those conditions. The term “emergency operating state” does not relate to an “emergency” as defined in the Act.

2.1 NORMAL OPERATING STATE

- 2.1.1 The *PSO controlled system* shall be considered as being in a *normal operating state* when:
- 2.1.1.1 the voltage magnitudes at all energised busbars at any switchhouse or substation of the *PSO controlled system* are within the *security limits* established by the *PSO* under section 5.2 or, in the case of the *PSO controlled grid*, set forth in the applicable *operating agreement*, and are not inconsistent with the limits described in section B.2 of Appendix 5B;
 - 2.1.1.2 the MVA flows on all *PSO controlled grid* and *generation facilities* are within the *security limits* established by the *PSO* under section 5.2 or, in the case of *PSO controlled grid*, set forth in the applicable *operating agreement*;
 - 2.1.1.3 all other electric plant forming part of, or having or likely to have a material impact on the operation of, the *PSO controlled system* is being operated within any *equipment limits* and *security limits* established by the *PSO* under section 5.2 or, in the case of other electric plant forming part of the *PSO controlled grid*, set forth in the applicable *operating agreement*;
 - 2.1.1.4 the configuration of the *PSO controlled system* is such that the severity of any potential fault is within the capability of circuit breakers to *disconnect* the faulted circuit or equipment;
 - 2.1.1.5 all *inerties* having or likely to have a material impact on the operation of the *PSO controlled system* are being operated within the equipment ratings that are jointly established by the *EMC*, the *PSO* and the *transmission licensee*;
 - 2.1.1.6 the frequency at all energised busbars of the *PSO controlled system* is within the normal operating frequency band described in Section B.1 of Appendix 5B;

- 2.1.1.7 the levels of *reserve, regulation* and other *ancillary services* being provided meet the requirements established by the *PSO* pursuant to section 4; and
- 2.1.1.8 conditions on the *PSO controlled system* are *secure* in accordance with the requirements set forth in section 5.

2.2 HIGH-RISK OPERATING STATE

- 2.2.1 The *PSO controlled system* shall be considered to be in a *high-risk operating state* when the observance of *security limits* applicable under a *normal operating state* will expose the *PSO controlled system* to a significantly higher than normal probability of one or more *contingency events* and associated consequences, or of a condition that may lead to, but is not yet, an *emergency operating state*. The *system operation manual* shall specify the conditions under which the *PSO controlled system* may be considered as entering into or exiting a *high-risk operating state*.
- 2.2.2 The *PSO* shall not take any action that it considers will be likely to lead to a *high-risk operating state*.
- 2.2.3 The *PSO* shall promptly inform *market participants* in accordance with the *system operation manual* when a *high-risk operating state* is anticipated or has been declared, and when it ceases to exist or to be anticipated.
- 2.2.4 During a *high-risk operating state*, the *PSO* shall have the authority to modify *security limits* as necessary to manage conditions on the *PSO controlled system*, and to take such other action or refrain from taking such other action consistent with good utility practice as may be required and with as little disruption to *electricity supply* or adverse impact on the operation of the *wholesale electricity markets* as is reasonably practicable in the circumstances.

Explanatory Note – The purpose of a high risk operation state is to provide warning to the market that it needs to take steps to avoid an emergency. In this state the PSO can take steps to relax some security limits, but it is not the intent that the PSO interfere with the normal operation of the market so as to return the system to a normal operating state. Rather, market participants should take such steps as are required to return the system to a normal operating state. If the market fails to achieve this result, with the system entering an emergency operating state, then the PSO can then take more direct action.

2.3 EMERGENCY OPERATING STATE

- 2.3.1 The *PSO controlled system* shall be considered as being in an *emergency operating state* when observance of *security limits* applicable under a *normal operating state* will require or be reasonably likely to require curtailment of *non-dispatchable load*.
- 2.3.2 The *PSO* shall not take any action that it considers will be likely to lead to an *emergency operating state*.
- 2.3.3 The *PSO* shall promptly inform *market participants* in accordance with the *system operation manual* when an *emergency operating state* is anticipated or has been declared, when it ceases to exist or to be anticipated and, where applicable, the *energy, reserve or regulation shortfall* relating to the *emergency operating state*.
- 2.3.4 During an *emergency operating state*, the *PSO* shall have the authority to modify *security limits* as necessary to manage conditions on the *PSO controlled system*, and to take such other action or refrain from taking such other action consistent with good utility practice as may be required to restore the *power system* to a *normal operating state* and with as little disruption to *electricity supply* or adverse impact on the operation of the *wholesale electricity markets* as is reasonably practicable in the circumstances.

3 OBLIGATIONS AND RESPONSIBILITIES

3.1 OBJECTIVES

- 3.1.1 This section 3 sets forth the responsibilities, obligations and authorities of the *PSO*, the *EMC* and each *market participant* in order to maintain the *reliability* of the *PSO controlled system*.

3.2 OBLIGATIONS OF THE PSO

- 3.2.1 The *PSO* shall direct the operations and maintain the *reliability* of the *PSO controlled system* and arrange for the *secure* operation of the *PSO controlled grid*. The *PSO's* responsibilities in this regard shall include:

3.2.1.1 monitoring *generation facilities*, *load facilities* and *PSO controlled grid* as required by these *market rules* and, in the case of *PSO controlled grid*, as may be required under the terms of any applicable *operating agreement*;

3.2.1.2 issuing orders, directions or instructions to *dispatch generation facilities* and *load facilities* in accordance with these *market rules*;

3.2.1.3 directing the operations of the *PSO controlled grid* in accordance with these *market rules* and any applicable *operating agreement*; and

3.2.1.4 determining standards, ratings and requirements as set out in these *market rules*.

3.2.1.5 assessments of the future *adequacy* and *security* of the *PSO controlled system*.

- 3.2.2 The *PSO* shall carry out its obligations under this Chapter in accordance with all applicable *reliability standards*.

3.3 RELIABILITY-RELATED INFORMATION

- 3.3.1 The *PSO* shall, prior to the *market commencement date*, include in the *system operation manual* a list of the categories of *reliability-related* information that it shall make available to *market participants*, the time periods within which such information will be provided, and the manner in which such information will be provided. Such information shall include information designed to:

- 3.3.1.1 enable the *EMC* and *market participants* to initiate procedures to mitigate any risks that could arise from any action taken by the *PSO* to maintain the *reliability* of the *PSO controlled system*;
 - 3.3.1.2 assist the *EMC* and *market participants* in meeting their obligations under this Chapter; and
 - 3.3.1.3 notify the *EMC* and *market participants* of any operating changes or decisions that may have an impact on their respective operations, facilities or equipment.
- 3.3.2 The *PSO* shall, prior to the *market commencement date*, include in the *system operation manual* a catalogue of the *reliability*-related information that the *PSO* shall require be provided to it by *market participants*, the time periods within which such information will be provided, the manner in which such information will be provided and the initial monitoring indices that the *PSO* shall use in evaluating the information so provided. *Market participants* shall provide the *PSO* with the information referred to in this section 3.3.2 within the time specified in and in the manner required by the *system operation manual*.
- 3.3.3 Subject to the provisions of section 6 of Chapter 3, the *PSO* shall, if requested to do so by a *market participant* but subject to such constraints as may exist on the resources of the *PSO*, provide to that *market participant* *reliability*-related information not contained in the list referred to in section 3.3.1 provided that the *PSO* shall not provide any information that, in the *EMC's* opinion, would provide the requesting *market participant* with an undue preference in the *wholesale electricity markets*. In order to prevent any such undue preference, the *PSO* may provide all *market participants* with notice of the request prior to providing such information and may make the information requested by a *market participant* simultaneously available to all *market participants*. Where the provision of information pursuant to this section 3.3.3 imposes a significant burden or expense on the *PSO*, the information may be provided on payment of a reasonable fee.

3.4 OBLIGATIONS OF THE EMC

- 3.4.1 In carrying out its obligations under these *market rules*, the *EMC* shall act in accordance with any and all advice, requirements and instructions issued in accordance with the *system operation manual* or any *market manual* by the *PSO* to the *EMC* with respect to maintaining the *reliability* of the *PSO controlled system*.
- 3.4.2 In carrying out its obligations under this Chapter 5 and Chapter 6, the *EMC* shall utilise any and all current *standing capability data* and

dispatch related data communicated to it by the *PSO* in accordance with these *market rules*, the *system operation manual* or any *market manual*.

3.5 OBLIGATIONS OF THE TRANSMISSION LICENSEE

- 3.5.1 The *transmission licensee* shall operate and maintain all *transmission facilities* and equipment, including energising, de-energising, *connecting*, *disconnecting*, opening and closing equipment *connected* to the *transmission system* and raising and lowering transformer taps, in a manner that is consistent with the *reliable* operation of the *power system* and with any applicable *operating agreement*, and shall assist the *PSO* in the discharge of its responsibilities relating to *reliability*. Such obligation shall include the following:
- 3.5.1.1 ensuring that systems and procedures for *automatic under-frequency load shedding* in emergencies are provided for as specified in section 10;
 - 3.5.1.2 arranging and providing controls, monitoring and secure communication systems to facilitate and carry out a manually initiated, rotational *load shedding* and restoration process in order to assist the *PSO* in the management of a prolonged, major shortage of electrical *supply* or an extreme disruption to or emergency on the *power system*;
 - 3.5.1.3 providing the *PSO* with functional descriptions, equipment ratings and operating restrictions for its equipment, in such form as may be specified in the *system operation manual*;
 - 3.5.1.4 promptly informing the *PSO* of any change or anticipated change in the status of its *PSO controlled grid* and of any other change or anticipated change in its *PSO controlled grid* that could have a material effect on the *reliability* of the *PSO controlled system*;
 - 3.5.1.5 promptly complying with the *PSO's* directions, including directions to *disconnect* equipment from the *PSO controlled grid* for *reliability* purposes, unless the *transmission licensee* reasonably believes that following the *PSO's* direction poses a real and substantial risk of substantial damage to its equipment, to the safety of its employees or the public, or of substantial damage to the environment. In all cases where the *transmission licensee* does not intend to follow the *PSO's* directions for any such reasons, it shall promptly notify the *PSO* of this fact and shall nonetheless comply with the *PSO's* directions to the fullest extent possible without causing the harms described in this section 3.5.1.5;

- 3.5.1.6 permitting and participating in any commissioning, inspection, or testing that the *PSO* requires of equipment that is or is to be *connected* to the *PSO controlled grid*, including remote monitoring and control facilities and wired and wireless communication facilities; and
 - 3.5.1.7 providing to the *PSO* within the time specified in the *system operation manual*, a report describing any modification proposed to be made to protection on a primary relay, and obtaining the approval of the *PSO* prior to implementing the proposed modification or, where the modification is effected on an unplanned, emergency basis, reporting the modification to the *PSO* as soon as practicable.
- 3.5.2 Each *transmission licensee* shall carry out its obligations under this Chapter in accordance with all applicable *reliability standards*.
- 3.5.3 The *transmission licensee* shall, no later than 2:00 p.m. on the last *business day* of every week, or more frequently if requested by the *PSO*, provide to the *PSO* the timing and duration of any *outage*, closure, test or other similar operational event in respect of any *load facility* that:
- 3.5.3.1 has been specifically designated by the *PSO* for inclusion in the preparation of any of the *PSO's* forecasts and assessments pursuant to section 6; and
 - 3.5.3.2 that is scheduled to commence or occur in the immediately succeeding four weeks, or during such longer period as may be requested by the *PSO*.

3.6 OBLIGATIONS OF WHOLESALE CUSTOMERS

- 3.6.1 Each *market participant* for a *load facility* that is *connected* to the *transmission system* shall operate and maintain its facilities and equipment in a manner that is consistent with the *reliable* operation of the *PSO controlled system* and shall assist the *PSO* in the discharge of its responsibilities relating to *reliability*. Such obligation shall include the following:
- 3.6.1.1 promptly informing the *PSO* of any change or anticipated change in the status of any of the *market participant's load facilities* or any related equipment that is under the *dispatch control* of the *PSO* as described in these *market rules* or of any other change or anticipated change in its *load facilities* or equipment that could have a material effect on the *reliability* of the *PSO controlled system*;

- 3.6.1.2 promptly complying with the *PSO's* directions, including directions to *disconnect* equipment from the *transmission system* for *reliability* purposes, unless the *market participant* reasonably believes that following the *PSO's* direction poses a real and substantial risk of substantial damage to its equipment, to the safety of its employees or the public, or of substantial damage to the environment. In all cases where the *market participant* does not intend to follow the *PSO's* directions for any such reasons, it shall promptly notify the *PSO* of this fact and shall nonetheless comply with the *PSO's* directions to the fullest extent possible without causing the harms described in this section 3.6.1.2;
- 3.6.1.3 providing to the *PSO*, no later than 2:00 pm on the last *business day* of every second week, or more frequently if requested by the *PSO*, the timing and duration of any *outage*, closure, test or other similar operational event in respect of any *load facility* that it operates that:
- a. has been specifically designated by the *PSO* for inclusion in the preparation of any of the *PSO's* forecasts and assessments pursuant to section 6; and
 - b. scheduled to commence or occur in the immediately succeeding four weeks, or during such longer period as may be requested by the *PSO*; and
- 3.6.1.4 providing to the *PSO* within the time specified in the *system operation manual*, a report describing any modification proposed to be made to protection on a primary relay, and obtaining the approval of the *PSO* prior to implementing the proposed modification or, where the modification is effected on an unplanned, emergency basis, reporting the modification to the *PSO* as soon as practicable.
- 3.6.2 Each *market participant* for a *load facility* that is *connected* to the *transmission system* shall carry out its obligations under this Chapter in accordance with all applicable *reliability standards*.
- 3.6.3 If an *LRF with REB* that is issued a *dispatch instruction* for energy deviates, in the manner and to the extent described in section E.3.1 of Appendix 5E, from its *real-time dispatch schedule* which is deemed to be or is otherwise issued as the *dispatch instructions* issued by the *PSO*, such *LRF with REB* shall be deemed to be a deviating *load registered facility* unless the deviation occurred in respect of *dispatch period(s)* where:

- 3.6.3.1 such *LRF with REB* had been issued *dispatch instructions* to deviate from its aforesaid *real-time dispatch schedule* (as notified by the *PSO* under section 9.1.6B);
- 3.6.3.2 section 9.3.5 applies to such *LRF with REB* (as notified by the *PSO* under section 9.3.6); or
- 3.6.3.3 section 9.3.5 applies to such *LRF with REB* in the immediately preceding *dispatch period* (as notified by the *PSO* under section 9.3.6).

The automatic financial penalty scheme described in Appendix 5E shall apply to the *market participant* of such deviating *load registered facility*.

- 3.6.4 For the avoidance of doubt, financial penalties applied under the automatic financial penalty scheme described in Appendix 5E shall not prejudice or derogate from the *market surveillance and compliance panel's* powers, including the imposition of any other or additional sanctions or enforcement actions, under section 7 of Chapter 3.
- 3.6.5 Section 9.6.3 shall not exempt a *market participant* of an *LRF with REB* from compliance with a *dispatch instruction* for energy on the ground that compliance with the *dispatch instruction* would substantially damage equipment.

3.7 OBLIGATIONS OF GENERATORS

- 3.7.1 Each *market participant* for a *generation facility* shall operate and maintain its facilities and equipment in a manner that is consistent with the *reliable* operation of the *PSO controlled system* and shall assist the *PSO* in the discharge of its responsibilities related to *reliability* and related responsibilities specified under this section 3.7.1. Such obligation shall include the following:
 - 3.7.1.1 arranging and providing controls, monitoring and secure communication systems to facilitate and carry out a manually initiated restoration process in order to assist the *PSO* in the management of a prolonged, major shortage of electrical *supply* or an extreme disruption to or emergency on the *PSO controlled system*;
 - 3.7.1.2 providing the *PSO*, in such form as may be agreed with the *PSO*, with functional descriptions, equipment ratings and operating restrictions for its equipment, as required by the *PSO* to *reliably* operate the *PSO controlled system*;
 - 3.7.1.3 promptly informing the *PSO* of any change or anticipated change in the status of any *generation facility* in respect of

which it is the *market participant* or any related equipment and that is under the *dispatch* control of the *PSO* as described in these *market rules*, or of any other change or anticipated change in its *generation facilities* or equipment that could have a material effect on the *reliability* of the *PSO controlled system*. Such change shall include any change in status that could affect the maximum output of a *generating unit*, the minimum load of a *generating unit*, the ability of a *generating unit* to operate with *automatic* voltage regulation or the availability of a *generating unit* to provide *contracted ancillary services*;

- 3.7.1.4 providing the *PSO* with current information showing the maximum unit capabilities of each of its *generating units* to facilitate *dispatch* when the *PSO controlled system* is in an *emergency operating state*. Such maximum unit capabilities shall consist of the maximum physical rating of the *generating unit* and shall not be limited to the unit capabilities implied by any *offers* submitted on behalf of such *generating unit*, or to *standing capability data*, pursuant to Chapter 6;
- 3.7.1.5 promptly complying with the *PSO's* directions, including directions to *disconnect* equipment from the *PSO controlled system* for *reliability* purposes, unless the *market participant* reasonably believes that following the *PSO's* direction poses a real and substantial risk of substantial damage to its equipment, to the safety of its employees or the public, or of substantial damage to the environment. In all cases where the *market participant* does not intend to follow the *PSO's* directions for any such reasons, it shall promptly notify the *PSO* of this fact and shall nonetheless comply with the *PSO's* directions to the fullest extent possible without causing the harms described in this section 3.7.1.5;
- 3.7.1.6 providing to the *PSO* within the time specified in the *system operation manual*, a report describing any modification proposed to be made to protection on a primary relay, and obtaining the approval of the *PSO* prior to implementing the proposed modification or, where the modification is effected on an unplanned, emergency basis, reporting the modification to the *PSO* as soon as practicable; and

- 3.7.1.7 promptly complying with the *PSO's* directions issued under Chapter 9, section 9.6.4(ii) of the *System Operation Manual*, and any further directions issued by the *PSO* relating to (a) the fuel to be used by the *generation facility*, (b) the relevant *market participant's* contractual agreements for and in relation to the purchase and use of fuel by the *generation facility*, and (c) the associated *energy offers* deemed necessary by the *PSO* to prevent inefficient market outcomes arising from the *PSO's* directions issued under Chapter 9, section 9.6.4(ii) of the *System Operation Manual*.
- 3.7.2 Each *market participant* for a *generation facility* shall carry out its obligations under this Chapter in accordance with all applicable *reliability standards*.
- 3.7.3 If a *generation registered facility* deviates, in the manner and to the extent described in section D.3.1 of Appendix 5D, from its *real-time dispatch schedule* or its *short-term schedule* (as the case may be) which is deemed to be or is otherwise issued as the *dispatch instructions* issued by the *PSO*, such *generation registered facility* shall be deemed to be a deviating *generation registered facility* unless the deviation occurred in respect of *dispatch period(s)* where the *generation registered facility*:
- 3.7.3.1 was at all relevant times operating under *AGC*;
 - 3.7.3.2 had been issued *dispatch instructions* to deviate from its aforesaid *real-time dispatch schedule* or *short-term schedule* (as the case may be), and such *dispatch instructions* in respect of the *generation registered facility* were complied with;
 - 3.7.3.3 was undergoing re-commissioning test(s) which had been approved by the *PSO*;
 - 3.7.3.4 experienced a *forced outage*, which caused the *generation registered facility* to *automatically disconnect* from the *transmission system*;
 - 3.7.3.5 had experienced a *forced outage* in the immediately preceding *dispatch period*, which caused the *generation registered facility* to *automatically disconnect* from the *transmission system* in that immediately preceding *dispatch period*;
 - 3.7.3.6 was being *start-up* or *shut-down* in accordance with its aforesaid *real-time dispatch schedule* or *short-term schedule* (as the case may be);
 - 3.7.3.7 was performing a fuel changeover as required under the *transmission code*; or

3.7.3.8 was on free governor control and responding positively to a *power system* disturbance.

The automatic financial penalty scheme described in Appendix 5D shall apply to the *market participant* of such deviating *generation registered facility*.

3.7.4 For the avoidance of doubt, financial penalties applied under the automatic financial penalty scheme described in Appendix 5D shall not prejudice or derogate from the *market surveillance and compliance panel's* power, including the imposition of any other or additional sanctions or enforcement actions, under section 7 of Chapter 3.

3.7.5 For the avoidance of doubt, section 3.7.3 and Appendix 5D shall not apply to a *generation settlement facility* or a *commissioning generation facility*.

Explanatory Note: A generation settlement facility is not subject to dispatch, that is, no dispatch schedules are produced for and no dispatch instructions are issued to a generation settlement facility. Accordingly, the automatic financial penalty scheme does not apply to generation settlement facilities. The automatic financial penalty scheme will also not apply to commissioning generation facilities.

4 ANCILLARY SERVICES

4.1 PURPOSE

- 4.1.1 This section 4 sets forth the requirements relating to the availability of sufficient *ancillary services* for *dispatch* so that the *PSO* can maintain the *reliability* of the *PSO controlled system*.

4.2 STANDARDS FOR ANCILLARY SERVICES

- 4.2.1 The requirements for *ancillary services* shall be determined by the *PSO* based on all applicable *reliability standards* and actual and expected conditions on the *PSO controlled system*. Requirements for *ancillary services* may be adjusted from time to time by the *PSO* to take into account factors including variations in *power system* conditions, real-time *dispatch* constraints, *contingency events*, the prevailing risk or vulnerability level of the *PSO controlled system* and the results of assessments of the voltage and dynamic stability of the *PSO controlled system*.
- 4.2.2 The *EMC* shall operate the *real-time markets* to ensure that sufficient *ancillary services*, other than *contracted ancillary services*, are available to satisfy the requirements for such *ancillary services* set by the *PSO* pursuant to section 4.2.1.
- 4.2.3 *Contracted ancillary services* shall be procured by the *EMC*, on behalf of the *PSO*, in accordance with section 8.

4.3 GENERIC PERFORMANCE REQUIREMENTS FOR ANCILLARY SERVICES

- 4.3.1 *Ancillary services* may be provided to the *PSO* and the *EMC* only by *registered facilities*.
- 4.3.2 The *EMC* shall not enter into a contract with a prospective *ancillary service provider* to provide a *contracted ancillary service* unless the facilities and procedures of such prospective *ancillary service provider* meet the requirements for registration as a *registered facility* in respect of the *ancillary service* to be provided and are otherwise in compliance with the requirements of this Chapter.
- 4.3.3 In order to make the determination referred to in section 4.3.2, the *PSO*, acting on behalf of the *EMC*, may require each prospective *ancillary*

service provider to demonstrate through physical tests or other appropriate means specified by the *PSO* that the *registered facilities* or equipment that will be used to provide the *ancillary service* meet the performance standards for the applicable *ancillary service* set forth in Appendix 5A.

4.4 REGULATION

- 4.4.1 *Regulation* may be provided by *registered facilities* to the extent that each meets the applicable requirements to be a *registered facility* and have been so registered. Notwithstanding the foregoing, *regulation* may not be provided by a *load facility* until the date on which the *EMC* publishes a notice pursuant to section 5.1.2.2 of Chapter 2 to the effect that *load facilities* may be registered as *registered facilities* for the purpose of providing *regulation*.
- 4.4.1A The *PSO* shall establish and include in the *system operation manual* the methodology by which the amount of *regulation* required in any *dispatch period* to meet all applicable *reliability standards* is determined.
- 4.4.2 The *EMC* shall operate the *real-time market* for *regulation* in accordance with Chapter 6 to schedule *regulation* specified by the *PSO* to be required in any *dispatch period*.
- 4.4.3 The *PSO* shall determine and include in the *system operation manual*, the minimum requirements for *regulation* providers.
- 4.4.4 The *PSO* shall, in accordance with the methodology described in section 4.4.1A, determine the quantity of *regulation* required for each *dispatch period* of the *market outlook horizon* to satisfy the requirements of section 2.1.4 of Chapter 6.
- 4.4.5 If the *real-time market* for *regulation* fails to provide adequate *regulation* capacity to satisfy all applicable *reliability standards*, the *PSO* shall immediately take corrective action as allowed by these *market rules* to achieve compliance as soon as possible.
- 4.4.6 A *registered facility* providing *regulation* shall meet the performance standards referred to in section A.1 of Appendix 5A and in the *system operation manual*, where applicable.

4.5 RESERVE

- 4.5.1 *Reserve* may be provided by *generation facilities* or *load facilities* to the extent that each meets the applicable requirements to be a *registered*

facility in respect of each applicable *reserve class* and have been so registered. Notwithstanding the foregoing, *reserve* may not be provided by a *load facility* until the date on which the *EMC* publishes a notice pursuant to section 5.1.2.2 of Chapter 2 to the effect that *load facilities* may be registered as *registered facilities* for the purpose of providing *reserve*.

- 4.5.2 The various *reserve classes* are set forth in section A.2.1 of Appendix 5A and have been established for the purpose of:
- 4.5.2.1 arresting a fall in the frequency of the *PSO controlled system* resulting from the *forced outage* of a *generation facility*, a part of the *PSO controlled grid* or associated equipment;
 - 4.5.2.2 restoring the frequency of the *PSO controlled system* to an acceptable limit following a *contingency event* and maintaining such frequency at an acceptable limit until such time as *AGC* or action by the *PSO* restores such frequency to normal; or
 - 4.5.2.3 replacing *energy* or *reserve* lost as a result of the *forced outage* of a *generation facility*, a part of the *PSO controlled grid* or associated equipment so that the *PSO controlled system* can operate in a *secure* manner in future *dispatch periods*.
- 4.5.3 The *PSO* shall establish and include in the *system operation manual* the methodology by which the amount of *reserve* of each *reserve class* required in any *dispatch period* to meet all applicable *reliability standards* is determined.
- 4.5.4 The *PSO* shall determine the necessary input parameters associated with the calculation of *reserve* capacity required for each *dispatch period* of the *market outlook horizon* to satisfy the requirements of section 2.1.4 of Chapter 6.
- 4.5.5 The *EMC* shall operate the *real-time market* for *reserve* in accordance with Chapter 6 to schedule *reserve* of each *reserve class* specified by the *PSO* to be required in any *dispatch period*.
- 4.5.6 If, for any reason, there is a deficiency of *reserve* of any *reserve class*, the *PSO* shall immediately take corrective action as allowed by these *market rules* to achieve compliance as soon as possible.
- 4.5.7 The sharing of *reserve* between the *PSO controlled system* and an *interconnected system* shall be effected in accordance with the applicable agreements governing such sharing.

- 4.5.8 A *dispatch coordinator* offering reserve from a *registered facility* shall ensure that the *registered facility* is capable of providing reserve consistent with the *reserve offer* and the *standing capability data* held by the *PSO* and the *EMC* for that *registered facility*.
- 4.5.9 A *reserve provider* shall provide energy corresponding to scheduled reserve when instructed to do so by the *PSO* or by means of *automated response systems* approved by the *PSO*.
- 4.5.10 A *registered facility* providing reserve shall meet the performance standards referred to in section A.2 of Appendix 5A.

4.6 RESERVE PROVIDER GROUPS

- 4.6.1 The *PSO* shall establish and *publish* notice of *reserve provider groups* for the purpose of grouping together *registered facilities* with similar reserve effectiveness for scheduling and *settlement* purposes in respect of the provision of *reserve*. The *PSO* may establish new *reserve provider groups* or eliminate existing *reserve provider groups* and shall *publish* notice of such new or eliminated *reserve provider groups*.
- 4.6.2 The *PSO* shall *publish* the minimum performance standards required of *reserve providers* for each *reserve provider group*. Such performance standards may include the *reserve response* of the *reserve provider* over a variety of timeframes and the reliability of *reserve response*.
- 4.6.3 The *PSO* shall determine piece-wise linear effectiveness functions for each *reserve provider group* to satisfy the requirements of section 2.1.5.4 of Chapter 6.
- 4.6.4 The *PSO* shall, in consultation with *market participants*, review the *reserve provider groups*, the minimum performance standards referred to in section 4.6.2 and the effectiveness functions referred to in section 4.6.3 at least annually.
- 4.6.5 The *PSO* shall assign each *registered facility* that has been registered to provide *reserve* of a given *reserve class* to one *reserve provider group* of that *reserve class*. In making such assignment, the *PSO* shall have regard to the results of tests of the *registered facility's* capability to provide *reserve* and to the historic performance of the *registered facility* during contingencies. The *PSO* shall notify each *dispatch coordinator* as to the *reserve provider group* to which each of its *registered facilities* has been assigned.

- 4.6.6 The *PSO* may, upon notice to the applicable *dispatch coordinator*, remove a *registered facility* from one *reserve provider group* and assign it to another *reserve provider group*.

4.7 REACTIVE SUPPORT AND VOLTAGE CONTROL

- 4.7.1 The resources utilised to *supply* reactive power to the *PSO controlled system* include capacitors, static VAR compensators, reactors, synchronous *generation facilities* and synchronous condensers.
- 4.7.2 The *PSO* shall ensure that sufficient resources are available throughout the *PSO controlled system* for *dispatch* by the *PSO* to meet all applicable *reliability standards* for *reactive support and voltage control service* and shall establish procedures to this effect in the *system operation manual*. Voltage levels shall be maintained within the levels specified in Appendix 5B within the *PSO controlled system* and at its boundaries with *interconnected systems*. As part of its assessment of *PSO controlled system adequacy* under the *market rules*, the *PSO* shall on a continual basis assess whether sufficient reactive power resources are available to it.
- 4.7.3 The *PSO* shall direct providers of *reactive support and voltage control service* to take any actions necessary to maintain stable voltage levels in accordance with all applicable *reliability standards* and to prevent the collapse of voltages on the *PSO controlled system*. Subject to section 8.4.2, a *market participant* that is providing *reactive support and voltage control service* other than pursuant to an *ancillary service contract* that is so directed may make a request to the *PSO* for compensation in accordance with the procedure set forth in section 3.11 of Chapter 3.
- 4.7.4 The *PSO* shall obtain reactive power resources to maintain *reactive support and voltage control service* in accordance with all applicable *reliability standards*. Where *reactive support and voltage control service* is made available by *market participants*, it shall be provided from equipment and facilities including the following:
- 4.7.4.1 reactive resources produced from within the standard power factor range of a *generation facility* in accordance with the requirements referred to in the *transmission code* or in any applicable *connection agreement*, which shall be *dispatchable* by the *PSO*; and
- 4.7.4.2 equipment owned or operated by *market participants* that is made available to the *PSO* pursuant to these *market rules* and to *ancillary service contracts*.

- 4.7.5 The equipment comprising the *transmission system* and each *registered facility* providing *reactive support and voltage control service* shall meet the performance standards referred to in sections A.4 and A.3, respectively, of Appendix 5A.

4.8 BLACK START SERVICE

- 4.8.1 The *PSO* shall determine the required amounts and locations of *black start capability* across the *PSO controlled system*, as required to satisfy the requirements of the *Singapore power system restoration plan* and all applicable *reliability standards*. The *PSO* shall notify *market participants* of these requirements before requesting the *EMC* to enter into *ancillary service contracts* with *market participants* for *black start capability* service.
- 4.8.2 A *registered facility* providing *black start capability* service shall meet the performance standards referred to in section A.5 of Appendix 5A.
- 4.8.3 The *PSO* shall, in consultation with the *transmission licensee* ensure that adequate *transmission* capacity exists to *connect* the *registered facility* or *registered facilities* proposing to provide *black start capability* to the *generation facilities* referred to in section A.5.7 of Appendix 5A before requesting the *EMC* enter into *ancillary service contracts* with the applicable *market participants* for *black start capability* service from any such *registered facility*.

4.9 FAST START SERVICE

- 4.9.1 The *PSO* shall determine the required amounts and locations of *fast start service* across the *PSO controlled system* in accordance with all applicable *reliability standards*. The *PSO* shall notify *market participants* of these requirements before requesting the *EMC* to enter into *ancillary service contracts* with *market participants* for *fast start* service.
- 4.9.2 A *registered facility* providing *fast start* service shall meet the performance standards referred to in section A.6 of Appendix 5A.

4.10 RELIABILITY MUST-RUN SERVICE

- 4.10.1 The *PSO* shall determine the required amounts and locations of *reliability must-run service* across the *PSO controlled system* in accordance with all applicable *reliability standards*. The *PSO* shall notify *market participants* of these requirements before requesting the *EMC* to enter

into *ancillary service contracts* with market participants for *reliability must-run service*.

- 4.10.2 A *registered facility* providing *reliability must-run service* shall meet the performance standards referred to in section A.7 of Appendix 5A.

4.11 AUDITING AND TESTING OF ANCILLARY SERVICES

- 4.11.1 The *PSO* shall develop requirements for the testing of facilities that will provide *ancillary services* to the *PSO controlled system*. The *PSO* shall use such tests to determine whether to register a facility as a *registered facility* for the provision of *ancillary services* and to ensure that each such *registered facility* continues to meet the requirements for registration to provide the applicable *ancillary services*. Such requirements:

4.11.1.1 shall not be inconsistent with any applicable *reliability standards*; and

4.11.1.2 shall be included in the *system operation manual*.

- 4.11.2 Prior to participating in any tests referred to in section 4.11.1, the *ancillary service provider* or prospective *ancillary service provider* shall submit a detailed test procedure plan for the *PSO's* approval. The *PSO* shall evaluate the detailed test procedure plan and shall either grant its approval or reject, with reasons, the detailed test procedure plan.

- 4.11.3 The costs incurred by the *PSO* in conducting and evaluating any tests referred to in section 4.11.1 shall be communicated to the *EMC* and shall be included in the monthly uplift charges imposed by the *EMC* pursuant to section 4.1 of Chapter 7.

- 4.11.4 Any costs incurred by an *ancillary service provider* or prospective *ancillary service provider* in participating in any tests referred to in section 4.11.1 shall be borne by the *ancillary service provider* or prospective *ancillary service provider*.

4.12 CONSEQUENCES OF FAILURE TO PASS A TEST

- 4.12.1 If a *registered facility* providing *ancillary services* fails a test performed pursuant to section 4.11.1, the *EMC* shall not schedule, and the *PSO* shall not *dispatch*, the applicable *ancillary service* from the *registered facility* until the *ancillary service provider* demonstrates that the *registered facility* can provide the relevant *ancillary service*. In addition, the *EMC* or the *PSO* may require the *ancillary service provider* to refund any compensation it has received for the applicable *ancillary service* during any period prior to the date of the test to the extent that the test results and

other information available to the *PSO* indicate that the applicable *ancillary service* was not provided during that period. Further, the *EMC* may impose such other sanctions as are permitted by the *market rules* or any applicable *ancillary service contract*.

4.13 ANCILLARY SERVICES AND EMERGENCY CONDITIONS

- 4.13.1 Notwithstanding any other provision of the *market rules* the *PSO* may, when the *PSO controlled system* is in an *emergency operating state*, acquire *ancillary services* from any *market participant*, whether or not such *market participant* satisfies all of the standards and registration requirements applicable in respect of such *ancillary services* and whether or not the *EMC* has a *contracted ancillary services* contract with the *market participant*.

5 SYSTEM SECURITY

5.1 OBJECTIVES AND GENERAL OBLIGATIONS

- 5.1.1 This section describes the procedures necessary to enable the *PSO* to ensure the *security* of the *PSO controlled system* and the *secure* operation of the *PSO controlled grid* in accordance with all applicable *reliability standards*.
- 5.1.2 In order to maintain the *security* of the *PSO controlled system* and the *secure* operation of the *PSO controlled grid* the *PSO* shall:
- 5.1.2.1 monitor the real-time operating status of the *PSO controlled system*;
 - 5.1.2.2 establish and *publish security limits* for all facilities that are part of the *PSO controlled system*;
 - 5.1.2.3 establish and include in the *system operation manual* the criteria and margins to be used in the development of *security limits* and a process for reviewing and revising such criteria and margins;
 - 5.1.2.4 direct the operation of facilities that are part of the *PSO controlled grid* within the appropriate *security limits* and in accordance with the applicable *operating agreement*;
 - 5.1.2.5 investigate major operational incidents on the *power system* and initiate plans to manage abnormal situations or significant deficiencies which, in the *PSO's* opinion, threaten the *reliability* of the *PSO controlled system*;
 - 5.1.2.6 issue directions to *market participants* in order to manage *emergency operating states*; and
 - 5.1.2.7 assess, on a monthly basis, the future *adequacy* and *security* of the *PSO controlled system* for the following 12 months.

5.2 SECURITY LIMITS

- 5.2.1 The *PSO* shall establish and *publish security limits* to prevent, contain and alleviate the effects of *contingency events*. Such *security limits* shall be as described in section 5.2.4.1 and shall be observed by the *PSO* in directing the real-time operation of the *PSO controlled system*.

- 5.2.2 The *PSO* shall establish and *publish* the *equipment limits* described in section 5.2.4.2, which *equipment limits* shall be observed by applicable *market participants* in operating their facilities and equipment.
- 5.2.3 *Market participants* shall immediately respond to directions from the *PSO* to alter their operations to stay within the *security limits* established by the *PSO*.
- 5.2.4 The following shall be established by the *PSO* based on data submitted by the *transmission licensee* and by *generation licensees*:
- 5.2.4.1 *security limits* based on the dynamic response of the *PSO controlled system*, including transient stability limits, voltage stability limits, dynamic stability limits, and voltage decline limits; and
- 5.2.4.2 *equipment limits* based on the ratings of equipment, including the thermal ratings of *transmission lines* and transmission equipment (e.g. the design characteristic of lines and equipment and weather conditions), *generation facility* ratings and the short circuit capability of equipment.
- 5.2.5 To enable the *PSO* to establish the *security limits* and *equipment limits* referred to in section 5.2.3, the *transmission licensee* and each *generation licensee* shall ensure that the equipment that it owns or operates has established ratings and shall provide such ratings to the *PSO* in a form suitable for the dynamic calculation of ratings, including continuous and limited time ratings. The *PSO* shall not deliberately operate or plan to operate equipment comprising the *PSO controlled grid* or require the operation of any *generation facility*, in excess of the relevant *equipment limit* for such equipment.

Explanatory Note: This information will be conveyed as part of facility registration.

- 5.2.6 Both the *EMC* and the *PSO* shall respect all pre-and post-contingency *security* criteria that are used to establish *security limits*.

5.3 THE USE OF INTERTIES

- 5.3.1 The *PSO* shall schedule the flow of *energy* over an *intertie* in accordance with applicable agreements for the management of that *intertie*.

5.4 THE MANAGEMENT OF VIOLATIONS TO SECURITY LIMITS

- 5.4.1 When there is a violation of a security limit on the *PSO controlled system* while in a *normal operating state*, the sequence of control actions taken by the *PSO* shall be as defined in the *system operation manual*.
- 5.4.2 In providing the information referred to in section G.5.1 of Appendix 6G of Chapter 6 to the *EMC* in accordance with sections 6.1 and 8.1 of Chapter 6, the *PSO* shall permit, provide for and use market mechanisms to the maximum extent possible for purposes of responding to violations of *security limits*.
- 5.4.3 Where market mechanisms fail to sufficiently maintain the *security* of the *PSO controlled system*, the *PSO* may direct *market participants* to take actions in accordance with the provisions of these *market rules*. A *market participant* that complies with such a direction may make a request to the *PSO* for compensation in accordance with the procedure set forth in section 3.11 of Chapter 3.

5.5 OPERATION UNDER A HIGH-RISK OPERATING STATE

- 5.5.1 Once a *high-risk operating state* has been declared by the *PSO*, the *PSO* shall temporarily and selectively increase the level of *security* on the *PSO controlled system*. In this regard, the *PSO* may take such action as it determines appropriate, including:
- 5.5.1.1 cancelling all planned maintenance or other work affecting the *security* of the *PSO controlled system*;
 - 5.5.1.2 cancelling, denying requests for or deferring approved *planned outages*;
 - 5.5.1.3 directing that parts of the *PSO controlled grid* be returned to service, as required;
 - 5.5.1.4 operating to *security limits* appropriate for a *high-risk operating state*; and
 - 5.5.1.5 coordinating with *interconnected system operators*.

5.6 OPERATION UNDER AN EMERGENCY OPERATING STATE

- 5.6.1 Once an *emergency operating state* has been declared by the *PSO*, the *PSO* shall operate to the *security limits* appropriate for an *emergency operating state* so as to allow for increased power transfers on the *PSO*

controlled grid. In this regard, the *PSO* may take such action as it determines appropriate, including:

- 5.6.1.1 cancelling all maintenance or other planned work affecting the *security* of the *PSO controlled system*;
 - 5.6.1.2 cancelling, denying requests for or deferring approved *planned outages*;
 - 5.6.1.3 directing that *PSO controlled grid* or *generation facilities* be returned to service;
 - 5.6.1.4 operating to *security limits* appropriate for an *emergency operating state*; and
 - 5.6.1.5 coordinating with *interconnected system operators*.
- 5.6.2 A *market participant* that complies with a direction issued to it pursuant to section 5.6.1 may make a request to the *PSO* for compensation in accordance with the procedure set forth in section 3.11 of Chapter 3.

5.7 RESTORATION OF SYSTEM SECURITY FOLLOWING A CONTINGENCY EVENT

- 5.7.1 *Market participants* shall be prepared for, shall be able to manage and shall take such actions as may be necessary to restore *security* of the *PSO controlled system* following a *contingency event*, as directed by the *PSO*.
- 5.7.2 The *PSO* shall, in consultation with *market participants*, establish and include in the *system operation manual* detailed procedures:
- 5.7.2.1 that identify the steps and timeframe necessary to restore the operation of the *PSO controlled system* to a *normal operating state*, respecting corresponding *security limits* from both *high risk operating states* and *emergency operating states*;
 - 5.7.2.2 that are designed to restore *supply* first to individual *loads* identified by *market participants* as being essential in nature, once the minimum acceptable level of *security* on the *PSO controlled system* has been restored; and
 - 5.7.2.3 that are designed to restore the operation of transmission equipment following *automatic outages* due to the operation of protection equipment.

6 FORECASTS AND ASSESSMENTS

6.1 FORECASTS PREPARED BY THE PSO

Explanatory Note: The PSO produces half-hourly forecasts for the next 2 weeks (for outage scheduling and market use) and monthly forecasts of daily peak load for the next 12 months (used for outage planning). Both forecasts contribute to assessments of security requirement compliance over the following year. It is understood that the Authority, and not the PSO, will be doing longer term forecasting to support system investment planning.

- 6.1.1 The *PSO* shall produce the following forecasts for Singapore on an on-going basis:
- 6.1.1.1 on a daily basis, a forecast of the following 14 day's *load*, by *dispatch period*, net of the *PSO's* estimate of the output of any *generation facilities* that are not *registered facilities*, with the forecast for the first 7 days being provided to the *EMC* in accordance with section 6.1 of Chapter 6;
 - 6.1.1.2 on a daily basis, a forecast of any *load shedding* expected in the following 7 days, by *dispatch period*, such forecast to be provided to the *EMC* in accordance with section 6.1 of Chapter 6;
 - 6.1.1.3 on a monthly basis, a forecast to be *published* no later than 5 *business days* before the end of each month of the peak daily *load* for each *dispatch day* in the next 12 months; and
 - 6.1.1.4 such additional forecasts of *load*, by *dispatch period*, as may be required by sections 6.1 and 8.1 of Chapter 6.
- 6.1.2 The forecasts referred to in section 6.1.1 shall, in addition to the purposes specified in that section, be used in conducting the assessments referred to in section 6.2.
- 6.1.3 The *PSO* shall *publish* the method to be used to perform the forecasts described in section 6.1.1.
- 6.1.4 Notwithstanding section 13 of Chapter 1, no *market participant* shall be entitled to compensation from the *PSO* for any financial loss sustained by the *market participant* due to the *market participant* having been *dispatched* on the basis of *load* as forecasted pursuant to section 6.1.1 rather than on the basis of actual *load*.

6.2 ADVANCE ASSESSMENTS OF SYSTEM SECURITY AND ADEQUACY

- 6.2.1 The *PSO* shall administer continuous processes to assess the *security* and *adequacy* of the *PSO controlled system* and shall *publish* reports of its findings in relation to such *security* and *adequacy* assessments over the following two time frames:
- 6.2.1.1 assessments performed monthly, covering a twelve-month period including the current month; and
 - 6.2.1.2 assessments performed daily, covering the fourteen-day period beginning at the end of the current day.

6.3 PURPOSE OF ASSESSMENTS

- 6.3.1 The *PSO* shall conduct the monthly assessments referred to in section 6.2.1.1 to:
- 6.3.1.1 provide forecasts of expected peak daily *loads*, *generation capacity* and transmission capacity, energy capability of *generation facilities*, and the possibility of occurrence of any *security*-related events on the *PSO controlled system* that could require contingency planning by *market participants* or by the *PSO*; and
 - 6.3.1.2 allow the *PSO* to identify exigencies potentially impacting on the coordination of *outages* that could give rise to shortfalls in *generation capacity* and thus provide information by which *market participants* and the *PSO* could act to reschedule *outage* plans to avoid such projected shortfalls.
- 6.3.2 The *PSO* shall conduct the daily assessments referred to in section 6.2.1.2 to provide forecasts of expected half-hourly *loads*, *generation capacity* and transmission capacity, energy capability of *generation facilities*, exports and imports of *energy*, and of events that may affect the *security* of the *PSO controlled system* or affect operational decisions to be taken by the *PSO* that must be made more than a day in advance.

6.4 INFORMATION REQUIREMENTS

- 6.4.1 The *PSO* shall, prior to the *market commencement date*, establish and include in the *system operation manual* the information that the *PSO* will require from *market participants* in order to perform the forecasts and the *adequacy* and *security* assessments referred to in sections 6.1 and 6.2, respectively, and to prepare the reports referred to in section 6.6, including:

- 6.4.1.1 the information required to be reported by *market participants*;
 - 6.4.1.2 the format in which the information is to be reported; and
 - 6.4.1.3 the time by which the information is to be reported.
- 6.4.2 In addition to the information referred to in section 6.4.1, the *PSO* shall have regard to the *outage* information provided to it by *market participants* pursuant to section 7 in performing the *adequacy* and *security* assessments referred to in section 6.2 and in preparing the reports referred to in sections 6.6.2 and 6.6.3. For this purpose, the *PSO* shall include in the *system operation manual* the date by which such *outage* information must be submitted in order to be included in the *assessment* referred to in section 6.2.1.1 in a given month, failing which it shall be included in the assessment performed in the following month.

6.5 THE REPORTING OF ADEQUACY AND SECURITY ASSESSMENTS

- 6.5.1 Upon receiving the information required to be provided by *market participants* pursuant to this section 6, the *PSO* shall perform the forecasts and *security* and *adequacy* assessments referred to in sections 6.1 and 6.2, respectively, and prepare reports summarising the information (in aggregate form, where necessary for confidentiality purposes) and presenting its findings and conclusions. The types of information to be contained in the reports referred to in section 6.6 shall be *published* and shall include the information referred to in section C.1 of Appendix 5C, such further information as may be deemed necessary by the *Authority* or other relevant agencies of the Government of Singapore and the *EMC* and the following information:
- 6.5.1.1 any significant assumptions made in the assessment;
 - 6.5.1.2 projected conditions on the *PSO controlled system* and projections of *power system reliability*, including *adequacy* and *security*; and
 - 6.5.1.3 requirements for *ancillary services*.

6.6 PUBLICATION OF REPORTS

- 6.6.1 The information contained in each of the reports referred to in this section 6.6 may differ in content, reflecting the different purposes of the individual assessments that form the bases of the reports.
- 6.6.2 The *PSO* shall, not later than 5 *business days* prior to the end of each month, prepare and *publish* a 12-Month Assessment Report covering a 12-month period commencing the following month. The *PSO* shall

publish and periodically update as required a schedule of the dates on which such 12-Month Assessment Report will be *published*.

- 6.6.3 The *PSO* shall, not later than 17:00 hours on each day, prepare and forward a Daily Assessment Report covering a 14-day period commencing on the following day to the *EMC*. Upon receipt of such report, the *EMC* shall communicate the information received to *market participants* via electronic means.
- 6.6.4 The *PSO* shall prepare updated versions of either of the assessment reports referred to in section 6.6.2 or 6.6.3 in the event of changes that, in the *PSO's* opinion, are materially significant and should be communicated to *market participants*. The updated version of the assessment report referred to in section 6.6.2 shall be *published* whilst the assessment report referred to in section 6.6.3 shall be forwarded to the *EMC*, which shall upon receipt communicate the information received to *market participants* via electronic means.
- 6.6.5 The *EMC* may, on the basis of the reports referred to in sections 6.6.2 and 6.6.3, produce additional related reports as required by relevant *standards authorities*, the *EMC Board*, the *Authority* or the Government of Singapore.

7 OUTAGE AND TESTING CO-ORDINATION

7.1 INTRODUCTION

- 7.1.1 The objectives of this section 7 are to enable the *PSO* to review and assess the impact of *outage* schedules on the fulfilment by the *PSO* of its *reliability*-related responsibilities under the *Electricity Act* and the *market rules*, to require *market participants* to obtain the approval of the *PSO* in respect of *planned outage* schedules, to permit the *PSO* to reject, defer and recall *outages* that may have an impact on the *reliability* of the *PSO controlled system*, to provide for certain consequences following the cancellation of *outages* and to require the publication of *approved annual outage plans* and *pro forma biennial outage plans*.
- 7.1.2 The *PSO* shall facilitate *outage* planning and administer the *outage* scheduling process over a number of timeframes in accordance with this section 7.
- 7.1.3 The *PSO* shall maintain a record of all submissions to the *outage* planning and scheduling process and of all *forced outage* notices and associated *forced outage* information submitted to it, and shall periodically, and not less than quarterly, submit a report to the *market surveillance and compliance panel* indicating the following with respect to *outages* and related requests for compensation and disputes occurring since the submission to the *market surveillance and compliance panel* of a previous report under this section 7.1.3:
- 7.1.3.1 a list of all *forced outages* that have occurred, including *forced outages* resulting from *planned outages* that exceeded their approved duration, differentiated to identify *forced outages* for facilities or equipment for which a *planned outage* was initially submitted to the *PSO* from other *forced outages*, together with the reasons for each *forced outage*;
 - 7.1.3.2 a list of all *outages* where approval by the *PSO* was withdrawn, including recalled *outages*, together with the reasons for such withdrawal and a record of whether the *market participant* submitted the matter to the dispute resolution process referred to in section 3 of Chapter 3;
 - 7.1.3.3 a list of all *outages* which were withdrawn by the applicable *market participant* prior to commencement of the *outage*; and
 - 7.1.3.4 such other *outage*-related information as may be requested by the *market surveillance and compliance panel*.

- 7.1.4 The *PSO* shall develop and *publish* a full description of the equipment and facilities the *outage* of which must be reported to and scheduled with the *PSO* in accordance with this section 7. Such equipment and facilities shall include the following:
- 7.1.4.1 facilities and equipment forming part of the *PSO controlled grid*;
 - 7.1.4.2 subject to section 7.1.6, *generation registered facilities* and auxiliary equipment *connected* to the *PSO controlled grid*;
 - 7.1.4.3 protective relaying; and
 - 7.1.4.4 communication equipment required for the *PSO* to communicate with the operators of *registered facilities*.
- 7.1.5 The *PSO* shall, in consultation with *market participants*, update the description of equipment and facilities referred to in section 7.1.4 from time to time as may be required. The *PSO* shall *publish* all updated versions of such description.
- 7.1.6 The following *outages* of the following *generation facilities* do not need to be reported to or scheduled with the *PSO* pursuant to sections 7.2 to 7.5 unless the *generation facility* has been designated by the *PSO* as affecting the *reliability* of the *PSO controlled system*:
- 7.1.6.1 any *outage* of a non-registered *generation facility*;
 - 7.1.6.2 any *outage* of a *generation registered facility* having a nameplate rating of less than 10 MW, a *generation settlement facility*, or a *non-exporting embedded intermittent generation facility*;
 - 7.1.6.3 an *outage* of a *generation registered facility* having a nameplate rating of 10 MW or more but no more than 50 MW, where the *outage* involves a de-rating of less than 20% of the *generation facility's* capacity and where such de-rating is not expected to last more than 72 hours; or
 - 7.1.6.4 an *outage* of a *generation registered facility* having a nameplate rating of more than 50 MW where the *outage* involves a de-rating of less than 10% of the *generation facility's* capacity and where such de-rating is not expected to last more than 72 hours.
- 7.1.7 The *PSO* may, upon request, exempt certain additional facilities and equipment from the application of the *outage* reporting and scheduling obligations set forth in this section 7 if the *PSO* determines that the

granting of such an exemption is not inconsistent with the *reliable* and efficient operation of the *PSO controlled system*. *Market participants* may submit an exemption request to the *PSO* at any time, provided that they shall continue to comply with the *outage* reporting and scheduling obligations with respect to the facilities or equipment that they wish to be exempted until the *PSO* has approved the applicable exemption request.

7.1.8 Nothing in this section 7 shall relieve a *market participant* from its responsibility for and arising from the performance of all work relating to any *outage* or test, whether in respect of energised or de-energised facilities or equipment, including its responsibility in respect of worker safety.

7.1.9 No *market participant* shall remove equipment or facilities of a type described in section 7.1.4 or 7.1.5 from service except in accordance with this section 7 unless such removal from service is necessary to prevent substantial damage to the *market participant's* equipment, facilities or the environment or to protect the safety of employees or the public. If any equipment or facilities are removed from service for these reasons, the *market participant* shall promptly so notify the *PSO*.

7.2 ANNUAL OUTAGE PLAN

Explanatory Note: Once each calendar year, the PSO forms an approved annual outage plan for the upcoming calendar year, and a pro forma biennial outage plan for the next succeeding two years following the upcoming calendar year.

Approved Annual Outage Plan

For the upcoming calendar year, market participants submit their outage plans and the PSO forms an initial plan including details of where outages are planned by market participants at times that are unacceptable to the PSO. The market participants use this information to refine their submissions and, based on these revised submissions, the PSO determines and publishes the approved annual outage plan for the upcoming calendar year.

Market participants can still make submissions after the approved annual outage plan is finalised and published, and updated outage plans will be issued by the PSO at intervals for the remainder of the year to which the approved annual outage plan relates. This is the first phase in the outage approval process, and market participants will also need to apply for final approval closer to the time of the outage.

Pro Forma Biennial Outage Plan

A pro forma biennial outage plan is formed and published by the PSO alongside each given approved annual outage plan described above (referred to below as the “related approved annual outage plan”). Each pro forma biennial outage plan covers a period of two consecutive calendar years, being a period which falls immediately after the calendar year covered by that pro forma biennial outage plan’s related approved annual outage plan.

At the same time as when market participants submit their outage plans for the upcoming calendar year for the purposes of an approved annual outage plan, market participants must also submit their indicative outage plans for the succeeding two-year period for the purposes of the pro forma biennial outage plan. The PSO will use these indicative outage plans to form and publish the pro forma biennial outage plan for the aforesaid succeeding two-year period.

- 7.2.1 Each *market participant* shall inform the *PSO* of its long-term plans for *outages* in accordance with the provisions of this section 7.2.
- 7.2.2 Each *market participant* shall establish its *outage* planning process in such manner as will enable it to comply with its reporting and scheduling obligations under this section 7.
- 7.2.3 The *PSO* shall carry out an annual *outage* planning process in accordance with the procedures and timetable specified in the *system operation manual*.
- 7.2.4 Subject to section 7.1.6, each *market participant* shall submit to the *PSO* *outage submissions* that include the information set forth in section C.2 of Appendix 5C, in respect of:
- 7.2.4.1 *planned outages* in the calendar year period to be covered by an *approved annual outage plan*. Such *outage submission* shall be submitted in accordance with the timeline specified in the *system operation manual*; and
- 7.2.4.2 *indicative planned outages* in a period of two consecutive calendar years (immediately following the period referred to in section 7.2.4.1 above) to be covered by a *pro forma biennial outage plan*. Such *outage submission* shall be submitted at the same time as when the *outage submission* for the related *approved annual outage plan* referred to in section 7.2.4.1 is submitted.

- 7.2.5 An *outage submission* submitted in accordance with section 7.2.4.1, 7.2.8 or 7.2.14 by a *market participant* shall represent the intention, subject only to approval by the *PSO*, of the *market participant* to take the relevant facility or equipment out of service at the scheduled time and to return the relevant facility or equipment to service at the scheduled time.
- 7.2.6 The *PSO* shall confirm receipt of an *outage submission* submitted in accordance with section 7.2.4.1, 7.2.8 or 7.2.14, which confirmation shall contain the information set forth in section C.3.1 of Appendix 5C.
- 7.2.7 The *PSO* shall use the information described in section 7.2.4.1 to form and *publish* the results of the provisional annual *outage* planning exercise in respect of an *approved annual outage plan* in accordance with the timetable specified in the *system operation manual*, which results shall include, for the calendar year period to which such *approved annual outage plan* relates:
- 7.2.7.1 a list indicating the requested *planned outages*, by *market participant* and associated facility or equipment; and
- 7.2.7.2 the degree to which, for each applicable time period, the *planned outages* requested by *market participants*, individually or in combination, would fail to meet the *PSO's* standards for *PSO controlled system reliability*.

Explanatory Note: The information described in the previous clause should be used by market participants to refine their outage schedule plans before seeking formal approval of those plans.

- 7.2.8 Following *publication* of the results referred to in section 7.2.7, *market participants* may revise and resubmit *outage submissions* in respect of the *planned outages* to be covered by an *approved annual outage plan*, that include the information referred to in section C.2 of Appendix 5C in accordance with the timetable specified in the *system operation manual*.
- 7.2.9 Where the scheduling of *outage submissions* of different *market participants* submitted for the purposes of section 7.2.4.1 conflicts such that the *planned outages* cannot all be accepted by the *PSO* for the purposes of an *approved annual outage plan*, the *PSO* shall inform the affected *market participants* and request that they resolve the conflict. The affected *market participants* may then submit revised *outage submissions* in accordance with section 7.2.8.
- 7.2.10 Should a conflict referred to in section 7.2.9 remain unresolved, the *PSO* shall determine which of the *planned outages* requested by *market participants* pursuant to section 7.2.4.1 or 7.2.8 can be accepted for

inclusion in the *approved annual outage plan* on the basis of the precedence accorded to each *planned outage* pursuant to section 7.5.

- 7.2.11 The *PSO* shall use the *outage submissions* submitted to it in accordance with section 7.2.4.1 or 7.2.8 and the precedence rules prescribed in section 7.5 to establish and *publish* the *approved annual outage plan* in accordance with the timetable specified in the *system operation manual*.
- 7.2.12 The *approved annual outage plan* shall comprise a list indicating the *planned outages*, by *market participant* and associated facility or equipment, that have received the *PSO's planning approval*. *Outage submissions* submitted in accordance with section 7.2.4.1 or 7.2.8 that are not included in the *approved annual outage plan* shall be deemed to have been rejected by the *PSO*.
- 7.2.13 The *PSO* shall publish *updated outage plans* in accordance with the timetable specified in the *system operation manual*. Each *updated outage plan* shall cover the period from the beginning of the calendar month following the calendar month in which it is *published* until the end of the period covered by the current *approved annual outage plan*. Each *updated outage plan* shall contain a list of all *planned outages* that have received *planning approval* pursuant to section 7.2.14, that have been withdrawn pursuant to section 7.2.15 or that have been cancelled by the *PSO* pursuant to section 7.2.16 since the *publication* of the immediately preceding *updated outage plan* or, in the case of the first *updated outage plan published* after *publication* of an *approved annual outage plan*, since the *publication* of the *approved annual outage plan*.
- 7.2.14 A *market participant* may at any time following *publication* of an *approved annual outage plan* submit an *outage submission* that includes the information referred to in section C.2 of Appendix 5C for a *planned outage* in the period covered by that *approved annual outage plan*, for approval by the *PSO*. The *PSO* shall assess such *outage submission* against all applicable *reliability* standards and shall notify the *market participant* within 4 *business days* as to whether *planning approval* has been granted for the *planned outage* which is the subject of such *outage submission*, or if the *planned outage* has been rejected. Any such *outage submissions* that receive *planning approval* from the *PSO* shall be included in the next *updated outage plan published* by the *PSO*.
- 7.2.15 A *market participant* that no longer intends to conduct a *planned outage* for which *planning approval* has been granted shall so notify the *PSO*. Any such withdrawn *planned outages* shall be included in the next *updated outage plan published* by the *PSO*.

- 7.2.16 The *PSO* may cancel a *planned outage* for which it has previously granted *planning approval* if it determines, in accordance with the *system operation manual*, that the *planned outage* would pose a risk to the *reliable* operation of the *PSO controlled system*. If the *PSO* cancels such a *planned outage*, it shall inform the affected *market participant* as soon as practicable.
- 7.2.17 The *PSO* shall, in accordance with section 6.4.2, include in each 12-Month Assessment Report referred to in section 6.2.1.1 all *planned outages* that have been granted *planning approval* and that are scheduled to occur in the period covered by the Report.
- 7.2.18 The *PSO* shall, in accordance with section 6.4.2 where applicable, reflect all *planned outages* that have been granted *planning approval* or *final approval* and that are scheduled to occur in the applicable period in the daily assessments referred to in section 6.2.1.2.
- 7.2.19 The *PSO* shall confirm receipt of the *outage submissions* submitted to it in accordance with section 7.2.4.2 and use such *outage submissions* to establish and *publish* the *pro forma biennial outage plan*. Such *publication* shall take place at the same time as the *publication* of the related *approved annual outage plan*. For the avoidance of doubt, sections 7.2.6 to 7.2.18 above shall not apply to *outage submissions* submitted in accordance with section 7.2.4.2, or the establishment and *publication* of a *pro forma biennial outage plan*.

7.3 FINAL CONFIRMATION OF PLANNED OUTAGES

- 7.3.1 No later than 12:00 on the *trading day* that is two *trading days* in advance of the scheduled time for a *planned outage*, the *PSO* shall confirm the *planned outage* with the applicable *market participant*. At the time of such confirmation:
- 7.3.1.1 the *PSO* shall communicate to the *market participant* the unique identifier associated with the *planned outage* as originally provided to the *market participant* by the *PSO* in accordance with section C.3 of Appendix 5C; and
- 7.3.1.2 the *market participant* shall either update any information provided to the *PSO* pursuant to section 7.2.4.1, 7.2.8 or 7.2.14 that has changed since it was provided, or shall confirm that the original information has not changed.

- 7.3.2 The *PSO* shall:
- 7.3.2.1 as soon as possible following confirmation and the receipt of any updated information pursuant to section 7.3.1, assess each confirmed *planned outage*;
 - 7.3.2.2 provide its *final approval* to a *planned outage* confirmed by it pursuant to section 7.3.1 unless it determines, in accordance with the *system operation manual* and based primarily on the Daily Assessment Report referred to in section 6.2.1.2, that the *planned outage* will or is reasonably likely to have an adverse impact on the *reliable* operation of the *PSO controlled system*, in which case it may cancel the *planned outage*;
 - 7.3.2.3 if the *planned outage* was confirmed by the *PSO* more than two *trading days* in advance of the *planned outage*, advise the relevant *market participant*, on a regular basis, of the expected outcome of the *final approval* process; and
 - 7.3.2.4 if the *planned outage* was confirmed by the *PSO* more than two *trading days* in advance of the *planned outage*, advise the relevant *market participant* of the *final approval* or cancellation of the *planned outage* no later than 15:00 on the *trading day* that is two *trading days* prior to the day on which the *planned outage* is scheduled to commence.
- 7.3.3 No *planned outage* shall occur or be permitted by a *market participant* to occur unless:
- 7.3.3.1 the *planned outage* has been confirmed by the *PSO* with the *market participant* in accordance with section 7.3.1; and
 - 7.3.3.2 the *planned outage* has received *final approval* from the *PSO* in accordance with section 7.3.2.
- 7.3.4 [Deleted and Intentionally Left Blank]
- 7.3.5 *Market participants* shall coordinate with the *PSO* in respect of the return to service of equipment following an *outage* in accordance with and in the manner provided in the *system operation manual*.
- 7.3.6 Any *planned outage* that has not received *final approval* from the *PSO*, or that takes place at a time or times other than the time period approved by the *PSO*, including *outages* that extend beyond the time originally approved by the *PSO* unless such extension was approved under section 7.4.5, shall be considered a *forced outage*. The *forced outage* may be referred by the *PSO* to the *market surveillance and compliance panel* at any time.

- 7.3.7 Subject to section 7.1.6, each *market participant* shall, to the maximum extent possible, notify the *PSO* in advance of a *forced outage*. When such advance notice cannot be given, the *market participant* shall as soon as practicable and in any event within 5 minutes of the beginning of the *forced outage*, notify the *PSO* of the occurrence of the *forced outage*.
- 7.3.8 Subject to section 7.1.6, the information required by section C.2 of Appendix 5C in respect of a *forced outage* shall be provided to the *PSO* by the applicable *market participant* as soon as practicable and in any event within 24 hours, or within such lesser period of time as may be required by the *PSO*. A detailed investigation report shall subsequently be submitted by the applicable *market participant* to the *PSO* as required by the *system operation manual*.
- 7.3.9 The *PSO* shall provide to each *market participant* that has submitted the *forced outage* information referred to in section 7.3.8 the information referred to in section C.3 of Appendix 5C.

7.4 **RESCHEDULING OUTAGES**

- 7.4.1 Where the *PSO* does not give its *final approval* to a *planned outage* pursuant to section 7.3.2, the *PSO* shall work with the relevant *market participant* to re-schedule the cancelled *planned outage* to a date and time at which the cancelled *planned outage* will not or is not reasonably likely to have an adverse impact on the *reliable* operation of the *PSO controlled system*. In re-scheduling the cancelled *planned outage*, the *PSO* shall where reasonably practicable take into account the date and time preferences of the *market participant*.
- 7.4.2 The *PSO* may direct a *market participant* to defer a *planned outage* that has received *final approval* from the *PSO* if the *PSO* determines that either an *emergency operating state* or a *high-risk operating state* is occurring or is reasonably likely to occur at the time at which the *planned outage* would otherwise take place or if necessary to avoid recalling another *planned outage* pursuant to section 7.4.4.
- 7.4.3 Where the *PSO* directs the deferral of a *planned outage* pursuant to section 7.4.2, the *PSO* shall work with the relevant *market participant* to re-schedule the *planned outage* to a date and time at which the *planned outage* will not or is not reasonably likely to have an adverse impact on the *reliable* operation of the *PSO controlled system*. In re-scheduling the *planned outage*, the *PSO* shall where reasonably practicable take into account the date and time preferences of the *market participant*.
- 7.4.4 The *PSO* may, where necessary to maintain the *reliability* of the *PSO controlled system* and in accordance with the *system operation manual*,

recall a *planned outage* that has already commenced, having regard to the time needed to return the facility or equipment to service as identified by the relevant *market participant* in the information submitted in accordance with section C.2 of Appendix 5C, and the *PSO* shall so advise the relevant *market participant*. Such *market participant* shall arrange for the accelerated return to service of the facility or equipment in accordance with the instructions of the *PSO*. The *PSO* shall not recall a *planned outage* unless further control action is required and it has cancelled, deferred or rejected requests for approval of all other *planned outages* the cancellation, deferral or rejection of which could eliminate the need to recall the *planned outage* that has already commenced.

- 7.4.5 Each *market participant* shall notify the *PSO* if a *planned outage* which has received *planning approval* or *final approval* from the *PSO* will have a duration which exceeds the duration originally approved by the *PSO*, which notice shall include a request that the *PSO* approve the extension. Such notice shall be provided to the *PSO* as soon as possible but in any event no less than 48 hours in advance of the date and time at which the *planned outage*, as approved by the *PSO*, was scheduled to end.
- 7.4.6 If the *PSO* determines that an extension to the duration of a *planned outage* will or is reasonably likely to adversely affect the *reliability* of the *PSO controlled system* or will or is reasonably likely to require the re-scheduling of another *planned outage* confirmed by the *PSO* pursuant to section 7.3.1 or the cancellation, deferral or recall of another *planned outage* that has received *final approval* pursuant to section 7.3.2, the *PSO* shall reject such extension and the *market participant* shall use its reasonable best efforts to ensure that the duration of the *planned outage* does not exceed the duration originally approved by the *PSO* or such longer period as the *PSO* may advise in rejecting the extension requested.

7.5 TIME STAMPING OF OUTAGE SUBMISSIONS

- 7.5.1 The *PSO* shall time stamp each *outage submission* received by the *PSO* in accordance with sections 7.2.4.1, 7.2.8 and 7.2.14. Where the *PSO* is required or permitted by this Chapter to approve, reject, re-schedule, cancel, defer or recall one or more *planned outages*, such *planned outages* shall:
- 7.5.1.1 be approved in order of precedence determined on the basis of sections 7.5.2 to 7.5.6; and
 - 7.5.1.2 be rejected, re-scheduled, cancelled, deferred or recalled in reverse order of precedence determined on the basis of sections 7.5.2 to 7.5.6.

- 7.5.2 Where a *planned outage* referred to in a previous *outage submission* is confirmed by the *PSO* and there is no change in the commencement, duration or nature of the *planned outage* relative to the commencement, duration or nature described in that previous *outage submission*, the time stamp associated with such previous *outage submission* shall be used by the *PSO* in determining the precedence to be given to the *planned outage*.
- 7.5.3 Where a *market participant* gives notice of a change in the commencement, duration or nature of a *planned outage* relative to the most recent *outage submission* submitted in accordance with section 7.4.2.1, 7.2.8 or 7.2.14 for that *planned outage*, the *PSO* shall stamp such notice with the time at which it was received by the *PSO*, which time shall be used by the *PSO* in determining the precedence to be given to the *planned outage*, except that where such notice reflects only a shortening in the duration of a *planned outage* relative to the most recent *outage submission* submitted in accordance with section 7.4.2.1, 7.2.8 or 7.2.14 for that *planned outage*, the time stamp associated with such previous *outage submission* shall be retained in determining the precedence to be given to the *planned outage*.
- 7.5.4 Where:
- 7.5.4.1 the *PSO* cancels or defers an approved *planned outage* prior to the commencement thereof; and
- 7.5.4.2 the *PSO* subsequently re-confirms the *planned outage* with the *market participant*;
- the time stamp of the re-confirmed *planned outage* shall be deemed to be the time stamp of the original *planned outage* as it was prior to such cancellation or deferral for the purpose of determining the precedence to be given to the *planned outage*.
- 7.5.5 Where:
- 7.5.5.1 a *planned outage* is, within 7 days of the date on which it was scheduled to commence, required by the *PSO* pursuant to this section 7 to be re-scheduled;
- 7.5.5.2 the *PSO* did not identify, through one or more of its *reliability forecasts*, a concern relating to *reliability* of the *PSO controlled system* in respect of the time scheduled for the *planned outage*; and
- 7.5.5.3 the *planned outage* is re-scheduled to a date that is within 9 days of the originally scheduled commencement date,

the time stamp of the rescheduled *planned outage* shall be deemed to be the time stamp of the original *planned outage* as it was prior to the re-scheduling for purposes of determining the precedence to be given to the *planned outage*.

- 7.5.6 Where the *PSO* has cancelled a *planned outage* pursuant to section 7.2.16 or 7.3.2, the time of receipt of confirmation of the *planned outage* shall be retained until such time as the confirmed commencement date of the *planned outage* has passed so as to facilitate the possible consent to the occurrence of the *planned outage* on the confirmed commencement date, in the event that the *reliability* concerns that prompted the cancellation cease to preclude the occurrence of the *planned outage*.

7.6 TESTS

- 7.6.1 A *market participant* who wishes to engage in a test of its facilities or equipment referred to in section 7.6.3 or that could affect the *reliability* of the *PSO controlled system* or the operation of the *wholesale electricity markets* shall request the approval of the *PSO* to the conduct of the test and shall provide the information referred to in section 7.6.2 to the *PSO*, the *EMC* and to any parties that are likely to be affected by the proposed test at least 14 days in advance of the proposed test to allow co-ordination and assessment to take place. No such test shall commence without *PSO* approval.
- 7.6.2 As a minimum, the information referred to in section 7.6.1 shall identify:
- 7.6.2.1 the equipment involved;
 - 7.6.2.2 the relevant details of contracts or agreements as they relate to the test activities;
 - 7.6.2.3 preferred and alternative dates and times for the conduct of the test activities;
 - 7.6.2.4 detailed system configurations or setup;
 - 7.6.2.5 the expected impact of the test activities on power flows, voltage and frequency, and of any other dynamic that could affect the *reliability* of the *PSO controlled system*, including details of the steps or precautions to be taken so as to minimise the impact on the *reliability* of the *PSO controlled system*;
 - 7.6.2.6 details of special readings, curves, plots or observations, as available; and

- 7.6.2.7 the names, designation and affiliation of, and methods of communication with, personnel who will be involved in the test activities and who may be contacted with respect thereto
- 7.6.3 Tests covered by the requirements of this section 7.6 and for which approval of the *PSO* is required shall include:
- 7.6.3.1 the deliberate application of short circuits;
- 7.6.3.2 stability tests of *generation facilities* and *PSO controlled grid*, including but not limited to drop load tests for *generating units* and line trip tests;
- 7.6.3.3 deliberate actions which could cause abnormal voltage, frequency or overload;
- 7.6.3.4 changes to *PSO controlled grid* or *transmission system* configurations;
- 7.6.3.5 commissioning tests of new *generation facilities* and re-commissioning tests of existing *generation facilities*; and
- 7.6.3.6 commissioning and re-commissioning tests of control, monitoring and communications systems in all transmission substations and *generation facilities*.
- 7.6.4 The *PSO* shall permit a test referred to in this section 7.6 to be performed unless the *PSO* determines that the performance of the test will have an adverse impact on the *reliability* or *security* of the *PSO controlled system*.
- 7.6.5 In permitting a test to be performed, the *PSO* shall endeavour to permit the test to be performed at the time and on the date preferred as identified by the *market participant* pursuant to section 7.6.2.3.

7.7 COMPENSATION

- 7.7.1 Notwithstanding section 13 of Chapter 1, the *transmission licensee* shall not be entitled to compensation for any costs, expenses, losses or damage associated with the rejection, cancellation, deferral or recall of *outages* of the *PSO controlled grid*.
- 7.7.2 The *market participant* for a *generation facility* in respect of which an *outage* is cancelled, deferred or recalled by the *PSO* shall be entitled to compensation for direct expenses incurred as a result of such cancellation, deferral or recall if:

- 7.7.2.1 the *outage* had originally received *planning approval* or *final approval* by the *PSO*;
 - 7.7.2.2 the *outage* was cancelled, deferred or recalled by reason of a material error in the *PSO's* demand forecast, a failure of *generation facilities* within the *PSO controlled system*, a failure of facilities forming part of the *PSO controlled grid* or a failure of *inertie* facilities;
 - 7.7.2.3 the direct expenses were identified to the *PSO* in accordance with section C.2 of Appendix 5C; and
 - 7.7.2.4 the direct expenses exceed \$10,000.00.
- 7.7.3 A *market participant* that wishes to make a request to the *PSO* for compensation for direct expenses pursuant to section 7.7.2 shall follow the procedure set forth in section 3.11 of Chapter 3.
- 7.7.4 Except as otherwise provided in section 7.7.2, the *market participant* for a *generation facility* in respect of which an *outage* is cancelled, deferred or recalled by the *PSO* shall not be entitled to compensation for any costs, expenses, losses or damage incurred as a result of such cancellation, deferral or recall.
- 7.7.5 Notwithstanding section 13 of Chapter 1, a *market participant* for a *generation facility* shall not be entitled to compensation for any costs, expenses, losses or damage associated with or incurred in respect of the rejection of an *outage* of that *generation facility* by the *PSO* pursuant to section 7.2.12 or 7.2.14.

8 PROCUREMENT OF ANCILLARY SERVICES

8.1 INTRODUCTION

8.1.1 The *EMC*, on behalf and at the request of the *PSO*, shall procure, primarily through contracts, certain *physical services* that are needed to maintain *reliable PSO controlled system* operations but are not available in the *real-time markets*. This section 8 describes such *physical services* and the manner in which the *EMC* shall procure them.

8.2 CONTRACTED ANCILLARY SERVICES

8.2.1 The *EMC* shall procure, on behalf and at the request of the *PSO*, *contracted ancillary services* through contracts with *ancillary service providers* that have either:

8.2.1.1 demonstrated the ability to the *PSO* to provide such *contracted ancillary services* from *registered facilities* in accordance with the performance standards and other applicable requirements referred to in section 4; or

8.2.1.2 concluded *ancillary service funding agreements* with the *Authority* with respect to such *contracted ancillary services*.

8.2.2 The principal *contracted ancillary services* that the *EMC* may procure pursuant to section 8.2.1 are

8.2.2.1 *reactive support and voltage control service*,

8.2.2.2 *black start capability*;

8.2.2.3 *fast start service*; and,

8.2.2.4 *reliability must-run service*.

8.2.3 The *EMC* shall procure each *contracted ancillary service*:

8.2.3.1 in sufficient quantities and at the appropriate locations to enable the *PSO* to meet its obligations under this Chapter to ensure the *reliable* operation of the *power system*, in accordance with all applicable *reliability standards*; and

8.2.3.2 having regard to the applicable performance standards referred to in section 4.

8.2.4 Amounts payable to a *market participant* under an *ancillary service contract* shall be paid by the *EMC* in accordance with the *ancillary service contract* and instructions to this effect given to it by the *PSO*, and shall be recovered by the *EMC* in accordance with section 4.1 of Chapter 7.

8.2A CONTRACTED ANCILLARY SERVICES FUNDING

8.2A.1 The *Authority* may from time to time enter into an *ancillary service funding agreement* with an *ancillary service provider* to fund the *refurbishment cost* for purposes of the provision of *contracted ancillary services* by that *ancillary service provider*.

8.2A.2 The *EMC* and an *ancillary service provider* (which have entered into or will be entering into an *ancillary service funding agreement* with the *Authority* pursuant to section 8.2A.1) shall, at the request of the *Authority*, enter into a *tripartite agreement* with the *Authority* to allow the *EMC* to set-off or deduct *ASFA liabilities* from *ASC payments*.

8.2A.3 The *ancillary service provider* shall:

8.2A.3.1 submit the proposed scope, cost and completion timeline with respect to the *refurbishment works* to the *PSO* for its approval;

8.2A.3.2 procure the *refurbishment works*, as approved by the *PSO*, to be performed in accordance with good utility practice and all applicable laws and regulations and so as to ensure that such *refurbishment works* when completed, shall be fit for the purposes of providing the applicable contracted *ancillary service*;

8.2A.3.3 procure the *refurbishment works* to be completed no later than the agreed completion date stipulated in the *ancillary service funding agreement*, failing which the *ancillary service provider* shall be liable to pay liquidated damages to the *Authority* in accordance with the *ancillary service funding agreement*; and

8.2A.3.4 if applicable, obtain the *land lease extension*.

8.2A.4 Amounts payable to an *ancillary service provider* to fund the *refurbishment cost* shall be paid by the *Authority* in accordance with the *ancillary service funding agreement*.

8.2A.5 The amounts of the *refurbishment cost* funded by the *Authority* shall be recovered by the *EMC* (on behalf and at the request of the *Authority*) as part of the *Authority funding costs* by including such amounts in the computation of the payments under section 4.1 of Chapter 7.

8.2B ANCILLARY SERVICE FUNDING AND TRIPARTITE AGREEMENTS

- 8.2B.1 Each *ancillary service funding agreement* shall contain the terms as required by the *Authority* which may include terms that address the following:
- 8.2B.1.1 the scope of the *refurbishment works* and if applicable, duration of the *land lease extension*;
 - 8.2B.1.2 the situations in which the *refurbishment works* may be varied;
 - 8.2B.1.3 the agreed fixed lump sum *refurbishment cost* to be funded by the *Authority* and if such costs could not be ascertained or agreed on a fixed lump sum basis as at the date of the conclusion of the *ancillary service funding agreement*, the manner in which such costs will be calculated and the agreed cap on such costs;
 - 8.2B.1.4 the agreed date by which the *refurbishment works* and if applicable, *land lease extension* must be completed (subject to any adjustments as permitted under the *ancillary service funding agreement*) and the consequences of any delay in the completion;
 - 8.2B.1.5 the situations in which the agreed costs or cap and the completion date of the *refurbishment works* and if applicable, *land lease extension* may be adjusted;
 - 8.2B.1.6 the conditions and schedule for the disbursement of funds by the *Authority* to the *ancillary service provider*;
 - 8.2B.1.7 the obligation of the *ancillary service provider* to enter into an *ancillary service contract* with the *EMC* and *tripartite agreement* with the *Authority* and the *EMC*;
 - 8.2B.1.8 the grounds which entitle the *Authority* to terminate the *ancillary service funding agreement* and consequences of termination;
 - 8.2B.1.9 the right (but not the obligation) of the *Authority* to step-in to take possession and control of the *refurbishment works* or *registered facility* (or any part thereof) in the event of certain breach or default of the *ancillary service provider*; and
 - 8.2B.1.10 the terms of assignment or transfer of the *ancillary service funding agreement* in the event of the assignment or transfer of the *funded contracted ancillary service resource* to another person.

- 8.2B.2 An *ancillary service provider* shall agree on and enter into an *ancillary service funding agreement* with the *Authority* at or about the same time when it is agreeing on and entering into an *ancillary service contract* with the *EMC* pursuant to section 8.3.2.2 for the provision of *contracted ancillary service* from its *funded contracted ancillary service resource*.
- 8.2B.3 The *Authority* may of its own accord engage one or more independent consultant(s) to:
- 8.2B.3.1 conduct an audit in respect of the scope, cost and schedule of the *refurbishment works* proposed by a prospective *ancillary service provider* prior to the entering into of any *ancillary service funding agreement*;
 - 8.2B.3.2 conduct an audit in respect of the costs of the *refurbishment works* incurred by the *ancillary service provider*; and/or
 - 8.2B.3.3 monitor progress and verify compliance of the *refurbishment works* in accordance with the standards set out in section 8.2A.3 and the *ancillary service funding agreement*.

In the event of any such engagement:

- 8.2B.3.4 the *Authority* may engage a consultant, where necessary, with inputs from the prospective *ancillary service provider* (where the engagement is for the scope referred to in section 8.2B.3.1) or the *ancillary service provider* (where the engagement is for the scope referred to in section 8.2B.3.2 and/or 8.2B.3.3). The consultant selected should be an independent professional consultant of good repute and having relevant skill and expertise, and should not have any real or potential conflict of interests, whether commercial or otherwise, in connection with the conduct of such audit;
- 8.2B.3.5 prior to commencing the conduct of such audit, the consultant shall have executed a confidentiality agreement upon such terms and in such form as the *Authority* may prescribe;
- 8.2B.3.6 the scope of the audit shall be determined by the *Authority*, where necessary, with inputs from the prospective *ancillary service provider* (where the engagement is for the scope referred to in section 8.2B.3.1) or the actual *ancillary service provider* (where the engagement is for the scope referred to in section 8.2B.3.2 and/or 8.2B.3.3);
- 8.2B.3.7 all fees incurred by the *Authority* relating to the engagement of the consultant shall be recovered by the *EMC* under section 4.1 of Chapter 7;

- 8.2B.3.8 the prospective or actual *ancillary service provider* (as the case may be) shall fully cooperate with, and provide all information and/or access to facilities, where relevant to the audit, to the consultant engaged by the *Authority*; and
- 8.2B.3.9 the findings of the consultant's audit (where the engagement is for the scope referred to in section 8.2B.3.1) shall serve as only a reference for further negotiations between the *Authority* and the prospective *ancillary service provider*.
- 8.2B.4 Subject to section 8.2B.6, each *tripartite agreement* shall contain the terms as required by the *Authority* which may include terms that address the following:
- 8.2B.4.1 the right of the *EMC* to set-off or deduct *ASFA liabilities* from *ASC payments*;
- 8.2B.4.2 any future *ancillary service funding agreement(s)* and future *ancillary service contract(s)* (which is concluded at or about the same time as an *ancillary service funding agreement(s)* pursuant to section 8.2B.2) to be entered into by the *ancillary service provider*;
- 8.2B.4.3 the procedures to effect the rights of set-off or deduction by the *EMC*;
- 8.2B.4.4 the grounds which entitle the *Authority* to terminate the *tripartite agreement* and consequences of termination;
- 8.2B.4.5 the right (but not the obligation) of the *Authority* to step-in to remedy any breach or default of the *EMC* (as notified by the *ancillary service provider* to the *Authority*) under any *ancillary service contract* which is subject to the *tripartite agreement*; and
- 8.2B.4.6 the terms of assignment or transfer of the *tripartite agreement* in the event of the assignment or transfer of the *funded contracted ancillary service resource* to another person.
- 8.2B.5 The *EMC* and an *ancillary service provider* shall agree and enter into a *tripartite agreement* with the *Authority* at the same time when they are agreeing and entering into an *ancillary service contract* pursuant to section 8.3.2.2 for the provision of *contracted ancillary service* from the *ancillary service provider's funded contracted ancillary service resource(s)*.
- 8.2B.6 The provisions of section 8.2B.4 shall be subject to any contrary provisions in:
- 8.2B.6.1 any *electricity licence*; or

- 8.2B.6.2 the terms of any *tripartite agreement* the terms of which are required by an *electricity licence* to be, and have been, approved by the *Authority*.

8.2C REFURBISHMENT COST

- 8.2C.1 Subject to section 8.2C.2, the *refurbishment cost* to be funded by the *Authority* under an *ancillary service funding agreement* may cover any of the following:

- 8.2C.1.1 the costs payable to the contractors and consultants appointed by the *ancillary service provider* to perform the *refurbishment works* and any other works (including pre-inspection works) to prepare for the commencement of the *refurbishment works*;

- 8.2C.1.2 to the extent not included in the costs referred to in section 8.2C.1.1, the costs of insurances which the *ancillary service provider* is required to effect and maintain under the *ancillary service funding agreement*;

- 8.2C.1.3 the premium and stamp duty (if any) payable for the *land lease extension*; and

- 8.2C.1.4 such other costs and/or compensation amount as the *Authority* determines to be fair and reasonable under the circumstances.

- 8.2C.2 The *refurbishment cost* to be funded by the *Authority* under an *ancillary service funding agreement* shall exclude:

- 8.2C.2.1 any mark-up by the *ancillary service provider*; and

- 8.2C.2.2 any costs, loss and expense incurred or to be incurred by the *ancillary service provider*, its contractors and/or consultants arising from or attributable to any default or negligence of the *ancillary service provider*, its contractors and/or consultants.

8.2D FRAMEWORK AGREEMENT

- 8.2D.1 The *EMC* shall, at the request of the *Authority*, enter into a *framework agreement* with the *Authority* to require the *EMC* to amongst others recover (on behalf of the *Authority*) the *Authority funding costs*.

- 8.2D.2 The *Authority funding costs* payable to the *Authority* under the *framework agreement* shall be recovered by the *EMC* (on behalf of and at the request of the *Authority*) in accordance with section 4.1 of Chapter 7, and such amounts shall be paid by the *EMC* in accordance with the *framework agreement*.

8.2D.3 The *framework agreement* shall contain the terms as required by the *Authority* which may include terms that address the following:

8.2D.3.1 the obligation of the *EMC* to recover (on behalf of the *Authority*) the *Authority funding costs* by including such costs in the computation of the payments under section 4.1 of Chapter 7;

8.2D.3.2 the obligation of the *EMC* to exercise its rights to set-off or deduct *ASFA liabilities* from *ASC payments* upon receipt of instructions from the *Authority*;

8.2D.3.3 the procedures for the recovery of the *Authority funding costs* and *ASFA liabilities*;

8.2D.3.4 the grounds which entitle the *Authority* to terminate the *framework agreement*; and

8.2D.3.5 the process for modifying the terms of the *framework agreement*.

8.2D.4 The *EMC* shall conclude the *framework agreement* with the *Authority* on or before the conclusion of any *ancillary service funding agreement* pursuant to section 8.2B.2 with an *ancillary service provider*.

8.3 ANCILLARY SERVICE CONTRACTS

8.3.1 The *EMC* shall, subject to section 8.3.5, include in each *ancillary service contract* terms and conditions that address, at a minimum, the following:

8.3.1.1 the duration of the *ancillary service contract*, which may be of any duration as deemed appropriate by the *PSO* or, in the case of an *ancillary service contract* which is concluded at or about the same time as an *ancillary service funding agreement* pursuant to section 8.2B.2, the *Authority*;

8.3.1.1A in respect of any *ancillary service contract* which is concluded at or about the same time as an *ancillary service funding agreement* pursuant to section 8.2B.2, the term for the provision of the *contracted ancillary services* shall only commence on the completion of the *refurbishment works* and the *PSO* being satisfied that the applicable *registered facility* is able to provide *contracted ancillary services* in accordance with the performance standards and other applicable requirements referred to in section 4;

- 8.3.1.2 the situations in which the *contracted ancillary service resource(s)* may be called;
 - 8.3.1.3 the nature and timing of any advance notice required for the *PSO* to call upon the *contracted ancillary service resource(s)*;
 - 8.3.1.4 payment terms for the provision of the *contracted ancillary service* above the levels required to be provided by any *electricity licence* or any registration or *connection* requirements referred to in these *market rules*, the *transmission code* or any applicable *connection agreement*, including the amount and timing of any availability payment;
 - 8.3.1.5 the situations under which some or all of the terms of the *ancillary service contract* may be suspended;
 - 8.3.1.6 the process for modifying the terms of the *ancillary service contract*;
 - 8.3.1.7 the terms of assignment or transfer of the *ancillary service contract* in the event of the assignment or transfer of the *contracted ancillary service resource(s)* to another person; and
 - 8.3.1.8 in the case of an *ancillary service contract* for *reliability must-run service*, agreed *offer variation* data that the *PSO* may direct the *contracted ancillary service resource(s)* to submit when it is called by the *PSO* to operate in various modes under the *ancillary service contract* for *reliability must-run service*, and provisions for the revision of such *offer variation* data, when necessary.
- 8.3.2 The *EMC* shall use one or a combination of the following processes to conclude *ancillary service contracts* with *ancillary service providers*:
- 8.3.2.1 where practicable, the *EMC* shall employ a competitive tendering or negotiation process to identify multiple potential *ancillary service providers* and to determine competitive prices and other terms for the *ancillary service contracts*; or
 - 8.3.2.2 otherwise, the *EMC* may negotiate *ancillary service contracts* with a single potential *ancillary service provider* where the *EMC* determines that this will result in reasonable prices and other terms.
- 8.3.3 At the time of commencement of the process(es) described in section 8.3.2 for the procuring of an *ancillary service* under an *ancillary service contract*, the *EMC* shall *publish* the following particulars in respect of that *ancillary service*:

- 8.3.3.1 the desired quantity (if any) of that *ancillary service*;
 - 8.3.3.2 the desired duration of that *ancillary service contract*;
 - 8.3.3.3 the desired situations in which that *ancillary service* may be called upon to be provided;
 - 8.3.3.4 the desired nature and timing of any advance notice required for the *PSO* to call upon the provision of that *ancillary service*;
 - 8.3.3.5 the desired timing of payment for the provision of that *ancillary service*;
 - 8.3.3.6 the desired service standards and performance levels applicable to that *ancillary service*;
 - 8.3.3.7 the desired situations under which some or all of the terms of the *ancillary service contract* may be suspended;
 - 8.3.3.8 the desired process for modifying the terms of the *ancillary service contract*; and
 - 8.3.3.9 the desired terms of assignment or transfer of the *ancillary service contract* to another person.
- 8.3.4 The *EMC* may, of its own accord or at the request of the *PSO*, engage an independent consultant to conduct an audit in respect of the proposals from prospective *ancillary service providers* pursuant to section 8.3.2, upon the following terms:
- 8.3.4.1 the *EMC* shall engage a consultant with inputs from the *PSO* and the prospective *ancillary service provider*. The consultant selected should be an independent professional consultant of good repute and having relevant skill and expertise, and should not have any real or potential conflict of interests, whether commercial or otherwise, in connection with the conduct of such audit;
 - 8.3.4.2 prior to commencing the conduct of such audit, the consultant has executed a confidentiality agreement upon such terms and in such form as the *EMC* may prescribe;
 - 8.3.4.3 the scope of the audit shall be determined jointly by the *PSO* and *EMC*, with inputs from the prospective *ancillary service provider*.
 - 8.3.4.4 all fees incurred by the *EMC* relating to the engagement of the consultant shall be recovered by the *EMC* under section 4.1 of Chapter 7;

- 8.3.4.5 the *market participant*, who is the prospective *ancillary service provider*, shall fully cooperate with, and provide all information and/or access to facilities, where relevant to the audit, to the consultant; and
- 8.3.4.6 the findings of the consultant's audit shall serve as only a reference for further negotiations between the *EMC* and the prospective *ancillary service provider*. The prospective *ancillary service provider* is not obliged to sign the proposed *ancillary service contract* based on specific prices and terms arising from the findings of the audit.
- 8.3.5 The provisions of sections 8.3.1 and 8.6.1 shall be subject to any contrary provisions contained in:
- 8.3.5.1 any *electricity licence*; or
- 8.3.5.2 the terms of any *ancillary service contract* the terms of which are required by an *electricity licence* to be, and have been, approved by the *Authority*.
- 8.3.6 Each person that:
- 8.3.6.1 has entered into an *ancillary service contract* with the *EMC*; and
- 8.3.6.2 is not, at any time during the term of such *ancillary service contract*, the *dispatch coordinator* for the facility from which the *contracted ancillary service* will be provided,
- shall ensure that the *dispatch coordinator* for that facility complies with the provisions of the *ancillary service contract*.

8.4 THE EFFECT OF GRID CONNECTION REQUIREMENTS

- 8.4.1 The *PSO* may at any time direct the *market participant* for a *registered facility* or *generation settlement facility* to provide the level of any *ancillary service* that the *registered facility* is required to provide as a condition of any *electricity licence* or as a result of any *connection* requirement or any registration requirement referred to in these *market rules*, the *transmission code* or any applicable *connection agreement*.
- 8.4.2 No person shall be entitled to compensation from the *PSO* or the *EMC* for any *ancillary service* that must be provided by a *registered facility* or *generation settlement facility* pursuant to any *electricity licence* or *connection* requirement or any registration requirement referred to in these *market rules*, the *transmission code* or any applicable *connection*

agreement unless and until the *EMC* develops a market for such *ancillary service* that:

8.4.2.1 pays all providers of the *ancillary service*; or

8.4.2.2 requires any person to pay for the failure of a *registered facility* or *generation settlement facility* to provide the *ancillary service* up to some standard that may be less than that attributable to the *connection* requirement,

or both.

8.4.3 If the *PSO* directs the *market participant* for a *registered facility* or *generation settlement facility* to provide a level of any *ancillary service* above the levels required by the *electricity licence* applicable to that *registered facility* or *generation settlement facility*, or by any registration or *connection* requirements or any registration requirements referred to in these *market rules*, the *transmission code* or any applicable *connection agreement* and the *registered facility* or *generation settlement facility* is not otherwise subject to an *ancillary service contract* with the *EMC*, the *market participant* for that *registered facility* or *generation settlement facility* may make a request to the *PSO* for compensation in accordance with the procedure set forth in section 3.11 of Chapter 3.

8.5 CONTRACTS FOR RELIABILITY MUST-RUN SERVICE

Explanatory Note: Must-run contracts could be used by the PSO to direct the operation of generating units in specific ways for reasons of reliability. The market price gives the incentive to address adequacy. If the PSO uses must-run contracts in this instance it will be seriously distorting the market outcomes. These contracts should only be used to address localised problems or timing issues.

8.5.1 Where the *EMC* and a *generation licensee* enter into an *ancillary service contract* for *reliability must-run service* with respect to a given facility, the *PSO* may direct that facility to operate in specific ways when directed by the *PSO* to do so for reasons of *reliability*, other than in situations of overall *adequacy* of the *PSO controlled system*.

8.5.2 The *PSO* shall not request the *EMC* to enter into an *ancillary service contract* for *reliability must-run service* unless studies performed by the *PSO* indicate that a *reliability must-run resource* is required to be available for the purposes of *reliability*, other than in situations of overall *adequacy* of the *PSO controlled system*.

8.5.3 The *EMC* shall enter into an *ancillary service contract* for *reliability must-run service* in respect of a facility only where the *electricity licence*

of the *generation licensee* for the facility contains a condition that provides for the *generation licensee* to enter into *ancillary service contracts* for *reliability must-run service*. Where the *electricity licence* of the *generation licensee* contains such a condition, the *generation licensee* shall enter into *ancillary service contracts* for *reliability must-run service* at the *EMC's* request, acting at the request and on behalf of the *PSO* under this section 8.

- 8.5.4 The *PSO* may call upon a facility with which the *EMC* has an *ancillary service contract* for *reliability must-run service* if and only if the *PSO*, in consultation with the *EMC*, determines that *market participants* will not offer sufficient *physical services* into the *real-time markets* to enable the *PSO* to maintain *reliability*, other than in situations of overall *adequacy* of the *PSO controlled system*.

8.6 COSTS PAYABLE FOR CERTAIN ANCILLARY SERVICES

- 8.6.1 Subject to section 8.3.5, the price payable under an *ancillary service contract* entered into by the *EMC* may cover any of the following:

- 8.6.1.1 the cost of being available to provide a *contracted ancillary service* if directed by the *PSO* to do so;
- 8.6.1.2 the direct costs and the opportunity costs of actually providing the *contracted ancillary service* when directed by the *PSO* to do so; and
- 8.6.1.3 such other compensation as the *EMC* determines to be fair and reasonable under the circumstances.

- 8.6.2 The *PSO* may, in the circumstances referred to in section 4.13, direct the *market participant* for a *registered facility* to provide any class of *contracted ancillary services* even though the *EMC* does not have an *ancillary service contract* in respect of that *registered facility* for that *contracted ancillary service*. A *market participant* for a *registered facility* that complies with such direction may make a request to the *PSO* for compensation in accordance with the procedure set forth in section 3.11 of Chapter 3.

8.7 PUBLICATION OF PROCUREMENT CONTRACT INFORMATION

- 8.7.1 The *EMC* shall treat information relating to the funding of the *refurbishment cost* and procurement of *contracted ancillary services* as follows:

- 8.7.1.1 the *EMC* shall *publish* annually the total costs of each class of *contracted ancillary services* listed in section 8.2.2 subject to *ancillary service contracts*, together with estimates of the total costs of each class of *contracted ancillary services* the *EMC* expects to recover for the next 36 months;
- 8.7.1.2 the *EMC* shall *publish* annually the quantities of each class of *contracted ancillary service* listed in section 8.2.2 covered under *ancillary service contracts*, together with estimates of any additional quantities the *EMC* expects to acquire during the next 36 months; and
- 8.7.1.3 the *EMC* shall *publish* annually the total *Authority funding costs* for the preceding 12 months which the *EMC* has recovered on behalf of the *Authority* in accordance with section 4.1 of Chapter 7, together with estimates of the total *Authority funding costs* that the *EMC* expects to recover on behalf of the *Authority* for the next 36 months.
- 8.7.2 Where an *ancillary service contract* is concluded pursuant to section 8.3.2.1, the *EMC* shall *publish* the price specified in that *ancillary service contract* in respect of the *contracted ancillary service* procured thereunder. Where an *ancillary service contract* is concluded otherwise than pursuant to section 8.3.2.1, then except where required by section 8.7.1, the *EMC* shall not *publish* the price specified in that *ancillary service contract* in respect of the *contracted ancillary service* nor the quantity of the *contracted ancillary service* procured under that *ancillary service contract*.

9 DISPATCH PROCESS

9.1 ISSUING DISPATCH INSTRUCTIONS

- 9.1.1 The *PSO* shall issue *dispatch instructions* for each *registered facility* in accordance with this section 9 as the primary means of coordinating the real-time operation of the *PSO controlled system*.
- 9.1.2 The issuance of *dispatch instructions* shall be as follows:
- 9.1.2.1 where a *real-time dispatch schedule* is released by the *EMC* pursuant to section 9.2.3 of Chapter 6 to a *dispatch coordinator* for a given *registered facility*, such *real-time dispatch schedule* shall be deemed to be the *dispatch instructions* issued by the *PSO* for that *registered facility* and that *dispatch period* unless and until the *PSO* issues subsequent *dispatch instructions* for that *registered facility* for that *dispatch period* in accordance with section 9.1.3; or
- 9.1.2.2 where a *real-time dispatch schedule* is not released by the *EMC* pursuant to section 9.2.3 of Chapter 6 to a *dispatch coordinator* for a given *registered facility* and *dispatch period*, the *PSO* shall issue *dispatch instructions* to that *dispatch coordinator* for that *dispatch period* in accordance with the procedures described in the *system operation manual* and section 9.1.2A, instructing the applicable *registered facility* to provide, to limit the provision of, to withdraw or to limit the withdrawal of the relevant *physical service* at or to the level specified in the *dispatch instruction*; and
- 9.1.2.3 in the case of *dispatch instructions* for *reactive support and voltage support service*, the *PSO* shall issue *dispatch instructions* for that *dispatch period*, instructing the applicable *registered facility* to provide or to limit the provision of the relevant *reactive support and voltage support service*, at or to the level specified in the *dispatch instruction*.
- 9.1.2A When issuing the *dispatch instructions* for a *dispatch period* referred to in section 9.1.2.2, the *PSO* shall, to the extent which the *PSO* determines that it is feasible to do so, use the latest available *short-term schedule*, *pre-dispatch schedule* or *market outlook scenario* released by the *EMC* pursuant to section 7.7 of Chapter 6 as the *dispatch instructions* for that *dispatch period*.
- 9.1.3 Where the *PSO* considers that any *dispatch instructions* issued in accordance with section 9.1.2 could result in the *PSO controlled system*

entering into a *high-risk operating state* or an *emergency operating state*, the *PSO* may issue *dispatch instructions* to a *dispatch coordinator* for a *dispatch period* at any time between the release of the *real-time dispatch schedule* to the *dispatch coordinator* for that *dispatch period* and the end of that *dispatch period*, instructing any *registered facility* to provide, to limit the provision of, to withdraw or to limit the withdrawal of the relevant *physical service* at or to the level specified in the *dispatch instruction*. Any such *dispatch instructions* shall override any prior *dispatch instructions*.

9.1.4 *Dispatch instructions* referred to in sections 9.1.2.2, 9.1.2.3 and 9.1.3 for any *registered facility* shall:

9.1.4.1 be consistent with the current operating status of that *registered facility* and with all relevant *security limits* and *equipment limits* established by the *PSO* pursuant to section 5.2; and

9.1.4.2 subject to section 9.3.5, be used by the *PSO* for the purpose of declaring the *registered facility* as non-conforming in accordance with section 9.6.4.

9.1.5 If a *dispatch coordinator* fails to receive a *real-time dispatch schedule* for a *dispatch period* for a *registered facility* and the *PSO* fails to issue *dispatch instructions* for that *dispatch period* and that *registered facility* pursuant to section 9.1.2.2, the *dispatch coordinator* for that *registered facility* shall use as its default *dispatch instructions* the most recent *dispatch instruction* issued to it in respect of that *registered facility*.

9.1.6 In relation to the *dispatch instructions* described in section 9.1.2.2, 9.1.2.3 or 9.1.3 the *PSO* shall:

9.1.6.1 establish and *publish* the communication systems and protocols to be used for issuing such *dispatch instructions*;

9.1.6.2 issue such *dispatch instructions* using the systems and protocols referred to in section 9.1.6.1; and

9.1.6.3 record and time-stamp all such *dispatch instructions*, store such records for at least six years and make such records available for purposes of audit and dispute resolution in accordance with these *market rules*.

9.1.6A If the *PSO* has:

9.1.6A.1 pursuant to section 9.1.3, overridden a *real-time dispatch schedule* released by the *EMC* under section 9.1.2.1 or a *dispatch instruction* issued by the *PSO* under section 9.1.2.2 for an *LRF with REB* relating to *energy* for a *dispatch period*; or

9.1.6A.2 pursuant to section 9.1.2.2, issued any *dispatch instructions* relating to *energy* to an *LRF with REB* for a *dispatch period*,

the *PSO* shall, by the next *business day*, provide to the *EMC* the last *dispatch instruction* issued to that *LRF with REB* for that *dispatch period* prior to the start of that *dispatch period*.

9.1.6B The *PSO* shall, by the next *business day*, notify the *EMC* if any *dispatch instructions* relating to *energy* for a *dispatch period* had been issued to an *LRF with REB* during that *dispatch period*.

9.1.7 Subject to section 9.1.8, a *market participant* for a *registered facility* that complies with *dispatch instructions* issued pursuant to section 9.1.3 may make a request to the *PSO* for compensation in accordance with section 3.11 of Chapter 3.

9.1.8 *Dispatch instructions* for *reactive support and voltage support service* released pursuant to section 9.1.3 shall not be eligible for compensation from the *PSO*.

9.2 DISPATCH OF ENERGY

9.2.1 The *dispatch instructions* for *energy* issued to each applicable *dispatch coordinator* for or within a given *dispatch period* shall indicate, as the case may be:

9.2.1.1 the instantaneous rate, in MW, at which *energy* is to be injected onto the *transmission system* by a *generation registered facility* at the end of the *dispatch period*;

9.2.1.2 in the case of *dispatch instructions* received as *AGC* signals, the *dispatch instructions* shall consist of control information consistent, were the *AGC* signal to continue until the end of the *dispatch period*, with the information described in section 9.2.1.1. Receipt of such *AGC* signals shall not constitute receiving new *dispatch instructions* pursuant to section 9.1.3 where the control information in the *AGC* signals continues to be consistent with the original *dispatch instructions* issued in accordance with section 9.1.2; or

9.2.1.3 the instantaneous rate, in MW, at which *energy* is to be withdrawn through the *transmission system* by an *LRF with REB* at the end of the *dispatch period*.

9.2.2 Each *dispatch coordinator* for a *registered facility* that receives *dispatch instructions* pertaining to *energy* from the *PSO* by means of *AGC* signals

shall ensure that the applicable *registered facility* is ready and able to respond to such signals.

9.2.3 Each *dispatch coordinator* for a *registered facility* that receives *dispatch instructions* pertaining to *energy* for a given *dispatch period* by means other than *AGC* signals shall:

9.2.3.1 in the case where the *registered facility* is registered to provide *energy*, immediately begin ramping the output of the *registered facility* linearly so as to be able to attain the instructed level of output by the end of the *dispatch period*; and

9.2.3.2 in the case where the *registered facility* is an *LRF with REB*, immediately begin ramping its *energy* withdrawal level at its ramp-up or ramp-down rate stated in its valid *energy bid* submitted under section 5.2A.2.6 of Chapter 6 so as to be able to attain the instructed level of *energy* withdrawal and maintain such level of *energy* withdrawal until the end of the *dispatch period*.

9.3 DISPATCH OF RESERVE CAPACITY AND RESERVE ACTIVATION

9.3.1 The *dispatch instructions* for *reserve* issued to each applicable *dispatch coordinator* for or within a given *dispatch period*, as the case may be, shall indicate the amount of *reserve*, in MW, of each *reserve class* that, throughout the *dispatch period* unless an event that triggers a *reserve* response occurs in such *dispatch period*, is to be in a condition to respond to a fall in *PSO controlled system* frequency or to respond to a *dispatch instruction* issued pursuant to section 9.3.4 calling for additional *energy* production.

9.3.2 Each *registered facility* that is issued a *dispatch instruction* for *reserve* in accordance with section 9.1.2 shall maintain unused *generation capacity* or *load* reduction capacity, as the case may be, during that *dispatch period* consistent with the *dispatch instructions* issued to it, so as to be able to increase *energy* production or decrease *energy* withdrawal, as the case may be, in accordance with sections 9.3.3 and 9.3.4 when a *contingency event* has occurred or is occurring.

9.3.3 Where a *contingency event* has occurred or is occurring, each *reserve provider* that has been issued *dispatch instructions* pursuant to section 9.1.2 for primary *reserve*, shall respond *automatically* to a frequency drop by increasing *energy* production or decreasing *energy* withdrawal by the amount specified in such *dispatch instructions* within the time and in accordance with the performance standards specified in section A.2 of Appendix 5A, until such time as further *dispatch instructions* are issued to it.

- 9.3.4 Where a *contingency event* has occurred or is occurring, each *reserve provider* that has been issued of *dispatch instruction* pursuant to section 9.1.2 for *contingency reserve* shall respond to any *dispatch instruction* that the *PSO* may issue, instructing the *registered facility* providing *reserve* to begin increasing *energy* production or decreasing *energy* withdrawal, as the case may be, and subject to section 4.13.1, up to the quantity specified in its *real-time dispatch schedule* for that *reserve class* within the time and in accordance with the performance standards specified in section A.2 of Appendix 5A.
- 9.3.5 Where a *reserve provider* responds *automatically* to a *contingency event* or to a *dispatch instruction* from the *PSO* pursuant to section 9.3.3 or 9.3.4, it shall not for the purposes of section 9.6 be considered as departing from, or declared as non-conforming in respect of, any other *dispatch instructions* for *energy* or *regulation* for the same *dispatch period*.
- 9.3.6 Notwithstanding anything to the contrary in section A.2 of Appendix 5A, if a *load registered facility* that is issued a *dispatch instruction* for *reserve* decreases *energy* withdrawal pursuant to the *market rules*, the *market manuals* or the *system operation manual*, its *load* shall not be restored until and unless directed or permitted by the *PSO* via a load restoration notice.
- 9.3.7 A *market participant* for a *load registered facility* may make a request to the *PSO* for compensation in accordance with the procedure set forth in section 3.11 of Chapter 3 if:
- 9.3.7.1 the *load registered facility* responded *automatically* to a *contingency event* in accordance with section 9.3.3, and the duration between the time of response and the time of a load restoration notice referred to in section 9.3.6 exceeds 120 minutes; or
- 9.3.7.2 the *load registered facility* responded to a *dispatch instruction* from the *PSO* in accordance with section 9.3.4, and the duration between the time of issuance of such *dispatch instruction* and the time of a load restoration notice referred to in section 9.3.6 exceeds 120 minutes,

provided that the *market participant* shall not be entitled to compensation for the initial 120-minute activation period.

9.4 DISPATCH OF REGULATION

- 9.4.1 The *dispatch instructions* for *regulation* issued to each applicable *dispatch coordinator* for or within a given *dispatch period*, as the case may be, shall indicate the amount of *regulation*, expressed as a MW range about its then current operating point, that a *registered facility* is to provide in response to *AGC* signals or other signals acceptable to the *PSO*.
- 9.4.2 Each *registered facility* providing *regulation* shall maintain unused *generation capacity* during the applicable *dispatch period* consistent with the *dispatch instructions* issued to it, so as to be able to increase or decrease *energy* production in response to *AGC* signals or other signals acceptable to the *PSO*.

9.5 DISPATCH OF REACTIVE SUPPORT AND VOLTAGE CONTROL

- 9.5.1 The *dispatch instructions* for *reactive support and voltage control service* issued to each applicable *market participant* for or within a given *dispatch period*, as the case may be, shall be instructions, in a form suitable for the equipment at the applicable *registered facility*, for *reactive support and voltage control service* to be provided under *ancillary service contracts*.
- 9.5.2 Each *market participant* for a *registered facility* providing *reactive support and voltage control service* shall operate its equipment, which may include reactors, transmission lines, generation plant and on-load transformer taps, in a manner consistent with the *dispatch instructions* issued to it in respect of *reactive support and voltage control service*.

9.6 NON-COMPLIANCE WITH DISPATCH INSTRUCTIONS

- 9.6.1 Each *dispatch coordinator* shall ensure that each of its *registered facilities* complies with the *dispatch instructions* issued in respect of such *registered facility*, except as may otherwise be permitted under these *market rules*.
- 9.6.2 A *dispatch coordinator* that expects its *registered facility* to operate in a manner that differs materially from the *dispatch instructions* issued to it shall so notify the *PSO* as soon as possible. The *PSO* shall *publish* in the *system operation manual* guidelines defining when a difference is material and how notice shall be provided for the purposes of sections 9.6.2 and 9.6.3.

Explanatory Note: In addition, the market participant will likely have to resubmit offers for any future period in which it expects not to be able to comply, under section 5.1.5 of Chapter 6.

- 9.6.3 Compliance with a *dispatch instruction* for a *registered facility* is not required if such compliance would endanger the safety of any person, substantially damage equipment, or violate any *applicable law*. Subject to section 9.3.5, the *dispatch coordinator* for a *registered facility* that departs from *dispatch instructions* for any such reason shall so notify the *PSO* in accordance with section 9.6.2.
- 9.6.4 If the failure by a *registered facility* to comply with a *dispatch instruction* has a materially adverse impact on the *reliability* of the *PSO controlled system*, the *PSO* shall declare the *registered facility* to be non-conforming and shall take any actions allowed by sections 9.6.5 and 9.6.6 or any other provision of these *market rules* as the *PSO* determines appropriate.
- 9.6.5 If the *PSO* declares a *registered facility* to be non-conforming under section 9.6.4:
- 9.6.5.1 the *PSO* shall require the *dispatch coordinator* for that *registered facility* to explain the reason for the non-compliance and shall record the response;
- 9.6.5.2 if the *PSO* determines that the *registered facility* is physically incapable of implementing the *dispatch instructions*, the *PSO* may require the *dispatch coordinator* for the *registered facility* to submit *offer variations*, *bid variations*, revised *standing capability data* or some or all of the foregoing for the non-conforming *registered facility*; and
- 9.6.5.3 if the *PSO* is not satisfied that the *registered facility* will respond to future *dispatch instructions*, the *PSO* may direct the *registered facility* to follow, as closely as practicable, an *energy output profile* specified by the *PSO*, and shall thereafter represent the *registered facility* as having the specified profile until the non-conforming *registered facility* satisfies the *PSO* that it has remedied the conditions causing the non-conformance, where applicable.
- 9.6.6 Until the *dispatch coordinator* for a non-conforming *registered facility* responds to the requirements of this section 9.6 to the satisfaction of the *PSO*, such *registered facility* shall continue to be designated as non-conforming, and such failure to respond on the part of that *dispatch coordinator* may be referred by the *PSO* to the *market surveillance and compliance panel* at any time.

9.7 DISPATCH ERRORS

9.7.1 A *dispatch error* shall be deemed to have occurred if either:

9.7.1.1 an *arbitration tribunal* determines that the *PSO* has failed to follow the real-time *dispatch* process as set out in these *market rules*; or

9.7.1.2 the *PSO* declares that it has made a *dispatch error*.

The *PSO* will notify the *EMC* of any *dispatch error* by electronic mail within 24 hours of the *dispatch error* being discovered.

9.7.2 A *dispatch error* shall not invalidate the *market prices* determined contemporaneously with the *real-time dispatch schedule* that was deemed to constitute the *dispatch instructions* that contained the *dispatch error*.

9.7.3 When a *dispatch error* has occurred, a *market participant* that has sustained a loss or damage as a result of the *dispatch error* may make a request to the *PSO* for compensation in accordance with the procedure set forth in section 3.11 of Chapter 3.

9.8 ADVISORY NOTICES

9.8.1 The *PSO* shall inform the *EMC* as soon as practicable of conditions on the *PSO controlled system* that in the *PSO's* opinion, merit the issuance by the *EMC* of an *advisory notice* under section 9.3 of Chapter 6.

9.8.2 The *PSO* shall provide to the *EMC* confirmation as to whether or not *load shedding* had occurred in the *dispatch period* referred to in section 9.3.2D of Chapter 6 within 1 *business day* of the *EMC's* request. If *load shedding* had not occurred in that *dispatch period*, the *PSO* shall also at the same time provide the information requested by the *EMC* under section 9.3.2D of Chapter 6 in such format as the *EMC* and the *PSO* may agree or, if such information is not available, inform the *EMC* of such fact.

9.9 PSO OBLIGATIONS AFTER THE DISPATCH PERIOD

9.9.1 The *PSO* shall, in respect of real-time operations, maintain a record, in sufficient detail to allow review by the *market surveillance and compliance panel*, of any situations with respect to one or more *market participants*, or to the *PSO controlled system* as a whole, in which:

9.9.1.1 it issued *dispatch instructions* pursuant to section 9.1.3;

9.9.1.2 *load shedding* occurred;

9.9.1.3 *reserve* or *regulation* requirements were compromised; or

9.9.1.4 it imposed a *generation fixing constraint* on the output level of a *generation registered facility*,

and shall communicate such information to the *EMC*.

9.9.2 The *PSO* shall, in respect of real-time operations, maintain a record, in sufficient detail to allow review by the *market surveillance and compliance panel*, of any situation:

9.9.2.1 in which *market participants* have performed in a manner inconsistent with or contrary to;

9.9.2.2 where equipment and processes have performed in a manner inconsistent with or contrary to; or

9.9.2.3 which has prevented the *PSO* from performing in a manner consistent with,

these *market rules*, any applicable *market manuals* or the *system operation manual*.

10 DEMAND CONTROL

10.1 INTRODUCTION

- 10.1.1 This section 10 applies in situations on the *PSO controlled system* where there is insufficient *generation capacity* available from *generation facilities* to satisfy expected demand, where operating problems (such as frequency, voltage levels or thermal over-loads) exist which affect the ability to serve *load*, or where there is a breakdown on any part of the *PSO controlled system*. This section 10 identifies actions that the *PSO* may take or may direct *market participants* to take to assist in achieving reductions in demand to either avoid or alleviate such situations.
- 10.1.2 The *PSO* shall continuously inform *market participants* of conditions of the *PSO controlled system* that may require the *PSO* to initiate reductions in demand by *non-dispatchable loads*.

10.2 UNDER-FREQUENCY LOAD SHEDDING

- 10.2.1 *Automatic* under-frequency *load shedding* shall be accomplished to maintain the frequency of the *PSO controlled system* and to restore the *PSO controlled system* to normal frequency following frequency deviations outside of the range established by the *PSO*.
- 10.2.2 The *PSO* shall make arrangements to facilitate the *disconnection* of a minimum percentage of the total peak customer demand, as determined by the *PSO*, by means of *automatic* under-frequency response equipment.
- 10.2.3 If directed by the *PSO*, the *transmission licensee* shall make arrangements to facilitate the *disconnection* of a minimum percentage of its total peak customer demand, as determined by the *PSO*, by means of *automatic* under-frequency response equipment.
- 10.2.4 The *non-dispatchable load* that is subject to *automatic* under-frequency *load shedding* pursuant to this section 10.2 shall be split into discrete stages. The number, location, MW size and associated low frequency settings of these stages shall be as specified by the *PSO*. Such specifications shall be established by the *PSO*, following consultations with relevant *market participants*, prior to the *market commencement date* and thereafter by the last day of June in each calendar year to cover the immediately following twelve-month period.
- 10.2.5 The *PSO* shall develop and include in the *system operation manual* a policy detailing the basis for exclusions to *load* management activities

that are undertaken for the purpose of shedding *load* during under-frequency conditions. The *PSO* shall consult with *market participants* when developing the policy.

- 10.2.6 Once *load* has been shed to maintain the frequency of the *PSO controlled system*, the *PSO* shall as soon as practicable report conditions on the *PSO controlled system* to the *transmission licensee*.
- 10.2.7 Neither the *transmission licensee* nor the *market participant* for a *load facility connected* to the *transmission system* shall restore *load* that has been shed pursuant to this section 10.2 until directions have been received from the *PSO* permitting it to do so. The *transmission licensee* or such *market participant* shall commence the restoration of *load* immediately following receipt of such direction.
- 10.2.8 The *transmission licensee* and each *market participant* for a *load facility connected* to the *transmission system* shall, as soon as practicable, provide the *PSO* with an estimate of the demand reduction that has occurred as a result of *disconnecting* under-frequency demand.

10.3 DEMAND CONTROL INITIATED BY THE PSO IN AN EMERGENCY OPERATING STATE

- 10.3.1 When an *emergency operating state* has been declared by the *PSO*, the actions available to the *PSO* to safeguard the *security* of the *PSO controlled system* may include issuing directions to the *transmission licensee* or to the *market participant* for a *load facility connected* to the *transmission system* to reduce demand for *electricity*.
- 10.3.2 The *transmission licensee* and each *market participant* for a *load facility connected* to the *transmission system* that receives a direction from the *PSO* to reduce demand shall achieve the reduction in demand within 5 minutes of receipt of the direction and shall, as soon as practicable, notify the *PSO* that it has done so.
- 10.3.3 Neither the *transmission licensee* nor a *market participant* for a *load facility connected* to the *transmission system* that has reduced demand pursuant to this section 10.3 shall restore demand until directions have been received from the *PSO* permitting it to do so. The *transmission licensee* or *market participant* for the *load facility connected* to the *transmission system* shall commence restoration of demand immediately following receipt of such directions.
- 10.3.4 The *PSO* shall develop and include in the *system operation manual* a policy detailing the basis for exclusions to *load* management activities

that are undertaken for the purpose of controlling demand. The *PSO* shall consult with *market participants* when developing the policy.

10.4 GENERATOR OBLIGATIONS DURING ABNORMAL FREQUENCY

- 10.4.1 Abnormal frequency conditions on the *PSO controlled system* may require immediate actions by *market participants* for *generation facilities* to restore the frequency to an acceptable level. The abnormal frequency conditions to which this section 10.4 applies and the actions that may be required of *generation facilities* under such conditions shall be defined by the *PSO* and included in the *system operation manual*. A *market participant* for a *generation facility* that takes action in response to an abnormal frequency excursion may make a request to the *PSO* for compensation in accordance with the procedure set forth in section 3.11 of Chapter 3.

11 COMMITMENT/DECOMMITMENT PROCEDURES

11.1 INTRODUCTION

- 11.1.1 Subject to 11.1.2, no *dispatch coordinator* for a *generation registered facility* may *synchronise* that *generation registered facility* to the *transmission system* or *desynchronise* that *generation registered facility* from the *transmission system* except as provided in this section 11.
- 11.1.2 All *generation registered facilities* located within Singapore or located outside of Singapore but *connected* to the *transmission system* are subject to this section 11.

11.2 PROCESS FOR SELF-COMMITMENT

- 11.2.1 A *dispatch coordinator* shall request approval from the *PSO* for the *synchronisation* of a *generation registered facility* where:
- 11.2.1.1 a valid and outstanding *energy offer*, *reserve offer* or *regulation offer* has been submitted for that *generation registered facility*;
or
- 11.2.1.2 the *generation facility* is being called to provide an *ancillary service* pursuant to an *ancillary service contract*,
- such that the *dispatch coordinator* can comply with any *dispatch instructions* for that *generation registered facility* which may be issued as a result of the acceptance of such *offer* or with the call to provide such *ancillary service*.
- 11.2.2 The *dispatch coordinator's* request issued pursuant to section 11.2.1 shall, having regard to the time taken to complete *synchronisation* of the *generation registered facility* on earlier occasions, be issued to the *PSO* in sufficient time to enable:
- 11.2.2.1 the *PSO* to approve and, where necessary, participate in the *synchronisation* of the *generation registered facility*; and
- 11.2.2.2 the *dispatch coordinator* to obtain approval of *synchronisation* in time to allow it to comply with any applicable *dispatch instruction* or call to provide *ancillary services*,
- and in no event shall such request be issued less than 30 minutes in advance of the anticipated time of *synchronisation*, unless the request is

associated with operations relating to the provision of *fast start service* or *regulation*.

- 11.2.3 Notwithstanding that a request for *synchronisation* may have been made pursuant to section 11.2.1, a *dispatch coordinator* shall not *synchronise* or attempt to *synchronise* a *generation registered facility* except and in accordance with the approval of the *PSO*.
- 11.2.4 The *PSO* shall process and approve or reject requests by *dispatch coordinators* for *synchronisation* in the order in which such requests are received by the *PSO* unless the *PSO* considers, on reasonable grounds, that the *security* and *reliability* of the *PSO controlled system* would be threatened by the processing of *synchronisation* requests in such order. In such case, the *PSO* may process and approve or reject requests for *synchronisation* in an order other than in the order in which the requests were received by the *PSO*.
- 11.2.5 The *PSO* shall approve requests by *dispatch coordinators* for *synchronisation* issued pursuant to 11.2.1 unless the *PSO* considers, on reasonable grounds, that the *security* and *reliability* of the *PSO controlled system* would be threatened by such approval. In such case, the *PSO* may reject the request.
- 11.2.6 The *PSO* shall notify a *dispatch coordinator* of the approval or rejection of its request for *synchronisation* as soon as practicable having regard to the order in which the request was processed in accordance with section 11.2.4.
- 11.2.7 If the *PSO* rejects a request for a *generation registered facility* to *synchronise*, its *dispatch coordinator* shall ensure that it does not commence to *synchronise* and that an *offer variation* is submitted in accordance with section 5.1.5 of Chapter 6.
- 11.2.8 Receipt by the *dispatch coordinator* for a *generation registered facility* of notification of approval by the *PSO* under section 11.2.6 gives the *dispatch coordinator* the right to *synchronise* the *generation registered facility* to the *PSO controlled system* at and from the time directed by the *PSO* pursuant to section 11.2.9. This right does not preclude the *PSO* from requiring *desynchronisation* of a *generation registered facility* in the event of there being a surplus of *energy* in accordance with any applicable provisions of these *market rules* relating to *energy surplus market advisories*.
- 11.2.9 The exact time of any *synchronisation* shall be subject to directions from the *PSO*.

- 11.2.10 Each *dispatch coordinator* for a *generation registered facility* shall promptly notify the *PSO* where it is unable to *synchronise* in accordance with the approval, or any directions given pursuant to section 11.2.9 by the *PSO*. Upon receipt of such notice, the *PSO* shall re-assess accordingly such approval for the *dispatch coordinator* to *synchronise* its *generation registered facility*.

11.3 PROCESS FOR DECOMMITMENT

- 11.3.1 A *dispatch coordinator* responsible for a *generation registered facility* that is *synchronised* to the *transmission system* and that, having regard to any valid and outstanding *offers* that may have been submitted in respect of the *generation registered facility* and to the provisions of any *ancillary service contract*, wishes to *desynchronise* from the *transmission system*, shall request approval from the *PSO* to *desynchronise* that *generation registered facility*, and in no event shall such request be issued less than 30 minutes in advance of the anticipated time of *desynchronisation*, unless the request is associated with operations relating to the cessation of provision of *fast start service* or *regulation*.
- 11.3.2 Except as otherwise permitted by section 11.3.5, a *dispatch coordinator* for a *generation registered facility* shall not *desynchronise* that *generation registered facility* except and in accordance with the approval of the *PSO* except where the *EMC* has issued an *energy surplus advisory notice* pursuant to section 9.3 of Chapter 6 and the *PSO* has directed that the *generation registered facility* be *desynchronised*. Where the *PSO* so directs a *dispatch coordinator* to *desynchronise* a *generation registered facility*, the *PSO* shall use reasonable endeavours to issue such direction no less than 30 minutes in advance of the required *desynchronisation* time.
- 11.3.3 The *PSO* shall approve any request to *desynchronise* made pursuant to section 11.3.1 unless:
- 11.3.3.1 the *generation registered facility* is operating under the provisions of an *ancillary service contract* for *reliability must-run service* and the *PSO* has directed it to operate thereunder;
 - 11.3.3.2 the *PSO* requires the *generation registered facility* to remain *synchronised* to maintain the *security* or *adequacy* of the *PSO controlled system*; or
 - 11.3.3.3 an *energy, reserve* or *regulation* shortfall *advisory notice* is in effect.
- 11.3.4 The *PSO* shall notify a *dispatch coordinator* of the approval or rejection of its request for *desynchronisation* as soon as practicable.

- 11.3.5 If the *PSO* rejects a request for a *generation registered facility* to *desynchronise*, its *dispatch coordinator* shall ensure that it remains *synchronised* and that an *offer variation* is submitted in accordance with section 5.1.5 of Chapter 6. The *dispatch coordinator* shall do the foregoing unless prevented on the grounds of plant or personnel safety.
- 11.3.6 The exact time of any *desynchronisation* approved by the *PSO* shall be subject to directions from the *PSO*.
- 11.3.7 Receipt by the *dispatch coordinator* for a *generation registered facility* of notification of approval by the *PSO* under section 11.3.4 gives the *dispatch coordinator* the right to commence shut-down of the *generation registered facility* at and from the time directed by the *PSO* pursuant to section 11.3.6.
- 11.3.8 Each *dispatch coordinator* for a *generation registered facility* shall promptly notify the *PSO* if it is unable to comply with:
- 11.3.8.1 a properly given direction by the *PSO* to *desynchronise* the *generation registered facility* pursuant to section 11.3.2; or
 - 11.3.8.2 the approval of the *PSO* for *desynchronisation* given pursuant to section 11.3.4.

Upon receipt of such notice, the *PSO* shall re-assess accordingly any direction to, or approval for, the *dispatch coordinator* to *desynchronise* such *generation registered facility*.

12 EMERGENCY PREPAREDNESS AND SYSTEM RESTORATION

12.1 OBJECTIVE

12.1.1 The objective of this section 12 is to establish the means by which the *PSO*, the *EMC* and *market participants* will fulfil their respective emergency preparedness and *power system* restoration obligations, including regular and real-time testing; the preparation by the *PSO* of the *Singapore electricity emergency plan* and of the *Singapore power system restoration plan*; the preparation by *market participants* and the *EMC* of emergency preparedness plans that support and are coordinated with the *Singapore electricity emergency plan*; and the preparation of *restoration plan market participant* attachments that support and are coordinated with the *Singapore power system restoration plan*. This objective will be met through cooperation with all relevant *market participants*.

12.2 EMERGENCY PREPAREDNESS PLANS AND SINGAPORE ELECTRICITY EMERGENCY PLAN

12.2.1 The *PSO* shall develop and maintain the *Singapore electricity emergency plan* describing the responsibilities of, and co-ordinating the actions of, *market participants* and each of the *EMC* and the *PSO* for the purpose of alleviating the effects of an emergency on the *power system*, having regard to the mitigation of the impact of an emergency on public health and safety as identified in each *market participant's* emergency preparedness plan.

12.2.2 In order to assist the *Authority* in fulfilling its responsibilities under section 40 of the *Electricity Act*, each *market participant* and the *EMC* shall prepare and submit to the *PSO* an emergency preparedness plan and such other emergency preparedness-related information as the *PSO* considers necessary. Each *market participant* and the *EMC* shall ensure that its emergency preparedness plan complies with section 12.2.3 and is submitted to the *PSO* not later than the *market commencement date*, or at such later times as the *PSO* may specify.

12.2.3 Each *market participant* and the *EMC* shall ensure that its emergency preparedness plan:

12.2.3.1 describes such planning, testing, information, communication and other elements designated by the *PSO*;

- 12.2.3.2 complies with such emergency planning criteria as may be designated by the *PSO*;
 - 12.2.3.3 complies with all relevant *reliability standards*;
 - 12.2.3.4 is consistent with the emergency planning and preparedness procedures established by relevant government authorities;
 - 12.2.3.5 indicates the manner in which the impact of an emergency on public health and safety will be mitigated; and
 - 12.2.3.6 indicates the manner in which the *market participant* will minimise the cutting and expedite the restoration of critical *loads* and sensitive users during short and prolonged emergencies.
- 12.2.4 The *PSO* shall assist *market participants* and the *EMC* in the development of their respective emergency preparedness plans for the purpose of ultimately establishing emergency preparedness plans that support and are coordinated with the *Singapore electricity emergency plan*.
- 12.2.5 The *PSO* may exempt a *market participant* or the *EMC* from the requirement to submit an emergency preparedness plan pursuant to section 12.2.2 or from the requirement to comply, in whole or in part, with the requirements of section 12.2.3 if the *PSO* is satisfied that such exemption will not adversely affect performance by the *PSO* of its obligations related to emergency preparedness or its *reliability*-related obligations.

12.3 SINGAPORE POWER SYSTEM RESTORATION PLAN AND RESTORATION PLAN MARKET PARTICIPANT ATTACHMENTS

- 12.3.1 The *PSO* shall develop and maintain the *Singapore power system restoration plan* for restoring the *security* of the *power system* following a major *contingency event* or emergency as required by all applicable *reliability standards* and considered prudent by the *PSO* for Singapore.
- 12.3.2 The *Singapore power system restoration plan* shall cover each of the planning, testing, information, *load* reduction, *load* restoration, communication and other elements described in section 10 and this section 12 and such other elements as the *PSO* determines necessary to implement effective restoration of the *security* of the *power system*.

- 12.3.3 The *Singapore power system restoration plan* shall include:
- 12.3.3.1 plans for managing major disturbances on the *power system* that black out all or a portion of the *power system*;
 - 12.3.3.2 plans for the testing and verification of emergency preparedness facilities and procedures; and
 - 12.3.3.3 descriptions of the roles of the *EMC*, the *PSO* and various *market participants* in the *Singapore power system restoration plan*.
- 12.3.4 Each *restoration plan market participant* shall prepare and submit to the *PSO* a *restoration plan market participant* attachment to the *Singapore power system restoration plan* and such other *power system* restoration-related information as the *PSO* considers necessary. Each *restoration plan market participant* shall ensure that its *restoration plan market participant* attachment complies with section 12.3.5 and is submitted to the *PSO* not later than the *market commencement date*, or at such later times as the *PSO* may specify.
- 12.3.5 Each *restoration plan market participant* shall ensure that its *restoration plan market participant* attachment:
- 12.3.5.1 includes the elements described in section 12.3.6;
 - 12.3.5.2 complies with such restoration planning criteria as may be designated by the *PSO*; and
 - 12.3.5.3 complies with all relevant *reliability standards*.
- 12.3.6 Each *restoration plan market participant* shall ensure that its *restoration plan market participant* attachment includes:
- 12.3.6.1 a three year schedule of *power system* restoration training activities, to be conducted by the *restoration plan market participant* at its own expense. The schedule shall be updated annually;
 - 12.3.6.2 documentation detailing organisational responsibility for co-ordinating with the *PSO* the development of and participation in *power system* restoration drills. Such development and participation shall be conducted by the *restoration plan market participant* at its own expense;
 - 12.3.6.3 a schedule for testing the *restoration plan market participant's* equipment as may be designated in the *Singapore power system*

restoration plan. Such testing shall be conducted by the *restoration plan market participant* at its own expense;

- 12.3.6.4 a statement of policy and supporting documentation demonstrating how the *restoration plan market participant* will minimise the cutting and expedite the restoration of critical *loads* and sensitive users under *power system* restoration conditions; and
- 12.3.6.5 any other documentation that the *PSO* deems necessary to support or facilitate the successful implementation of the *Singapore power system restoration plan*.
- 12.3.7 The *PSO* may exempt a *restoration plan market participant* from the requirement to submit a *restoration plan market participant* attachment pursuant to section 12.3.4 or from the requirement to comply, in whole or in part, with the requirements of section 12.3.5 or 12.3.6 if the *PSO* is satisfied that such exemption will not adversely affect performance by the *PSO* of its obligations related to restoration of the *security* of the *power system* or its *reliability*-related obligations.
- 12.3.8 The *PSO* shall assist *restoration plan market participants* in the development of *restoration plan market participant* attachments that support and are co-ordinated with the *Singapore power system restoration plan* for the purpose of ultimately establishing one integrated restoration plan for Singapore.
- 12.3.9 Each *restoration plan market participant* shall ensure that the guidelines and procedures applicable to it and set forth in the *Singapore power system restoration plan* are carried out by trained operating staff with sufficient authority to take any action that may be necessary to ensure that all relevant equipment is operated in a timely, stable and reliable manner.
- 12.3.10 The *PSO* shall direct *market participants* in restoring the *power system* following major disturbances. Each *market participant* shall be responsible for carrying out such *PSO* directions in accordance with the provisions of the *Singapore power system restoration plan*.

12.4 REVIEW AND AUDIT

- 12.4.1 The *PSO* shall review each emergency preparedness plan and each *restoration plan market participant* attachment submitted to it, whether in its original or a revised form, and shall prepare and provide to the *EMC* or the relevant *market participant*, as the case may be, a record of review indicating the changes, if any, required to be made and the date by which

the revised emergency preparedness plan or *restoration plan market participant* attachment must be submitted to the *PSO*.

12.4.2 The *EMC* and each *market participant* shall make such changes to its emergency preparedness plan or *restoration plan market participant* attachment as may be required by the record of review and shall submit to the *PSO* a revised emergency preparedness plan or *restoration plan market participant* attachment within the time specified in the record of review or within such other period as may be agreed with the *PSO*.

12.4.3 The *EMC* and each *market participant* shall review its emergency preparedness plan and *restoration plan market participant* attachment at least annually, or as required, and shall, following such review, submit to the *PSO*:

12.4.3.1 confirmation that the review has not required any change to be made to its emergency preparedness plan or its *restoration plan market participant* attachment; or

12.4.3.2 a revised version of its emergency preparedness plan or *restoration plan market participant* attachment, modified as may be required by the results of the review, together with a statement identifying such modifications, as the case may be. The *EMC* and each *market participant* shall ensure that any revised emergency preparedness plan or *restoration plan market participant* attachment prepared and submitted pursuant to this section 12.4.3 complies with section 12.2.3 or with sections 12.3.5 and 12.3.6, as the case may be.

12.4.4 Notwithstanding any reviews conducted pursuant to section 12.4.3, the *EMC* and each *market participant* shall ensure that its emergency preparedness plan and *restoration plan market participant* attachment are audited every three years by the *PSO* or by an independent person approved by the *PSO*.

12.4.5 The *PSO* shall review the *Singapore power system restoration plan* and the *Singapore electricity emergency plan* at least annually, or more frequently if required.

12.5 EMERGENCY FACILITIES

12.5.1 Each of the *EMC* and the *PSO* may evacuate their respective principal control centres in the event that a circumstance arises that poses a hazard to their respective personnel. During and following such evacuation, operation of the *PSO controlled system* shall be effected in accordance with this section 12.5.

- 12.5.2 The *wholesale electricity markets* shall continue to operate during an evacuation of the *EMC's* or the *PSO's* principal control centre unless conditions exist that would warrant a suspension of market operations.
- 12.5.3 During the interval between the evacuation of the *PSO's* principal control centre and the establishment of a backup control centre:
- 12.5.3.1 the *PSO* shall designate an interim emergency system coordinator to act in its stead, as required; and
- 12.5.3.2 the *transmission licensee* and all *generation licensees* shall manage their facilities and support the interim emergency system coordinator in the operation of the *PSO controlled system*.
- 12.5.4 Each of the *EMC* and the *PSO* shall test their respective backup control centres and associated procedures and facilities on a regular basis, and each *market participant* whose facility is *connected* to the *transmission system* shall, at its own expense and as directed by the *PSO*, support and actively participate in evacuation tests and simulations.

12.6 TESTING

- 12.6.1 The *EMC* and each *market participant* shall ensure that the capability and *reliability* of its personnel, procedures and equipment are maintained to the extent necessary to enable it to fulfil its obligations under its emergency preparedness plan and its *restoration plan market participant attachment*.
- 12.6.2 The *PSO* shall develop, schedule, implement and conduct such tests as are provided for in the *Singapore electricity emergency plan* and the *Singapore power system restoration plan*.
- 12.6.3 The *PSO* shall develop and *publish* test plans and procedures for voice communication during an emergency on the *power system*.
- 12.6.3.1 The *EMC* and each *market participant* shall support and actively participate, at its own expense and as directed by the *PSO*, in the implementation and testing of its emergency preparedness plan, its *restoration plan market participant attachment*, the *Singapore electricity emergency plan*, the *Singapore power system restoration plan*, and the voice communications procedures referred to in section 12.6.3 and associated equipment; and
- 12.6.3.2 any emergency management exercise designed to test the compatibility of its emergency preparedness plans with the

Singapore electricity emergency plan and the ability of its emergency preparedness plan to be integrated with the *Singapore electricity emergency plan*.

The costs incurred by the *PSO* in supporting and actively participating in such tests and exercises shall be recovered by the *EMC*, on behalf of the *PSO*, in accordance with section 4.1 of Chapter 7.

- 12.6.4 The *PSO* shall schedule the tests referred to in section 12.6.3 at an appropriate time of the year and time of day, in consideration of the needs of the *EMC* and of *market participants* and of the desire to minimise their costs relating to such tests. To the extent practicable, the tests of any *restoration plan market participant* attachment shall be scheduled in a manner consistent with the *outage* co-ordination process described in section 7.

12.7 ENFORCEMENT

Failure by a *market participant* to take any action required to be taken in, or to act in a manner consistent with, its emergency preparedness plan or its *restoration plan market participant* attachment shall be deemed to constitute a breach of the *market rules*.

APPENDIX A – PERFORMANCE STANDARDS FOR ANCILLARY SERVICES

A.1 REGULATION

- A.1.1 The *market participant* for a *registered facility* providing *regulation* shall ensure that all monitoring and control information required to be provided pursuant to section A.1.2 is provided by the *registered facility*.
- A.1.2 The telemetering between the *PSO's* Energy Management System and a *registered facility* providing *regulation* shall indicate the gross power output of the *registered facility* and whether the *generating unit(s)* within the *registered facility* are:
- A.1.2.1 *synchronised* with the *transmission system*; and
 - A.1.2.2 (if the *registered facility* is registered as having *AGC* capability) selected to be on *AGC*.
- A.1.3 A *registered facility* providing *regulation* must conform with the maximum response period specified in section A.1.5 for the full amount of *regulation* capacity *offered*.
- A.1.4 A *registered facility* providing *regulation* must be able to increase its output in, at most, the period specified in section A.1.5, up to the maximum output specified in the most recent *standing capability data* submitted on behalf of the *registered facility* in accordance with section 4.4 of this Chapter and must be able to decrease its output in, at most, the period specified in section A.1.5 down to the minimum output specified in the most recent *standing capability data* submitted on behalf of the *registered facility* in accordance with section 4.4 of this Chapter.
- A.1.5 The maximum response period when increasing or decreasing output referred to in sections A.1.3 and A.1.4 shall be 60 seconds.

A.2 RESERVE

- A.2.1 The *PSO* shall maintain two classes of *reserve*; namely *primary reserve* and *contingency reserve*.
- A.2.2 Each *registered facility* offering *primary reserve* shall be capable of achieving its scheduled MW response *automatically* without further

instruction from the *PSO* within 9 seconds of being triggered by any *contingency event*, and shall be able to maintain that scheduled MW response until 10 minutes from the time it was triggered.

A.2.3 [Deleted and Intentionally Left Blank]

A.2.4 Each *registered facility* offering *contingency reserve* shall be capable of achieving its scheduled MW response within 10 minutes of being instructed to do so, and shall be able to maintain its scheduled MW response for not less than 30 minutes.

A.3 REACTIVE SUPPORT AND VOLTAGE CONTROL – GENERATION FACILITIES

A.3.1 All *generation registered facilities* providing *reactive support service* and *voltage control service* must be capable of meeting the requirements of this section A.3.

A.3.2 Subject to section A.3.6, *generation registered facilities* providing *reactive support and voltage control service* shall have automatic voltage regulators (“AVRs”) which shall be in service at all times and in automatic mode unless the *generation registered facility* is specifically directed by the *PSO* to operate the AVRs in manual mode.

A.3.3 Subject to section A.3.4, *generation registered facilities* providing *reactive support service* and *voltage control service* shall be operated within the standard power factor range in accordance with the *transmission code*.

A.3.4 The *PSO* may direct a *generation registered facility* providing *reactive support service* and *voltage control service* to operate in an under- or over-excited state for a certain period of time in order to maintain prescribed voltages on the *PSO controlled system*. Such direction may require such *registered facility* to operate in the compensation mode or to reduce real power output in order to increase its ability to provide reactive power.

A.3.5 Unless otherwise specified by the *PSO*, each *generation registered facility* providing *reactive support service* and *voltage control service* shall respond to voltage or reactive power schedules immediately following receipt of the *PSO’s* request. Where such *registered facility* cannot be operated as directed by the *PSO*, the *dispatch coordinator* for the *registered facility* shall immediately so notify the *PSO* and shall indicate the reasons for such non-compliance.

- A.3.6 Each *generation registered facility* providing *reactive support service* and *voltage control service* shall:
- A.3.6.1 notify the *PSO* immediately upon the *AVR* at its *generation registered facility* being forced out of service; or
 - A.3.6.2 prior to the *AVR* being removed from its *generation registered facility* for planned maintenance in accordance with section 7 of this Chapter.
- A.3.7 Following a *contingency event*, each *generation registered facility* shall respond *automatically* without further instruction from the *PSO* to provide or absorb reactive power in accordance with the established maximum and minimum reactive power capabilities of such *registered facility*. Each *dispatch coordinator* shall immediately notify the *PSO* whenever its *generation registered facility* cannot perform to the established maximum and minimum reactive power capabilities of such *registered facility*.

A.4 REACTIVE SUPPORT AND VOLTAGE CONTROL – NON-GENERATION FACILITIES

- A.4.1 Except for *forced outages* and *planned outages* co-ordinated with the *PSO* pursuant to these *market rules*, the *transmission licensee* shall keep its transmission assets in service at all times unless released from service by the *PSO* or directed by the *PSO* to be removed from service pursuant to section A.4.2.
- A.4.2 The *PSO* may direct the *transmission licensee* to remove transmission assets from service to the extent necessary to maintain *reactive support* and *voltage control*.
- A.4.3 The *transmission licensee* and each *market participant* for a *load facility* connected to the *PSO controlled system* providing *reactive support service* and *voltage control service* shall respond immediately following receipt of a direction from the *PSO* with respect to directions concerning, but not limited to, static capacitors, static VAR compensators and reactors. Each such provider of *reactive support service* and *voltage control service* shall immediately notify the *PSO*, with reasons, whenever the devices referred to in this section A.4.3 cannot be switched in accordance with the *PSO's* direction.

A.5 BLACK START

- A.5.1 A *registered facility*, or *registered facilities*, providing *black start capability* must be available as specified in its *ancillary service contract* for *black start capability*.
- A.5.2 A *registered facility*, or *registered facilities*, providing *black start capability* must provide in its *ancillary service contract* sufficient MWs and MVARs to:
- A.5.2.1 energise the specified transmission path within the applicable time period specified in its *ancillary service contract* for *black start capability*;
 - A.5.2.2 provide *energy* requirements along such transmission path, including the requirements of any *load connected* to the transmission path; and
 - A.5.2.3 provide start-up power to the nearest *generation facility* as specified in its *ancillary service contract* for *black start capability*.
- A.5.3 A *registered facility*, or *registered facilities*, providing *black start capability* must maintain voltage within emergency voltage limits over a range of loading from no external *load* to full external *load* in accordance with all applicable *reliability standards*.
- A.5.4 A *registered facility*, or *registered facilities*, providing *black start capability* must be equipped with governors that are capable of operating in an islanded mode.
- A.5.5 Except during *outages* approved by the *PSO* pursuant to section 7 of this Chapter, a *registered facility* or *registered facilities* providing *black start capability* must provide *black start capability* regardless of the operating status of such *facility* or *facilities* prior to a blackout.
- A.5.6 A *registered facility*, or *registered facilities*, providing *black start capability* must provide startup power for the period of time it takes to switch the applicable transmission path specified in section A.5.2.1 into service and to complete the start-up process at the nearest *generation facility* as specified in its *ancillary service contract* for *black start capability*.
- A.5.7 A *registered facility* or *registered facilities* providing *black start capability* must be able to complete such number of successive starts

within such period of time as may be specified in its *ancillary service contract* for *black start capability*.

A.5.8 A *registered facility*, or *registered facilities*, providing *black start capability* must produce the range of reactive power resources required by the *PSO controlled system* as specified in the *system operation manual*.

A.5.9 A *registered facility*, or *registered facilities*, providing *black start capability* must participate in the training activities and restoration drills referred to in sections 12.3.6.1 and 12.3.6.2, respectively, of this Chapter.

A.6 FAST START

A.6.1 A *registered facility*, or *registered facilities*, providing *fast start capability* must be available as specified in its *ancillary service contract* for *fast start capability*.

A.7 RELIABILITY MUST-RUN

A.7.1 A *registered facility*, or *registered facilities*, providing *reliability must-run service* must be available as specified in its *ancillary service contract* for *reliability must-run service*.

APPENDIX B – PERFORMANCE STANDARDS FOR SYSTEM OPERATION

B.1 FREQUENCY STANDARDS

- B.1.1 The frequency of the *electricity system* shall normally be maintained at 50 Hertz \pm 0.2 Hertz and shall not be permitted to rise above 50.5 Hertz or fall below 49.5 Hertz without corrective action being taken.
- B.1.2 The deviation of electric time shall normally be limited to \pm 10 seconds and shall be permitted to deviate to within \pm 60 seconds without corrective action being taken.

B.2 VOLTAGE STANDARDS

- B.2.1 The transmission voltages of 400kV, 230kV and 66kV shall normally be maintained within $\pm 3\%$ of their nominal values and shall be permitted to operate within $\pm 5\%$ for 400kV and $\pm 6\%$ for 230kV and 66kV without corrective action being taken.

APPENDIX C – OUTAGE SCHEDULING INFORMATION

C.1 CONTENT OF ASSESSMENT REPORTS

C.1.1 In each of the 12-Month Assessment Reports and Daily Assessment Reports referred to in sections 6.6.2 and 6.6.3 of this Chapter, respectively, the *PSO* shall include the following information for the period covered by each such Report:

- C.1.1.1 a forecast of Singapore demand;
- C.1.1.2 a forecast of the available *reserve* in each *reserve class* and a comparison of this amount with the aggregate of demand plus the *reserve* requirement, together with a higher total accounting for additional contingency allowance;
- C.1.1.3 a forecast of the available *regulation* capacity, together with the forecast *regulation* requirement;
- C.1.1.4 a forecast of excess output from *generation facilities* (quantities and periods);
- C.1.1.5 a forecast of a deficit in the output from *generation facilities* (quantities and periods);
- C.1.1.6 a forecast of the adequacy of *ancillary services*;
- C.1.1.7 a forecast of *transmission line* congestion; and
- C.1.1.8 the most current *outage* plans of the *transmission licensee*.

C.2 OUTAGE SUBMISSION INFORMATION REQUIRED BY THE PSO

C.2.1 The following information shall be provided to the *PSO* by each *market participant* for each *planned outage* or *forced outage* as required by section 7.2.4, 7.2.8, 7.2.14 or 7.3.8, as the case may be, of this Chapter:

- C.2.1.1 the identity of the *market participant* submitting the information;
- C.2.1.2 a single point of contact, identified by name or position, along with sufficient information to enable the *PSO* to communicate with that single point of contact, such as phone, fax, email or a combination of one or more of these;

- C.2.1.3 the type of *outage* and the nature of the *outage*, such as a derating, a complete *outage* or a test;
- C.2.1.4 sufficient information to allow the *PSO* to identify the specific facility or equipment affected by the *outage* and the location of such facility or equipment;
- C.2.1.5 the proposed start date, start time, end date and end time of the *outage*. In the case of a *planned outage*, where an acceptable range of dates exists, the *market participant* may identify the preferred period along with the acceptable alternative periods;
- C.2.1.6 the amount of time required for the facility or equipment that is the subject of the *outage* to become fully available following a request by the *PSO* to have the equipment returned to service once the *outage* has commenced;
- C.2.1.7 the periodic nature of the *outage*, such as continuous, continuous except for weekends or daily, as applicable;
- C.2.1.8 general information about the *outage*, such as a brief description of the purpose of the *outage* and specific requirements or information pertinent to the *outage*, such as loading levels for the test of a *generation facility*, as well as any regulatory requirements applicable to the *outage*;
- C.2.1.9 the impact, if any, on real power resources, and in particular the reduction in such resources, which results or has resulted from the *outage*, determined on the basis of the direct impact associated with the specific facility or equipment that is the subject of the *outage*;
- C.2.1.10 the impact, if any on reactive power resources, and in particular the reduction in such resources, which results or has resulted from the *outage*, determined on the basis of the direct impact associated with the specific facility or equipment that is the subject of the *outage*; and
- C.2.1.11 in the case of a *planned outage* of a *generation facility* or equipment, the estimated direct expenses to be incurred by the *market participant*.

C.3 OUTAGE PLANNING INFORMATION PROVIDED BY THE PSO

- C.3.1 The *PSO* shall communicate to each *market participant* which has made an *outage submission* under section 7.2.4.1, 7.2.8 or 7.2.14 of this Chapter, has made a request for a *planned outage* in accordance with section 7.3 of this Chapter or has notified the *PSO* of a *forced outage* in accordance with section 7.3.7 of this Chapter a unique identifier for the purposes of *outage* identification and to assist with any required audit function. The *PSO* shall also send to the *market participant* an acknowledgement of receipt of each *outage submission* submitted in accordance with section 7.4.2.1, 7.2.8 or 7.2.14 indicating such unique identifier, the time of receipt, the *PSO*'s single point of contact in respect of the *outage* and any other information the *PSO* determines appropriate.

APPENDIX D – AUTOMATIC FINANCIAL PENALTY SCHEME FOR DEVIATION BY GENERATION REGISTERED FACILITY

D.1 PURPOSE

- D.1.1 This Appendix describes the automatic financial penalty scheme applicable to deviating *generation registered facilities*.
- D.1.2 This Appendix describes the procedures that shall be used to calculate and collect the financial penalty to be imposed on *market participants* of deviating *generation registered facilities*, and to return the financial penalty collected through the MEUC. Unless otherwise indicated, the procedures described in this Appendix shall be applied for each *dispatch period*.

D.2 DEFINITIONS & INTERPRETATION

- D.2.1 In this Appendix:
- D.2.1.1 “automatic financial penalty scheme” means the financial penalty scheme which is described in and provided for under section 3.7.3 of Chapter 5 and this Appendix 5D;
- D.2.1.2 “financial penalty” means the financial penalty which is or is to be imposed under the automatic financial penalty scheme;
- D.2.1.3 “deviating *generation registered facility*” means the *generation registered facility* which is deemed as such under section 3.7.3 of Chapter 5;
- D.2.1.4 “notice of error” means the notice of error submitted by a *market participant* to the *EMC* pursuant to section D.4.3;
- D.2.1.5 “preliminary financial penalty statement” or “PFPS” in respect of a *market participant* means the *EMC's* preliminary statement of the financial penalties to be paid by the *market participant* in respect of all its deviating *generation registered facilities*;
- D.2.1.6 “final financial penalty statement” or “FFPS” in respect of a *market participant* means the *EMC's* final statement of the financial penalties to be paid by the *market participant* in respect of all its deviating *generation registered facilities*;

- D.2.1.7 “T” refers to a given *trading day*;
- D.2.1.8 “T+X” refers to the Xth *business day* after a given *trading day* T;
- D.2.1.9 “EndGeneration” refers to a *generation registered facility’s* gross generation output (in MW) at the end of a *dispatch period*, as recorded by the PSO’s Energy Management System for that *dispatch period*;
- D.2.1.10 “EndScheduledQty” refers to a *generation registered facility’s* scheduled *energy* output (in MW) for a *dispatch period*, as scheduled in the *real-time dispatch schedule* that is deemed to be *dispatch instructions* for that *dispatch period*, if such *real-time dispatch schedule* is released to the *dispatch coordinator* of the *generation registered facility* on time, in accordance with the *market operations timetable*, or, if such *real-time dispatch schedule* is not released on time as aforesaid, as scheduled in the *short-term schedule* that is issued as *dispatch instructions* for that *dispatch period*;
- D.2.1.11 “HEUC” refers to the hourly *energy* uplift charge which is to be determined as provided in section 3.5.2A of Chapter 7;
- D.2.1.12 “MEUC” refers to the monthly *energy* uplift charge which is to be estimated as provided in section 3.5.3 of Chapter 7;
- D.2.1.13 the use of superscript “m(a)” in respect of any value is a reference to the value for the *generation registered facility* located at *market network node* m and associated with *settlement account* a; and
- D.2.1.14 the use of subscript “h” in respect of any value is a reference to the value for a given *settlement interval* h or its corresponding *dispatch period* h, as the case may be.

D.3 DEVIATIONS & CALCULATION OF FINANCIAL PENALTY

- D.3.1 For the purposes of section 3.7.3 of Chapter 5, a *generation registered facility* shall have deviated from its *real-time dispatch schedule* or its *short-term schedule* (as the case may be) that is deemed to be or issued as *dispatch instructions* for a given *dispatch period*, if its deviation is more than 10 MW, as determined in accordance with the following formula:

$$\frac{1}{2} \times \left| \text{EndScheduledQty}_h^{m(a)} - \text{EndGeneration}_h^{m(a)} \right| \times \frac{1}{2} \text{ hour} > 2.5\text{MWh}$$

- D.3.2 The *EMC* shall calculate the financial penalty to be imposed on a *market participant* in respect of each of its deviating *generation registered facilities* for a given *dispatch period* as follows:

$$\text{financial penalty}_h^{m(a)} = \text{Max} \{ 2 \times (USEP_h + HEUC_h) \times [\frac{1}{2} \times | \text{EndScheduledQty}_h^{m(a)} - \text{EndGeneration}_h^{m(a)} | \times \frac{1}{2} \text{ hour} - 2.5 \text{ MWh}], \$5000 \}$$

D.4 CALCULATION & COLLECTION OF FINANCIAL PENALTY

- D.4.1 The procedure and timelines for calculation of financial penalties, submission of notices of error, verification and imposition of financial penalties, on the *market participants* of the deviating *generation registered facilities*, are set out in the following table:

Day	Time of Day	Event	Provided By	Provided To	Frequency
By T+4	By 17:00	<p>The <i>PSO</i> to submit the following data to the <i>EMC</i>:</p> <p>(a) identification of all deviating <i>generation registered facilities</i> for each <i>dispatch period</i> for trading day T; and</p> <p>(b) <i>EndScheduledQty</i> and <i>EndGeneration</i> for each such deviating <i>generation registered facility</i> identified in (a) for each <i>dispatch period</i> for trading day T.</p>	<i>PSO</i>	<i>EMC</i>	Once per business day
By T+4	By 20:00	<p>The <i>EMC</i> to release the following data (if such data has been received from the <i>PSO</i>) to each <i>market participant</i> with one or more deviating <i>generation registered facilities</i>:</p> <p>(a) identification of the deviating <i>generation registered facilities</i> for each <i>dispatch period</i> for trading day T; and</p> <p>(b) <i>EndScheduledQty</i> and <i>EndGeneration</i> for each such deviating <i>generation registered facility</i> identified in (a) for each <i>dispatch period</i> for trading day T.</p>	<i>EMC</i>	<i>Market participant</i> with one or more deviating <i>generation registered facilities</i>	Once per business day

Day	Time of Day	Event	Provided By	Provided To	Frequency
By T+6	By 20:00	The <i>EMC</i> to calculate the financial penalty to be imposed on each <i>market participant</i> with one or more deviating <i>generation registered facilities</i> for each <i>dispatch period</i> for <i>trading day T</i> , and to issue the PFPS for <i>trading day T</i> to each such <i>market participant</i> .	<i>EMC</i>	<i>Market participant</i> with one or more deviating <i>generation registered facilities</i>	Once per <i>business day</i>
By T+7	By 17:00	A <i>market participant</i> to whom a PFPS is issued, to submit a notice of error to the <i>EMC</i> if it is of the view that there is an error with any item and/or calculation in any PFPS issued to it for <i>trading day T</i> .	<i>Market participant</i> to which the PFPS is issued	<i>EMC</i>	As required
By T+7	By 20:00	If any data referred to in a duly submitted notice of error had been provided by the <i>PSO</i> for the purposes of the <i>EMC</i> issuing a PFPS, the <i>EMC</i> to request the <i>PSO</i> (and give a copy of such request to the <i>market participant</i> which submitted that notice of error) for confirmation of the accuracy of data.	<i>EMC</i>	<i>PSO</i> (with copy to <i>market participant</i> which submitted the duly submitted notice of error)	As required
By T+9	By 17:00	In respect of each request by the <i>EMC</i> for confirmation of accuracy of data as aforesaid, the <i>PSO</i> to send confirmation to the <i>EMC</i> as required under section D.4.7.2(a) or D.4.7.2(b) as applicable.	<i>PSO</i>	<i>EMC</i>	As required

Day	Time of Day	Event	Provided By	Provided To	Frequency
By T+9	By 20:00	The <i>EMC</i> to notify the <i>market participant</i> which submitted a duly submitted notice of error, of the matters specified in sections D.4.8.1(a), D.4.8.2(a), D.4.9.1(a) and D.4.9.2(a) as applicable.	<i>EMC</i>	<i>Market participant</i> which submitted the duly submitted notice of error (with copy to <i>PSO</i>)	As required
By T+10	By 20:00	The <i>EMC</i> to issue the FFPS for <i>trading day T</i> .	<i>EMC</i>	<i>Market participant</i> upon whom financial penalties are to be imposed	Once per <i>business day</i>
By 20 th day after <i>trading day T</i> (subject to <i>business day convention</i>)	By 17:00	A <i>market participant</i> to pay financial penalty, specified in its FFPS issued for <i>trading day T</i> .	<i>Market participant</i> upon whom penalties are imposed	<i>EMC</i>	Once per <i>business day</i>

- D.4.2 The *EMC* shall issue a preliminary financial penalty statement to each *market participant*, for all its deviating *generation registered facilities* for all relevant *dispatch periods* for a given *trading day*, in accordance with the timeline set forth in section D.4.1.
- D.4.3 A *market participant* who is issued with a preliminary financial penalty statement shall notify the *EMC*, by way of a notice of error, of any error in such preliminary financial penalty statement within the timeline set forth in section D.4.1. A *market participant* shall not raise any error in such preliminary financial penalty statement on the grounds that one or more of the conditions in section 9.6.3 of Chapter 5 apply to its non-compliance with the relevant *dispatch instruction*.
- D.4.4 Each notice of error shall relate to only one preliminary financial penalty statement. Each notice of error shall be submitted together with all relevant supporting material, and shall clearly state at least the following information:
- D.4.4.1 the date of issuance of the relevant preliminary financial penalty statement to which the notice of error relates;
 - D.4.4.2 the *trading day* to which such preliminary financial penalty statement relates;
 - D.4.4.3 the nature and particulars of the error(s);
 - D.4.4.4 the reason(s) the *market participant* is of the view that the preliminary financial penalty statement is erroneous; and
 - D.4.4.5 a proposed correction of the error(s).
- (A notice of error submitted to the *EMC* within the timeline set forth in section D.4.1 and in compliance with all the requirements in sections D.4.3 and D.4.4 is referred to in this Appendix as a “duly submitted notice of error”.)
- D.4.5 The *EMC* shall acknowledge its receipt of a duly submitted notice of error.
- D.4.6 No *market participant* may submit a notice of error, and the *EMC* shall not acknowledge receipt or take any further action in respect of a notice of error, unless the notice of error is a duly submitted notice of error.
- D.4.7 In respect of a duly submitted notice of error, and all in accordance with the timeline set forth in section D.4.1:

- D.4.7.1 if any data alleged therein to be erroneous was provided by the *PSO*, the *EMC* shall send a request for confirmation of the accuracy of such data to the *PSO* and give a copy of such request to the *market participant* which submitted that notice of error; and
- D.4.7.2 if upon such request,
- a. the *PSO* determines that such data is accurate, the *PSO* shall send a confirmation to the *EMC* to that effect and the *PSO* shall not provide any further data to the *EMC* which is different or inconsistent with the data to which such request relates; or
 - b. the *PSO* determines that such data is inaccurate, the *PSO* shall send a confirmation to the *EMC* to that effect and the *PSO* shall send the corrected data to the *EMC*.
- D.4.8 If any data is alleged to be erroneous in a duly submitted notice of error in relation to a preliminary financial penalty statement, and such data had been provided by the *PSO*, then
- D.4.8.1 if the *PSO* has confirmed to the *EMC* that the data is accurate, or if the *PSO* did not respond to the *EMC*, in either case within the timeline set forth in section D.4.1, the *EMC* shall:
- a. so notify the *market participant* of the same and give a copy of such notice to the *PSO*;
 - b. not make any correction to such data to be reflected in the corresponding final financial penalty statement; and
 - c. not make any correction (save for any correction otherwise required under section D.4.9.2) to the financial penalty to be reflected in the corresponding final financial penalty statement; or
- D.4.8.2 if the *PSO* has confirmed to the *EMC* that the data is inaccurate and has provided the corrected data to the *EMC* within the timeline set forth in section D.4.1, the *EMC* shall:
- a. so notify the *market participant* of the same and give a copy of such notice to the *PSO*;
 - b. make the appropriate correction to reflect such corrected data in the corresponding final financial penalty statement; and

- c. make the appropriate correction to the financial penalty to be reflected in the corresponding final financial penalty statement, taking into account the corrected data and together with any other correction as may be required under section D.4.9.2.

D.4.9 If any data, calculation or other information is alleged to be erroneous in a duly submitted notice of error of a *market participant* in relation to a preliminary financial penalty statement, and such data, calculation or other information had been produced by the *EMC*, if the *EMC* determines that:

D.4.9.1 no such error has occurred, the *EMC* shall:

- a. so notify the *market participant* of the same; and
- b. not make any correction (save for any correction otherwise required under section D.4.8.2) to such data, calculation or other information when issuing the corresponding final financial penalty statement; or

D.4.9.2 an error has occurred, the *EMC* shall:

- a. so notify the *market participant* of the same; and
- b. make the appropriate correction to such error when issuing the corresponding final financial penalty statement, taking into account any corrected data provided by the *PSO* and together with any other correction as may be required under section D.4.8.2.

D.4.10 The *EMC* shall issue the final financial penalty statement to each *market participant*, for all its deviating *generation registered facilities* for all relevant *dispatch periods* for a given *trading day* and where applicable, incorporating all appropriate corrections referred to in sections D.4.8 and D.4.9, in accordance with the timeline set forth in section D.4.1. If the corrections referred to in sections D.4.8 and D.4.9 result in no financial penalty to be applied to any *dispatch period* in a given *trading day* for a *market participant* who was previously issued a preliminary financial penalty statement for that given *trading day*, then notwithstanding any provision to the contrary in this Appendix 5D, the *EMC* may issue to that *market participant* a final financial penalty statement with a zero penalty amount for that given *trading day*.

D.4.11 Each *market participant* that receives a final financial penalty statement shall pay the financial penalty as stated therein, in accordance with the timeline set forth in section D.4.1, whether or not any notice of error had been submitted in respect of the corresponding preliminary financial

penalty statement, whether or not any *notice of arbitration* had been submitted in respect of the final financial penalty statement and whether or not the *market participant* has made any appeal to the *market surveillance and compliance panel* pursuant to section D.5.1.

- D.4.12 If a *market participant*, after submitting a duly submitted notice of error with respect to its preliminary financial penalty statement, disagrees with the financial penalty stated in its corresponding final financial penalty statement and still wishes to continue to dispute the matter, it shall refer the matter to the *dispute resolution counsellor* by filing a *notice of arbitration* pursuant to section 3.9.2 of Chapter 3. A *market participant* shall not dispute the matter under this section D.4.12 on the grounds that one or more of the conditions in section 9.6.3 of Chapter 5 apply to its non-compliance with the relevant *dispatch instruction*.
- D.4.13 Subject to section D.4.14, no *market participant* may submit, and the *dispute resolution counsellor* shall not accept or take any action with respect to, a *notice of arbitration* filed pursuant to section 3.9.2 of Chapter 3 if more than twenty *business days* has elapsed since the date on which the final financial penalty statement to which the *notice of arbitration* relates was issued.
- D.4.14 A *market participant* may submit the *notice of arbitration* referred to in section D.4.12 after the time limit specified in section D.4.13 only if:
- D.4.14.1 such *market participant* has received the notification referred to in section D.5.4 in respect of one or more *dispatch periods* and it does not wish to appeal to court pursuant to section D.5.6 in respect of one or more of those *dispatch periods*, but it still wishes to dispute the final financial penalty statement in respect of one or more of those *dispatch periods*. In such case, the *market participant* shall submit such *notice of arbitration* in respect of one or more of those *dispatch periods* to the *dispute resolution counsellor* within twenty *business days* from the issuance of the notification referred to in section D.5.4. Such *notice of arbitration* shall be submitted by the *market participant* together with a copy of the notification referred to in section D.5.4; or
- D.4.14.2 such *market participant* has received the notification referred to in section D.5.4 in respect of one or more *dispatch periods* and has made an appeal to court pursuant to section D.5.6 in respect of those *dispatch periods*, but it still wishes to dispute the final financial penalty statement in respect of one or more of those *dispatch periods*. In such case, the *market participant* shall submit such *notice of arbitration* to the *dispute resolution counsellor* within twenty *business days* from the date that a

court order or judgment which is final and conclusive as between the parties is issued by a court of competent jurisdiction in Singapore. Such *notice of arbitration* shall be submitted together with a copy of such court order or judgment.

- D.4.15 The *dispute resolution counsellor* shall dismiss a *notice of arbitration* filed under section 3.9.2 of Chapter 3 and shall not take any further action with respect to the *notice of arbitration* if the element of the final financial penalty statement that is the subject-matter of the *notice of arbitration* is identical to the same element in the corresponding preliminary financial penalty statement for which element there is no duly submitted notice of error, unless the *market participant* demonstrates to the satisfaction of the *dispute resolution counsellor* that the *market participant* could not, with the exercise of due diligence, have submitted a duly submitted notice of error in respect of that element in the preliminary financial penalty statement.

Explanatory Note: A market participant is expected to file a notice of error in a timely manner if there is an error in the PFPS. If the market participant fails to file a notice of error in time, which it could have done if it had exercised due diligence, the market participant is not permitted to dispute that same error through the dispute resolution counsellor after the FFPS is issued.

D.5 APPEAL TO THE MARKET SURVEILLANCE AND COMPLIANCE PANEL

- D.5.1 The *market participant* of a deviating *generation registered facility* may appeal to the *market surveillance and compliance panel* for a refund of any financial penalties paid or required to be paid by it under the automatic financial penalty scheme detailed in this Appendix 5D if it can demonstrate to the satisfaction of the *market surveillance and compliance panel* that compliance with a *dispatch instruction* was not required pursuant to one or more of the conditions in section 9.6.3 of Chapter 5. Such appeal shall be made in writing in such form and manner as may be prescribed by the *market surveillance and compliance panel* and shall:
- D.5.1.1 contain the name and address of the *market participant* submitting the appeal;
 - D.5.1.2 contain the particulars of the appeal;
 - D.5.1.3 contain all information, facts and evidence supporting the appeal; and

D.5.1.4 be accompanied by a copy of the final financial penalty statement setting out the financial penalty which is the subject of the appeal.

A *market participant* shall not submit, and the *market surveillance and compliance panel* may dismiss, an appeal to the *market surveillance and compliance panel* if more than twenty *business days* have elapsed since the date of the issuance of such final financial penalty statement.

D.5.2 The *market surveillance and compliance panel* may request from

D.5.2.1 the *market participant* which submitted an appeal under section D.5.1;

D.5.2.2 the *EMC*; and/or

D.5.2.2 the *PSO*,

further information, facts and evidence relating to the *market participant's* appeal, to be provided in writing in such form and manner and within such time as may be specified by the *market surveillance and compliance panel*. Each recipient of such request shall provide the requested information, facts and evidence in writing in such form and manner and within such time as may be specified by the *market surveillance and compliance panel*.

D.5.3 For the avoidance of doubt, and notwithstanding section D.5.2, it shall remain the responsibility of the *market participant* which submitted an appeal under section D.5.1 to ensure that all information, facts and evidence supporting the *market participant's* appeal are duly and promptly made available to the *market surveillance and compliance panel* in accordance with section D.5.1 (and if applicable section D.5.2), and the *market surveillance and compliance panel* shall not be required to conduct its own investigations to obtain any or further information, facts or evidence in support of such appeal. Nothing in this Appendix 5D shall prevent the *market surveillance and compliance panel* from exercising its investigative powers under the *market rules* in an appropriate case.

D.5.4 If the *market surveillance and compliance panel* determines that the *market participant* referred to in section D.5.1 was not required to comply with a *dispatch instruction* for any given *dispatch period* on the ground that at least one of the conditions in section 9.6.3 of Chapter 5 applies, the *market surveillance and compliance panel* shall:

D.5.4.1 allow the *market participant's* appeal in respect of that *dispatch period* submitted under section D.5.1; and

D.5.4.2 direct the *EMC* to refund such *market participant* of the relevant financial penalty received by the *EMC* from such *market participant* for that *dispatch period*. Such financial penalty shall be refunded to the *market participant* without interest.

If the *market surveillance and compliance panel* determines that none of the conditions in section 9.6.3 of Chapter 5 applies to the non-compliance with a *dispatch instruction* by a *market participant* referred to in section D.5.1, the *market surveillance and compliance panel* shall dismiss the appeal submitted under section D.5.1. The *market surveillance and compliance panel* shall notify the *EMC* and such *market participant* of its determination under this section D.5.4 and give its reasons for such determination. The *EMC* shall *publish* such determination of the *market surveillance and compliance panel* and its reasons for such determination.

D.5.5 The *market surveillance and compliance panel* may, in the determination of an appeal submitted by a *market participant* under section D.5.1, allocate the costs associated with the appeal for payment by such *market participant* as the *market surveillance and compliance panel* deems just and reasonable.

D.5.6 All decisions, directions and orders of the *market surveillance and compliance panel* in respect of an appeal submitted under section D.5.1 shall be final and binding on the *market participant* subjected thereto and shall not be subject to any appeal by the *market participant* except an appeal to a court of competent jurisdiction in Singapore only on issues of law, jurisdiction or natural justice. For the avoidance of doubt, all findings of fact by the *market surveillance and compliance panel* shall not be the subject matter of any appeal to any court of competent jurisdiction in Singapore unless such findings were made in breach of law, jurisdiction or natural justice.

D.5.7 A *market participant* shall not appeal to any court in the circumstances contemplated in section D.5.6 unless it does so within 14 *business days* after receiving the notification from the *market surveillance and compliance panel* referred to in section D.5.4.

D.5.8 A *market participant* shall not appeal to any court in Singapore for a refund of any financial penalties paid or required to be paid by it under the automatic financial penalty scheme detailed in this Appendix 5D on the ground that one or more of the conditions in section 9.6.3 of Chapter 5 apply to its non-compliance with the relevant *dispatch instruction*, if the *market participant* had not first submitted an appeal to the *market surveillance and compliance panel* in accordance with this section D.5.

D.5.9 Neither the *market participant* referred to in section D.5.1 nor the *market surveillance and compliance panel* shall use the dispute resolution procedures set forth in section 3 of Chapter 3 in relation to such *market participant's* appeal for a refund of any financial penalties paid or required to be paid by it under the automatic financial penalty scheme detailed in this Appendix 5D.

APPENDIX E – AUTOMATIC FINANCIAL PENALTY SCHEME FOR DEVIATION BY LOAD REGISTERED FACILITIES WITH RESTRICTED ENERGY BIDS

E.1 PURPOSE

- E.1.1 This Appendix describes the automatic financial penalty scheme applicable to deviating *load registered facilities* referred to in section 3.6.3 of Chapter 5.
- E.1.2 This Appendix describes the procedures that shall be used to calculate and collect the financial penalty to be imposed on *market participants* of deviating *load registered facilities*, and to return the financial penalty collected through the MEUC. Unless otherwise indicated, the procedures described in this Appendix shall be applied for each *dispatch period*.

E.2 DEFINITIONS & INTERPRETATION

- E.2.1 In this Appendix:
- E.2.1.1 “automatic financial penalty scheme” means the financial penalty scheme which is described in and provided for under section 3.6.3 of Chapter 5 and this Appendix 5E;
- E.2.1.2 “financial penalty” means the financial penalty which is or is to be imposed under the automatic financial penalty scheme;
- E.2.1.3 “deviating *load registered facility*” or “deviating *LRF*” means the *LRF with REB* which is deemed as such under section 3.6.3 of Chapter 5;
- E.2.1.4 “notice of error” means the notice of error submitted by a *market participant* to the *EMC* pursuant to section E.4.3;
- E.2.1.5 “preliminary financial penalty statement” or “PFPS” in respect of a *market participant* means the *EMC’s* preliminary statement of the financial penalties to be paid by the *market participant* in respect of all its deviating *LRFs*;
- E.2.1.6 “final financial penalty statement” or “FFPS” in respect of a *market participant* means the *EMC’s* final statement of the financial penalties to be paid by the *market participant* in respect of all its deviating *LRFs*;

- E.2.1.7 “T” refers to a given *trading day*;
- E.2.1.8 “T+X” refers to the Xth *business day* after a given *trading day* T;
- E.2.1.9 “*LRF p*” refers to a given *load registered facility* associated with *restricted energy bid p*;
- E.2.1.10 “MEUC” refers to the monthly *energy uplift charge* which is to be estimated as provided in section 3.5.3 of Chapter 7;
- E.2.1.11 the use of superscript “p(a)” in respect of any value is a reference to the value for the *LRF with REB* associated with *restricted energy bid p* and associated with *settlement account a*;
- E.2.1.12 the use of subscript “h” in respect of any value is a reference to the value for a given *dispatch period h* or its corresponding *settlement interval h*, as the case may be; and
- E.2.1.13 the following definitions apply:

$USEP_h$ = *uniform Singapore energy price* (in \$/MWh) at the *SHUB* for the *settlement interval* corresponding to *dispatch period h*, which is to be determined as provided in section D.24.6 of Appendix 6D;

$HEUC_h$ = *hourly energy uplift charge* for the *settlement interval* corresponding to *dispatch period h*, which is to be determined in accordance with section 3.5.2A of Chapter 7;

$LCQ_h^{p(a)}$ = *load curtailment quantity* (in MWh) for *LRF p* which is associated with *settlement account a* for *dispatch period h*, which is to be determined in accordance with section L.3 of Appendix 6L;

$OIEC_h^{p(a)}$ = *offered implied energy consumption quantity* (in MWh) of *LRF p* for *dispatch period h*, which is to be determined in accordance with section L.2.2 of Appendix 6L;

$SIEC_h^{p(a)}$ = scheduled implied *energy* consumption quantity (in MWh) of *LRF* p , which is to be determined in accordance with section L.2.3 of Appendix 6L;

LCP_h = *load curtailment price* (in \$/MWh) for *dispatch period* h , which is to be determined in accordance with section L.4 of Appendix 6L, subject to sections 10.2.2 and 10.2.3 of Chapter 6;

$WLQ_h^{p(a)}$ = withdrawal *energy* quantity (in MWh) for *LRF* p for the *settlement interval* corresponding to *dispatch period* h , received from the *market support services licensee* in accordance with section 2.2.3 of Chapter 7; and

$CurtailedLoad_h^{p(a)}$ = *load curtailment* (in MW) for *LRF* p for *dispatch period* h , given by the variable $CurtailedLoad_p$ in section D.25.1.2B of Appendix 6D.

E.3 DEVIATIONS & CALCULATION OF FINANCIAL PENALTY

E.3.1 For the purposes of section 3.6.3 of Chapter 5, an *LRF with REB* shall have deviated from either its *real-time dispatch schedule* released by the *EMC* (if such *real-time dispatch schedule* was not overridden by the *PSO*), or the last *dispatch instruction* issued by the *PSO* as referred to in section 9.1.6A of Chapter 5, if:

E.3.1.1 in the case of an *LRF with REB* which is scheduled for *load curtailment* (i.e. $CurtailedLoad_h^{p(a)} > 0$ in respect of the *LRF with REB* for that *dispatch period*), the following condition is met:

$$OIEC_h^{p(a)} - WLQ_h^{p(a)} < 0.95 \times LCQ_h^{p(a)}$$

Explanatory Note: If an *LRF with REB* is scheduled for load curtailment, it is considered a deviating load registered facility if its actual load reduction (determined by the difference between its expected withdrawal based on its bids and its actual withdrawal) is less than 95 per cent of the load curtailment quantity.

E.3.1.2 in the case of an *LRF with REB* which is not scheduled for *load curtailment* (i.e. $CurtailedLoad_h^{p(a)} = 0$ in respect of the *LRF with REB* for that *dispatch period*), the following condition is met:

$$WLQ_h^{p(a)} < 0.95 \times SIEC_h^{p(a)}$$

Explanatory Note: If an LRF with REB is not scheduled for load curtailment, it is considered a deviating load registered facility if its actual energy withdrawal is less than 95 per cent of its scheduled energy withdrawal.

E.3.2 The *EMC* shall calculate the financial penalty to be imposed on a *market participant* in respect of each of its deviating *LRFs* for a given *dispatch period* as follows:

E.3.2.1 in the case of a deviating *LRF* referred to in section E.3.1.1,

$$\text{financial penalty}_h^{p(a)} = LCP_h \times LCQ_h^{p(a)}$$

E.3.2.2 in the case of a deviating *LRF* referred to in section E.3.1.2,

$$\text{financial penalty}_h^{p(a)} = \text{Max} \{2 \times (\text{USEP}_h + \text{HEUC}_h) \times (SIEC_h^{p(a)} - WLQ_h^{p(a)}), \$5000\}$$

E.4 CALCULATION AND COLLECTION OF FINANCIAL PENALTY

E.4.1 The procedures and timelines for calculation of financial penalties, submission of notices of error, verification and imposition of financial penalties on the *market participants* of the deviating *LRFs*, are set out in the following table:

Day	Time of Day	Event	Provided By	Provided To	Frequency
By T+6	By 20:00	The <i>EMC</i> to calculate, in accordance with section E.3.2, the financial penalty to be imposed on each <i>market participant</i> with one or more deviating <i>LRFs</i> for each <i>dispatch period</i> for <i>trading day T</i> , and to issue the PFPS for <i>trading day T</i> to each such <i>market participant</i> .	<i>EMC</i>	<i>Market participant</i> with one or more deviating <i>LRFs</i>	Once per <i>business day</i>
By T+7	By 17:00	A <i>market participant</i> to whom a PFPS is issued, to submit a notice of error to the <i>EMC</i> if it is of the view that there is an error with any item and/or calculation in any PFPS issued to it for <i>trading day T</i> .	<i>Market participant</i> to which the PFPS is issued	<i>EMC</i>	As required
By T+7	By 20:00	If any error alleged in a duly submitted notice of error relates to the accuracy of the data notified by the <i>PSO</i> (as referred to in sections 3.6.3.1 to 3.6.3.3 of Chapter 5), the <i>EMC</i> to request the <i>PSO</i> (and give a copy of such request to the <i>market participant</i> which submitted that notice of error) for confirmation of the accuracy of data.	<i>EMC</i>	<i>PSO</i> (with copy to <i>market participant</i> which submitted the duly submitted notice of error)	As required

Day	Time of Day	Event	Provided By	Provided To	Frequency
By T+7	By 20:00	If any data referred to in a duly submitted notice of error had been provided by the <i>market support services licensee</i> for the purposes of the <i>EMC</i> issuing a PFPS, the <i>EMC</i> to request the <i>market support services licensee</i> (and give a copy of such request to the <i>market participant</i> which submitted that notice of error) for confirmation of the accuracy of data.	<i>EMC</i>	<i>Market support services licensee</i> (with copy to <i>market participant</i> which submitted the duly submitted notice of error)	As required
By T+9	By 17:00	In respect of each request by the <i>EMC</i> for confirmation of accuracy of data as aforesaid, the <i>PSO</i> or the <i>market support services licensee</i> , as the case may be, to send confirmation to the <i>EMC</i> as required under section E.4.7.2(a), E.4.7.2(b), E.4.8.2(a) or E.4.8.2(b) as applicable.	<i>PSO</i> or the <i>market support services licensee</i> , as the case may be	<i>EMC</i>	As required
By T+9	By 20:00	The <i>EMC</i> to notify the <i>market participant</i> which submitted a duly submitted notice of error, of the matters specified in sections E.4.9.1(a), E.4.9.2(a), E.4.10.1.(a) and E.4.10.2(a) as applicable.	<i>EMC</i>	<i>Market participant</i> which submitted the duly submitted notice of error (with copy to the <i>PSO</i> or the <i>market</i>)	As required

Day	Time of Day	Event	Provided By	Provided To	Frequency
				<i>suppose services licensee as the case may be)</i>	
By T+10	By 20:00	The <i>EMC</i> to issue the FFPS for <i>trading day T</i> .	<i>EMC</i>	<i>Market participant</i> upon whom financial penalties are to be imposed	Once per <i>business day</i>
By 20 th day after <i>trading day T</i> (subject to <i>business day convention</i>)	By 17:00	A <i>market participant</i> to pay the financial penalty specified in its FFPS issued for <i>trading day T</i> .	<i>Market participant</i> upon whom penalties are imposed	<i>EMC</i>	Once per <i>business day</i>

- E.4.2 The *EMC* shall issue a preliminary financial penalty statement to each *market participant*, for all its deviating *LRFs* for all relevant *dispatch periods* for a given *trading day*, in accordance with the timeline set forth in section E.4.1.
- E.4.3 A *market participant* who is issued with a preliminary financial penalty statement shall notify the *EMC*, by way of a notice of error, of any error in such preliminary financial penalty statement within the timeline set forth in section E.4.1. A *market participant* shall not raise any error in such preliminary financial penalty statement on the grounds that one or more of the conditions in section 9.6.3 of Chapter 5 apply to its non-compliance with the relevant *dispatch instruction*.
- E.4.4 Each notice of error shall relate to only one preliminary financial penalty statement. Each notice of error shall be submitted together with all relevant supporting material, and shall clearly state at least the following information:
- E.4.4.1 the date of issuance of the relevant preliminary financial penalty statement to which the notice of error relates;
 - E.4.4.2 the *trading day* to which such preliminary financial penalty statement relates;
 - E.4.4.3 the nature and particulars of the error(s);
 - E.4.4.4 the reason(s) the *market participant* is of the view that the preliminary financial penalty statement is erroneous; and
 - E.4.4.5 a proposed correction of the error(s).
- (A notice of error submitted to the *EMC* within the timeline set forth in section E.4.1 and in compliance with all the requirements in sections E.4.3 and E.4.4 is referred to in this Appendix as a “duly submitted notice of error”.)
- E.4.5 The *EMC* shall acknowledge its receipt of a duly submitted notice of error.
- E.4.6 No *market participant* may submit a notice of error, and the *EMC* shall not acknowledge receipt or take any further action in respect of a notice of error, unless the notice of error is a duly submitted notice of error.

- E.4.7 In respect of a duly submitted notice of error, and all in accordance with the timeline set forth in section E.4.1:
- E.4.7.1 if any error alleged therein relates to the accuracy of the data notified by the *PSO* (as referred to in sections 3.6.3.1 to 3.6.3.3 of Chapter 5), the *EMC* shall send a request for confirmation of the accuracy of such data to the *PSO* and give a copy of such request to the *market participant* which submitted that notice of error; and
- E.4.7.2 if upon such request,
- a. the *PSO* determines that such data is accurate, the *PSO* shall send a confirmation to the *EMC* to that effect and the *PSO* shall not provide any further data to the *EMC* which is different or inconsistent with the data to which such request relates; or
 - b. the *PSO* determines that such data is inaccurate, the *PSO* shall send a confirmation to the *EMC* to that effect and the *PSO* shall send the corrected data to the *EMC*.
- E.4.8 In respect of a duly submitted notice of error, and all in accordance with the timeline set forth in section E.4.1:
- E.4.8.1 if any data alleged therein to be erroneous was provided by the *market support services licensee*, the *EMC* shall send a request for confirmation of the accuracy of such data to the *market support services licensee* and give a copy of such request to the *market participant* which submitted that notice of error; and
- E.4.8.2 if upon such request,
- a. the *market support services licensee* determines that such data is accurate, the *market support services licensee* shall send a confirmation to the *EMC* to that effect and the *market support services licensee* shall not provide any further data to the *EMC* which is different or inconsistent with the data to which such request relates; or
 - b. the *market support services licensee* determines that such data is inaccurate, the *market support services licensee* shall send a confirmation to the *EMC* to that effect and the *market support services licensee* shall send the corrected data to the *EMC*.
- E.4.9 If any data is alleged to be erroneous in a duly submitted notice of error in relation to a preliminary financial penalty statement, and such data had

been notified by the *PSO* or provided by the *market support services licensee*, then

E.4.9.1 if the *PSO* or the *market support services licensee*, as the case may be, has confirmed to the *EMC* that the data is accurate, or if the *PSO* or the *market support services licensee*, as the case may be, did not respond to the *EMC*, in either case within the timeline set forth in section E.4.1, the *EMC* shall:

- a. so notify the *market participant* of the same and give a copy of such notice to the *PSO* or the *market support services licensee*, as the case may be;
- b. not make any correction to such data to be reflected in the corresponding final financial penalty statement; and
- c. not make any correction (save for any correction otherwise required under section E.4.10.2) to the financial penalty to be reflected in the corresponding final financial penalty statement; or

E.4.9.2 if the *PSO* or the *market support services licensee*, as the case may be, has confirmed to the *EMC* that the data is inaccurate and has provided the corrected data to the *EMC* within the timeline set forth in section E.4.1, the *EMC* shall:

- a. so notify the *market participant* of the same and give a copy of such notice to the *PSO* or the *market support services licensee*, as the case may be;
- b. make the appropriate correction to reflect such corrected data in the corresponding final financial penalty statement; and
- c. make the appropriate correction to the financial penalty to be reflected in the corresponding final financial penalty statement, taking into account the corrected data and together with any other correction as may be required under section E.4.10.2.

E.4.10 If any data, calculation or other information is alleged to be erroneous in a duly submitted notice of error of a *market participant* in relation to a preliminary financial penalty statement, and such data, calculation or other information had been produced by the *EMC*, if the *EMC* determines, taking into account any corrected *metering data* or other information (if any) which the *EMC* receives prior to such determination, that:

E.4.10.1 no such error has occurred, the *EMC* shall:

- a. so notify the *market participant* of the same; and
- b. not make any correction to such data, calculation or other information when issuing the corresponding final financial penalty statement; or

E.4.10.2 an error has occurred, the *EMC* shall:

- a. so notify the *market participant* of the same; and
- b. make the appropriate correction to such error when issuing the corresponding final financial penalty statement, taking into account any corrected data and together with any other correction as may be required under section E.4.9.2.

E.4.11 The *EMC* shall issue the final financial penalty statement to each *market participant*, for all its deviating *LRFs* for all relevant *dispatch periods* for a given *trading day* and where applicable:

E.4.11.1 incorporating all appropriate corrections referred to in sections E.4.9 and E.4.10; and

E.4.11.2 taking into account all corrected *metering data* or other information (if any) which the *EMC* receives prior to issuance of the final financial penalty statement,

in accordance with the timeline set forth in section E.4.1. The *EMC* may, on its own initiative, also issue a final financial penalty statement if no preliminary financial penalty statement was issued based on any data or information referred to in section E.4.11.2, in accordance with the timeline set forth in section E.4.1. If the corrections referred to in sections E.4.9 and E.4.10 and any corrected *metering data* or other information received by the *EMC* result in no financial penalty to be applied to any *dispatch period* in a given *trading day* for a *market participant* who was previously issued a preliminary financial penalty statement for that given *trading day*, then notwithstanding any provision to the contrary in this Appendix 5E, the *EMC* may issue to that *market participant* a final financial penalty statement with a zero penalty amount for that given *trading day*.

- E.4.12 Each *market participant* that receives a final financial penalty statement shall pay the financial penalty as stated therein, in accordance with the timeline set forth in section E.4.1, whether or not any notice of error had been submitted in respect of the corresponding preliminary financial penalty statement, whether or not any *notice of arbitration* had been submitted in respect of the final financial penalty statement and whether or not the *market participant* has made any appeal to the *market surveillance and compliance panel* pursuant to section E.5.1.
- E.4.13 If a *market participant*, after submitting a duly submitted notice of error with respect to its preliminary financial penalty statement, disagrees with the financial penalty stated in its corresponding final financial penalty statement and still wishes to continue to dispute the matter, it shall refer the matter to the *dispute resolution counsellor* by filing a *notice of arbitration* pursuant to section 3.9.2 of Chapter 3. A *market participant* shall not dispute the matter under this section E.4.13 on the grounds that one or more of the conditions in section 9.6.3 of Chapter 5 apply to its non-compliance with the relevant *dispatch instruction*.
- E.4.14 Subject to section E.4.15, no *market participant* may submit, and the *dispute resolution counsellor* shall not accept or take any action with respect to, a *notice of arbitration* filed pursuant to section 3.9.2 of Chapter 3 if more than twenty *business days* has elapsed since the date on which the final financial penalty statement to which the *notice of arbitration* relates was issued.
- E.4.15 A *market participant* may submit the *notice of arbitration* referred to in section E.4.13 after the time limit specified in section E.4.14 only if:
- E.4.15.1 such *market participant* has received the notification referred to in section E.5.4 in respect of one or more *dispatch periods* and it does not wish to appeal to court pursuant to section E.5.7 in respect of one or more of those *dispatch periods*, but it still wishes to dispute the final financial penalty statement in respect of one or more of those *dispatch periods*. In such case, the *market participant* shall submit such *notice of arbitration* in respect of one or more of those *dispatch periods* to the *dispute resolution counsellor* within twenty *business days* from the issuance of the notification referred to in section E.5.4. Such *notice of arbitration* shall be submitted by the *market participant* together with a copy of the notification referred to in section E.5.4; or
- E.4.15.2 such *market participant* has received the notification referred to in section E.5.4 in respect of one or more *dispatch periods* and has made an appeal to court pursuant to section E.5.7 in respect of those *dispatch periods*, but it still wishes to dispute the final

financial penalty statement in respect of one or more of those *dispatch periods*. In such case, the *market participant* shall submit such *notice of arbitration* to the *dispute resolution counsellor* within twenty *business days* from the date that a court order or judgment which is final and conclusive as between the parties is issued by a court of competent jurisdiction in Singapore. Such *notice of arbitration* shall be submitted together with a copy of such court order or judgment.

- E.4.16 The *dispute resolution counsellor* shall dismiss a *notice of arbitration* filed pursuant to section 3.9.2 of Chapter 3 and shall not take any further action with respect to the *notice of arbitration* if the element of the final financial penalty statement that is the subject-matter of the *notice of arbitration* is identical to the same element in the corresponding preliminary financial penalty statement for which element there is no duly submitted notice of error, unless the *market participant* demonstrates to the satisfaction of the *dispute resolution counsellor* that the *market participant* could not, with the exercise of due diligence, have submitted a duly submitted notice of error in respect of that element in the preliminary financial penalty statement.

Explanatory Note: A market participant is expected to file a notice of error in a timely manner if there is an error in the PFPS. If the market participant fails to file a notice of error in time, which it could have done if it had exercised due diligence, the market participant is not permitted to dispute that same error through the dispute resolution counsellor after the FFPS is issued.

E.5 APPEAL TO THE MARKET SURVEILLANCE AND COMPLIANCE PANEL

- E.5.1 The *market participant* of a deviating *LRF* may appeal to the *market surveillance and compliance panel* for a refund of any financial penalties paid or required to be paid by it under the automatic financial penalty scheme detailed in this Appendix 5E if it can demonstrate to the satisfaction of the *market surveillance and compliance panel* that compliance with a *dispatch instruction* was not required pursuant to section 9.6.3 of Chapter 5 on the ground(s) that such compliance would endanger the safety of any person and/or violate any *applicable law*. Such appeal shall be made in writing in such form and manner as may be prescribed by the *market surveillance and compliance panel* and shall:
- E.5.1.1 contain the name and address of the *market participant* submitting the appeal;
 - E.5.1.2 contain the full particulars of the grounds of appeal;

- E.5.1.3 contain all information, facts and evidence supporting the appeal; and
- E.5.1.4 be accompanied by a copy of the final financial penalty statement setting out the financial penalty which is the subject of the appeal.

A market participant shall not submit, and the market surveillance and compliance panel may dismiss, an appeal to the market surveillance and compliance panel if more than twenty business days have elapsed since the date of the issuance of such final financial penalty statement.

- E.5.2 The *market surveillance and compliance panel* may request from
 - E.5.2.1 the *market participant* which submitted an appeal under section E.5.1;
 - E.5.2.2 the *EMC*;
 - E.5.2.3 the *PSO*; and/or
 - E.5.2.4 the *market support services licensee*,

further information, facts and evidence relating to the market participant's appeal, to be provided in writing in such form and manner and within such time as may be specified by the market surveillance and compliance panel. Each recipient of such request shall provide the requested information, facts and evidence in writing in such form and manner and within such time as may be specified by the market surveillance and compliance panel.

- E.5.3 For the avoidance of doubt, and notwithstanding section E.5.2, it shall remain the responsibility of the *market participant* which submitted an appeal under section E.5.1 to ensure that all information, facts and evidence supporting the *market participant's* appeal are duly and promptly made available to the *market surveillance and compliance panel* in accordance with section E.5.1 (and if applicable section E.5.2), and the *market surveillance and compliance panel* shall not be required to conduct its own investigations to obtain any or further information, facts or evidence in support of such appeal. Nothing in this Appendix 5E shall prevent the *market surveillance and compliance panel* from exercising its investigative powers under the *market rules* in an appropriate case.
- E.5.4 If the *market surveillance and compliance panel* determines that the *market participant* referred to in section E.5.1 was not required to comply with a *dispatch instruction* for any given *dispatch period* pursuant to section 9.6.3 of Chapter 5 on the ground(s) that such compliance would

endanger the safety of any person and/or violate any *applicable law*, the *market surveillance and compliance panel* shall:

- E.5.4.1 allow the *market participant's* appeal in respect of that *dispatch period* submitted under section E.5.1; and
- E.5.4.2 direct the *EMC* to refund such *market participant* of the relevant financial penalty received by the *EMC* from such *market participant* for that *dispatch period*. Such financial penalty shall be refunded to the *market participant* without interest.

If the *market surveillance and compliance panel* determines that:

- E.5.4.3 the *market participant* is not exempted from compliance with a *dispatch instruction* pursuant to section 9.6.3 of Chapter 5 on the ground that such compliance would endanger the safety of any person; and
- E.5.4.4 the *market participant* is not exempted from compliance with a *dispatch instruction* pursuant to section 9.6.3 of Chapter 5 on the ground that such compliance would violate any *applicable law*,

the *market surveillance and compliance panel* shall dismiss the appeal submitted under section E.5.1. The *market surveillance and compliance panel* shall notify the *EMC* and such *market participant* of its determination under this section E.5.4 and give its reasons for such determination. The *EMC* shall *publish* such determination of the *market surveillance and compliance panel* and its reasons for such determination.

- E.5.5 The *market surveillance and compliance panel* may, in the determination of an appeal submitted by a *market participant* under section E.5.1, allocate the costs associated with the appeal for payment by such *market participant* as the *market surveillance and compliance panel* deems just and reasonable.
- E.5.6 A *market participant* shall not appeal to the *market surveillance and compliance panel* under this section E.5 on the ground that compliance with a *dispatch instruction* would substantially damage equipment. The *market surveillance and compliance panel* shall dismiss any appeal submitted under this section E.5 if the sole ground for that appeal is that compliance with a *dispatch instruction* would substantially damage equipment.
- E.5.7 All decisions, directions and orders of the *market surveillance and compliance panel* in respect of an appeal submitted under section E.5.1 shall be final and binding on the *market participant* subjected thereto and

shall not be subject to any appeal by the *market participant* except an appeal to a court of competent jurisdiction in Singapore only on issues of law, jurisdiction or natural justice. For the avoidance of doubt, all findings of fact by the *market surveillance and compliance panel* shall not be the subject matter of any appeal to any court of competent jurisdiction in Singapore unless such findings were made in breach of law, jurisdiction or natural justice.

- E.5.8 A *market participant* shall not appeal to any court in the circumstances contemplated in section E.5.7 unless it does so within 14 *business days* after receiving the notification from the *market surveillance and compliance panel* referred to in section E.5.4.
- E.5.9 A *market participant* shall not appeal to any court in Singapore for a refund of any financial penalties paid or required to be paid by it under the automatic financial penalty scheme detailed in this Appendix 5E on the ground that one or more of the conditions in section 9.6.3 of Chapter 5 apply to its non-compliance with the relevant *dispatch instruction*, if the *market participant* had not first submitted an appeal to the *market surveillance and compliance panel* in accordance with this section E.5.
- E.5.10 Neither the *market participant* referred to in section E.5.1 nor the *market surveillance and compliance panel* shall use the dispute resolution procedures set forth in section 3 of Chapter 3 in relation to such *market participant's* appeal for a refund of any financial penalties paid or required to be paid by it under the automatic financial penalty scheme detailed in this Appendix 5E.

Singapore Electricity Market Rules

Chapter 6 Market Operation

Energy Market Authority

1 January 2022

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1 INTRODUCTION

1.1 INTRODUCTION AND INTERPRETATION

- 1.1.1 This Chapter sets forth the obligations and responsibilities of the *EMC*, the *PSO* and *market participants* relative to the establishment, operation and suspension of the *real-time markets* and the *procurement markets*, including:
- 1.1.1.1 the submission of *standing offers*, *standing bids*, *offer variations* and *bid variations* by *market participants*;
 - 1.1.1.2 the operation of the *market clearing engine*;
 - 1.1.1.3 the development of *market outlook scenarios*, *pre-dispatch schedules* and *short-term schedules* and the associated pricing schedules;
 - 1.1.1.4 the development of *real-time dispatch schedules* and *real-time pricing schedules*;
 - 1.1.1.5 the issuance of *advisory notices*; and
 - 1.1.1.6 the description of data to be provided to the settlement process.
- 1.1.2 The provisions in respect of *load registered facilities* in this Chapter shall not be construed and applied to any *load registered facility* except that if the *EMC* has *published* a notice referred to in section 5.1.2.2 of Chapter 2, the provisions in respect of *load registered facilities* in this Chapter shall, to the extent applicable and from the effective date specified in that notice, then be construed and applied to the type of *load registered facilities* referred to in that notice.

1.2 MARKET SUSPENSION

- 1.2.1 The *Authority* may, on its own initiative or at the request of the *EMC*, declare the suspension of and suspend the operation of the *real-time markets* and the *procurement markets* if:
- 1.2.1.1 the Government of Singapore has declared or has announced that it anticipates that it will declare a state of emergency;
 - 1.2.1.2 there is a declaration or outbreak of war in or involving Singapore;
 - 1.2.1.3 there is a significant and continuing degradation of the *power system* as the result of a natural or man made disaster;

1.2.1.4 the *Authority* receives notification from the *EMC* that circumstances have arisen, other than the inability of the *EMC* to meet its financial obligations under the *market rules*, which mean that it is no longer possible or practical for the *EMC* to comply with its non-financial functions and duties or meet its non-financial obligations under the *market rules*; or

1.2.1.5 following receipt of a request by the *EMC* made under section 1.2.2 if the *Authority* is satisfied that the condition set forth in that section has been met,

and the *Authority* determines, in its sole discretion, that the ability of the *EMC* to operate the *real-time markets* and the *procurement markets* has, as a result, been materially detrimentally affected thereby.

1.2.2 The *EMC* may request that the *Authority* suspend the operation of the *real-time markets* and the *procurement markets* if an emergency situation has required or will imminently require the *EMC*, the *PSO* or both to evacuate their respective principal control centres and move into their respective back-up control centres.

1.2.3 A suspension of the operation of the *real-time markets* and the *procurement markets* shall take effect:

1.2.3.1 immediately upon a declaration to that effect being made by the *Authority* pursuant to section 1.2.1; or

1.2.3.2 at such later time as the *Authority* may specify in such declaration.

No suspension of the operation of the *real-time markets* and the *procurement markets* shall have effect retroactively to a time prior to such declaration.

1.2.4 The *Authority* shall, if it suspends the operation of the *real-time markets* and the *procurement markets* pursuant to section 1.2.1:

1.2.4.1 notify all *electricity licensees* of the suspension as soon as practicable and by such means as the *Authority* considers appropriate and notify all *electricity licensees* of:

a. the cause of the suspension;

b. the expected duration of the suspension if such duration is known or can reasonably be estimated; and

- c. description of the manner in which facilities will be *dispatched* and *market participants* and *market support services licensees* will be *settled* under section 1.2.5;
 - 1.2.4.2 continuously monitor the circumstances which gave rise to the suspension;
 - 1.2.4.3 in conjunction with the *EMC*, take such measures or direct that such measures be taken as may mitigate the events or circumstances which gave rise to the suspension or mitigate the effects of such events or circumstances on the operation of the *real-time markets* and the *procurement markets* for the purpose and with the intent of permitting the resumption of the operation of the *real-time markets* and the *procurement markets* at the earliest opportunity;
 - 1.2.4.4 make every endeavour to restore or to have restored the operation of the *real-time markets* and the *procurement markets* as soon as possible after the events or circumstances which gave rise to the suspension have abated sufficiently or may be expected to cease to have a materially detrimental effect on the operation of the *real-time markets* and the *procurement markets*; and
 - 1.2.4.5 notify *electricity licensees* of the *dispatch period* in which the operation of the *real-time markets* and the *procurement markets* will be resumed as long in advance of such resumption as practicable but in any event no less than one hour prior to such resumption.
- 1.2.5 While a suspension of the operation of the *real-time markets* and the *procurement markets* is in effect:
 - 1.2.5.1 facilities shall be *dispatched*;
 - 1.2.5.2 *market participants* shall be *settled* for *physical services* injected onto the *transmission system*; and
 - 1.2.5.3 *market participants* and *market support services licensees* shall be *settled* for *physical services* withdrawn from the *transmission system*,

in accordance with the manner and on the basis of prices determined by the *Authority* in consultation with the *EMC* and the *PSO*. Such prices may be determined by means of the fixing of their amounts or by reference to a formula or method of calculation *published* in accordance with Section 1.2.5A.

- 1.2.5A On the day that this section shall come into force, the *Authority* shall provide to the *EMC* for *publication*, the formula or method of calculation for determining prices when the operation of the *real-time markets* and/or the *procurement markets* are suspended. This formula or method of calculation may be revised from time to time and any such revisions shall be provided by the *Authority* to the *EMC* for *publication*.
- 1.2.6 Each *market participant* and *market support services licensee* shall promptly provide the *Authority*, the *EMC* or the *PSO*, as the case may be, with such information that each may request immediately prior to, during or following the suspension of the operation of the *real-time markets* or the *procurement markets* in order to assist in or facilitate:
- 1.2.6.1 the *dispatch* of facilities while a suspension of the operation of the *real-time markets* and the *procurement markets* is in effect;
 - 1.2.6.2 *settlement* in respect of any *physical services* injected onto or withdrawn from the *transmission system* while a suspension of the operation of the *real-time markets* and the *procurement markets* is in effect;
 - 1.2.6.3 the resumption of operation of the *real-time markets* and the *procurement markets*; and
 - 1.2.6.4 the preparation of the report referred to in section 1.2.9.
- 1.2.7 Each *market participant* and *market support services licensee* shall comply with any and all directions issued to it by the *Authority*, the *EMC* or the *PSO* while a suspension of the operation of the *real-time markets* and the *procurement markets* is in effect.
- 1.2.8 Where the *Authority* determines, on its own initiative or upon receipt of information from the *EMC* or the *PSO*, that one or more corrective measures are required by the *EMC*, *market participants* or *market support services licensees* to avoid the recurrence of a suspension of the operation of the *real-time markets* and the *procurement markets*, the *Authority* may direct the *EMC* or the affected *market participants* or *market support services licensees* to implement the corrective measures and the *EMC* or the affected *market participants* or *market support services licensees* shall implement the corrective measures as soon as practicable.

- 1.2.9 The *Authority* shall, as soon as reasonably practicable following the resumption of operation of the *real-time markets* and the *procurement markets* prepare, in consultation with the *EMC* and the *PSO*, and *publish* a report describing:
- 1.2.9.1 the reason for the suspension of the operation of the *real-time markets* and the *procurement markets*;
 - 1.2.9.2 the steps taken by the *Authority*, the *EMC* and the *PSO* during the period of suspension of the operation of the *real-time markets* and the *procurement markets* to ensure the *reliable* operation of the *power system* and to remedy the causes or effects on the *real-time markets* and the *procurement markets* of the suspension;
 - 1.2.9.3 the actions of *market participants* and *market support services licensees* during the suspension of the operation of the *real-time markets* and the *procurement markets*; and
 - 1.2.9.4 any conclusions or recommendations for avoiding similar suspension of the operation of the *real-time markets* and the *procurement markets* in the future.

2 SYSTEM REPRESENTATION

2.1 DISPATCH NETWORK DATA

Explanatory Note: The dispatch network is the representation of the Singaporean network used for dispatch purposes. It comprises dispatch network nodes and dispatch network lines. Most dispatch network nodes will not have market transactions occurring at them because there will be no generators or consumers at those dispatch network nodes. A separate set of nodes, called market network nodes, is described below. The market network nodes correspond to nodes at which market transactions occur. A market network node could be defined to be a dispatch network node, or there could be several market network nodes (representing different facilities offering into the market) at a single dispatch network node. While the Market Clearing Engine explicitly represents dispatch network nodes when determining power flows etc, the market network node prices are derived as part of a post-processing exercise. These rules allow the flexibility to define market network nodes in many different ways.

The dispatch network will be based on EMS data, but the rules and systems do allow (but do not require) simplifications in this representation if this is considered desirable (e.g. to make the software run faster).

- 2.1.1 The *EMC* shall establish, prior to the *market commencement date* and in consultation with the *PSO*, and shall thereafter maintain and, in consultation with the *PSO*, update as required, requirements for *dispatch network data*, which requirements shall be consistent with the equations describing the *dispatch network* in Appendix 6D, and shall communicate such requirements and updated requirements to the *PSO*.
- 2.1.2 The *PSO* shall establish, prior to the *market commencement date* and in consultation with the *EMC*, and shall thereafter maintain and, in consultation with the *EMC*, update as required *dispatch network data* consistent with the requirements for *dispatch network data* specified by the *EMC* pursuant to section 2.1.1. Such *dispatch network data* shall comprise a representation of all *dispatch network lines*, *dispatch network nodes* and facilities forming part of or *connected* to the *PSO controlled system* which:
- 2.1.2.1 the *PSO* considers may be *connected* in such a manner as to materially affect the *dispatch* of facilities pursuant to this Chapter; or
 - 2.1.2.2 the *EMC* requires to be included for purposes of the operation of the *real-time markets*.

- 2.1.3 *Dispatch network lines* and *dispatch network nodes* need not correspond exactly to physical *electricity lines* or *nodes*. In establishing or updating the requirements for *dispatch network data* the EMC may, in consultation with the PSO, simplify or expand the representation of the physical network in ways that do not materially affect scheduling, pricing or *settlement*, but that simplify the scheduling, pricing or *settlement* processes.

Explanatory Note: The dispatch network is used to determine the schedules used by the PSO and determines the prices which the EMC applies, possibly with transformations, to market network nodes. For this reason, both the EMC and the PSO must have input to the dispatch network representation.

- 2.1.4 The PSO shall specify and *publish*, prior to the *market commencement date*, and shall thereafter maintain, update and re-*publish* as required, any *generic constraints* that are likely to arise, which *generic constraints* shall be consistent with the *generic constraint* equations in Appendix 6D.

- 2.1.5 The PSO shall, prior to the *market commencement date*:

2.1.5.1 establish the minimum total requirements for each *reserve class* in accordance with section 4.5.3 of Chapter 5;

2.1.5.2 establish the total requirements for *regulation* in accordance with section 4.4.4 of Chapter 5;

2.1.5.3 establish *reserve provider groups*, each of which is associated with a single *reserve class*, and the criteria by which prospective *reserve providers* will be assigned to such *reserve provider groups* in accordance with section 4.6.1 of Chapter 5; and

2.1.5.4 establish parameters describing the effectiveness of each *reserve provider group* in meeting the *reserve* requirements for its *reserve class* in accordance with section 4.6.3 of Chapter 5,

and shall thereafter maintain and update as required the elements described in this section 2.1.5.

- 2.1.6 The PSO shall update all data and elements described in sections 2.1.2 to 2.1.5:

2.1.6.1 in the manner and at the times required by this Chapter; and

2.1.6.2 in any event, in a timely fashion as may otherwise be required to reflect temporary or permanent changes in the

structure, capacity and operation of the *PSO controlled system*.

- 2.1.7 The *PSO* shall, prior to the *market commencement date*, establish such systems and procedures, and train such staff, as may be necessary to allow the *PSO* to provide to the *EMC*, on a continuous basis as required by sections 6.1 and 8.1, the data referred to in those sections so as to enable the *EMC* to determine forecasts and schedules in accordance with this Chapter.

2.2 IMPORT AND EXPORT LIMITS

- 2.2.1 The *Authority* shall, prior to the *market commencement date*, establish an *import limit* for Singapore, which shall be a limit on the total net *energy flows* into Singapore across all *connections*, including *interties*, from facilities outside of Singapore. The *import limit* shall be communicated by the *Authority* to the *EMC* and the *EMC* shall *publish* the *import limit*.
- 2.2.2 The *Authority* may, from time to time revise the *import limit* in consultation with *market participants*. Such revised *import limits* shall be communicated by the *Authority* to the *EMC* and the *EMC* shall *publish* the revised *import limit*.
- 2.2.3 The *Authority* shall, prior to the *market commencement date*, establish an *export limit* for Singapore, which shall be a limit on the total net *energy flows* out of Singapore across all *connections*, including *interties*, to facilities outside of Singapore. The *export limit* shall be communicated by the *Authority* to the *EMC* and the *EMC* shall *publish* the *export limit*.
- 2.2.4 The *Authority* may, from time to time revise the *export limit* in consultation with *market participants*. Such revised *export limits* shall be communicated by the *Authority* to the *EMC* and the *EMC* shall *publish* the revised *export limit*.

2.3 CONSTRAINT VIOLATIONS

- 2.3.1 The *PSO* shall, prior to the *market commencement date* and in consultation with the *EMC* and the *rules change panel*, establish any *constraint violation costs*, except those specified in Appendix 6J, as the *EMC* determines may be required to ensure that the *market clearing engine* can always determine a solution.
- 2.3.2 The *PSO* shall, in consultation with the *rules change panel*, from time to time review the *constraint violation costs* referred to in section 2.3.1 and may, after any such review, alter their values.
- 2.3.3 A *constraint violation cost* established or altered by the *PSO* pursuant to section 2.3.1 or 2.3.2 may comprise a range of values to be applied in different circumstances in that their application may vary depending on the extent of the violation of a given constraint.
- 2.3.4 The *PSO* shall communicate the *constraint violation costs* established pursuant to section 2.3.1 and any alteration to their values made pursuant to section 2.3.2 to the *EMC*, and the *EMC* shall *publish* the values.

3 EMC RESPONSIBILITIES

3.1 MARKET NETWORK NODES

Explanatory Note: The Market Network Nodes (MNNs) represent those nodes at which market transactions take place. Thus a dispatch network node (DNN) with no load or generation will not be represented as a MNN. A MNN will be associated with each different schedulable resource to be settled. Thus if there are 5 different meters corresponding to different facilities at a dispatch network node then there will need to be 5 MNNs associated with that dispatch network node. While this feature has been defined to allow maximum generality, the fact that loads are settled at a single location (the SHUB) will mean that the distinction between MNNs and DNNs will be most relevant for generators.

- 3.1.1 The *EMC* shall define a set of *market network nodes* or *MNN* having the following characteristics:
- 3.1.1.1 at each *market network node* there shall be either a single *revenue quality meter* measuring all relevant flows into or out of that *market network node*, or a process by which the flows measured by one or more *revenue quality meters* can be transformed to determine the *deemed flow* at that *market network node*; and
 - 3.1.1.2 each *market network node* shall be associated with only one *market participant*.
- 3.1.2 Only one *market participant* shall, for *settlement* purposes, be assigned to and responsible for making or receiving *settlement amounts* in respect of the metered flow or the *deemed flow* at a given *MNN*.
- 3.1.3 The *EMC* shall:
- 3.1.3.1 establish the necessary parameters for relating *dispatch network nodes* and *market network nodes* to all *generation registered facilities* and *generation settlement facilities* in accordance with section D.7 of Appendix 6D;
 - 3.1.3.2 develop software and procedures to perform the price transformations described in sections D.7 and D.24 of Appendix 6D; and
 - 3.1.3.3 *publish* the names of the *market network nodes* and the identity of the *revenue quality meter* assigned to each *market network node*.

- 3.1.4 The *EMC* shall maintain and update as required the elements described in section 3.1.3, including *publishing* changes to any information previously *published* pursuant to section 3.1.3.3.

3.2 FORECASTING SYSTEMS

- 3.2.1 The *EMC* shall establish such systems and procedures, and train such staff, as may be necessary to allow the *EMC* to transform, on a regular basis as required by sections 7.2.1 and 9.1.1, *load* forecasts for Singapore received from the *PSO* for each *dispatch period* into *nodal load forecasts* for the same *dispatch period*. The methodology, including revisions thereto, for transforming *load* forecasts for Singapore received from the *PSO* into *nodal load forecasts* shall be published by the *EMC*.

3.3 MARKET CLEARING ENGINE

- 3.3.1 The *EMC* shall develop, test, and implement the *market clearing engine*, which shall:
- 3.3.1.1 employ linear programming to maximise the net gains from trade between *market participants*, as defined by their *offers*, given the conditions and requirements assumed for any *dispatch period*;
 - 3.3.1.2 implement the formulation specified in Appendix 6D, employing such approximations as may be necessary to provide a sufficient approximation of physical reality for scheduling purposes within a linear programming framework;
 - 3.3.1.3 be capable of always producing a solution within a timeframe that allows the *EMC* and the *PSO* to perform their respective obligations under these *market rules* in a timely manner;
 - 3.3.1.4 accept as input the data referred to in Appendix 6B;
 - 3.3.1.5 produce *dispatch schedules* for each *dispatch period* containing the data referred to in section C.2 of Appendix 6C;
 - 3.3.1.6 produce *price schedules* for each *dispatch period* containing the data referred to in sections C.3.1 of Appendix 6C; and
 - 3.3.1.7 produce additional reports containing the data referred to in section C.4 of Appendix 6C.

3.4 DATA SUBMISSION PROCESS

3.4.1 The *EMC* shall establish, *publish* in the applicable *market manual* and implement a process for the submission and validation of the following data:

3.4.1.1 *standing offers* for energy, reserve and regulation;

3.4.1.2 *offer variations* for energy, reserve and regulation;

3.4.1.2A *standing bids* for energy;

3.4.1.2B *bid variations* for energy; and

3.4.1.3 *standing capability data*.

Explanatory Note: Standing offers, standing bids, offer variations and bid variations will be submitted and validated via computer without human intervention. Modifications to standing capability data will be quite infrequent and the data in question must be certified by the PSO, so this information will be entered manually by the EMC.

3.4.2 Validation by the *EMC* of *standing offers*, *standing bids*, *offer variations*, *bid variations* and *standing capability data* shall be limited to determining whether:

3.4.2.1 they are in the form and contain the information required by the *market rules* and any applicable *market manual*;

3.4.2.2 they are submitted in the manner and within the time prescribed by the *market rules* and any applicable *market manual*;

3.4.2.3 in the case of *standing capability data*, it has been approved by the *PSO* in accordance with section 4.2; and

3.4.2.4 in the case of *standing offers*, *standing bids*, *offer variations*, and *bid variations*, they are in accordance with the corresponding *standing capability data* to the extent described in sections 5.2 to 5.4,

and the applicable *dispatch coordinator* shall be responsible for ensuring that such *standing offers*, *standing bids*, *offer variations*, *bid variations* and *standing capability data* comply with the *market rules* and all applicable *market manuals*.

3.5 ELECTRONIC COMMUNICATIONS SYSTEM

- 3.5.1 The *EMC* shall have an *electronic communications system* that allows for:
- 3.5.1.1 the submission of *standing offers, standing bids, offer variations* and *bid variations* by *dispatch coordinators*;
 - 3.5.1.2 the communication by the *EMC* to each *dispatch coordinator* of the acceptance or rejection of *standing offers, standing bids, offer variations* and *bid variations*;
 - 3.5.1.3 the issuance by the *EMC* of *market outlook scenarios, pre-dispatch schedules, short-term schedules* and *real-time dispatch schedules* and the associated pricing schedules,
- on a timely basis and in a manner consistent with these *market rules*.
- 3.5.2 The *EMC* shall *publish* in the applicable *market manual*:
- 3.5.2.1 the protocols and procedures for the use of the *electronic communications system*; and
 - 3.5.2.2 the method by which exchanges of the data referred to in section 3.5.1 shall be communicated in the event of a failure of the *electronic communications system*.

3A TIMETABLE

3A.1 TIMETABLE

- 3A.1.1 The *EMC*, the *PSO* and each *market participant* shall comply with the *market operations timetable* set out in Appendix 6A, unless the *market rules* allow otherwise.

4 STANDING CAPABILITY DATA

4.1 SUBMISSION

- 4.1.1 When a *market participant* applies to register a facility under section 5 of Chapter 2, it shall at the same time submit that facility's initial *standing capability data* to the *PSO* for approval.
- 4.1.2 If there is a change in the physical capability of a *registered facility*, its *dispatch coordinator* shall submit revised *standing capability data* as necessary to reflect the change, to the *PSO* for approval.
- 4.1.3 *Standing capability data* shall:
- 4.1.3.1 comply with the requirements of Appendix 6E;
 - 4.1.3.2 be submitted to the *PSO* in the form specified by the *system operation manual*; and
 - 4.1.3.3 in the case of revised *standing capability data*, be submitted to the *PSO* within the time specified by the *system operation manual*.
- 4.1.4 If the *PSO* requires a *dispatch coordinator* to provide revised *standing capability data* under section 9.6.5 of Chapter 5, it shall do so within the time specified by the *PSO*.

4.2 APPROVAL OR REJECTION

- 4.2.1 If any initial *standing capability data* submitted by a *market participant* or revised *standing capability data* submitted by a *dispatch coordinator* is:
- 4.2.1.1 approved by the *PSO*, the *PSO* shall forward the relevant *standing capability data* to the *EMC*; or
 - 4.2.1.2 rejected by the *PSO*, the *PSO* shall notify the *market participant* or the *dispatch coordinator* (as the case may be) of the rejection, with the reasons for the rejection.

4.3 RECEIPT

- 4.3.1 When the *EMC* receives approved *standing capability data* from the *PSO* under section 4.2.1.1, the *EMC* shall:
- 4.3.1.1 confirm receipt to the *PSO* and the *market participant* or *dispatch coordinator* who submitted the *standing capability data* (as the case may be) in the manner and within the time specified in the applicable *market manual*; and
 - 4.3.1.2 create or update, as applicable, its records of that relevant *standing capability data* to be used by the *market clearing engine* in accordance with the applicable *market manual*.
- 4.3.2 If a *market participant* or *dispatch coordinator* (as the case may be) does not receive confirmation of receipt of *standing capability data* under section 4.3.1.1, it must immediately notify the *EMC* in accordance with the applicable *market manual*.

4.4 HOW STANDING CAPABILITY DATA IS USED

- 4.4.1 The *EMC* shall use the *standing capability data* held in its records to produce *market schedules*.
- 4.4.2 For a given *dispatch period*, if a *registered facility*'s revised *standing capability data*:
- 4.4.2.1 is not communicated by the *PSO* to the *EMC* in time to allow the *EMC* to revise its records in accordance with section 4.3.1.2; or
 - 4.4.2.2 is rejected by the *PSO*,

the *EMC* shall use that *registered facility*'s last approved *standing capability data* held in the *EMC*'s records to produce *market schedules* for that *dispatch period*.

5 OFFERS AND BIDS

5.1 OBLIGATION TO HAVE OFFERS

- 5.1.1 Each *generation registered facility* shall at all times have a valid *standing offer for energy* for each *dispatch period* of each day of the week.
- 5.1.2 If a *generation registered facility* is *registered* to provide:
- 5.1.2.1 *reserve* of a *reserve class*, it shall at all times have a valid *standing offer for reserve* of that *reserve class*; and
- 5.1.2.2 *regulation*, it shall at all times have a valid *standing offer for regulation*,
- for each *dispatch period* of each day of the week.
- 5.1.3 If a *load registered facility* is *registered* to provide *reserve* of a *reserve class*, it shall at all times have a valid *standing offer for reserve* of that *reserve class* for each *dispatch period* of each day of the week.
- 5.1.4 A *dispatch coordinator* may revise a *standing offer* at any time.

Explanatory Note: The gate closure requirement in section 10.4 shall apply to the revision under section 5.1.4.

- 5.1.5 Subject to section 10.4.1, for any *dispatch period* in the current *market outlook horizon*, if the quantity currently *offered* in a valid *offer* for a *registered facility* exceeds the relevant quantity that its *dispatch coordinator* reasonably expects to be available from the *registered facility* by more than:
- 5.1.5.1 10 MW; or
- 5.1.5.2 5 percent of the quantity currently *offered*,
- whichever is greater, then that *dispatch coordinator* shall immediately submit an *offer variation* for that *registered facility* for that *dispatch period* to the *EMC*.

5.1.6 Subject to section 10.4.1, for each *dispatch period* that a *registered facility* is not *synchronised* and until the earliest *dispatch period* in which it would be possible for that *registered facility* to be *synchronised*, its *dispatch coordinator* shall:

5.1.6.1 submit *offer variations* where there are existing *offer variations*; or

5.1.6.2 submit revised *standing offers* where there are no *offer variations*,

so that all the *offered* quantities are zero.

5.1.7 Subject to section 10.4.1, the *dispatch coordinator* of a *registered facility* shall, to the extent necessary for consistency with any *standing capability data* that is revised and approved under section 4, submit revised *standing offers* and *offer variations* that apply from the time that revised *standing capability data* takes effect.

5.1A OBLIGATION TO HAVE BIDS

5.1A.1 If a *load registered facility* is registered to be scheduled for *energy* withdrawal for the purposes of *load curtailment*, it shall at all times have a valid *restricted standing bid* for *energy* for each *dispatch period* of each day of the week.

5.1A.2 A *dispatch coordinator* may revise a *standing bid* at any time.

Explanatory Note: The gate closure requirement in section 10.4 shall apply to the revision under section 5.1A.2.

5.1A.3 Subject to section 10.4.2, for any *dispatch period* in the current *market outlook horizon*, if the quantity of *energy* currently *bidden* in a valid *bid* for an *LRF with REB* exceeds the relevant quantity of *energy* that its *dispatch coordinator* reasonably expects to be able to be withdrawn by that *LRF with REB* by more than:

5.1A.3.1 0.5 MW; or

5.1A.3.1 5 percent of the quantity of *energy* currently *bidden*,

whichever is greater, then that *dispatch coordinator* shall immediately submit a *bid variation* for that *LRF with REB* for that *dispatch period* to the *EMC*.

- 5.1A.4 Subject to section 10.4.2, for each *dispatch period* that an *LRF with REB* is not able to be subject to be scheduled for *energy withdrawal* for the purposes of *load curtailment* and until the earliest *dispatch period* in which it would be possible for that *LRF with REB* to be subject to be scheduled for *energy withdrawal* for the purposes of *load curtailment*, its *dispatch coordinator* shall:
- 5.1A.4.1 submit *bid variations* where there are existing *bid variations*; or
- 5.1A.4.2 submit revised *standing bids* where there are no *bid variations*, so that all the *bidden quantities* are zero.
- 5.1A.5 Subject to section 10.4.2, the *dispatch coordinator* of an *LRF with REB* shall, to the extent necessary for consistency with any *standing capability data* that is revised and approved by the *PSO* under section 4, or any applicable price limits as revised from time to time, submit revised *standing bids* and *bid variations* that apply from the time that revised *standing capability data* takes effect.

5.2 FORM OF ENERGY OFFERS

- 5.2.1 Each *energy offer* is an *offer* to provide *energy* to the relevant *real-time market* by a *generation registered facility* at its *market network node* in a *dispatch period*.
- 5.2.2 Each *energy offer* shall state:
- 5.2.2.1 the identity of the *generation registered facility* that the *energy offer* is for;
- 5.2.2.2 if it is a *standing offer* or an *offer variation*;
- 5.2.2.3 the *dispatch period* that the *energy offer* is for;
- 5.2.2.4 between 1 to 10 *price-quantity pairs*. These shall be stated in increasing order of price;
- 5.2.2.5 the maximum combined capacity of the *generation registered facility* for *energy*, *reserve* and *regulation* for the *dispatch period*; and

Explanatory Note: Under normal circumstances, the maximum combined capacity under section 5.2.2.5 could be stated as at least equal to the highest maximum combined generation capacity and reserve capacity for any reserve class, indicated in that generation facility’s standing capability data under section E.1.1.6 of Appendix 6E. (In such situations, the limits in the standing capability data will apply through sections D.9A.7.1 and D.9A.8.1 of Appendix 6D.)

If the market participant wishes to temporarily de-rate its generation facility for maintenance or other purposes, the maximum combined capacity under section 5.2.2.5 could be stated at a lower level. (In such situations, the stated maximum combined capacity will apply through sections D.9A.7.2 and D.9A.8.2 of Appendix 6D.)

- 5.2.2.6 the *energy* ramp-up rate and the *energy* ramp-down rate, which respectively imply the allowable increase and decrease in the output of the *generation registered facility* during the *dispatch period*.
- 5.2.3 The *generation registered facility* that the *energy offer* is for must be *registered* to provide *energy*.
- 5.2.4 The price in each *price-quantity pair* of an *energy offer* shall:
- 5.2.4.1 be expressed in \$/MWh to two decimal places;
- 5.2.4.2 not exceed the upper price limit specified in Appendix 6J; and
- 5.2.4.3 not be less than the lower price limit specified in Appendix 6J.
- 5.2.5 The quantity in each *price-quantity pair* of an *energy offer* shall be expressed in MW to one decimal place and shall not be less than 0.0 MW.
- 5.2.5A Notwithstanding sections 5.2.4.3 and 5.2.6, for *energy offers* in respect of a *generation registered facility* that is an *embedded generation facility*:
- 5.2.5A.1 subject to section 5.2.5, the quantity (if any) in the first *price-quantity pair* of an *energy offer* (referred to in sections 5.2.5B and 5.2.5C as “declared quantity”) shall be the quantity of *electricity* that the *embedded generation facility* is intended to *generate* for the associated *load* of its *EGF group*; and

5.2.5A.2 the price in the first *price-quantity pair* of an *energy offer* shall be set to equal 95% of CDC, where CDC shall be as specified in section J.2 of Appendix 6J.

Explanatory Note: The price in the first price-quantity pair of the energy offer in respect of an generation registered facility that is an embedded generation facility will be set below the lower limit for energy offers so that the energy offered from embedded generation facility for consumption by the associated load of its EGF group will have a higher priority to be dispatched.

5.2.5B The declared quantity for any *dispatch period* h shall comply with the formula set out in section 5.2.5C. The *EMC* shall report any breach of the foregoing requirement to the *market surveillance and compliance panel* for investigation.

5.2.5C The formula referred to in section 5.2.5B above is as follows:

$$\sum_{m(sa)} [\frac{1}{2} \times (\text{Declared Quantity}_{h^{m(sa)}} + \text{Declared Quantity}_{h-1^{m(sa)}})] \times \frac{1}{2} \text{ hour} - \text{WPQ}_{h(sa)} \leq 5 \text{ MWh}$$

where:

h = a *settlement interval* or the *dispatch period* corresponding to that *settlement interval*

$h-1$ = the *dispatch period* immediately preceding *dispatch period* h

$\text{WPQ}_{h(sa)}$ = associated *load* for that *EGF group*

$\sum_{m(sa)}$ = sum over all *MNNs* associated with the *settlement account* that is associated with that *EGF group*

5.2.6 If the quantity in a *price-quantity pair* of an *energy offer* is 0.0 MW, the corresponding price shall be \$0.00/MWh.

5.2.7 The total of the quantities in all the *price-quantity pairs* of an *energy offer* for a *dispatch period* shall not exceed:

5.2.7.1 the maximum *generation capacity*, indicated in the relevant *generation registered facility's standing capability data* for that *dispatch period*;

5.2.7.2 the maximum quantity of *energy* that can be supplied in that *dispatch period* by that *generation registered facility*, as reasonably estimated by its *dispatch coordinator*; or

- 5.2.7.3 the maximum combined capacity of that *generation registered facility* for *energy, reserve and regulation* stated in the *energy offer* under section 5.2.2.5.
- 5.2.8 The maximum combined capacity of the *generation registered facility* for *energy, reserve and regulation* stated in an *energy offer* under section 5.2.2.5 shall be expressed in MW to one decimal place and not be less than 0.0 MW.
- 5.2.9 The *energy* ramp-up rate and the *energy* ramp-down rate stated in an *energy offer* shall each:
- 5.2.9.1 be expressed in MW/minute to one decimal place;
- 5.2.9.2 not be less than 0.0 MW/minute; and
- 5.2.9.3 not exceed respectively the maximum ramp-up rate and maximum ramp-down rate indicated in the relevant *generation registered facility's standing capability data*.

5.2A FORM OF RESTRICTED ENERGY BIDS

- 5.2A.1 Each *restricted energy bid* is a *bid* to withdraw *energy* in the relevant *real-time market* by an *LRF with REB* in a *dispatch period*.
- 5.2A.2 Each *restricted energy bid* submitted for an *LRF with REB* shall state:
- 5.2A.2.1 the identity of the *LRF with REB* that the *restricted energy bid* is for;
- 5.2A.2.2 if it is a *standing bid* or a *bid variation*;
- 5.2A.2.3 the *dispatch period* that the *restricted energy bid* is for;
- 5.2A.2.4 the total *load* capacity, which is the total quantity of *energy* that the *LRF with REB* would have withdrawn if the *LRF with REB* was not subject to *load curtailment*;
- 5.2A.2.5 between 1 to 10 *price-quantity pairs*. These shall be stated in decreasing order of price for the quantity of *load* that the *LRF with REB* commits to be subject to *dispatch* by the *PSO*; and
- 5.2A.2.6 the *energy* ramp-up rate and the *energy* ramp-down rate, which respectively imply the allowable increase and decrease in *energy* withdrawal by the *LRF with REB* during the *dispatch period*.

Explanatory Note: In relation to sections 5.2A.2.4 and 5.2A.2.5, if an LRF with REB does not intend to be scheduled for energy withdrawal for the purposes of load curtailment for a particular dispatch period, all bid quantities and the total load capacity for that particular dispatch period should be specified by its dispatch coordinator as zero.

- 5.2A.3 The *load facility* that a *restricted energy bid* is for must be registered to be scheduled for *energy* withdrawal for the purposes of *load curtailment*.
- 5.2A.4 The price in each *price-quantity pair* of a *restricted energy bid* shall, subject to section 5.2A.6:
- 5.2A.4.1 be expressed in \$/MWh to two decimal places;
 - 5.2A.4.2 not exceed the upper price limit specified in Appendix 6J; and
 - 5.2A.4.3 not be less than the lower price limit specified in Appendix 6J.

Explanatory Note: The lower price limit on restricted energy bids varies every calendar quarter. Market participants for LRFs with REB shall ensure the price in each price-quantity pair of a restricted energy bid is not less than the applicable lower price limit.

- 5.2A.5 The quantity in each *price-quantity pair* of a *restricted energy bid* shall be expressed in MW to one decimal place and shall not be less than 0.0 MW.
- 5.2A.6 If the quantity in a *price-quantity pair* of a *restricted energy bid* is 0.0 MW, the corresponding price shall be \$0.00/MWh.
- 5.2A.7 The total of the quantities in all the *price-quantity pairs* of a *restricted energy bid* for a *dispatch period* shall not exceed any one of the following:
- 5.2A.7.1 the maximum *load curtailment* capacity, indicated in the *standing capability data* for that *LRF with REB* for that *dispatch period*;
 - 5.2A.7.2 the maximum quantity of *load* of that *LRF with REB* that can be subject to *load curtailment* as reasonably estimated by its *dispatch coordinator*; and
 - 5.2A.7.3 the total *load* capacity stated in the *restricted energy bid* in section 5.2A.2.4.

- 5.2A.8 The total *load* capacity of the *LRF with REB* stated in section 5.2A.2.4 shall be expressed in MW to one decimal place and not be less than 0.0 MW.
- 5.2A.9 The *energy* ramp-up rate and the *energy* ramp-down rate stated in a *restricted energy bid* shall each:
- 5.2A.9.1 be expressed in MW/minute to three decimal places;
 - 5.2A.9.2 not be less than 0.000 MW/minute; and
 - 5.2A.9.3 not exceed respectively the maximum ramp-up rate and the maximum ramp-down rate indicated in the *LRF with REB's standing capability data*.

5.3 FORM OF RESERVE OFFERS

- 5.3.1 Each *reserve offer*:
- 5.3.1.1 is an *offer* to provide *reserve* to the relevant *real-time market* by a *generation registered facility* or a *load registered facility* in a *dispatch period*;
 - 5.3.1.2 applies only to one *reserve class*; and
 - 5.3.1.3 constitutes an *offer* to provide *reserve* within the *reserve provider group* to which the *generation registered facility* or the *load registered facility* (as the case may be) has been assigned by the *PSO* for that *reserve class*.
- 5.3.2 Each *reserve offer* shall state:
- 5.3.2.1 the identity of the *generation registered facility* or *load registered facility* that the *reserve offer* is for;
 - 5.3.2.2 if it is a *standing offer* or an *offer variation*;
 - 5.3.2.3 the *reserve class* that the *reserve offer* relates to;
 - 5.3.2.4 the *dispatch period* that the *reserve offer* is for;
 - 5.3.2.5 between 1 to 5 *price-quantity pairs*. These shall be stated in increasing order of price; and
 - 5.3.2.6 if the *reserve offer* is for a *generation registered facility*, a *reserve proportion*, which constrains the maximum *reserve* that may be scheduled from that *generation registered facility* to a specified ratio of its *energy* scheduled.

- 5.3.3 The *generation registered facility* or *load registered facility* must be registered to provide *reserve* for the *reserve class* that its *reserve offer* is for.
- 5.3.4 The price in each *price-quantity pair* of a *reserve offer* shall:
- 5.3.4.1 be expressed in \$/MWh to two decimal places;
 - 5.3.4.2 not exceed the upper price limit for the applicable *reserve class* specified in Appendix 6J; and
 - 5.3.4.3 not be less than \$0.00/MWh.
- 5.3.5 The quantity in each *price-quantity pair* of a *reserve offer* shall be expressed in MW to one decimal place and must not be less than 0.0 MW.
- 5.3.6 If the quantity in a *price-quantity pair* of a *reserve offer* is 0.0 MW, the corresponding price shall be \$0.00/MWh.
- 5.3.7 The total of the quantities in all the *price-quantity pairs* of a *reserve offer* of a *dispatch period* shall not exceed:
- 5.3.7.1 the maximum *reserve capacity* for that *reserve class*, indicated in the relevant *generation registered facility's* or *load registered facility's standing capability data* for that *dispatch period*; or
 - 5.3.7.2 the maximum quantity of *reserve* that can be supplied for that *reserve class* in that *dispatch period* by that *generation registered facility* or *load registered facility*, as reasonably estimated by its *dispatch coordinator*.
- 5.3.8 The *dispatch coordinator* shall state in a *reserve offer* the *reserve proportion* that minimises the likelihood of the *generation registered facility* being scheduled to provide more *reserve* than it can reliably provide at any given level of scheduled *energy*.
- 5.3.9 The *reserve proportion* stated in a *reserve offer* shall:
- 5.3.9.1 not be less than zero; and
 - 5.3.9.2 not exceed the *reserve proportion* indicated in the relevant *generation registered facility's standing capability data*.

5.4 FORM OF REGULATION OFFERS

- 5.4.1 Each *regulation offer* is an *offer* to provide *regulation* to the relevant *real-time market* by a *generation registered facility* in a *dispatch period*.
- 5.4.2 The *EMC* shall use a *regulation offer* of a *generation registered facility* to produce *market schedules* only if it is represented as *synchronised* in the *dispatch network data* and its forecast generation level at the beginning of that *dispatch period* indicates that it is able to provide *regulation*.
- 5.4.3 Each *regulation offer* shall state:
- 5.4.3.1 the identity of the *generation registered facility* that the *regulation offer* is for;
 - 5.4.3.2 if it is a *standing offer* or an *offer variation*;
 - 5.4.3.3 the *dispatch period* that the *regulation offer* is for; and
 - 5.4.3.4 between 1 to 5 *price-quantity pairs*. These shall be stated in increasing order of price.
- 5.4.4 The *generation registered facility* that the *regulation offer* is for must be *registered* to provide *regulation*.
- 5.4.5 The price in each *price-quantity pair* of a *regulation offer* shall:
- 5.4.5.1 be expressed in \$/MWh to two decimal places;
 - 5.4.5.2 not exceed the upper price limit specified in Appendix 6J; and
 - 5.4.5.3 not be less than \$0.00/MWh.
- 5.4.6 The quantity in each *price-quantity pair* of a *regulation offer* shall be expressed in MW to one decimal place and shall not be less than 0.0 MW.
- 5.4.7 If the quantity in a *price-quantity pair* of a *regulation offer* is 0.0 MW, the corresponding price shall be \$0.00/MWh.
- 5.4.8 The total of the quantities in all the *price-quantity pairs* of a *regulation offer* shall represent both the maximum increase and the maximum decrease in *energy* output that the relevant *generation registered facility* can achieve for the purpose of providing *regulation*. The total of the

quantities in all the *price-quantity pairs* of a *regulation offer* of a *dispatch period* shall not exceed:

- 5.4.8.1 the maximum *regulation* capacity, indicated in that *generation registered facility's standing capability data* for that *dispatch period*; or
- 5.4.8.2 the maximum quantity of *regulation* that can be supplied in that *dispatch period* by that *generation registered facility*, as reasonably estimated by its *dispatch coordinator*.

5.5 COMMUNICATION OF OFFERS AND BIDS

5.5.1 Each *offer* or *bid* shall:

- 5.5.1.1 be submitted using the forms, procedures and data formats prescribed in the applicable *market manual*;
- 5.5.1.2 comply with the requirements in section 5.2, 5.2A, 5.3 or 5.4; and
- 5.5.1.3 be submitted to the *EMC* by the applicable *dispatch coordinator* via the *electronic communications system* or in accordance with section 3.5.2.2.

5.6 RECEIPT OF OFFERS AND BIDS

5.6.1 When the *EMC* receives any *offer* or *bid*, it shall:

- 5.6.1.1 stamp the *offer* or *bid* with the time that it was received;
- 5.6.1.2 within five minutes, confirm receipt of the *offer* or *bid*; and
- 5.6.1.3 within five minutes, validate the *offer* or *bid* in accordance with section 5.7 and release information indicating that the *offer* or *bid* has been:
 - a. accepted as valid; or
 - b. rejected, with reasons for the rejection.

- 5.6.2 If a *dispatch coordinator* does not receive confirmation of receipt or information on the acceptance or rejection of an *offer* or *bid* from the *EMC* in accordance with section 5.6.1, it shall immediately inform the *EMC*. If the problem lies with the *electronic communications systems*, the *EMC* shall take steps to rectify the problem as soon as possible.
- 5.6.3 For a given *registered facility*, if any revised *standing offer* or *offer variation* applicable to a given *dispatch period*:
- 5.6.3.1 is not communicated to the *EMC*, or
- 5.6.3.2 is rejected by the *EMC*,
- the last accepted valid *standing offer* for that *dispatch period* shall apply. However, if that *registered facility* has a last accepted valid *offer variation* for that *dispatch period*, that *offer variation* shall apply instead in respect of that *dispatch period*.
- 5.6.4 For a given *LRF with REB*, if any revised *standing bid* or *bid variation* applicable to a given *dispatch period*:
- 5.6.4.1 is not communicated to the *EMC*, or
- 5.6.4.2 is rejected by the *EMC*,
- the last accepted valid *standing bid* (if any and which has not been invalidated in accordance with the applicable *market manual*) for that *dispatch period* shall apply. However, if that *LRF with REB* has a last accepted valid *bid variation* (which has not been invalidated in accordance with the applicable *market manual*) for that *dispatch period*, that *bid variation* shall apply instead in respect of that *dispatch period*.

5.7 VALIDATION OF OFFERS AND BIDS

- 5.7.1 The *EMC* shall determine if each *offer*:
- 5.7.1.1 complies with the *market manual* referred to in section 3.4.1; and
- 5.7.1.2 complies with the requirements in section 5.2, 5.3 or 5.4.
- If an *offer* satisfies both conditions, the *EMC* shall accept the *offer* as valid. If not, the *EMC* shall reject the *offer*.
- 5.7.2 The *EMC* shall determine if each *bid*:
- 5.7.2.1 complies with the *market manual* referred to in section 3.4.1; and

5.7.2.2 complies with the requirements in section 5.2A,

from time to time as may be required under such *market manual*. If a *bid* complies with the requirements of both sections 5.7.2.1 and 5.7.2.2 above, the *EMC* shall accept or deem the *bid* as valid until the time of the next determination as may be required under such *market manual*. The *EMC* shall reject the *bid* or treat the *bid* as invalidated if any of the requirements of sections 5.7.2.1 and 5.7.2.2 is not complied with.

5.8 HOW OFFERS AND BIDS ARE USED

5.8.1 All *offers* and *bids* shall, if accepted as valid by the *EMC*, be stored by the *EMC*.

5.8.2 Subject to sections 5.8.3 and 5.8.4, the *EMC* shall:

5.8.2.1 use the last accepted valid *standing offer*, except that, if there is a last accepted valid *offer variation*, the *EMC* shall use that *offer variation* instead; and

5.8.2.2 use the last accepted valid *standing bid* (if any and which has not been invalidated in accordance with the applicable *market manual*), except that, if there is a last accepted valid *bid variation* (which has not been invalidated in accordance with the applicable *market manual*), the *EMC* shall use that *bid variation* instead,

to produce *market schedules* for the applicable *dispatch period*.

5.8.3 If an *offer* or *bid* for a *dispatch period* was accepted as valid before the scheduled time for commencement of computation of a *market schedule* containing that *dispatch period* using the *market clearing engine*, as stipulated in Appendix 6A, that *offer* or *bid* (in the case of the *bid*, if it has not been invalidated in accordance with the applicable *market manual*) shall be used by the *EMC* in the production of that *market schedule*.

5.8.4 If an *offer variation* or *bid variation* for a *dispatch period* was submitted after that *dispatch period* had begun, the *EMC* shall not use that *offer variation* or *bid variation* in the production of any *market schedule* containing that *dispatch period*.

6 PSO RESPONSIBILITIES WITHIN THE MARKET OUTLOOK HORIZON

6.1 MARKET OUTLOOK HORIZON DATA

6.1.1 The *PSO* shall, on each *dispatch day* and in accordance with the *market operations timetable*:

6.1.1.1 conduct such studies as may be necessary to determine the appropriate parameters to be used as inputs to the *market clearing engine* for each *dispatch period* in the current *market outlook horizon*;

6.1.1.2 determine or update, as the case may be, the *dispatch related data* referred to in Appendix 6G for each *dispatch period* in the *market outlook horizon*; and

6.1.1.3 communicate the *dispatch related data* referred to in section 6.1.1.2 to the *EMC*.

7 EMC RESPONSIBILITIES WITHIN THE MARKET OUTLOOK HORIZON

7.1 TERMINOLOGY AND PURPOSE

- 7.1.1 The *market outlook horizon* is, at any given point in time, the period running continuously from that point in time to the end of the sixth *dispatch day* thereafter.
- 7.1.2 The *pre-dispatch horizon* shall:
- 7.1.2.1 at any given time before 12:00 hours on a given *dispatch day*, cover all *dispatch periods* commencing at the end of the current *dispatch period* and ending following the end of the last *dispatch period* of the current *dispatch day*; and
 - 7.1.2.2 at any given time at or after 12:00 hours on a given *dispatch day*, cover all *dispatch periods* commencing at the end of the current *dispatch period* and ending following the end of the last *dispatch period* of the *dispatch day* following the current *dispatch day*.
- 7.1.2A The *short-term horizon* shall, at any given point in time, cover twelve consecutive *dispatch periods* commencing immediately after the end of the current *dispatch period*.
- 7.1.3 The *EMC* shall determine *market outlook scenarios*, *pre-dispatch schedules* and *short-term schedules* in order to provide itself, the *PSO* and *market participants* with advance information and projections necessary to plan the physical operation of the *PSO controlled system* and *registered facilities* and to manage *load* over the *market outlook horizon*.

7.2 LOAD FORECASTING

- 7.2.1 The *EMC* shall prepare and update, on the basis of the data received from the *PSO* pursuant to section 6.1.1.3 and in accordance with section 7.2.2, the following three *nodal load forecasts* covering the remainder of the current *market outlook horizon*:
- 7.2.1.1 a normal *load* forecast, being based on the expected system *load* forecast provided by the *PSO* pursuant to section 6.1.1.3;

- 7.2.1.2 a low forecast, being based on the expected system *load* forecast referred to in section 7.2.1.1 less the load sensitivity factor; and
- 7.2.1.3 a high forecast, being based on the expected system *load* forecast referred to in section 7.2.1.1 plus the load sensitivity factor;

where the load sensitivity factor shall be a fixed MW quantity determined and *published* by the *EMC* from time to time.

Explanatory Note: If the demand forecast was for 5000 MW and the load sensitivity factor was 600 MW then we would have load scenarios for 4400 MW, 5000 MW, 5600 MW. The MCE will be solved with the 4400 MW, 5000 MW and 5600 MW loads for the short-term schedules. The results of these scenarios give participants some idea as to how the schedules will differ if the load differs from the expected value. However, for the market outlook scenario and pre-dispatch schedule, the MCE will only solve with the 5000MW demand forecast (i.e. the normal load forecast).

- 7.2.2 The *nodal load forecasts* described in section 7.2.1, comprising a forecast of *load* for each *dispatch network node* for the relevant *dispatch period*, shall be prepared by applying the *load* participation factors to the forecast of *non-dispatchable load* provided by the *PSO* in accordance with section G.2.1 of Appendix 6G. The *load* participation factor for a given *dispatch period* shall be determined by the *EMC* using *load* disposition for similar days and similar *dispatch periods*. *Load* disposition shall be determined by the *EMC* using the data provided by the *PSO* pursuant to section G.2.3 of Appendix 6G or historical *metering data*, as the *EMC* deems appropriate. The *load* participation factors for all *dispatch network nodes* for a given *dispatch period* shall sum to one. The methodology, including revisions thereto, for determining the *load* participation factors and how the *load* participation factors are utilised to determine the *nodal load* forecasts, shall be *published* by the *EMC* in the publication referred to in section 3.2.1 of Chapter 6.

Explanatory Note: The phrase “load disposition for similar days and similar dispatch periods” is explained in the aforesaid published methodology.

- 7.2.3 In the event that the *PSO* forecasts a shortfall of *energy* in accordance with section G.2.2 of Appendix 6G for any *dispatch period* within the first two hours of the *market outlook horizon*, the *EMC* shall immediately adjust the *nodal load forecasts* described in section 7.2.1 for the corresponding *dispatch periods* to reflect the shortfall quantities and locations specified by the *PSO*.

- 7.2.4 Notwithstanding section 13 of Chapter 1, no *market participant* shall be entitled to compensation from the *EMC* or the *PSO* for any financial loss sustained by the *market participant* due to the *market participant* having been *dispatched* on the basis of *load* as forecasted pursuant to this section 7 rather than on the basis of actual *load*.

7.3 DETERMINING MARKET OUTLOOK SCENARIOS

- 7.3.1 The *EMC* shall, in accordance with section 7.6 and Appendix 6A, determine a *market outlook scenario* corresponding to the *nodal load forecast* described in sections 7.2.1.1, adjusted where applicable under section 7.2.3.
- 7.3.2 Each *market outlook scenario* shall include all *dispatch periods* between the end of the *pre-dispatch horizon* current at the time when the *market outlook scenario* is due to be released and the end of the *market outlook horizon* current at the time when the *market outlook scenario* is due to be released in accordance with section 7.7.1.

7.4 DETERMINING PRE-DISPATCH SCHEDULES

- 7.4.1 The *EMC* shall, in accordance with section 7.6 and Appendix 6A, determine a *pre-dispatch schedule* corresponding to the *nodal load forecast* described in section 7.2.1.1, adjusted where applicable under section 7.2.3.
- 7.4.2 Each *pre-dispatch schedule* shall include all *dispatch periods* in the *pre-dispatch horizon* current at the time when the *pre-dispatch schedule* is due to be released in accordance with section 7.7.2.

Explanatory Note: This means that the pre-dispatch schedule will always cover at least 12 hours and not more than 36 hours of time. Before noon it will cover the period up to the end of the current dispatch day, and after noon will cover the period up to the end of the next dispatch day. The market outlook scenario will cover the remaining 6 days to the end of the market outlook horizon.

7.4A DETERMINING SHORT-TERM SCHEDULES

- 7.4A.1 The *EMC* shall, in accordance with section 7.6 and Appendix 6A, determine three *short-term schedules* corresponding to the *nodal load forecasts* described in section 7.2.1, adjusted where applicable under section 7.2.3.

- 7.4A.2 Each *short-term schedule* shall include all *dispatch periods* in the *short-term horizon* current at the time when the *short-term schedule* is due to be released in accordance with section 7.7.2A.

Explanatory Note: The short-term schedule will always cover 12 consecutive dispatch periods.

7.5 INFORMATION USED IN EACH SCENARIO OR SCHEDULE

- 7.5.1 The *EMC* shall use the most current valid information on the following to determine and revise each of the scenarios or schedules referred to in sections 7.3, 7.4 and 7.4A:
- 7.5.1.1 *offers and bids* for the relevant *dispatch period* held by the *EMC*;
 - 7.5.1.2 *standing capability data* as applicable to each *dispatch period* represented within the *short-term horizon*, *pre-dispatch horizon* and the *market outlook horizon*, as the case may be, held by the *EMC*;
 - 7.5.1.3 the applicable *nodal load forecasts* referred to in section 7.3.1, 7.4.1 or 7.4A.1, as the case may be;
 - 7.5.1.4 the *dispatch related data* referred to in section 6.1.1.3 received from the *PSO*;
 - 7.5.1.5 the initial loading of each *generation facility*, determined:
 - a. in the case of each *market outlook scenario*, on the basis of the end of the last *dispatch period* represented in the most recently *published pre-dispatch schedule* which was determined using the same *nodal load forecast* and that contains the applicable *dispatch period*; and
 - b. in the case of each *pre-dispatch schedule*, on the basis of the later of the *real-time dispatch schedule* for the period after the current *dispatch period* (if available) and the *real-time dispatch schedule* for the current *dispatch period*;
 - 7.5.1.6 the *import limit* and *export limit*;
 - 7.5.1.7 the applicable price limits from Appendix 6J; and

- 7.5.1.8 such other parameters or data as may be required to enable the *market clearing engine* to determine the required outputs.

7.6 SOLVING EACH SCENARIO OR SCHEDULE

- 7.6.1 The *EMC* shall determine and revise as required each *market outlook scenario*, *pre-dispatch schedule* and *short-term schedule* by sequentially running the *market clearing engine* for each *dispatch period* specified in section 7.3.2, 7.4.2 or 7.4A.2, as the case may be, using the information described in section 7.5.

- 7.6.1A When preparing each *pre-dispatch schedule*, the *market clearing engine* shall be run for each *dispatch period* from the end of the relevant *dispatch period* for which the *real-time dispatch schedule* used in section 7.5.1.5(b) applies, until the end of the *pre-dispatch horizon* to which such *pre-dispatch schedule* relates.

Explanatory note: This means that for pre-dispatch schedules, the market clearing engine is always run from the best current estimates of data. However, when reporting the actual schedule, only the dispatch periods in the schedule are reported – the initial periods that are run in order to get to the start of the pre-dispatch horizon are not reported.

- 7.6.1B When preparing each *short-term schedule*, the *market clearing engine* shall be run for each *dispatch period* from the end of the current *dispatch period*, until the end of the *short-term horizon* to which such *short-term schedule* relates.

Explanatory note: This means that for the short-term schedule, the market clearing engine is always run from the best current estimates of data. However, when reporting the actual schedule, only the dispatch periods in the short-term horizon are reported – the initial period that is run in order to get to the start of the short-term horizon is not reported.

- 7.6.2 In determining the scenarios referred to in section 7.6.1, each *dispatch period* shall be assumed to be independent of the others except that:

- 7.6.2.1 subject to section 7.6.2.2, the initial loading of each *generation facility* for each *dispatch period* shall be set equal to the value determined for the end of the preceding *dispatch period* for the relevant *nodal load forecast*; and

- 7.6.2.2 the initial loading of each *generation facility* for the first *dispatch period* shall be set in accordance with section 7.5.1.5 for the relevant *nodal load forecast*.

7.7 RELEASE OF SCENARIO INFORMATION

- 7.7.1 By 9:00 hours of each *dispatch day* the *EMC* shall, for each *dispatch period* covered by the *market outlook scenario* referred to in section 7.3.1:
- 7.7.1.1 release to the *dispatch coordinator* for each *registered facility* the projected schedules for *energy, regulation and reserve, by reserve class*, for that *registered facility*;
- 7.7.1.2 *publish* the information described in section 7.7.3; and
- 7.7.1.3 communicate to the *PSO* the projected schedules for *energy, regulation and reserve, by reserve class*, for each *registered facility*, together with the information described in section 7.7.3, in accordance with the *system operation manual* and any applicable *market manual*.
- 7.7.2 Not later than 15 minutes prior to the commencement of the first *dispatch period* of the *pre-dispatch schedule* referred to in section 7.4.1, the *EMC* shall, for each *dispatch period* covered by the *pre-dispatch schedule*:
- 7.7.2.1 release to the *dispatch coordinator* for each *registered facility* the projected schedules for *energy, regulation and reserve, by reserve class*, for that *registered facility*;
- 7.7.2.2 *publish* the information described in section 7.7.3; and
- 7.7.2.3 communicate to the *PSO* the projected schedules for *energy, regulation and reserve, by reserve class*, for each *registered facility*, together with the information described in section 7.7.3, in accordance with the *system operation manual* and any applicable *market manual*.
- 7.7.2A Not later than 25 minutes prior to the commencement of the first *dispatch period* of each of the three *short-term schedule* referred to in section 7.4A.1, the *EMC* shall, for each *dispatch period* included in each of those three *short-term schedule*:
- 7.7.2A.1 release to the *dispatch coordinator* for each *registered facility* the projected schedules for *energy, regulation and reserve, by reserve class*, for that *registered facility*;
- 7.7.2A.2 *publish* the information described in section 7.7.3; and

- 7.7.2A.3 communicate to the *PSO* the projected schedules for *energy, regulation and reserve*, by *reserve class*, for each *registered facility*, together with the information described in section 7.7.3, in accordance with the *system operation manual* and any applicable *market manual*.
- 7.7.3 In accordance with sections 7.7.1, 7.7.2 and 7.7.2A, the *EMC* shall *publish* the following information for each *dispatch period* and for each *market outlook scenario, pre-dispatch schedule and short-term schedule*:
- 7.7.3.1 the projected total *load*;
- 7.7.3.1A the projected total *load curtailment* of all *LRFs with REB*;
- 7.7.3.2 the projected total transmission losses;
- 7.7.3.3 total *reserve* requirements by *reserve class*;
- 7.7.3.4 total *regulation* requirements;
- 7.7.3.5 projected *energy* prices associated with each *market network node* at which a *generation registered facility* or *generation settlement facility* is located, determined in accordance with sections D.24.1 and D.24.5 of Appendix 6D;
- 7.7.3.6 the projected *uniform Singapore energy price*, determined in accordance with section D.24.6 of Appendix 6D;
- 7.7.3.6A the projected *load curtailment price*, determined in accordance with D.24.10 of Appendix 6D;
- 7.7.3.6B the projected counterfactual *uniform Singapore energy price*, determined in accordance with sections D.24.8 and D.24.9 of Appendix 6D;
- 7.7.3.7 projected *reserve prices* for each *reserve class* and *reserve provider group*, determined in accordance with sections D.24.3, D.24.5 and D.24.7 of Appendix 6D;
- 7.7.3.8 projected *regulation prices*, determined in accordance with sections D.24.4 and D.24.5 of Appendix 6D;
- 7.7.3.9 any predicted system *energy* shortfalls;
- 7.7.3.10 any predicted system *reserve* shortfalls, by *reserve class*;
- 7.7.3.11 any predicted system *regulation* shortfalls;

- 7.7.3.12 a list of *security constraints* and *generation fixing constraints* applied; and
 - 7.7.3.13 the projected estimated hourly *energy uplift rebate*, determined in accordance with section D.25.1.13 of Appendix 6D.
- 7.7.4 The *market outlook scenarios*, *pre-dispatch schedules* and *short-term schedules* reflect indicative forecasts which are released for information purposes only and are not binding on the *EMC*, the *PSO* or any *market participant*.

8 PSO RESPONSIBILITIES IN REAL TIME

8.1 PREPARATION FOR REAL-TIME DISPATCH

- 8.1.1 The *PSO* shall, prior to each *dispatch period* and in accordance with the *market operations timetable*, take the following actions so as to keep *dispatch related data* current and available for the *EMC*:
- 8.1.1.1 conduct such studies as may be necessary to determine the appropriate parameters to be used as inputs to the *market clearing engine* for the upcoming *dispatch period*;
 - 8.1.1.2 determine or update, as the case may be, the *dispatch related data* referred to in Appendix 6G for the *dispatch period*; and
 - 8.1.1.3 communicate the *dispatch related data* referred to in section 8.1.1.2 to the *EMC*.
- 8.1.2 In accordance with section 9.1.2 of Chapter 5, any *real-time dispatch schedule* received from the *EMC* shall be deemed to constitute the *dispatch instructions* issued by the *PSO* to the applicable *dispatch coordinators* unless and until further *dispatch instructions* are issued by the *PSO* to a given *dispatch coordinator* pursuant to section 9.1.3 of Chapter 5.

9 EMC RESPONSIBILITIES IN REAL TIME

9.1 PREPARATION FOR REAL-TIME DISPATCH

- 9.1.1 The *EMC* shall for each *dispatch period* and in accordance with the *market operations timetable*:
- 9.1.1.1 revise as required the most current *nodal load forecast* referred to in section 7.2.1.1 on the basis of information received from the *PSO* pursuant to section 8.1.1.3; and
 - 9.1.1.2 determine and communicate *real-time dispatch schedules* in accordance with section 9.2.
- 9.1.2 In the event that the *PSO* forecasts a shortfall of *energy* in accordance with section G.2.2 of Appendix 6G for any *dispatch period* within the first two hours of the market outlook horizon, the *EMC* shall immediately adjust the *nodal load forecasts* described in section 7.2.1.1 for the corresponding *dispatch periods* to reflect the shortfall quantities and locations specified by the *PSO*.
- 9.1.3 Notwithstanding section 13 of Chapter 1, no *market participant* shall be entitled to compensation from the *EMC* or the *PSO* for any financial loss sustained by the *market participant* due to the *market participant* having been *dispatched* on the basis of *load* as forecasted pursuant to this section 9 rather than on the basis of actual *load*.

9.2 THE REAL-TIME SCHEDULING PROCESS

- 9.2.1 The *EMC* shall, prior to the commencement of each *dispatch period* and in accordance with the *market operations timetable*, use the *market clearing engine* to determine for that *dispatch period*:
- 9.2.1.1 a *real-time dispatch schedule*, containing schedules of *energy*, *reserve* and *regulation* for *registered facilities*, to be released to the *PSO*, which in accordance with section 9.1.2 of Chapter 5 shall be deemed to constitute the *dispatch instructions* issued by the *PSO* to the applicable *dispatch coordinators* unless and until further *dispatch instructions* are issued by the *PSO* to a given *dispatch coordinator* pursuant to section 9.1.3 of Chapter 5; and
 - 9.2.1.2 a *real-time pricing schedule* determined by the *market clearing engine* in accordance with section D.24 of Appendix 6D, including:

- a. *energy prices for each market network node;*
 - b. *the uniform Singapore electricity price;*
 - c. *reserve prices for each reserve class and for each reserve provider group;*
 - d. *regulation prices; and*
 - e. *the load curtailment price.*
- 9.2.2 The *EMC* shall use the most current valid information on the following to determine the *real-time dispatch schedule* and *real-time pricing schedule* described in section 9.2.1:
- 9.2.2.1 *offers and bids for the relevant dispatch period held by the EMC;*
 - 9.2.2.2 *standing capability data for the relevant dispatch period held by the EMC;*
 - 9.2.2.3 *the nodal load forecast referred to in section 9.1.1.1, adjusted where applicable under section 9.1.2;*
 - 9.2.2.4 *the dispatch related data referred to in section 8.1.1.3 received from the PSO;*
 - 9.2.2.5 *the import and export limits;*
 - 9.2.2.6 *the applicable price limits from Appendix 6J; and*
 - 9.2.2.7 *such other parameters or data as may be required to enable the market clearing engine to determine the required outputs.*
- 9.2.3 The *EMC* shall, in accordance with the *market operations timetable*, release to the *dispatch coordinator* for each *registered facility* a *real-time dispatch schedule* comprising that portion of the *real-time dispatch schedule* referred to in section 9.2.1.1 that describes the quantities of *energy, reserve by reserve class and regulation* scheduled in respect of that *registered facility*.

Explanatory Note: Participants will be sent the specific schedule quantities that pertain to them under section 9.2.3 and will be provided with the associated prices under section 9.2.4.

- 9.2.4 The *EMC* shall, in accordance with the *market operations timetable*, *publish* the following information as it pertains to each *dispatch period*:
- 9.2.4.1 total *load*;
 - 9.2.4.1A total *load curtailment* of all *LRFs with REB*;
 - 9.2.4.2 total transmission losses;
 - 9.2.4.3 total *reserve* requirements by *reserve class*;
 - 9.2.4.4 total *regulation* requirements;
 - 9.2.4.5 *energy* prices associated with each *market network node* at which a *generation registered facility* or *generation settlement facility* is located, determined in accordance with sections D.24.1 and D.24.5 of Appendix 6D;
 - 9.2.4.6 the *uniform Singapore energy price*, determined in accordance with section D.24.6 of Appendix 6D;
 - 9.2.4.6A the *load curtailment price*, determined in accordance with section D.24.10 of Appendix 6D;
 - 9.2.4.6B the counterfactual *uniform Singapore energy price*, determined in accordance with sections D.24.8 and D.24.9 of Appendix 6D;
 - 9.2.4.7 *reserve prices* for each *reserve class* and *reserve provider group*, determined in accordance with sections D.24.3, D.24.5 and D.24.7 of Appendix 6D;
 - 9.2.4.8 *regulation prices*, determined in accordance with sections D.24.4 and D.24.5 of Appendix 6D;
 - 9.2.4.9 any system *energy* shortfalls reported by the *market clearing engine*;
 - 9.2.4.10 any system *reserve* shortfalls, by *reserve class*, reported by the *market clearing engine*;
 - 9.2.4.11 any system *regulation* shortfalls reported by the *market clearing engine*;
 - 9.2.4.12 a list of *security constraints* and *generation fixing constraints* applied; and
 - 9.2.4.13 the estimated hourly *energy* uplift rebate, determined in accordance with section D.25.1.13 of Appendix 6D.

- 9.2.5 The quantities specified in a *real-time dispatch schedule* shall be considered firm in the sense that:
- 9.2.5.1 they are deemed to be the *dispatch instructions* for each *registered facility* unless and until further *dispatch instructions* are issued by the *PSO* to the *dispatch coordinator* for a given *registered facility* pursuant to section 9.1.3 of Chapter 5;
 - 9.2.5.2 *market participants* shall comply with the *dispatch instructions* referred to in section 9.2.5.1 unless forced to deviate from those *dispatch instructions* under the conditions referred to in and to the extent permitted by section 9.6 of Chapter 5.
- 9.2.6 In the event the *market clearing engine* fails to produce any *real-time pricing schedule* for a particular *dispatch period* for any reason other than due to the suspension of *real time market*, then the *EMC* shall issue a price revision *advisory notice* in accordance with 9.3.2B as if for provisional prices confirmed to be subject to revision. In such circumstances, the prices for the affected *dispatch period* for which no *real-time pricing schedule* was produced shall be determined in accordance with the provisions of section 10.2.

9.3 MARKET ADVISORIES

- 9.3.1 The *EMC* shall issue, as soon as practicable and in such manner as will provide adequate notice, using electronic means or in the case where electronic means are not available, by any other means it considers suitable, *advisory notices* pertaining to the incidence and extent of any of the following events for any *dispatch period* included in the current *market outlook horizon* in respect of which such event is indicated by the *market outlook scenarios*, *pre-dispatch schedules* and *short-term schedules* described in sections 7.3, 7.4 and 7.4A respectively, and containing the applicable information described in Appendix 6H:
- 9.3.1.1 any *energy* surplus;
 - 9.3.1.2 any *energy* shortfalls;
 - 9.3.1.3 any *reserve* shortfalls, by *reserve class*; and
 - 9.3.1.4 any *regulation* shortfalls.
- 9.3.2 The *EMC* shall issue, as soon as practicable and in such manner as will provide adequate notice, using electronic means, or in the case where electronic means are not available, by any other means it considers

suitable, and containing the applicable information described in Appendix 6H:

- 9.3.2.1 system status *advisory notices* for the current *dispatch period*, any *dispatch period* of the current *short-term horizon* or any *dispatch period* of the current *pre-dispatch horizon* in respect of which it has been informed by the *PSO* that a major equipment *outage*, *load shedding* or other abnormal condition on the *PSO controlled system* that the *PSO* considers material is occurring or is likely to occur;
 - 9.3.2.2 communications warning *advisory notices* for the current *dispatch period*, any *dispatch period* of the current *short-term horizon* or any *dispatch period* of the current *pre-dispatch horizon* in respect of which *market participants* are experiencing, or the *EMC* considers that there is a significant probability that *market participants* will experience, difficulties in delivering communications to, or receiving communications from, the *EMC*, or that the *EMC* will experience, difficulties in delivering communications to, or receiving communications from, the *PSO*; and
 - 9.3.2.3 price warning *advisory notices* for the current *dispatch period*, any *dispatch period* of the current *short-term horizon*, any *dispatch period* of the *pre-dispatch horizon* or any *dispatch period* of the *market outlook horizon* for which the prices calculated or released to *market participants* may be subject to revision.
- 9.3.2A The *EMC* shall provide confirmation by 12.00 noon each day, in such manner as will provide adequate notice, using electronic means, or in the case where electronic means are not available, by any other means it considers suitable, as to whether prices determined for the previous *dispatch day* are final or provisional. Provisional prices may be subject to revision.
- 9.3.2B For provisional prices which are confirmed to be subject to revision, and where section 9.3.2C does not apply, the *EMC* shall issue, as soon as possible but no later than 2 *business days* prior to the time at which the *preliminary settlement statements* for the relevant *dispatch day* must be issued in accordance with section 5.2.1 of Chapter 7, price revision *advisory notices* for the relevant *dispatch day* in such manner as will provide adequate notice, using electronic means, or in the case where electronic means are not available, by any other means it considers suitable, and containing the applicable information in Appendix 6H. Provisional prices in respect of which no such price revision advisory notices are issued by the deadline stipulated above shall be deemed final.

- 9.3.2C Where *constraint violation costs* have been applied by the *market clearing engine* in accordance with section D.16 of Appendix 6D in respect of any *dispatch period*, the *EMC* shall declare the prices for that *dispatch period* to be provisional in accordance with section 9.3.2A.
- 9.3.2D Where prices in respect of any *dispatch period* have been declared to be provisional pursuant to section 9.3.2C, the *EMC* shall request that the *PSO* confirm whether or not *load shedding* had occurred during that *dispatch period* and provide to the *EMC* the maximum actual line flow values of such lines as identified by the *EMC* for that *dispatch period*.
- 9.3.2E If the *PSO* confirms that *load shedding* had not occurred in the *dispatch period* referred to in section 9.3.2D, the *EMC* shall issue a price revision *advisory notice* for that *dispatch period* no later than 2 *business days* prior to the time at which the *preliminary settlement statements* for the relevant *dispatch day* must be issued in accordance with section 5.2.1 of Chapter 7, in such manner as will provide adequate notice, using electronic means, or in the case where electronic means are not available, by any other means it considers suitable, and containing the applicable information in Appendix 6H. Provisional prices in respect of which no such price revision *advisory notices* are issued by the deadline stipulated above shall be deemed final.
- 9.3.3 The *EMC* shall, as soon as practicable and in such manner as will provide adequate notice, using electronic means, or in the case where electronic means are not available, by any other means it considers suitable, withdraw any of the *advisory notices* referred to in sections 9.3.2.1 and 9.3.2.2 and issued in respect of a *dispatch period* to the extent that the conditions referred to in such *advisory notices* are no longer or are expected to no longer be applicable to such *dispatch period*.
- 9.3.4 [Deleted and Intentionally Left Blank]
- 9.3.5 [Deleted and Intentionally Left Blank]
- 9.3.6 Where the *EMC* issues a communications warning *advisory notice* pursuant to section 9.3.2.3, it shall use all reasonable endeavours to promptly restore communications, establish alternative means of communication or avoid the communications problem anticipated in the *advisory notice*, as the case may be.

10 EMC RESPONSIBILITIES AFTER EACH DISPATCH PERIOD

10.1 FINALISING SETTLEMENT DATA

10.1.1 The *EMC* shall, in accordance with section 10.2 and the *market operations timetable*, determine final prices and quantities for *energy*, *reserve* and *regulation* that are to be used for *settlement* purposes in accordance with Chapter 7.

10.2 DETERMINING SETTLEMENT PRICE DATA

10.2.1 The *EMC* shall, for *settlement* purposes, use the following price data, determined in accordance with section D.24 of Appendix 6D and, where applicable, sections 10.2.2 and 10.2.3:

10.2.1.1 the *market energy price* or *MEP* for each *market network node*;

10.2.1.2 the *uniform Singapore energy price*;

10.2.1.3 the *market reserve price* or *MRP* for each *reserve provider group*;

10.2.1.4 the *market regulation price* or *MFP*;

10.2.1.5 the *load curtailment price* or *LCP*; and

10.2.1.6 the counterfactual *uniform Singapore energy price* or *CUSEP*.

10.2.2 If a price revision *advisory notice* for a *dispatch period* is not in effect at beginning of the *dispatch period*, the *EMC* shall use prices taken from the *real-time pricing schedule* described in section 9.2.1.2 for that *dispatch period*, whether or not produced in accordance with the *market operations timetable*, as and for the *settlement* data described in section 10.2.1 for that *dispatch period*, unless and until a price revision *advisory notice* is later issued by the *EMC* for that *dispatch period* under section 9.3.2B or section 9.3.2E, in which case the *settlement* data described in section 10.2.1 shall be determined in accordance with section 10.2.3 or section 10.2.3A as appropriate.

10.2.3 If a price revision *advisory notice* is issued by the *EMC* under section 9.3.2B in respect of a *dispatch period*:

- 10.2.3.1 and if an *energy shortfall advisory notice* was in effect at the beginning of that *dispatch period*, the *EMC* shall use the process described in sections 10.2.7 to 10.2.8 to determine the *settlement* data described in section 10.2.1 for that *dispatch period*; and
 - 10.2.3.2 in all other cases, the *EMC* shall use the process described in section 10.2.4 to determine the *settlement* data described in section 10.2.1 for that *dispatch period*.
- 10.2.3A If a price revision *advisory notice* is issued by the *EMC* under section 9.3.2E in respect of a *dispatch period* and:
- 10.2.3A.1 if the *EMC* has received the maximum actual line flow values requested from the *PSO* under section 9.3.2D, the *EMC* shall use the process described in section 10.2.4A to determine the *settlement* data described in section 10.2.1 for that *dispatch period*; and
 - 10.2.3A.2 if the *EMC* has not received the maximum actual line flow values requested from the *PSO* under section 9.3.2D, the *EMC* shall determine *settlement* data referred to in section 10.2.1 for that *dispatch period* by re-running the *market clearing engine* with the application of section D.16.4 of Appendix 6D.
- 10.2.4 Where section 10.2.3.2 applies, the *EMC* shall, as soon as possible but no later than 1 *business day* prior to the time at which the *preliminary settlement statements* for the relevant *dispatch day* must be issued in accordance with section 5.2.1 of Chapter 7, calculate in accordance with sections 10.2.5 and 10.2.6 and *publish* revised values of the *settlement* data described in section 10.2.1 to be used for *settlement* purposes for that *dispatch period*.
- 10.2.4A Where section 10.2.3A.1 applies, the *EMC* shall, as soon as possible but no later than 1 *business day* prior to the time at which the *preliminary settlement statements* for the relevant *dispatch day* must be issued in accordance with section 5.2.1 of Chapter 7, calculate in accordance with sections 10.2.5A and 10.2.5B and *publish* revised values of the *settlement* data described in section 10.2.1 to be used for *settlement* purposes for that *dispatch period*.

- 10.2.5 The revised values referred to in section 10.2.4 shall, if possible, be determined by re-running the *market clearing engine* for the *dispatch period* using all the input data that should have been supplied to the *market clearing engine* at the time the *real-time dispatch schedule* for that *dispatch period* would normally have been produced.
- 10.2.5A The revised values referred to in section 10.2.4A shall, if possible, be determined by re-running the *market clearing engine* for that *dispatch period* using the maximum actual line flow values provided by the *PSO* under section 9.8.2 of Chapter 5 and applying the rest of the input data that have been supplied to the *market clearing engine* at the time the *real-time dispatch schedule* for that *dispatch period* would normally have been produced.
- 10.2.5B If any *constraint violation costs*, including the *constraint violation costs* referred to in section 9.3.2C, are still present in the revised values determined after re-running the *market clearing engine* in accordance with section 10.2.5A, the *EMC* shall determine *settlement* data referred to in section 10.2.1 by re-running the *market clearing engine* with the application of Section D.16.4 of Appendix 6D.
- 10.2.6 If it is not possible to re-run the *market clearing engine* in accordance with section 10.2.5 or section 10.2.8, the *settlement* data described in section 10.2.1 shall be determined for that *dispatch period* as being equal to the average of the *settlement* prices for the *dispatch period* corresponding to the time of the day of that *dispatch day* over the 30 days immediately preceding that *dispatch day* unless:
- 10.2.6.1 *load shedding* occurred during the *dispatch period* for which *settlement* data is being determined under this section 10.2.6, in which case each of *MEP* and the *uniform Singapore energy price* shall equal the *energy price ceiling*; or
- 10.2.6.2 any *settlement* data calculated as the average referred to above exceeds the applicable upper limit described in Appendix 6J, then that *settlement* data shall be set to that upper limit.

- 10.2.7 Where section 10.2.3.1 applies, the *EMC* shall use its best endeavours to calculate and *publish*, as soon as possible but no later than 1 *business day* prior to the time at which the *preliminary settlement statements* for the relevant *dispatch day* must be issued in accordance with section 5.2.1 of Chapter 7, revised values of the *settlement* data described in section 10.2.1 in accordance with section 10.2.8 to be used for *settlement* purposes for that *dispatch period*.
- 10.2.8 The revised values described in section 10.2.7 shall be determined by re-running the *market clearing engine* for the *dispatch period* using the same input data as was used in preparing the *real-time schedules* described in section 9.2.1, except that the *nodal load forecast* used shall be the *nodal load forecast* determined without any adjustment for any *energy* shortfall referred to in section 9.1.2. If it is not possible to re-run the *market clearing engine* the *EMC* shall determine the *settlement* data described in section 10.2.1 in accordance with section 10.2.6.

Explanatory Note: This means that the revised MCE solution is an analysis of “what might have happened” if the load shedding perfectly matched the available capacity. Load shedding in practice generally occurs in large blocks of load, so that the load shed may not match the shortfall in capacity exactly.

- 10.2.9 Where the *EMC* determines revised values pursuant to section 10.2.8, the *EMC* shall also calculate, in accordance with Appendix 6I, compensation payments for *market participants* with *generation registered facilities* that were scheduled to produce less *energy* in the *real-time dispatch schedule* described in section 9.2.1 than in the revised *real-time dispatch schedule* produced by re-running the *market clearing engine* pursuant to section 10.2.8. Such compensation shall be paid to applicable *market participants* by means of a credit on the next applicable *preliminary settlement statement* and shall be recovered by the *EMC* pursuant to section I.2 of Appendix 6I.
- 10.2.10 Where the *EMC* has determined revised values for the *settlement* data pursuant to the provisions under section 10.2 (other than pursuant to sections 10.2.7 and 10.2.8), a *market participant* with one or more *generation registered facilities* may make a request to the *EMC* for compensation in accordance with section 3.11 of Chapter 3, if its *generation registered facility* satisfies the criteria for compensation set out in section M.2 of Appendix 6M. Such request shall be submitted in such form as may be prescribed by the *EMC* and the compensation amount shall be calculated in accordance with Appendix 6M. For the purposes of section 3.11.2 of Chapter 3, the timeline within which a request under this section must be submitted shall commence from the date that the *final settlement statement* for the *trading day* which the compensation request relates is issued.

Explanatory Note: Because load shedding is not expected to occur frequently, it is likely that the special MCE runs and compensation calculations will take place in a manual offline process, with the compensation payments and the cost recovery via ad-hoc payments, rather than an adjustment of settlement prices.

10.3 DETERMINING SETTLEMENT QUANTITY DATA

- 10.3.1 Subject to 10.3.3 and 10.3.4, for *settlement* purposes, the quantity in MWh of *reserve* of each *reserve class* supplied from a *registered facility* in a *dispatch period* shall equal one-half of the MW quantity described in the *real-time dispatch schedule* for the corresponding *reserve class* for that *dispatch period*.
- 10.3.2 Subject to 10.3.3 and 10.3.4, for *settlement* purposes, the quantity in MWh of *regulation* supplied from a *registered facility* in a *dispatch period* shall equal one-half of the quantity described in the *real-time dispatch schedule* for that *dispatch period*.
- 10.3.3 Where the *EMC* has issued a price revision *advisory notice* under section 9.3.2B for a *dispatch period* with no useable *real-time dispatch schedule* for *energy*, *reserve* and *regulation*, the *EMC* shall determine, for *settlement* purposes:
- 10.3.3.1 the size of a *GRF* in section A.2.1.1 of Appendix 7A;
 - 10.3.3.2 subject to 10.3.4, the quantity of *reserve* supplied from a *registered facility* in section 10.3.1; and
 - 10.3.3.3 subject to 10.3.4, the quantity of *regulation* supplied from a *registered facility* in section 10.3.2,

by re-running the *market clearing engine* for the *dispatch period*. The *market clearing engine* shall be re-run using all the input data that should have been supplied to it when the *real-time dispatch schedule* for that *dispatch period* would normally have been produced.

Where it is not possible to so re-run the *market clearing engine*, the *EMC* shall, subject to 10.3.4, determine the quantities in sections 10.3.3.1 to 10.3.3.3 based on the *PSO's dispatch instructions* for *energy*, *reserve* and *regulation* for that *dispatch period*.

10.3.4 Notwithstanding section 10.3.1, 10.3.2 or 10.3.3, where the *EMC* is notified by the *PSO* in accordance with section 2.6.3.1 of Chapter 7 that a *non-provision event* has occurred in a *dispatch period* with respect to a *registered facility*, if:

10.3.4.1 such *non-provision event* is in respect of *reserve*, then the quantity of *reserve* of each *reserve class* supplied from that *registered facility* in that *dispatch period* shall equal zero for *settlement* purposes; or

10.3.4.2 such *non-provision event* is in respect of *regulation*, then the quantity of *regulation* supplied from that *registered facility* in that *dispatch period* shall equal zero for *settlement* purposes.

Explanatory Note:

For settlement purposes, the quantity in MWh of energy supplied from a generation registered facility or generation settlement facility or the net flow on the intertie in a dispatch period shall be determined from metering data in accordance with the metering code and does not need to be stated in this section.

When no timely real-time dispatch schedule is received by the PSO, the dispatch instructions for reserve and regulation issued by the PSO for the applicable dispatch period are based on the procedure described in the system operation manual as revised from time to time.

- 10.3.5 For *settlement* purposes, the *load curtailment quantity* in MWh associated with an *LRF with REB* for a given *dispatch period* shall be determined in accordance with section L.3.1 of Appendix 6L, subject to sections 10.3.6 and 10.3.7.
- 10.3.6 Notwithstanding section 10.3.5, where a *non-curtailment event* is deemed to have occurred in a *dispatch period* in respect of an *LRF with REB* as referred to in section 2.8 of Chapter 7, then the *load curtailment quantity* associated with that *LRF with REB* in that *dispatch period* shall equal zero for *settlement* purposes.
- 10.3.7 Notwithstanding section 10.3.5, but subject to section 10.3.6, for *settlement* purposes, where the *EMC* is notified by the *PSO* pursuant to section 9.1.6A of Chapter 5 that *dispatch instructions* have been issued to an *LRF with REB* between the release of the *real-time dispatch schedule* and the start of the *dispatch period*, then the *load curtailment quantity* calculated in accordance with section L.3.2 of Appendix 6L shall be used instead.

10.4 GATE CLOSURE

- 10.4.1 Notwithstanding sections 5.1.5, 5.1.6 and 5.1.7, no *offer variation* or revised *standing offer* shall be submitted by or for a *market participant* within 65 minutes immediately prior to the *dispatch period* to which the *offer variation* or revised *standing offer* applies, except:

10.4.1.1 where it is intended:

- a. for a *generation registered facility*, to reflect its expected ramp-up and ramp-down profiles during periods following *synchronisation* or preceding *desynchronisation*; or
- b. for a *generation registered facility*, to reflect its revised capability for the three consecutive *dispatch periods* immediately following a *forced outage* or its failure to *synchronise*; or
- c. to contribute positively to the resolution of an *energy surplus* situation pertaining to which the *EMC* has issued an *advisory notice* under section 9.3.1, by allowing for decreased supply of *energy*; or

- d. to contribute positively to the resolution of *energy, reserve or regulation* shortfall situations pertaining to which the *EMC* has issued *advisory notices* under section 9.3.1, by allowing for increased supply of *energy, reserve or regulation*; or
- e. to contribute positively to the resolution of *energy, reserve or regulation* shortfall situations in that *dispatch period*, where:
 - (i) the shortfall situations were indicated in a system status *advisory notice* issued by the *EMC* in respect of a *high-risk operating state* or *emergency operating state* declared by the *PSO*; and
 - (ii) at the time of submission of such *offer variation* or revised *standing offer*, the *EMC* has not yet withdrawn, in respect of that *dispatch period*, such system status *advisory notice*,

by allowing for increased supply of *energy, reserve or regulation*; and
- f. for a *load registered facility*, to reflect its revised capability during a *forced outage* or following a decrease in *energy* withdrawal under sections 9.3.3 and/or 9.3.4 of Chapter 5; and

10.4.1.2 where the price so *offered*, other than for additional quantities of *energy, reserve or regulation*, is the same as that previously *offered* for that *dispatch period*.

10.4.2 Notwithstanding sections 5.1A.2, 5.1A.3 and 5.1A.4, no *bid variation* or revised *standing bid* shall be submitted by or for a *market participant* within 65 minutes immediately prior to the *dispatch period* to which the *bid variation* or revised *standing bid* applies, except:

10.4.2.1 where it is intended:

- a. for a *load registered facility* to reflect its revised capability during a *forced outage* or following a decrease in *energy* withdrawal under sections 9.3.3 and/or 9.3.4 of Chapter 5; or
- b. to contribute positively to the resolution of *energy* shortfall situations pertaining to which the *EMC* has issued *advisory notices* under section 9.3.1, by allowing for increased quantities in its *energy bids*; or

- c. to contribute positively to the resolution of *energy* shortfall situations in that *dispatch period*, where:
 - (i) the shortfall situations were indicated in a system status *advisory notice* issued by the *EMC* in respect of a *high-risk operating state* or *emergency operating state* declared by the *PSO*; and
 - (ii) at the time of submission of such *bid variation* or revised *standing bid*, the *EMC* has not yet withdrawn, in respect of that *dispatch period*, such system status *advisory notice*,by allowing for increased quantities in its *energy bids*; and

10.4.2.2 where the price so *bidden*, other than for additional quantities of *energy*, is the same as that previously *bidden* for that *dispatch period*.

10.4.3 The *EMC* shall report to the *market surveillance and compliance panel* for investigation, *all offer variations*, revised *standing offers*, *bid variations* and revised *standing bids* submitted during the 65-minute period referred to in section 10.4.1, and provide any factors of which the *EMC* is aware that could reasonably justify such *offer variations*, revised *standing offer*, *bid variations* and revised *standing bids*.

10.5 COMPENSATION FOR MINIMUM STABLE LOAD CONSTRAINTS

10.5.1 The *EMC* shall calculate, in accordance with Appendix 6K, the compensation amount payable to a *market participant* whose *generation registered facility* has a minimum stable load level registered with the *EMC*, if such *generation registered facility*:

10.5.1.1 is scheduled for *energy* at its minimum stable load level in its *real-time dispatch schedule* referred to in section 9.2.3 for a given *dispatch period*, and where the *PSO* did not also issue subsequent *dispatch instructions* for such *generation registered facility* for that *dispatch period* pursuant to section 9.1.3 of Chapter 5; and

10.5.1.2 satisfies all other criteria for compensation set out in section K.2 of Appendix 6K.

10.5.2 The *EMC* shall calculate the compensation amount referred to in section 10.5.1 in accordance with the procedures and timeline set out in Appendix 6K.

11 EMC RESPONSIBILITIES AFTER TRADING DAY

11.1 PUBLISHING SETTLEMENT QUANTITY DATA

- 11.1.1 The *EMC* shall use *energy* quantities provided by the *market support services licensee* pursuant to section 2.2.3 of Chapter 7 to determine the *energy* quantities specified in sections 11.1.2 and 11.1.3.
- 11.1.2 The *EMC* shall, on the tenth *business day* after each *trading day*, *publish* the following *energy* quantities for each *settlement interval* in that *trading day* for each type of *generation facility* referred to in section 5.6.2.5 of Chapter 2:
- 11.1.2.1 Total gross injection *energy* quantity (in MWh) for each type of *generation facility*, being the quantity of *energy* determined as the sum of injection *energy* quantities of all *generation registered facilities* and *generation settlement facilities* of such type; and
- 11.1.2.2 Total net injection *energy* quantity (in MWh) for each type of *generation facility*, being the quantity of *energy* determined as the sum of:
- (a) the sum of net injection *energy* quantities for every *EGF group* and its associated *load* which are associated with such type of *generation facility*, determined in accordance with section 11.1.3; and
 - (b) the sum of injection *energy* quantity of all *generation registered facilities* and *generation settlement facilities* of such type, which are not assigned to any *EGF group*.

- 11.1.3 The *EMC* shall determine the net injection *energy* quantity (in MWh) for each *EGF group* referred to in section 11.1.2.2(a) for each given *settlement interval* h in accordance with the following formula:

$$\text{MAX}[\sum_{m(sa)} \text{IEQ}_h^{m(sa)} - \text{WPQ}_{h(sa)}, 0]$$

where:

sa = the *settlement account* assigned to that group

$\sum_{m(sa)}$ = sum over all *MNNs* $m(sa)$ of *GRFs* and *GSFs* of the *EGF group* that is associated with *settlement account* sa

$\text{WPQ}_{h(sa)}$ and $\text{IEQ}_h^{m(sa)}$ refer to the *energy* quantities provided by the *market support services licensee* pursuant to section 2.2.3 of Chapter 7 in respect of such *EGF group*, and the *GRFs* and *GSFs* of such *EGF group* respectively

11.2 PUBLISHING OFFER DATA

- 11.2.1 The *EMC* shall *publish* the information specified in section 11.2.2 contained in *offers* accepted as valid and required to be used by the *EMC* in the production of the *real-time schedule* in accordance with section 5.8.

- 11.2.2 The *EMC* shall, on the twenty-eighth day after each *trading day*, *publish* for each *dispatch period* in that *trading day*:

11.2.2.1 each price *offered* in *price-quantity pairs* of all *energy offers* and the total of the quantities in all the *price-quantity pairs* of all *energy offers* *offered* at such price;

11.2.2.2 each price *offered* in *price-quantity pairs* of all *reserve offers* for each *reserve class* and the total of effective quantities in all the *price-quantity pairs* of all *reserve offers* for each *reserve class* *offered* at such price, where the effective quantity in each such *price-quantity pair* in a *reserve offer* is determined by multiplying the quantity in each such *price-quantity pair* with the parameter $\text{EstReserveEffectiveness}_r$ applicable to such *offer*; and

11.2.2.3 each price *offered* in *price-quantity pairs* of all *regulation offers* and the total of the quantities in all the *price-quantity pairs* of all *regulation offers* *offered* at such price.

- 11.2.3 The information specified in section 11.2.2 will not contain any express reference to any *market participant* or *registered facility*.

APPENDIX A - MARKET OPERATIONS TIMETABLE

A.1 INTRODUCTION

A.1.1 This Appendix sets forth certain obligations regarding actions to be taken, and the time at which such actions must be taken, by the *EMC*, the *PSO* and *market participants* in respect of *real-time market operations*.

A.1.2 In this Appendix:

A.1.2.1 “D” shall refer to a *trading day*;

A.1.2.2 “T” shall refer to the beginning of a *dispatch period*; and

A.1.2.3 “PDS” shall refer to a *pre-dispatch schedule*.

A.2 THE MARKET OPERATIONS TIMETABLE

Day	Time of Day	Event	Provided By/ Who does it	Provided To	Period Covered	Frequency
		Standing Capability Data				
Prior to facility registration	As specified in the applicable <i>market manual</i>	Provide initial <i>standing capability data</i> where such data shall have been provided to the <i>PSO</i> by a <i>market participant</i> , and approved by the <i>PSO</i> , in accordance with the <i>systems operations manual</i> .	<i>PSO</i>	<i>EMC</i>	From first day of participation and until superseded.	Once
Before day D	As specified in the applicable <i>market manual</i>	Provide revised <i>standing capability data</i> where such data shall have been provided to the <i>PSO</i> by a <i>dispatch coordinator</i> , and approved by the <i>PSO</i> , in accordance with the <i>systems operations manual</i> .	<i>PSO</i>	<i>EMC</i>	From day D until superseded	As required

Day	Time of Day	Event	Provided By/ Who does it	Provided To	Period Covered	Frequency
		Standing Offers and Standing Bids				
Prior to facility registration	Any	First <i>standing offer</i> or <i>standing bid</i> submitted.	<i>Market participant</i>	<i>EMC</i>	Until superseded or (if applicable) invalidated, whichever is earlier	Once
Any time, until D	T-65 minutes	Deadline before which a revised <i>standing offer</i> or revised <i>standing bid</i> may be submitted without being reported to the <i>market surveillance and compliance panel</i> .	<i>Market participant</i>	<i>EMC</i>	Until superseded or (if applicable) invalidated, whichever is earlier	On going/as required
Any time, until D	T-5 minutes.	Deadline before which a revised <i>standing offer</i> or revised <i>standing bid</i> must be accepted as valid in order to be used in the production of the <i>real-time schedule</i> .	<i>Market participant</i>	<i>EMC</i>	Until superseded or (if applicable) invalidated, whichever is earlier	On going/as required

Day	Time of Day	Event	Provided By/ Who does it	Provided To	Period Covered	Frequency
		Offer Variations and Bid Variations				
D-8 days	09:00	<i>EMC</i> begins accepting <i>offer variations</i> or <i>bid variations</i> for <i>dispatch periods</i> during trading day D.	<i>EMC</i>		D	On going
D-8 days to D	From 09:00 on D-8 days, within 5 minutes of receipt	Notification of acceptance/rejection of <i>offer variation</i> or <i>bid variation</i> .	<i>EMC</i>	<i>Market participant</i>	D	On going
D	T-65 minutes	Deadline before which an <i>offer variation</i> or <i>bid variation</i> may be submitted without being reported to the <i>market surveillance and compliance panel</i> .	<i>Market participant</i>	<i>EMC</i>	T + 30 minutes	On going
D	T-5 minutes.	Deadline before which an <i>offer variation</i> or <i>bid variation</i> must be accepted as valid in order to be used in the production of the <i>real-time schedule</i> .	<i>Market participant</i>	<i>EMC</i>	T + 30 minutes	On going

Day	Time of Day	Event	Provided By/ Who does it	Provided To	Period Covered	Frequency
		Market Outlook Scenarios				
D-6 days	02:00	Deadline before which revised <i>standing offers</i> , <i>offer variations</i> , revised <i>standing bids</i> and <i>bid variations</i> must be accepted as valid in order to be used in the production of the <i>market outlook scenarios</i> at 02:00 on D-6 days.	<i>Market participant</i>	<i>EMC</i>		Daily
D-6 days	By 02:00	<i>Dispatch related data</i> issued for D, and revised data issued for days D-5 to D-1.	<i>PSO</i>	<i>EMC</i>	1 to 6 days hence	Daily
D-6 days	02:00	Computation begins of <i>market outlook scenarios</i> using the <i>market clearing engine</i> .	<i>EMC</i>		End of current <i>pre-dispatch horizon</i> (beginning of D-5 to end of D)	Daily
D-6 days	9:00	<i>Market outlook scenario</i> results for period from the beginning of D-5 to end of D <i>published</i> .	<i>EMC</i>	Some just to <i>market participants</i> , some <i>published</i> . All to <i>PSO</i> .	D-5 00:00 to D 23:30	Daily

Day	Time of Day	Event	Provided By/ Who does it	Provided To	Period Covered	Frequency
		Pre-Dispatch Schedules				
D-1 day/ D	PDS publication time – 120 minutes	Deadline before which revised <i>standing offers</i> , <i>offer variations</i> , revised <i>standing bids</i> and <i>bid variations</i> must be accepted as valid in order to be used in the production of the PDSs.	<i>Market participant</i>	<i>EMC</i>		Every 120 minutes
D-1 day/ D	PDS publication time – 120 minutes	Latest time to complete updating of <i>dispatch related data</i> to be used in the PDS.	<i>PSO</i>	<i>EMC</i>	<i>pre-dispatch horizon</i> as at that time.	Every 120 minutes
D-1 day / D	PDS publication time – 120 minutes	Computation begins of PDS using the <i>market clearing engine</i> .	<i>EMC</i>		<i>pre-dispatch horizon</i> as at that time.	Every 120 minutes
D-1 day	By 11:45	First PDS information released for <i>trading day</i> .	<i>EMC</i>	Some just to <i>market participants</i> , some <i>published</i> All to <i>PSO</i> .	12:00 on D-1 day to 23:30 on D	Daily
D-1 day to D	Every 120 minutes from	PDS information released for remaining periods in day D.	<i>EMC</i>	Some just to <i>market</i>	PDS <i>publication</i> time plus 15	Every 120 minutes

Day	Time of Day	Event	Provided By/ Who does it	Provided To	Period Covered	Frequency
	11:45 on D-1 day.			<i>participants, some published</i> All to <i>PSO</i> .	minutes to 23:30 on D	
D	21:45	Final PDS information released for last <i>dispatch period</i> in day D. (Information for D+1 also included.)	<i>EMC</i>	Some just to <i>market participants, some published</i> All to <i>PSO</i> .		Daily
		Short-Term Schedule				
D	T-4 minutes	Deadline before which revised <i>standing offers, offer variations, revised standing bids and bid variations</i> must be accepted as valid in order to be used in the production of the <i>short-term schedule</i> .	<i>Market participant</i>	<i>EMC</i>		Every 30 minutes
D	T-4 minutes	Latest time to complete updating of <i>dispatch related data</i> to be used in the production of the <i>short-term schedule</i> .	<i>PSO</i>	<i>EMC</i>	13 consecutive <i>dispatch periods</i> commencing at T. (Note: The first dispatch period will not be published. This is	Every 30 minutes

Day	Time of Day	Event	Provided By/ Who does it	Provided To	Period Covered	Frequency
					covered in the RTS.)	
D	T-4 minutes	Computation begins of <i>short-term schedule</i> using the <i>market clearing engine</i> .	<i>EMC</i>		13 consecutive <i>dispatch periods</i> commencing at T. (Note: The first dispatch period will not be published. This is covered in the RTS.)	Every 30 minutes
D	T+5 minutes	<i>Short-term schedule</i> information released.	<i>EMC</i>	Some just to <i>market participants</i> , some published All to <i>PSO</i> .	12 consecutive <i>dispatch periods</i> commencing at T+30 minutes	Every 30 minutes

Day	Time of Day	Event	Provided By/ Who does it	Provided To	Period Covered	Frequency
		Real-Time Dispatch Schedule				
D	T-5 minutes	Latest time to complete updating of <i>dispatch related data</i> to be used in the production of the <i>real-time dispatch schedule</i> .	<i>PSO</i>	<i>EMC</i>		Every 30 minutes
D	T –5 minutes	Computation begins of <i>real-time dispatch schedule</i> using the <i>market clearing engine</i> .	<i>EMC</i>			Every 30 minutes
D	Prior to T – 30 seconds	Issuance of <i>real-time dispatch schedules</i> , <i>real-time pricing schedule</i> , and the market information set out in section 9.2.4 of this Chapter.	<i>EMC</i>	Some just to <i>market participants</i> , some <i>published</i> . <i>Real-time dispatch schedules</i> to <i>PSO</i> .	T + 30 minutes, or until revised.	Every 30 minutes
D	Prior to T	Where necessary, <i>PSO</i> issues dispatch instructions.	<i>PSO</i>	<i>Market participants</i> .	T + 30 minutes, or until revised.	Every 30 minutes
D	All times	In accordance with Chapter 5, <i>PSO</i> monitors dispatch and may	<i>PSO</i>	<i>Market participants</i>	T + 30 minutes	On going

Day	Time of Day	Event	Provided By/ Who does it	Provided To	Period Covered	Frequency
		intervene by issuing <i>dispatch instructions</i> via <i>AGC</i> or voice communications.				
		After Real-Time Dispatch				
D+1 day	12:00	Issue report as required for day D.	<i>EMC</i>	<i>Market Surveillance and Compliance Panel</i>	Previous <i>trading day</i>	Daily

APPENDIX B - INPUT DATA FOR THE MARKET CLEARING ENGINE

B.1 INTRODUCTION

B.1.1 The information described in sections B.2 to B.9 of this Appendix shall be used as input data for the *market clearing engine* for each *dispatch period* for which the *market clearing engine* is required to produce schedules and prices.

B.2 MARKET PARTICIPANT DATA

B.2.1 All valid *energy offers* and valid *energy bids* for *registered facilities* for that *dispatch period*.

B.2.2 All valid *reserve offers* for each *reserve class* for *registered facilities* for that *dispatch period*.

B.2.3 All valid *regulation offers* for *registered facilities* for that *dispatch period*.

B.2.4 All valid *standing capability data* corresponding to *registered facilities* for the *trading day* within which to that *dispatch period* occurs.

B.3 NODAL LOAD FORECAST

B.3.1 The relevant *nodal load forecast* prescribed in the provisions of Chapter 6.

B.4 INTERTIE SCHEDULE DATA

B.4.1 For each *intertie*, up to ten *price-quantity pairs*, represented as included in an *energy offer*, where the *price-quantity pairs* shall be specified by the *EMC* so that the schedules produced by the *market clearing engine* will reasonably correspond to the scheduled flow as provided by *PSO* into Singapore on the *intertie* for that *dispatch period* to the extent that it is possible for the *market clearing engine* to produce such an outcome.

B.4.2 For each *intertie*, up to ten *price-quantity pairs*, represented as included in an *energy bid* except that the prices shall decrease with increasing cumulative quantity, where the *price-quantity pairs* shall be specified by

the *EMC* so that the schedules produced by the *market clearing engine* will reasonably correspond to the scheduled flow as provided by *PSO* out of Singapore on the *intertie* for that *dispatch period* to the extent that it is possible for the *market clearing engine* to produce such an outcome.

Explanatory Note: Interchange schedules will be represented as a dummy market participant with imports represented as a conventional energy offer while exports are represented as a dispatchable load energy bid would be represented, i.e. like an energy offer but as prices increase then less MWs are scheduled, not more. The price-quantity pairs could be defined so that the schedule only deviated from the desired flow if prices went to their maximum or minimum levels (i.e. shortage or over-supply). Thus the MCE would always schedule the required flow unless there was not enough generation to supply power for export, or not enough load to consume imported power. The availability of ten price-quantity pairs does allow for more price sensitive schedules if these are ever required.

B.5 PSO CONTROLLED GRID DATA

- B.5.1 The set of *dispatch network lines* that are in service in that *dispatch period* as specified by the *PSO* in accordance with Appendix 6G.
- B.5.2 The resistance, reactance and fixed losses for each *dispatch network line* that is in service in that *dispatch period* as specified by the *PSO* in accordance with Appendix 6G.
- B.5.3 The thermal line ratings and operational flow limits on each *dispatch network line* for each direction of flow for that *dispatch period* as specified by the *PSO* in accordance with Appendix 6G.
- B.5.4 An estimate of the reactive power flows on each *dispatch network line* for that *dispatch period* as specified by the *PSO* in accordance with Appendix 6G.

B.6 GENERATOR DATA

- B.6.1 Initial output levels for each *generation registered facility* as at the start of that *dispatch period* as specified by the *PSO* in accordance with Appendix 6G.
- B.6.2 The set of all *generation fixing constraints* and such additional *generic constraints* as may be specified by the *PSO* in accordance with Appendix 6G to apply within that *dispatch period*.

B.7 SECURITY, RESERVE AND REGULATION DATA

- B.7.1 The set of all *security constraints* specified by the *PSO* in accordance with Appendix 6G to apply within that *dispatch period*.
- B.7.2 The set of *reserve provider groups* with the *reserve class* and the set of *registered facilities* to which each such *reserve provider group* is associated as specified by the *PSO* in accordance with Appendix 6G for that *dispatch period*.
- B.7.3 Piece-wise linear effectiveness functions specified by the *PSO* in accordance with Appendix 6G for each *reserve provider group*, describing the expected effectiveness of different levels of *reserve quantity* scheduled from that *reserve provider group* for that *dispatch period*.
- B.7.4 The minimum required *reserve* for each *reserve class* specified by the *PSO* in accordance with Appendix 6G for that *dispatch period*.
- B.7.5 For each *reserve class*, a risk adjustment factor specified by the *PSO* in accordance with Appendix 6G that scales the contingency risk determined within the *market clearing engine* to reflect special conditions within that *dispatch period*.
- B.7.6 The total *regulation* requirement and minimum required *regulation* specified by the *PSO* in accordance with Appendix 6G for that *dispatch period*.

B.8 VIOLATION COST AND PRICE CAP DATA

- B.8.1 *Constraint violation costs* as specified in Appendix 6J, or as established by the *PSO* in accordance with section 2.3 of this Chapter 6, as the case may be, where the specific values to apply in that *dispatch period* shall be specified by the *EMC* except where specified by the *PSO* in accordance with Appendix 6G.
- B.8.2 The *settlement* price limits specified in Appendix 6J.

B.9 MARKET CLEARING ENGINE PARAMETERS

- B.9.1 Such parameters as may be required to indicate the sources of input data and the destinations of output data for the production of each of the *market outlook scenarios*, the *pre-dispatch schedules*, the *short-term schedules* and the *real-time dispatch schedules*.

APPENDIX C - OUTPUT DATA FROM THE MARKET CLEARING ENGINE

C.1 INTRODUCTION

C.1.1 The *market clearing engine* shall produce, at minimum, the outputs described in sections C.2 to C.4 of this Appendix.

C.2 REGISTERED FACILITY AND INTERTIE SPECIFIC QUANTITIES

C.2.1 The *market clearing engine* shall produce, using the mathematical model in Appendix 6D, end-of-*dispatch period* target values for the following *physical services* for each *registered facility* that has associated with it a valid *offer* to provide or a valid *bid* to withdraw that *physical service*:

C.2.1.1 the amount of *energy* scheduled to be injected onto or withdrawn through the *transmission system*, expressed in MW;

C.2.1.2 the amount of *reserve*, for each *reserve class*, scheduled to be provided, expressed in MW; and

C.2.1.3 the amount of *regulation* scheduled to be provided, expressed in MW.

C.2.2 The *market clearing engine* shall produce, using the mathematical model in Appendix 6D, end-of-*dispatch period* target values for the *energy* to be injected onto, or withdrawn from, the *transmission system* in each *dispatch period* on each *intertie*, expressed in MW.

C.3 PRICES

C.3.1 The *market clearing engine* shall produce, using the mathematical model in Appendix 6D, the following prices for each *dispatch period*:

C.3.1.1 the *market energy price* or *MEP* for each *market network node*, expressed in \$/MWh;

C.3.1.2 the *uniform Singapore energy price* or *USEP*, expressed in \$/MWh;

C.3.1.3 the price of *reserve* for each *reserve class*, expressed in \$/MWh;

- C.3.1.4 the *market reserve price* or *MRP* for each *reserve provider group*, expressed in \$/MWh;
- C.3.1.5 *market regulation price* or *MFP*, expressed in \$/MWh; and
- C.3.1.6 the *load curtailment price* or *LCP*, expressed in \$/MWh.

C.4 ADDITIONAL DATA

- C.4.1 The *market clearing engine* shall, at a minimum, produce the following information for each *dispatch period*:
 - C.4.1.1 the total *load* scheduled to be supplied at each *dispatch network node* and in aggregate, expressed in MW;
 - C.4.1.2 the total generation scheduled at each *generation registered facility* and in aggregate, expressed in MW;
 - C.4.1.2A the total *energy* scheduled to be withdrawn for each *restricted energy bid* associated with an *LRF with REB*, expressed in MW;
 - C.4.1.2B the *load curtailment* in respect of each *LRF with REB*, expressed in MW;
 - C.4.1.2C the total *load curtailment* in respect of all *LRFs with REB*, expressed in MW;
 - C.4.1.2D the total transmission losses in the system, expressed in MW;
 - C.4.1.3 the extent of any shortfall in *energy*, by *dispatch network node* and in aggregate, expressed in MW;
 - C.4.1.4 the extent of any surplus in *energy*, by *dispatch network node* and in aggregate, expressed in MW;
 - C.4.1.4A the total *reserve* requirement by *reserve class*, expressed in MW;
 - C.4.1.5 total *reserve* scheduled to supply each *reserve class*, from each *reserve provider group* and in aggregate, expressed in MW;
 - C.4.1.6 the extent of any shortfall in *reserve*, by *reserve class*, expressed in MW;
 - C.4.1.6A the total *regulation* requirement, expressed in MW;
 - C.4.1.7 total *regulation* scheduled, expressed in MW;

- C.4.1.8 the extent of any shortfall in *regulation*, expressed in MW;
- C.4.1.9 predicted power flows and *energy losses on dispatch network lines*, expressed in MW;
- C.4.1.10 a list of *security constraints* and *generation fixing constraints* applied;
- C.4.1.11 details of the extent of any constraint violations;
- C.4.1.12 the value, in dollars, of the objective function specified in Appendix 6D; and
- C.4.1.13 estimated hourly *energy uplift rebate*, determined in accordance with section D.25.1.13 of Appendix 6D, expressed in \$/MWh.

APPENDIX D - MARKET CLEARING FORMULATION

SECTION A: DEFINITIONS

D.1 INTERPRETATION

D.1.1 In this appendix:

- D.1.1.1 sets shall be identified by being expressed in CAPITAL letters;
- D.1.1.2 variables in the linear program shall be identified by being expressed in Arial font text;
- D.1.1.3 parameters set outside of the linear program shall be identified by being expressed in ordinary text;
- D.1.1.4 indices or members of sets shall be identified by being expressed in lower case letters in *italicised* text;
- D.1.1.5 a reference to “generation” shall be a reference to the output of a *generation registered facility*; and
- D.1.1.6 unless a contrary intention appears, all sets, parameters, variables and functions are defined in relation to the single *dispatch period* for which the *market clearing engine* is being solved.

D.1.2 Wherever the following notation is found, it shall be interpreted as, for each x in the set GROUP, take each of the corresponding blocks from XBLOCKS:

$$\{j, x \mid j \in \text{XBLOCKS}_x, \text{ where } x \in \text{GROUP}\}$$

D.2 SETS

ARTIFICIALLINES	The set of <i>dispatch network lines</i> that have been artificially added to the dispatch network to model the connection of <i>generation registered facilities</i> . It comprises the union of the sets ARTIFICIALLINES1, ARTIFICIALLINES2 and ARTIFICIALLINES3. A subset of LINES.
ARTIFICIALLINES1	The set of <i>dispatch network lines</i> added to the dispatch network pursuant to section D.8.2. A subset of ARTIFICIALLINES and LINES.
ARTIFICIALLINES2	The set of <i>dispatch network lines</i> added to the dispatch network pursuant to section D.6.5. A subset of ARTIFICIALLINES and LINES.
ARTIFICIALLINES3	The set of <i>dispatch network lines</i> corresponding to notional loss-less lines connecting two electrically equivalent buses that have been introduced to the dispatch network in accordance with section D.6.3.4. A subset of ARTIFICIALLINES and LINES.
CONNECTEDUNITS _g	A subset of UNITS _g that consists only of constituent <i>generating units</i> , of the <i>multi-unit facility</i> associated with <i>energy offer g</i> , that are either (i) represented as <i>synchronised</i> in the <i>dispatch network data</i> or (ii) connected to the dispatch network, in accordance with section D.6.5.
DAMPINGGENERATORS	The set of all <i>energy offers</i> which are associated with <i>generation registered facilities</i> that are considered likely to decrease their generation output as a result of the frequency drop during a primary contingency. A subset of ENERGY OFFERS. The set of <i>generation registered facilities</i> that this applies to is supplied by the PSO in

	accordance with Appendix 6G section G.5.12.
DEFICITGENERATIONBLOCKS _n	The set of generation penalty blocks for failure to meet demand at node <i>n</i> . Indexed by <i>j</i> .
DISCRSUB _k	The discretisation subset for line <i>k</i> . It defines the points on the line flow / loss curve that are used to define the linear approximation of the quadratic loss curve. These points may be revised where the circumstances described in section D.22 apply. An ordered set, starting with the point representing the maximum reverse flow.
DISPLOADRESERVEOFFERS	The set of <i>reserve offers</i> that have been submitted by the <i>dispatch coordinators</i> for <i>LRFs with REB</i> . A subset of RAWRESERVEOFFERS.
ENERGYBIDS	The set of all <i>energy bids</i> , referenced by <i>p</i> . This comprises all valid <i>restricted energy bids</i> associated with <i>LRFs with REB</i> received by the <i>EMC</i> , together with <i>bids</i> to purchase <i>energy</i> at the relevant <i>dispatch network nodes</i> created by the <i>EMC</i> in accordance with sections D.9A.3 and D.9A.4.
ENERGYBIDS _n	The set of <i>energy bids</i> associated with node <i>n</i> , but excluding the <i>energy bids</i> submitted for <i>LRFs with REB</i> . A subset of ENERGYBIDS.
ENERGYOFFERS	The set comprising all <i>energy offers</i> from <i>dispatch coordinators</i> for <i>generation registered facilities</i> together with data entered for the <i>intertie</i> nodes to represent any scheduled import flows across the <i>interties</i> .
ENERGYOFFERS _n	The set of all <i>energy offers</i> from the <i>dispatch coordinators</i> of <i>generation registered facilities</i> that will inject into node <i>n</i> , or the data entered for the <i>intertie</i> node <i>n</i> to represent any scheduled import flows across the <i>intertie</i> . A subset of

	ENERGYOFFERS.
EXCESSGENERATIONBLOCKS _n	The set of penalty blocks for excess generation at node <i>n</i> . Indexed by <i>j</i> .
GENERATIONOFFERBLOCKS _g	The set of <i>price-quantity pairs</i> for the <i>energy offer g</i> . Indexed by <i>j</i> .
GENCONRESERVEOFFERS	The subset of GENRESERVEOFFERS that have been submitted by the <i>dispatch coordinators</i> for <i>generation registered facilities</i> for the purposes of offering <i>contingency reserve</i> , as set out in Section A.2.4 of Appendix 5A.
GENPRIRESERVEOFFERS	The subset of GENRESERVEOFFERS that have been submitted by the <i>dispatch coordinators</i> for <i>generation registered facilities</i> for the purposes of offering <i>primary reserve</i> , as set out in Section A.2.2 of Appendix 5A.
GENRESERVEOFFERS	The subset of RAWRESERVEOFFERS that have been submitted by the <i>dispatch coordinators</i> for <i>generation registered facilities</i> .
INTERTIEENERGYBIDS	The set of <i>energy bids</i> created by the <i>EMC</i> in accordance with section D.9A.4 to represent scheduled export <i>energy flows</i> across the <i>interties</i> . A subset of ENERGYBIDS.
INTERTIEENERGYOFFERS	The set comprising <i>energy offers</i> created by the <i>EMC</i> in accordance with section D.9A.4 to represent scheduled import <i>energy flows</i> across the <i>interties</i> . A subset of ENERGYOFFERS.
LINES	The set of all <i>dispatch network lines</i> in the dispatch network representation of the <i>transmission system</i> , referenced by <i>k</i> .
LINES _n	The set of all <i>dispatch network lines</i> which are connected to node <i>n</i> . A subset of LINES.
MULTICONSTRAINTSLINESGROUP _s	A subset of LINES grouped together for the purpose of expressing multi-unit

	constraint $s \in \text{MULTIUNITCONSTRAINTS}$. Indexed by k .
LOADZONES	The set of <i>load zones</i> associated with <i>load registered facilities</i> .
MULTIUNITCONSTRAINTS	The set of constraints on the ratios of injections at different connection points of a <i>multi-unit facility</i> . Indexed by s .
NODES	The set of all <i>dispatch network nodes</i> in the dispatch network representation of the <i>transmission system</i> , referenced by n .
NODES _{p}	The set of <i>dispatch network nodes</i> that are associated with <i>energy bid p</i> , where $p \in \text{RESTRICTEDENERGYBIDS}$.
PSTLINES	The set of <i>pst lines</i> . A subset of LINES.
PURCHASEBIDBLOCKS _{p}	The set of <i>bid blocks</i> for the <i>energy bid p</i> . Indexed by j .
RAWRESERVEBLOCKS _{r}	The set of <i>price-quantity pairs</i> for the <i>reserve offer r</i> . Indexed by j .
RAWRESERVEOFFERS	The set of <i>reserve offers</i> , referenced by r .
RAWRESERVEOFFERS _{x}	The set of <i>reserve offers</i> that come from <i>reserve provider group x</i> . A subset of RAWRESERVEOFFERS.
REFERENCENODE	The singleton set whose element is the <i>dispatch network node</i> that is the reference node for the Singapore system.
REGULATIONOFFERBLOCKS _{l}	The set of <i>regulation offer price-quantity pairs</i> for the <i>regulation offer l</i> . Indexed by j .
REGULATIONOFFERS	The set of <i>regulation offers</i> , referenced by l .
RESERVECLASSES	The set of <i>reserve classes</i> referenced by c .
RESERVEGROUPBLOCKS _{x}	The set of blocks of the aggregate <i>reserve response</i> from <i>reserve providers</i>

	belonging to <i>reserve provider group x</i> .
RESERVEGROUPS	The set of <i>reserve provider groups</i> . Indexed by <i>x</i> .
RESERVEGROUPS _c	The set of <i>reserve provider groups</i> associated with <i>reserve class c</i> . A subset of RESERVEGROUPS.
RESTRICTEDENERGYBIDS	The set of <i>restricted energy bids</i> submitted by the <i>dispatch coordinators</i> for <i>LRFs with REB</i> . A subset of ENERGYBIDS.
RESTRICTEDENERGYBIDS _n	The set of <i>restricted energy bids</i> which are deemed to be associated with the <i>dispatch network node n</i> . A subset of RESTRICTEDENERGYBIDS.
RESTRICTEDENERGYBIDS _z	The set of <i>restricted energy bids</i> which are associated with the <i>load zone z</i> . A subset of RESTRICTEDENERGYBIDS.
RISKGENERATORS	The set of all <i>energy offers</i> which are associated with <i>generation registered facilities</i> that are considered a primary contingency risk. A subset of ENERGYOFFERS.
SECONDARYRISKGENERATORS	The set of all <i>energy offers</i> which are associated with <i>generation registered facilities</i> that are considered a secondary risk, that is <i>generation registered facilities</i> that may fail as a result of the frequency drop during a primary contingency. A subset of ENERGYOFFERS
SECURITYCONSTRAINTS	The set of all <i>security constraints</i> , referenced by <i>s</i> .
SECURITYGENERATIONGROUP _s	A subset of ENERGYOFFERS grouped together for the purpose of expressing <i>security constraint s</i> .
SECURITYLINESGROUP _s	A subset of LINES grouped together for the purpose of expressing <i>security constraint s</i> .

SECURITYNODESGROUP _s	A subset of NODES grouped together for the purpose of expressing <i>security constraints</i> .
TIEDENERGYOFFERBLOCKPAIR _o	The <i>o</i> th pair of <i>price-quantity pairs</i> identified under section D.9C.2.
TIEDENERGYOFFERBLOCKPAIRS	The set of all pairs of <i>price-quantity pairs</i> identified under section D.9C.2. Indexed by <i>o</i> .
TIEDREGULATIONOFFERBLOCKPAIR _o	The <i>o</i> th pair of <i>price-quantity pairs</i> identified under section D.9C.4.
TIEDREGULATIONOFFERBLOCKPAIRS	The set of all pairs of <i>price-quantity pairs</i> identified under section D.9C.4. Indexed by <i>o</i> .
TIEDRESERVEOFFERBLOCKPAIR _o	The <i>o</i> th pair of <i>price-quantity pairs</i> identified under section D.9C.3.
TIEDRESERVEOFFERBLOCKPAIRS	The set of all pairs of <i>price-quantity pairs</i> identified under section D.9C.3. Indexed by <i>o</i> .
UNITS _g	The set of all constituent <i>generating units</i> that form part of the <i>multi-unit facility</i> associated with <i>energy offer g</i> .
VIOLATIONGROUPBLOCKSFAC _{y(g)}	The set of violation penalty blocks for violation of violation constraint group <i>y(g)</i> which consists of violations associated with <i>generation registered facilities</i> . Indexed by <i>j</i> .
VIOLATIONGROUPBLOCKSFAC _{y(p)}	The set of violation penalty blocks for violation of violation constraint group <i>y(p)</i> which consists of violations associated with the <i>LRF with REB</i> associated with <i>energy bid p</i> . Indexed by <i>j</i> .
VIOLATIONGROUPBLOCKSLIN _{y(k)}	The set of violation penalty blocks for violation of violation constraint group <i>y(k)</i> which consists of violations associated with lines. Indexed by <i>j</i> .
VIOLATIONGROUPBLOCKSREG _{y(regul)}	The set of violation penalty blocks for violation of violation constraint group

<i>ation)</i>	$y(\textit{regulation})$ which consists of violations associated with <i>regulation</i> requirements. Indexed by j .
VIOLATIONGROUPBLOCKSRES $_{y(c)}$	The set of violation penalty blocks for violation of violation constraint group $y(c)$ which consists of violations associated with <i>reserve</i> requirements for <i>reserve class c</i> . Indexed by j .
VIOLATIONGROUPBLOCKSSEC $_{y(s)}$	The set of violation penalty blocks for violation of violation constraint group $y(s)$ which consists of violations associated with <i>security constraints</i> . Indexed by j .
VIOLATIONGROUPBLOCKS $_y$	The set of violation penalty blocks for violation of violation constraint group y . Indexed by j , in ascending order of violation group block penalty if multiple violation group blocks apply to a violation constraint group, as set out in section J.3 of Appendix 6J.
VIOLATIONGROUPS	The set of violation constraint groups, indexed by y . Violation constraint groups are used to group together violations of constraints. Each violation constraint group is associated with only one type of entity: lines, <i>reserve</i> requirement, <i>regulation</i> requirement, facility or <i>security constraint</i> .

D.3 PARAMETERS

AcceptableFreqDeviation _c	A scaling factor to represent the maximum frequency deviation that is acceptable in the event of a system event, for <i>reserve class c</i> . This factor is the ratio of the maximum acceptable frequency deviation to the nominal frequency. Determined based on <i>intertie</i> status, in accordance with section D.13B.2.
ActualLoss _k	The <i>dispatch network line</i> loss calculated for <i>dispatch network line k</i> after the linear program is solved, in the event that it is suspected that the linear program has not calculated the <i>dispatch network line</i> loss correctly. Calculated in accordance with section D.22.4.
AdditionalNumPoints _k	The additional number of line flow/line loss points used to represent <i>dispatch network line k</i> for the purpose of constraint relaxation. Set by the <i>EMC</i> .
CircuitError _k	The difference between the <i>dispatch network line</i> loss calculated within the linear program and the <i>dispatch network line</i> loss calculated after the linear program has solved for <i>dispatch network line k</i> . Calculated in accordance with section D.22.4.
CombinedRampThreshold	The threshold in seconds that determines which instances of the combined ramping, <i>reserve</i> and <i>regulation</i> constraints, specified in section D.19.2, will be included in the linear program. Set by the <i>EMC</i> .
DeficitGenerationBlockMax _{n,j}	The maximum violation for block <i>j</i> of <i>energy</i> shortfall at <i>dispatch network node n</i> . Set by the <i>EMC</i> in accordance with Appendix 6J.
DeficitGenerationPenalty _{n,j}	The per MW constraint violation cost associated with block <i>j</i> of <i>energy</i> shortfall at <i>dispatch network node n</i> . Set from the <i>values</i> in Appendix 6J.
DegreeShiftPerTap _k	The degree of phase angle shift in radian units that will result from a change from one tap position to the next immediate tap position of the phase-shifting transformer of <i>pst line k</i> at no

	load condition. Received from the <i>PSO</i> in accordance with Appendix 6G section G.4.4A.
DispatchPeriod	The length in seconds of the dispatch period. This shall be 1800.
DownRampRate _g or DownRampRate _p	The maximum ramp-down rate of the <i>generation registered facility</i> that the <i>energy offer g</i> is for, or the <i>LRF with REB</i> that the <i>energy bid p</i> is for, in MW/minute. Set from the values stated in valid <i>energy offers</i> referred to in section 5.2.2.6 of Chapter 6 or in valid <i>restricted energy bids</i> referred to in section 5.2A.2.6 of Chapter 6.
Effectiveness _{x,j}	The effectiveness multiplier of raw <i>reserve</i> in block <i>j</i> of <i>reserve provider group x</i> . Received from the <i>PSO</i> in accordance with Appendix 6G section G.5.3.
EstGTOutputDamping _c	A scaling factor to represent the estimated contribution of GT output damping to the calculation of <i>PowerSystemResponse</i> , for <i>reserve class c</i> . This factor is the ratio of estimated GT output reduction to frequency deviation. The factor is applied to the output of <i>generation registered facilities</i> that are members of the set DAMPINGGENERATORS. Supplied by the <i>PSO</i> in accordance with section G.5.11 of Appendix 6G.
EstimatedReactivePowerFlow _k	The estimated net reactive power flow along <i>dispatch network line k</i> at the end of the <i>dispatch period</i> . This may be positive or negative. Calculated in accordance with section D.10.1
EstIntertieContribution	A scaling factor to represent the estimated contribution of the <i>intertie</i> to the calculation of <i>PowerSystemResponse</i> . Determined based on <i>intertie</i> status, in accordance with section D.13B.1.
EstLoadDamping _c	A scaling factor to represent the estimated contribution of load damping to the calculation of <i>PowerSystemResponse</i> , for <i>reserve class c</i> . This factor is the ratio of the estimated demand reduction to frequency deviation. Supplied by the <i>PSO</i> in accordance with Appendix 6G section G.5.10.

EstReserveEffectiveness _r	The estimated <i>reserve</i> effectiveness of <i>reserve</i> from <i>reserve offer r</i> , calculated in accordance with section D.11. In the case of a <i>generation registered facility</i> , it is used when calculating the effective risk due to a failure of the <i>generation registered facility</i> .
ExcessGenerationBlockMax _{n,j}	The maximum violation for block <i>j</i> of <i>energy surplus</i> at <i>dispatch network node n</i> . Set by the <i>EMC</i> in accordance with Appendix 6J.
ExcessGenerationPenalty _{n,j}	The per MW constraint violation cost associated with block <i>j</i> of <i>energy surplus</i> at <i>dispatch network node n</i> . Set from the <i>values</i> in Appendix 6J.
ExpectedStartGeneration _g	The forecast generation level at the beginning of a given <i>dispatch period</i> of a <i>generation registered facility</i> associated with <i>energy offer g</i> for that <i>dispatch period</i> , which shall be determined in accordance with section D.12.5.
FixedLosses _k	The fixed losses attributed to <i>dispatch network line k</i> . Received from the <i>PSO</i> in accordance with Appendix 6G section G.4.4.
GenerationBlockMax _{g,j}	The maximum MW which can be scheduled from block <i>j</i> ∈ GENERATIONOFFERBLOCKS _g for <i>energy offer g</i> ∈ ENERGYOFFERS. Set from the <i>price-quantity pairs</i> for valid <i>energy offers</i> referred to in section 5.2.2.4 of Chapter 6, or from the <i>PSO intertie schedules</i> in accordance with section D.9A.6.1.
GenerationEndMax _g	The maximum end of <i>dispatch period</i> MW output for the <i>generation registered facility</i> associated with <i>energy offer g</i> , given its forecast status at the beginning of the <i>dispatch period</i> . Calculated in accordance with section D.12.
GenerationEndMin _g	The minimum end of <i>dispatch period</i> MW output for the <i>generation registered facility</i> associated with <i>energy offer g</i> , given its forecast status at the beginning of the <i>dispatch period</i> . Calculated in accordance with section D.12.
GenerationOfferPrice _{g,j}	The per MW price assigned to <i>energy offer g</i> ∈

	ENERGYOFFERS applicable to offer block $j \in$ GENERATIONOFFERBLOCKS $_g$. Set from the <i>price-quantity pairs</i> for valid <i>energy offers</i> referred to in section 5.2.2.4 of Chapter 6 or in the case of offers representing power flows across the <i>intertie</i> , set by the <i>PSO</i> in accordance with section 2.3 of this Chapter.
GenerationMax $_g$	The maximum generation output for the <i>generation registered facility</i> associated with <i>energy offer g</i> . Set from the <i>standing capability data</i> referred to in Appendix 6E section E.1.1.2.
GenericSecurityLimit $_s$	The minimum limit for <i>security constraint s</i> . Received from the <i>PSO</i> in accordance with section G.5.1 of Appendix 6G.
GroupResponseMax $_{x,j}$	The maximum response allowed from block j of <i>reserve provider group x</i> . Received from the <i>PSO</i> in accordance with Appendix 6G section G.5.3.
HighLoad $_g$	The <i>energy</i> output of the <i>generation registered facility</i> associated with <i>energy offer g</i> , that is calculated by multiplying the constant, HighLoadFactor, by the parameter, StandingReserveGenerationMax $_g$.
HighLoadFactor	A constant equal to 0.9 that is used in the determination of the parameter, HighLoad $_g$.
HighLoadReserve $_r$	The quantity of <i>reserve</i> in MW that can be provided by a <i>generation registered facility</i> operating with an <i>energy</i> output of HighLoad $_{g(r)}$ and offering <i>reserve offer r</i> .
ILProportionMax $_c$	The maximum proportion of the Risk $_c$ that can be covered by <i>reserve of reserve class c</i> provided by <i>load registered facilities</i> . Received from the <i>PSO</i> in accordance with Appendix 6G section G.5.3C.
InfinitePositiveValue	A relatively large positive value applied in sections D.15.1.3, D.17.2.8, D.17.4.2, and D.18.1 as a selector variable coefficient.

LineAdmittance _k	The “admittance” ¹ of transmission line <i>k</i> . Calculated in accordance with section D.9.1.
LineFlowConst _{k,j}	The <i>dispatch network line</i> flow (in the conventional forward direction) associated with point <i>j</i> of the loss representation of line <i>k</i> . Since losses are assigned equally to each end of the line, the flow is notionally measured at the “midpoint” of the line. A negative value indicates flow in the conventional reverse direction. Calculated in accordance with section D.9.3.
LineLossConst _{k,j}	The <i>dispatch network line</i> loss associated with point <i>j</i> of the loss representation of <i>dispatch network line k</i> . Includes both fixed and variable losses. Calculated in accordance with section D.9.4.
LineMaxForward _k	The forward maximum available capacity of transmission line $k \in \text{LINES}$. Calculated in accordance with section D.10.
LineMaxReverse _k	The reverse maximum available capacity of transmission line $k \in \text{LINES}$. A negative quantity. Calculated in accordance with section D.10.
LineRatingForward _k	The operational capacity rating of <i>dispatch network line k</i> in the conventional forward direction. Received from the <i>PSO</i> in accordance with Appendix 6G section G.4.3.
LineRatingReverse _k	The operational capacity rating of <i>dispatch network line k</i> in the conventional reverse direction. Received from the <i>PSO</i> in accordance with Appendix 6G section G.4.3.
LowLoad _g	The lowest <i>load</i> in MW at which the <i>generation registered facility</i> associated with <i>energy offer g</i> , can provide <i>reserve</i> that meets the requirements of the <i>transmission code</i> .

¹Technically, the susceptance “B” of the branch is used. However the loose use of “admittance” is widespread, and is maintained here.

LowLoadReserve _r	The quantity of <i>reserve</i> in MW that can be provided by a <i>generation registered facility</i> operating with an <i>energy</i> output of LowLoad _g and offering <i>reserve offer r</i> .
MaxLineRating _k	The largest absolute value operational capacity of the <i>dispatch network line k</i> in either direction. Calculated in accordance with section D.9.3
MaxResponse _l	The maximum change in generation output possible for <i>regulation</i> purposes for <i>regulation offer l</i> , assuming no underlying energy ramp. Calculated in accordance with section D.13.3.
MaxResponse _r	The maximum change in generation output possible for <i>reserve</i> purposes for <i>reserve offer r</i> , assuming no underlying energy ramp. Calculated in accordance with section D.13.1.
MediumLoad _g	The <i>energy</i> output of the <i>generation registered facility</i> associated with <i>energy offer g</i> , that is calculated by multiplying the constant, MediumLoadFactor, by the parameter, StandingReserveGenerationMax _g .
MediumLoadFactor	A constant equal to 0.75 that is used in the determination of the parameter, MediumLoad _g .
MediumLoadReserve _r	The quantity of <i>reserve</i> in MW that can be provided by a <i>generation registered facility</i> operating with an <i>energy</i> output of MediumLoad _{g(r)} and offering <i>reserve offer r</i> .
MinimumRegulation	The minimum <i>regulation</i> required to correct any <i>power system</i> frequency variations or imbalances between <i>load</i> and output from <i>generation facilities</i> . Received from the <i>PSO</i> in accordance with section G.5.6A of Appendix 6G.
MinimumRisk _c	The minimum contingency risk to be covered by the aggregate system response in <i>reserve class c</i> . Received from the <i>PSO</i> in accordance with section G.5.4 of Appendix 6G.
MinimumStableLoad _g	The minimum output level in MW of a <i>generation registered facility</i> associated with <i>energy offer g</i> , at which the <i>generation</i>

	<p><i>registered facility</i> can maintain stable operation. Set in accordance with section E.1.1.14 of Appendix 6E. For other <i>generation registered facilities</i>, this takes on a value of zero.</p>
MultiGroupLineWeights _{s,k}	<p>The parameter associated with the artificial <i>dispatch network line k</i> and the multi-unit constraint <i>s</i>, which constrains the ratio of injections for the injection points of a <i>multi-unit facility</i>. Set in accordance with section D.8.7 and D.8.8.</p>
NumPoints _k	<p>The number of line flow/line loss points used to represent <i>dispatch network line k</i>. Set by the <i>EMC</i>.</p>
OfferedCapacity _g	<p>The maximum combined capacity of the <i>generation registered facility</i> for <i>energy, reserve</i> and <i>regulation</i> stated in <i>energy offer g</i> under section 5.2.2.5 of Chapter 6.</p>
PriorScheduledGeneration _g	<p>In respect of a <i>generation registered facility</i> associated with an <i>energy offer g</i> for a given <i>dispatch period</i>, either:</p> <ul style="list-style-type: none"> (a) the scheduled <i>energy</i> in the <i>real-time dispatch schedule</i> for that <i>generation registered facility</i> for the prior <i>dispatch period</i>, or (b) in the event that such <i>real-time dispatch schedule</i> is not available, that <i>generation registered facility's</i> StartGeneration_g.
PriorScheduledPurchase _p	<p>The MW quantity of scheduled <i>energy</i> withdrawal for the <i>LRF with REB</i> associated with <i>energy bid p</i> for the immediately preceding <i>dispatch period</i>. Determined in accordance with section D.12.10.</p>
Proportion _{p,n}	<p>The proportion of the <i>bid</i> quantity from <i>energy bid p</i> that is deemed to be at <i>dispatch network node n</i>, where $p \in \text{RESTRICTEDENERGYBIDS}$, $n \in \text{NODES}_p$ and $\sum_{n \in \text{NODES}_p} \text{Proportion}_{p,n} = 1$.</p>
Proportion _u	<p>The default proportion of generation for <i>generating unit u</i> of a <i>multi-unit facility</i>, specified by the <i>EMC</i> in accordance with section D.7.3. The number specified must be greater</p>

	than zero.
$PSTTapPosition_k$	The integer value assigned to the tap position of the phase-shifting transformer of <i>pst line k</i> . Used in accordance with Appendix 6D section D.13C.
$PurchaseBidPrice_{p,j}$	The per MW price assigned to <i>energy bid p</i> \in ENERGYBIDS applicable to <i>energy bid block j</i> \in PURCHASEBIDBLOCKS _p . Set in accordance with section D.9A.
$PurchaseBlockMax_{p,j}$	The maximum MW to be scheduled in block <i>j</i> \in PURCHASEBIDBLOCKS _p for <i>energy bid p</i> \in ENERGYBIDS. Set from the <i>nodal load forecast</i> in accordance with section D.9A.3.1, from the <i>intertie schedules</i> in accordance with section D.9A.5.1, or from <i>energy bids</i> submitted for <i>LRFs with REB</i> .
$PurchaseEndMax_p$	The maximum end-of- <i>dispatch period</i> MW <i>energy</i> withdrawal for the <i>LRF with REB</i> associated with <i>energy bid p</i> . Calculated in accordance with section D.12.8.
$PurchaseEndMin_p$	The minimum end-of- <i>dispatch period</i> MW <i>energy</i> withdrawal for the <i>LRF with REB</i> associated with <i>energy bid p</i> . Calculated in accordance with section D.12.9.
RampingTime	10 minutes, or such other time period as may be determined by the <i>EMC</i> in consultation with the <i>PSO</i> .
$RawReserveBlockMax_{r,j}$	The maximum MW to be scheduled in block <i>j</i> \in RAWRESERVEBLOCKS _r for <i>reserve offer r</i> \in RAWRESERVEOFFERS. Set from the <i>price-quantity pairs</i> for valid <i>reserve offers</i> referred to in section 5.3.2.5 of Chapter 6.
Reactance _k	The reactance of <i>dispatch network line k</i> . Received from the <i>PSO</i> in accordance with Appendix 6G section G.4.4.
$RegulationBlockMax_{l,j}$	The maximum MW to be scheduled in block <i>j</i> \in REGULATIONOFFERBLOCKS _r for <i>regulation offer l</i> \in REGULATIONOFFERS. Set from the <i>price-quantity pairs</i> for valid <i>regulation offers</i>

	referred to in section 5.4.3.4 of Chapter 6.
RegulationMax _g	The maximum output for which <i>automatic generator control (AGC)</i> or other signals acceptable to the <i>PSO</i> can operate the <i>generation registered facility</i> associated with <i>energy offer g</i> to provide <i>regulation</i> capability. Calculated in accordance with section D.9A.8.
RegulationMin _g	The minimum output for which <i>automatic generator control (AGC)</i> or other signals acceptable to the <i>PSO</i> can operate the <i>generation registered facility</i> associated with <i>energy offer g</i> to provide <i>regulation</i> capability. Set from the <i>standing capability data</i> referred to in Appendix 6E section E.1.1.10.
RegulationOfferPrice _{l,j}	The per MW price assigned to <i>regulation offer l</i> ∈ REGULATIONOFFERS applicable to <i>offer block j</i> ∈ REGULATIONOFFERBLOCKS _l . Set from the <i>price-quantity pairs</i> for valid <i>regulation offers</i> referred to in section 5.4.3.4 of Chapter 6.
RegulationRequirement	The MW amount of <i>regulation</i> required. Received from the <i>PSO</i> in accordance with Appendix 6G section G.5.6.
RegulationResponsePeriod	The allowable response time period for <i>regulation</i> , in seconds.
RegulationResponseRatio	The ratio that converts energy ramping to units that may be compared with those used for ramping due to <i>regulation</i> . Calculated in accordance with section D.13.4.
RemainingTime	The length in seconds remaining in the dispatch period. This shall be the lesser of 1800 and the number of seconds from when the schedule is expected to be implemented until the end of the <i>dispatch</i> period. Calculated from the system clock and a parameter set by the <i>EMC</i> representing the estimated elapsed time to produce a schedule.
ReserveGenerationMax _r	The maximum combined generation and <i>reserve</i> of the relevant class that can be provided by the <i>generation registered facility</i> associated with <i>reserve offer r</i> . Calculated in accordance with

	section D.9A.7.
ReserveOfferPrice _{<i>r,j</i>}	The per MW price assigned to <i>reserve offer</i> $r \in \text{RAWRESERVEOFFERS}$ applicable to <i>offer</i> block $j \in \text{RAWRESERVEBLOCKS}_r$. Set from the <i>price-quantity pairs</i> for valid <i>reserve offers</i> referred to in section 5.3.2.5 of Chapter 6.
ReserveProportion _{<i>r</i>}	The ratio limiting the quantity of <i>reserve</i> that can be provided by a <i>generation registered facility</i> to a proportion of the generation output respectively. Set from the values stated in valid <i>reserve offers</i> referred to in section 5.3.2.6 of Chapter 6.
ReserveProportionCombined _{<i>r</i>}	The maximum of ReserveProportion _{<i>r</i>} and ReserveResponseRatio _{<i>r</i>} . Calculated in accordance with section D.13.5.
ReserveResponsePeriod _{<i>c</i>}	The allowable response time period for <i>reserve class</i> c , in seconds. Set in accordance with Appendix 5A section A.2.
ReserveResponseRatio _{<i>r</i>}	The ratio that converts <i>energy</i> ramping to comparable units to ramping due to <i>reserve</i> for <i>reserve offer</i> r . Calculated in accordance with section D.13.2.
Resistance _{<i>k</i>}	The resistance of <i>dispatch network line</i> k . Received from the <i>PSO</i> in accordance with Appendix 6G section G.4.4.
ResponseDelay _{<i>r</i>}	The time delay, in seconds, before the <i>generation registered facility</i> associated with raw <i>reserve offer</i> r begins to respond following a <i>contingency event</i> . Set from the <i>standing capability data</i> referred to in section E.1.1.11 of Appendix 6E.
RevisedMaxLineRating _{<i>k</i>}	The new max line rating that is calculated based on the number of additional flow/line points used to represent <i>dispatch network line</i> k for the purpose of constraint relaxation.
RiskAdjustmentFactor _{<i>c</i>}	The factor which re-scales the risk to be met, in <i>reserve class</i> c , according to system conditions (e.g. inertia) at the time. Received from the <i>PSO</i> in accordance with Appendix 6G section G.5.5.

SecurityGroupGenerationWeight _{s,g}	The weighting attached to <i>energy offer g</i> 's <i>dispatched</i> generation in <i>security constraint s</i> . Received from the <i>PSO</i> in accordance with section G.5.1 of Appendix 6G.
SecurityGroupLineWeight _{s,k}	The weighting attached to <i>dispatch network line k</i> 's flow in <i>security constraint s</i> . Received from the <i>PSO</i> in accordance with section G.5.1 of Appendix 6G.
SecurityGroupNodeWeight _{s,n}	The weighting attached to <i>dispatch network node n</i> 's net injection in <i>security constraint s</i> . Received from the <i>PSO</i> in accordance with section G.5.1 of Appendix 6G.
StandingReserveGenerationMax _{g(r)}	The maximum combined generation and <i>reserve</i> of the relevant class that can be provided by the <i>generation registered facility</i> associated with <i>reserve offer r</i> in <i>standing capability data</i> . Set in accordance with Appendix 6E, section E.1.1.6.
StartGeneration _g	The forecast generation level at the beginning of a given <i>dispatch period</i> of a <i>generation registered facility</i> associated with <i>energy offer g</i> for that <i>dispatch period</i> . For <i>multi-unit facilities</i> , this is calculated in accordance with sections D.8.3 to D.8.6. For other <i>generation registered facilities</i> this is calculated in accordance with sections D.12.1 to D.12.4.
StartGeneration _u	The forecast generation level at the beginning of a given <i>dispatch period</i> of <i>generating unit u</i> . Received from the <i>PSO</i> in accordance with section G.3.1 of Appendix 6G.
StatusDataLifeMax	The maximum interval, measured in seconds, between the start of the <i>dispatch period</i> for which the <i>EMC</i> will use the status data on the network elements referred to in section D.6.1.2 and the compilation of the data by the <i>PSO</i> . Defined by the <i>EMC</i> in accordance with section D.6.6.
SysError	The total across the dispatch network of all of the differences between the line losses calculated within the linear program and the line losses calculated after the linear program has

	solved. Calculated in accordance with section D.22.4.
SystemLoadResponseMax	The maximum of the aggregate of <i>reserve response</i> and <i>load curtailment</i> allowed in respect of <i>load registered facilities</i> on a system-wide basis. Received from the <i>PSO</i> in accordance with section G.5.3D of Appendix 6G.
T1Margin	A margin parameter set by <i>EMC</i> to determine the forward maximum available capacity for the <i>dispatch network lines</i> referred to in section D.8.2.
TapMax _k	The largest of the integer values assigned to each of the tap positions of the phase-shifting transformer of <i>pst line k</i> . Received from the <i>PSO</i> in accordance with Appendix 6G section G.4.4A.
TapMin _k	The smallest of the integer values assigned to each of the tap positions of the phase-shifting transformer of <i>pst line k</i> . Received from the <i>PSO</i> in accordance with Appendix 6G section G.4.4A.
TapZero _k	The integer value assigned to the tap position of the phase-shifting transformer of <i>pst line k</i> that results in a zero degree phase angle shift on that line <i>k</i> . Received from the <i>PSO</i> in accordance with Appendix 6G section G.4.4A.
TieBreakingPenaltyFactor	A factor having the value of 10^{-6} , or such other value as may be determined by the <i>EMC</i> .
UpRampRate _g or UpRampRate _p	The maximum ramp-up rate of the <i>generation registered facility</i> that the <i>energy offer g</i> is for, or the <i>LRF with REB</i> that the <i>energy bid p</i> is for, in MW/minute. Set from the values stated in valid <i>energy offers</i> referred to in section 5.2.2.6 of Chapter 6 or in valid <i>restricted energy bids</i> referred to in section 5.2A.2.6 of Chapter 6.
ViolationGroupBlockMax _{y,j}	The maximum MW violation allowed in block <i>j</i> of violation constraint group <i>y</i> . Set from the values in Appendix 6J where such values are specified, unless otherwise set by the <i>PSO</i> in accordance with section 2.3 of Chapter 6.

ViolationGroupBlockPenalty _{y,j}	The per MW <i>constraint violation cost</i> associated with block <i>j</i> of violation constraint group <i>y</i> . Set from the values in Appendix 6J where such values are specified, unless otherwise set by the <i>PSO</i> in accordance with section 2.3 of Chapter 6.
ViolationGroupProportion _c	A constant equal to 0.2 for primary <i>reserve</i> and 0.3 for contingency <i>reserve</i> , that is used in the determination of violation group block quantities in section D.21.3.
ZoneResponseMax _z	The maximum of the aggregate of <i>reserve response</i> and <i>load curtailment</i> allowed in respect of <i>load registered facilities</i> in <i>load zone z</i> . Received from the <i>PSO</i> in accordance with section G.5.3B of Appendix 6G.

D.4 VARIABLES

D.4.1 Primal Linear Programme Variables: Unless otherwise noted, all primal linear programme variables are assumed to be non-negative.

CurtailedLoad _{<i>p</i>}	The MW amount of <i>energy bid p</i> \in RESTRICTEDENERGYBIDS that is not scheduled to be withdrawn.
DeficitGenerationBlock _{<i>n,j</i>}	The block <i>j</i> MW deficit generation at node <i>n</i> .
DeficitMSL _{<i>g</i>}	The MW amount by which the constraint in section D.15.1.3.2 that limits the <i>dispatch</i> of <i>energy</i> for the <i>generation registered facility</i> associated with <i>energy offer g</i> to at least its minimum stable load is violated.
DeficitMulti _{<i>s</i>}	The MW deficit for multi-unit constraints.
DeficitRegGen _{<i>l</i>}	The MW amount by which the constraint giving the lower bound of output for regulation capability is breached for the <i>generation registered facility</i> associated with <i>regulation offer l</i> .
DeficitRegulation	The MW deficit of <i>regulation</i> .
DeficitReserve _{<i>c</i>}	The MW deficit of <i>reserve class c</i> .
DeficitSecurity _{<i>s</i>}	The MW deficit for <i>security constraint s</i> .
DeficitWLineFlow _{<i>k</i>}	The MW flow on <i>dispatch network line k</i> below the flow consistent with the line flow/line loss weight variables.
EffectiveReserve _{<i>x</i>}	The total effective <i>reserve</i> contribution from all <i>reserve offers</i> cleared from <i>reserve provider group x</i> .
EnergyTieBreakSlack1 _{<i>o</i>} EnergyTieBreakSlack2 _{<i>o</i>}	The variables representing the extent to which the <i>energy tie-breaking</i> constraint associated with TIEDENERGYOFFERBLOCKPAIR _{<i>o</i>} in section D.20A.1 is violated.
ExcessDownRamp _{<i>g</i>} or ExcessDownRamp _{<i>p</i>}	The MW amount by which the maximum down ramp of the <i>generation registered facility</i> associated with <i>energy offer g</i> , or the <i>LRF with REB</i> associated with <i>energy bid p</i> , is exceeded.

ExcessGenerationBlock _{<i>n,j</i>}	The block <i>j</i> MW excess generation at <i>dispatch network node n</i> .
ExcessLineFlowForward _{<i>k</i>}	The MW flow on <i>dispatch network line k</i> above LineMaxForward _{<i>k</i>} , the maximum capacity in the forward direction.
ExcessLineFlowReverse _{<i>k</i>}	The MW flow on <i>dispatch network line k</i> below LineMaxReverse _{<i>k</i>} , the maximum capacity in the reverse direction.
ExcessResGen Segment1 _{<i>r</i>}	The MW amount by which the Reserve Generation Segment 1 constraint limiting the total simultaneous <i>dispatch</i> of generation and <i>reserve</i> (of the class to which <i>reserve offer r</i> belongs) from the same <i>generation registered facility</i> is exceeded.
ExcessResGen Segment2 _{<i>r</i>}	The MW amount by which the Reserve Generation Segment 2 constraint limiting the total simultaneous <i>dispatch</i> of generation and <i>reserve</i> (of the class to which <i>reserve offer r</i> belongs) from the same <i>generation registered facility</i> is exceeded.
ExcessResGen Segment3 _{<i>r</i>}	The MW amount by which the Reserve Generation Segment 3 constraint limiting the total simultaneous <i>dispatch</i> of generation and <i>reserve</i> (of the class to which <i>reserve offer r</i> belongs) from the same <i>generation registered facility</i> is exceeded.
ExcessWLineFlow _{<i>k</i>}	The MW flow on <i>dispatch network line k</i> above the flow consistent with the line flow/line loss weight variables.
ExcessMulti _{<i>s</i>}	The MW excess for multi-unit constraint <i>s</i> .
ExcessRawReserve _{<i>r</i>}	The MW amount by which the constraint limiting raw <i>reserve</i> from <i>reserve offer r</i> to a proportion of generation at the associated <i>generation registered facility</i> , is exceeded.
ExcessRegGen _{<i>l</i>}	The MW amount by which the constraint giving the upper bound of output for regulation capability is exceeded for the <i>generation registered facility</i> associated with <i>regulation offer l</i> .
ExcessRegRamp _{<i>l</i>}	The MW amount by which the constraint giving the combined limit for ramping and regulation is

	exceeded for the <i>generation registered facility</i> associated with <i>regulation offer l</i> .
ExcessResGen _r	The MW amount by which the constraint limiting the total simultaneous <i>dispatch</i> of generation, <i>regulation</i> and <i>reserve</i> (of the class to which <i>reserve offer r</i> belongs) from the same <i>generation registered facility</i> is exceeded.
ExcessResPropRamp _r	The MW amount by which the constraint giving the combined limit for ramping and <i>reserve</i> response as a fraction of generation output is exceeded for the <i>generation registered facility</i> associated with <i>reserve offer r</i> .
ExcessResRamp _r	The MW amount by which the constraint giving the combined limit for ramping and <i>reserve</i> response is exceeded for the <i>generation registered facility</i> associated with <i>reserve offer r</i> .
ExcessMSL _g	The MW amount by which the constraint in section D.15.1.3.1 that limits the <i>dispatch</i> of <i>energy</i> for the <i>generation registered facility</i> associated with <i>energy offer g</i> to zero is violated.
ExcessUpRamp _g or ExcessUpRamp _p	The MW amount by which the maximum up ramp of the <i>generation registered facility</i> associated with <i>energy offer g</i> , or the <i>LRF with REB</i> associated with <i>energy bid p</i> , is exceeded.
FacilityLineFlowViolation _g	The total MW violation of connection line flow constraints associated with the <i>generation registered facility</i> that <i>energy offer g</i> is for.
FacilityMSLViolation _g	The total MW violation of the minimum stable load constraints associated with the <i>generation registered facility</i> that <i>energy offer g</i> is for.
FacilityMultiUnitViolation _g	The total MW violation of the multi-unit constraints associated with the <i>multi-unit facility</i> that <i>energy offer g</i> is for.
FacilityRampViolation _g	The total MW violation of the ramping constraints associated with the <i>generation registered facility</i> that <i>energy offer g</i> is for.
FacilityRampViolation _p	The total MW violation of ramping constraints associated with the <i>LRF with REB</i> associated with <i>energy bid p</i> .

FacilityRegulationViolation _g	The total MW violation of the <i>regulation</i> constraints associated with the <i>generation registered facility</i> that <i>energy offer g</i> is for.
FacilityReserveViolation _g	The total MW violation of the <i>reserve</i> constraints associated with the <i>generation registered facility</i> that <i>energy offer g</i> is for.
GenerationBlock _{g,j}	The MW generation scheduled in block <i>j</i> of <i>energy offer g</i> .
Generation _g or Generation _h	The total MW amount scheduled for <i>energy offer g</i> or <i>h</i> , respectively.
GroupResponse _{x,j}	The <i>jth</i> block of <i>reserve</i> response from <i>reserve offers</i> from <i>reserve provider group x</i> .
LoadEnergyReserveSelector _{p(r)}	Binary integer variable associated with the <i>LRF with REB</i> with <i>reserve offer r</i> and <i>energy bid p(r)</i> . A value of 0 indicates that it will be scheduled to provide <i>reserve</i> and must therefore be scheduled for its <i>energy</i> withdrawal in full, while a value of 1 indicates that it is not scheduled to provide <i>reserve</i> , and therefore need not be scheduled for its <i>energy</i> withdrawal in full.
LineFlow _k	The MW flow scheduled for <i>dispatch network line k</i> in the conventional direction of flow. This variable can be positive or negative, with negative values indicating flows in the reverse direction.
LineLoss _k	The MW losses for <i>dispatch network line k</i> .
MSLSelector _g	Binary integer variable associated with <i>energy offer g</i> , used for the modelling of a <i>generation registered facility's</i> minimum stable load level in section D.15.1.3.
NodeAngle _n	The voltage angle at <i>dispatch network node n</i> . This variable can be positive or negative.
NodeNetInjection _n	The net injection of electricity at <i>dispatch network node n</i> . This variable can be positive or negative.
PurchaseBlock _{p,j}	The MW <i>load</i> scheduled in block <i>j</i> of <i>energy bid p</i> .
Purchase _p	The total MW amount scheduled for <i>energy bid p</i> .

Purchase _{<i>p,n</i>}	The MW amount of <i>energy bid</i> $p \in \text{RESTRICTEDENERGYBIDS}$ that is scheduled to be withdrawn from <i>dispatch network node</i> $n \in \text{NODES}_p$.
RawReserveBlock _{<i>r,j</i>}	The MW <i>reserve</i> scheduled in block j of <i>reserve offer</i> r .
RawReserve _{<i>r</i>}	The total MW amount scheduled for <i>reserve offer</i> r .
RegulationBlock _{<i>l,j</i>}	The MW <i>regulation</i> scheduled in block j of <i>regulation offer</i> l .
Regulation _{<i>l</i>}	The total MW amount scheduled for <i>regulation offer</i> l .
RegulationEligibilitySwitch _{<i>l</i>}	Binary integer variable associated with <i>regulation offer</i> l , used for modelling of regulation-generation constraints in section D.18.1.
RegulationTieBreakSlack1 _{<i>o</i>} RegulationTieBreakSlack2 _{<i>o</i>}	The variables representing the extent to which the <i>regulation</i> tie-breaking constraint associated with $\text{TIEDREGULATIONOFFERBLOCKPAIR}_o$ in section D.20A.3 is violated.
ReserveEligibilitySwitch _{<i>g(r)</i>}	Binary integer variable, associated with the <i>generation registered facility</i> with <i>reserve offer</i> r and <i>energy offer</i> g , used for modelling of reserve-generation constraints in section D.17.2.8.
ReserveTieBreakSlack1 _{<i>o</i>} ReserveTieBreakSlack2 _{<i>o</i>}	The variables representing the extent to which the <i>reserve</i> tie-breaking constraint associated with $\text{TIEDRESERVEOFFERBLOCKPAIR}_o$ in section D.20A.2 is violated.
Risk _{<i>c</i>}	The MW risk to be covered by aggregate system response for <i>reserve class</i> c .
TieBreakingPenalties	The sum of all tie-breaking penalties arising from the violation of any tie-breaking constraints set out in section D.20A.
TotalPurchase	The total MW amount scheduled for all <i>energy bids</i> p , where $p \in \text{ENERGYBIDS}$, $p \notin \text{INTERTIEENERGYBIDS}$.

ViolationGroupBlock _{y,j}	The MW violation attributed to block <i>j</i> of violation constraint group <i>y</i> .
ViolationPenalties	The aggregate violation penalty cost of all constraint violations, as determined by the linear program. This aggregate amount is a sum formed by multiplying each violation group block penalty within the linear program, except those for <i>energy deficit and excess</i> , by its associated violation group block.
Weight _{k,j}	The weighting variable used in the <i>dispatch network line</i> loss and flow equations to constrain the losses to be weighted combinations of points on the loss curve. The weight given to point <i>j</i> on the representation of <i>dispatch network line k</i> . These variables are constrained to be in the range 0 to 1.
ZoneResponse _{z,c}	The total <i>reserve</i> response of <i>reserve class c</i> from <i>load registered facilities</i> in <i>load zone z</i> .

D.4.2 Linear Program Dual Variables

EnergyPrice _n	The dual variable corresponding to constraint D.16.1.2 for the <i>dispatch network node n</i> . Calculated as part of the solution to the linear program.
ReservePrice _c	The dual variable corresponding to constraint D.17.3.4 for the <i>reserve class c</i> . Calculated as part of the solution to the linear program.
RegulationPrice	The dual variable corresponding to constraint D.18.2.1. Calculated as part of the solution to the linear program.

D.5 FUNCTIONS

$c(r)$	References the <i>reserve class</i> associated with <i>reserve offer r</i> , and to which it contributes.
$g(k)$	References the <i>energy offer g</i> associated with the <i>generation registered facility</i> which is connected to the dispatch network by <i>dispatch network line</i> $k \in \text{ARTIFICIAL LINES1} \cup \text{ARTIFICIAL LINES2}$.
$g(l)$	References the <i>energy offer g</i> that has the same associated <i>generation registered facility</i> as the <i>regulation offer l</i> .
$(g(o), j(o)),$ $(g'(o), j'(o))$	References respectively each of the <i>price-quantity pairs</i> identified under section D.9C.2 belonging to $\text{TIEDENERGYOFFERBLOCKPAIR}_o$.
$g(r)$	References the <i>energy offer g</i> that has the same associated <i>generation registered facility</i> as the <i>reserve offer r</i> .
$g(s)$	References the <i>energy offer g</i> for the <i>multi-unit facility</i> that is associated with the <i>multiconstraint</i> $s \in \text{MULTIUNITCONSTRAINTS}$.
$k(g)$	References the <i>dispatch network line</i> $k \in \text{ARTIFICIAL LINES1} \cup \text{ARTIFICIAL LINES2}$ that connects the <i>generation registered facility</i> associated with <i>energy offer g</i> to the dispatch network.
$k(ST, g), k(GT, g),$ $k(GT1, g),$ $k(GT2, g)$	References the artificial <i>dispatch network line</i> added to connect the <i>generation registered facility</i> associated with <i>energy offer g</i> to the connection point of the steam unit, the single gas turbine, or the first or second gas turbine of that <i>multi-unit facility</i> respectively.
$l(g)$	References the <i>regulation offer l</i> that has the same associated <i>generation registered facility</i> as the <i>energy offer g</i> .
$(l(o), j(o)),$ $(l'(o), j'(o))$	References respectively each of the <i>price-quantity pairs</i> identified under section D.9C.4 belonging to $\text{TIEDREGULATIONOFFERBLOCKPAIR}_o$.
$l(r)$	References the <i>regulation offer l</i> that has the same associated <i>generation registered facility</i> as the <i>reserve offer r</i> .
$m(g)$	References the <i>market network node m</i> corresponding to the <i>energy offer g</i> .

$n(m)$	References the <i>dispatch network node</i> n corresponding to <i>market network node</i> m .
$NodeAtEndOf(k)$	References the end <i>dispatch network node</i> of transmission line k in the conventional direction of flow.
$NodeAtStartOf(k)$	References the start <i>dispatch network node</i> of transmission line k in the conventional direction of flow.
$n(u)$	References the <i>dispatch network node</i> n corresponding to the default bus for <i>generating unit</i> u .
$p(r)$	References the <i>energy bid</i> p that has the same associated <i>LRF with REB</i> as the <i>reserve offer</i> r .
$r(g,c), r(h,c)$	References the <i>reserve offer</i> r that has the same associated <i>generation registered facility</i> as the <i>energy offer</i> g or h , and applies to <i>reserve class</i> c .
$(r(o),j(o)),$ $(r'(o),j'(o))$	References respectively each of the <i>price-quantity pairs</i> identified under section D.9C.3 belonging to TIEDRESERVEOFFERBLOCKPAIR _o .
$s(g)$	References the multi-unit constraint s associated with the <i>multi-unit facility</i> that the <i>energy offer</i> g is for.
$u(k)$	References the <i>generating unit</i> u of a <i>multi-unit facility</i> that is associated with the <i>dispatch network line</i> $k \in \text{ARTIFICIALLINES1} \cup \text{ARTIFICIALLINES2}$.
$u(ST), u(GT),$ $u(GT1), u(GT2)$	References the unit of a <i>multi-unit facility</i> that is the steam unit, the single gas turbine, or the first or second gas turbine of that <i>multi-unit facility</i> respectively.
$x(g,c)$	References the <i>reserve provider group</i> that <i>generation registered facility</i> g is associated with in respect of <i>reserve class</i> c .
$y(k), y(c), y(g),$ $y(p), y(s),$ $y(regulation)$	References the violation constraint group associated with line k , the <i>reserve requirement</i> for <i>reserve class</i> c , the <i>generation registered facility</i> associated with <i>energy offer</i> g , the <i>LRF with REB</i> associated with <i>energy bid</i> p , the <i>security constraint</i> s , the multi-unit constraint s , or the <i>regulation requirement</i> , respectively.

SECTION B: PRE-PROCESSING

D.6 DISPATCH NETWORK DERIVATION

D.6.1 The *EMC* shall use the following information on network elements when deriving the dispatch network for a *dispatch period*:

D.6.1.1 standing data on the network elements;

D.6.1.2 status data on the network elements; and/or

D.6.1.3 the *outage* schedule for the network elements.

For avoidance of doubt, the information stated in sections D.6.1.1 and D.6.1.2 shall be used for deriving the dispatch network for a *dispatch period* in the *real-time schedule*, whereas the information stated in sections D.6.1.1 and D.6.1.3 shall be used for deriving the dispatch network for a *dispatch period* in the *short-term schedule*, *pre-dispatch schedule* and *market outlook scenario*.

D.6.2 The information referred to in section D.6.1.1 shall be provided to the *EMC* by the *PSO* in accordance with Appendix 6G section G.1.1 and G.4.1.

D.6.3 In accordance with sections 2.1.2 and 2.1.3 of Chapter 6, the *EMC* may simplify the dispatch network by combining series elements in single *dispatch network lines*, but shall ensure that the essential *connectivity* of the physical *transmission system* is maintained. The simplification process may involve any of the following:

D.6.3.1 Eliminate intermediate network elements between branches or facilities (units or loads) and the buses they are electrically connected to, while maintaining the electrical connectivity status between the remaining network elements.

D.6.3.2 Eliminate network elements that are spurious to the dispatch network model, e.g. elements that do not facilitate a connection between the primary network elements (buses, branches and facilities).

D.6.3.3 Merge buses that are electrically equivalent (connected by an essentially loss-less connection) into a single node.

D.6.3.4 Create notional loss-less lines between buses that are electrically equivalent.

D.6.3.5 Eliminate branches that do not terminate, either directly or through a series of network elements, at a bus at each end of the branch.

D.6.3.6 Eliminate isolated sections of the resulting dispatch network model where the section does not include any bus that is the nominated default *market network node* for a *generating unit* in accordance with section D.7.2 or D.7.3.

- D.6.4 In accordance with section 2.1.2 and 2.1.3 of Chapter 6, the *EMC* may expand the dispatch network by the addition of artificial *dispatch network lines* and artificial *dispatch network nodes* for the purpose of modelling the connectivity of *generation registered facilities* and *interties* for any *dispatch period*. The expansion may involve any of the following:
- D.6.4.1 The addition of *dispatch network nodes* and *dispatch network lines* in accordance with section D.8.2 to represent *multi-unit facilities*.
- D.6.4.2 The addition of *dispatch network nodes* and *dispatch network lines* in accordance with section D.6.5 in the circumstances described therein.
- D.6.5 In the case where a *dispatch period* is involved in the calculation of a *real-time dispatch schedule*, *short-term schedule*, *pre-dispatch schedule* or *market outlook scenario*, then:
- D.6.5.1 in respect of each *generating unit* (for each *generation registered facility*) which is not represented as *synchronised* in the *dispatch network data* for that *dispatch period*, the *EMC* shall change the dispatch network for that *dispatch period* by adding an artificial *dispatch network node* for such *generating unit* connecting each such *generating unit* to its artificial *dispatch network node*; and
- D.6.5.2 for each of the *generating units* referred to in section D.6.5.1 above that satisfies one of the following:
- a. the *generating unit* is not a constituent unit of a *generation registered facility* that is a *multi-unit facility*;
 - b. the *generating unit* is a constituent unit of a *generation registered facility* that is a *multi-unit facility*, and the *generating unit* is not *islanded*; or
 - c. the *generating unit* is a constituent unit of a *generation registered facility* that is a *multi-unit facility*, and all the *generating units* of that *generation registered facility* are *islanded*,
- the *EMC* shall add an artificial *dispatch network line* to connect the artificial *dispatch network node* described in section D.6.5.1 to a default bus for the *generating unit* described in section D.7.2 or D.7.3, as the case may be.
- D.6.5A An artificial *dispatch network line* defined for the purposes of section D.6.5.2 shall not include the constraints in section D.21.1, and shall:
- D.6.5A.1 have the same electrical characteristics as the corresponding default line that is designated by *PSO* in section D.7.2A or D.7.3A, as the case may be; or

D.6.5A.2 have electrical characteristics determined by the *EMC* if no corresponding default line is designated by *PSO*.

Explanatory Note: The effect of this section is that in the preparation of real-time dispatch schedule, short-term schedule, pre-dispatch schedule and market outlook scenarios, the MCE will model unsynchronised units (based on the dispatch network data) as connected provided they satisfy one of the conditions described in section D.6.5.2.

D.6.6 For the purpose of determining when the status data on the network elements is no longer recent enough for use in the preparation of a *short-term schedule* or a *real-time dispatch schedule* in accordance with section D.6.5, the *EMC* shall define, prior to the *market commencement date* and in consultation with the *PSO*, and shall thereafter maintain and update as required, in consultation with the *PSO*, the parameter *StatusDataLifeMax*.

D.7 MARKET NETWORK NODES

- D.7.1 A *market network node* for each *generation registered facility* and each *generation settlement facility* that is not a *pseudo generation settlement facility*, in each *dispatch period*, shall be determined in accordance with sections D.7.2 to D.7.5.
- D.7.2 The *PSO* shall designate a main default bus, and an alternate default bus which is in the same substation/switchhouse as the main default bus, for each *generation registered facility* that is not a *multi-unit facility* and each *generation settlement facility* that is not a *pseudo generation settlement facility*, representing the most likely *connection point* for that *generation facility*.
- D.7.2A The *PSO* shall, wherever possible, designate a default line for each *generation registered facility* that is not a *multi-unit facility* and each *generation settlement facility* that is not a *pseudo generation settlement facility*, representing the most likely *connection line* for that *generation facility*.
- D.7.3 The *PSO* shall designate a main default bus, and an alternate default bus which is in the same substation/switchhouse as the main default bus, for each *generating unit* of each *generation registered facility* that is a *multi-unit facility*, representing the most likely *connection point* for that *generating unit*. For each *generating unit*, *u*, of each *generation registered facility* that is a *multi-unit facility*, the *EMC* shall specify on reasonable grounds, the parameter Proportion_u to be employed in:
- D.7.3.1 combining the prices of the nodes corresponding to the designated main default buses into the *market energy price*, via section D.24.1.2;
- D.7.3.2 forming ratio constraints to be applied to transmission flows out of those nodes, via section D.8.7; and
- D.7.3.3 setting flow limits on the transmission flows out of those nodes, via section D.8.9.
- D.7.3A In the event where both the designated main and alternate default buses of a *generation facility* referred to in section D.7.2 above or a *generating unit* referred to in section D.7.3 above are represented in the *dispatch network data* as *disconnected* from the *PSO controlled system*, the *EMC* shall, in consultation with the *PSO*, select a suitable bus for that *generation facility* or *generating unit*, as the case may be, to be used for the *market clearing engine re-run* for *settlement purposes*.
- D.7.3B The *PSO* shall, wherever possible, designate a default line for each *generating unit* of each *generation registered facility* that is a *multi-unit facility*, representing the most likely *connection line* for that *generating unit*.

- D.7.4 If a *generation registered facility* is not a *multi-unit facility* and is either represented as *synchronised* in the *dispatch network data*, or is connected to the dispatch network in accordance with section D.6.5, then the *dispatch network node* representing the point of connection in the *dispatch network data* shall be designated the *market network node* for that *generation facility*.
- D.7.5 [Deleted and Intentionally Left Blank]
- D.7.6 If a *generation registered facility* is a *multi-unit facility* and is either represented as *synchronised* in the *dispatch network data* or is connected to the dispatch network in accordance with section D.6.5, then the artificial *dispatch network node* added to the dispatch network in accordance with section D.8.2 shall be designated the *market network node* for that *generation facility*.
- D.7.7 [Deleted and Internationally Left Blank]
- D.7.8 The *market network node* for a *generation settlement facility* that is not a *pseudo generation settlement facility* shall be the *dispatch network node* corresponding to:
- D.7.8.1 the main default bus, if the main default bus is represented as *connected* in the *dispatch network data*; or
- D.7.8.2 the alternate default bus,
- designated by the *PSO* as being the default *connection* point for that *generation facility*.
- D.7.9 A *market network node* shall be assigned by the *EMC* for each *pseudo generation settlement facility*.

D.8 REPRESENTATION OF MULTI-UNIT FACILITIES

D.8.1 For *generation registered facilities* that are *multi-unit facilities*, the arrangements in this section D.8 shall apply.

Explanatory Note: The tables in these sections cover all multi-unit facility configurations in Singapore at market start. However, any additional configurations will need to be addressed with additions to the tables via the rules change process.

D.8.2 The *EMC* shall add an artificial *dispatch network node* for each *generation registered facility* that is a *multi-unit facility*. Each *generation registered facility* that is a *multi-unit facility* shall be connected to the dispatch network at its artificial *dispatch network node*, which in turn is connected to each of the nodes where the constituent *generating units* are connected, and such connection shall be achieved by the use of additional *dispatch network lines*, with a conventional direction defined to be from the artificial *dispatch network node* to the connection nodes. However, *dispatch network lines* used for this purpose shall not include constraints in sections D.16.2.1, D.16.2.3, D.16.3.1, D.16.3.2, D.16.3.3 and D.21.1 for that line.

D.8.3 In the case where the *dispatch period* is being produced for a *real-time dispatch schedule*, or where the *dispatch period* is the first *dispatch period* of the multiple *dispatch periods* involved in the calculation of a *short-term schedule*, then the initial generation levels $StartGeneration_g$ for *multi-unit facilities* shall be calculated from the initial generation levels of the constituent *generating units*, subject to section D.8.3.1, in accordance with the following table:

For *multi-unit facilities* g comprising one gas turbine and one steam turbine which is not shared with another *generation registered facility*:

$$StartGeneration_g = \sum_{u \in UNITS_g} StartGeneration_u$$

For *multi-unit facilities* g comprising one gas turbine and one steam turbine which is shared with another *generation registered facility*, which other *generation registered facility* comprises a gas turbine and the shared steam turbine:

$$StartGeneration_g = StartGeneration_{u(GT)} + \frac{StartGeneration_{u(GT)}}{StartGeneration_{u(GT)} + StartGeneration_{u(GT2)}} \times StartGeneration_{u(ST)}$$

where:

$StartGeneration_{u(ST)}$ is the initial generation of the shared steam turbine.

$StartGeneration_{u(GT)}$ is the initial generation of the gas turbine for the

current *generation registered facility*.

StartGeneration_{u(GT2)} is the initial generation of the gas turbine for the *generation registered facility* which shares the steam turbine with the current *generation registered facility*.

However, if the initial generation of both gas turbines is zero, then the following formula will be used to calculate StartGeneration_g for the *generation registered facility*:

$$\text{StartGeneration}_g = 0.5 \times \text{StartGeneration}_{u(ST)}$$

For *multi-unit facilities g* comprising two gas turbines and one steam turbine which is not shared with another *generation registered facility*:

$$\text{StartGeneration}_g = \sum_{u \in \text{UNITS}_g} \text{StartGeneration}_u$$

- D.8.3.1 In the event that the time difference between the start of the *dispatch period* and the time at which the *PSO* compiled the most recently received status data on the network elements referred to in section D.6.1.2 is greater than StatusDataLifeMax, or in the event that a value StartGeneration_u for any *generating unit* of a *multi-unit facility* is not included in the most recently received status data on the network elements referred to in D.6.1.2, then the initial generation level StartGeneration_g for the corresponding *multi-unit facility* shall be the same as the corresponding value Generation_g for the same *generation registered facility* in the *real-time dispatch schedule* for the *dispatch period* current at the time when the calculation of the *real-time dispatch schedule* commences. In the event that no such *real-time dispatch schedule* is available, then the *EMC* shall use a value of zero for that StartGeneration_u for that *generating unit* in the calculations of this section D.8.3.
- D.8.4 In the case where the *dispatch period* is involved in the calculation of a *pre-dispatch schedule* and is the first *dispatch period* of the multiple *dispatch periods* involved in the calculation of the *pre-dispatch schedule*, then the initial generation levels StartGeneration_g for *multi-unit facilities* shall be the same as the corresponding values Generation_g for the same *generation registered facility* in the *real-time dispatch schedule* for the *dispatch period* current at the time when the calculation of the *pre-dispatch schedule* commences.
- D.8.5 In the case where the *dispatch period* is involved in the calculation of a *market outlook scenario*, and is the first *dispatch period* of the multiple *dispatch periods* involved in the calculation of the *market outlook scenario*, then the initial generation levels StartGeneration_g for *multi-unit facilities* shall be the same as the corresponding values Generation_g for

the same *generation registered facility* in the most recently released *pre-dispatch schedule* with a *nodal load forecast* corresponding to the *market outlook scenario* being calculated, and shall be taken from the *dispatch period* in such *pre-dispatch schedule* immediately preceding the first *dispatch period* required in the calculation of the *market outlook scenario*, provided that such *pre-dispatch schedule* contains the appropriate *dispatch period*. If such *pre-dispatch schedule* does not contain the appropriate *dispatch period*, then initial generation levels StartGeneration_g for *multi-unit facilities* shall be taken to be zero.

D.8.6 In the case where the *dispatch period* is involved in the calculation of a *short-term schedule*, a *pre-dispatch schedule* or a *market outlook scenario*, but is not the first *dispatch period* of the multiple *dispatch periods* involved in the calculation of the *short-term schedule*, *pre-dispatch schedule* or *market outlook scenario*, then the initial generation levels StartGeneration_g for *multi-unit facilities* shall be the same as the corresponding values Generation_g for the same *generation registered facility* for the immediately preceding *dispatch period* in that *short-term schedule*, *pre-dispatch schedule* or *market outlook scenario*.

D.8.7 Constraints of the form specified in section D.20.2 will be placed on the *dispatch network lines* referred to in section D.8.2, with the $\text{MultiGroupLineWeight}_{s,k}$ coefficients for the LineFlow_k variables set in accordance with the following table:

For <i>multi-unit facilities</i> g comprising one gas turbine and one steam turbine:	
Where the gas turbine and steam turbine are each represented as <i>synchronised</i> in the <i>dispatch network data</i> or connected to the dispatch network in accordance with section D.6.5	<p>Constraint s:</p> $\frac{1}{\text{Proportion}_{u(GT)}} \times \text{LineFlow}_{k(GTg)}$ $- \frac{1}{\text{Proportion}_{u(ST)}} \times \text{LineFlow}_{k(STg)}$ $+ \text{DeficitMulti}_s - \text{ExcessMulti}_s = 0$
Explanatory Note: The constraint above is applied in both the case where the steam turbine is shared with another gas turbine that is part of a separate generation registered facility, and the case where the steam turbine is not shared.	

For *multi-unit facilities* g comprising two gas turbines and one steam turbine which is not shared with another *generation registered facility*:

Where the steam turbine and at least one of the two gas turbines are each represented as *synchronised* in the *dispatch network data* or connected to the dispatch network in accordance with section D.6.5

Constraint s :

$$\sum_{u(GTi \neq \text{CONNECTED UNITS}_g)} \frac{1}{\text{Proportion}_{u(GTi)}} \times \text{LineFlow}_{k(GTi,g)} - \frac{2}{\text{Proportion}_{u(ST)}} \times \text{LineFlow}_{k(ST,g)} + \text{DeficitMulti}_s - \text{ExcessMulti}_s = 0$$

Explanatory Note: The constraint above assumes that, in a multi-unit facility comprising two gas turbines and one steam turbine, each of the gas turbines is capable of driving exactly half of the capacity of the steam turbine. They are not applicable to more general configurations.

- D.8.8 The variable LineFlow_k shall have a lower bound of a negative value specified by *EMC* for the *dispatch network lines* referred to in section D.8.2.

Explanatory Note: The allowance for a very small reverse capability on the dispatch network lines is to allow a shadow price to be derived at the dispatch network node which is based on the local system marginal price.

- D.8.9 The parameter LineMaxForward_k shall have a value calculated as follows for the *dispatch network lines* referred to in section D.8.2.

$$\text{LineMaxForward}_k = \frac{\text{Proportion}_{u(k)}}{\sum_{u \in \text{UNITS}_{g(k)}} \text{Proportion}_u} \times \text{Generation Max}_{g(k)} \times (1 + \text{T1Margin})$$

where "T1Margin" is a margin parameter determined by the *EMC*.

D.9 LINE ADMITTANCE AND LINE LOSS APPROXIMATION

$$D.9.1 \quad \text{LineAdmittance}_k = -\frac{\text{Reactance}_k}{\text{Resistance}_k^2 + \text{Reactance}_k^2}$$

$$\{k \in \text{LINES}, k \notin \text{ARTIFICIALLINES} \cup \text{ARTIFICIALLINES3}\}$$

$$D.9.1A \quad \text{PhaseAngleShift}_k = \text{PSTTapOffset}_k \times \text{DegreeShiftPerTap}_k$$

$$\{k \in \text{PSTLINES}, k \notin \text{ARTIFICIALLINES}\}$$

$$\text{where} \quad \text{PSTTapOffset}_k = \text{PSTTapPosition}_k - \text{TapZero}_k$$

$$\{k \in \text{PSTLINES}, k \notin \text{ARTIFICIALLINES}\}$$

$$\text{PhaseAngleShift}_k = 0$$

$$\{k \notin \text{PSTLINES}\}$$

D.9.2 The EMC shall determine NumPoints_k , the number of line flow/line loss points required in the set DISCRSUB_k in order to define the linear approximation of the quadratic loss curve for each *dispatch network line* k , except for the artificial *dispatch network lines* added under sections D.6.3.4 or D.8.2.

$$D.9.3 \quad \text{MaxLineRating}_k = \text{maximum}(\text{LineRatingForward}_k, \text{LineRatingReverse}_k)$$

$$\text{LineFlowConst}_{k,j} = -\text{MaxLineRating}_k + \frac{j-1}{\text{NumPoints}_k - 1} \times \text{MaxLineRating}_k \times 2$$

$$\{k, j / j \in \{1, \dots, \text{NumPoints}_k\}, \text{ where } k \in \text{LINES}, k \notin \text{ARTIFICIALLINES1} \cup \text{ARTIFICIALLINES3}\}$$

$$D.9.4 \quad \text{LineLossConst}_{k,j} = \text{FixedLosses}_k + \text{Resistance}_k \times \text{LineFlowConst}_{k,j}^2$$

$$\{k, j / j \in \{1, \dots, \text{NumPoints}_k\}, \text{ where } k \in \text{LINES}, k \notin \text{ARTIFICIALLINES1} \cup \text{ARTIFICIALLINES3}\}$$

D.9A ENERGY BIDS AND OFFERS

- D.9A.1 The set ENERGYOFFERS shall comprise all valid *energy offers* for the *dispatch period* received by the EMC, together with *offers* created by the EMC in accordance with section D.9A.4.
- D.9A.2 The set ENERGYBIDS shall comprise all valid *restricted energy bids* associated with *LRFs with REB* for the *dispatch period* received by the EMC, together with *bids* to purchase *energy* at the relevant *dispatch network nodes* created by the EMC in accordance with sections D.9A.3 and D.9A.4.
- D.9A.3 For each *dispatch network node* for which a *load* is forecast in the *nodal load forecast* referred to in sections 7.2 or 9.1.1 of this Chapter 6, the EMC shall create an *energy bid* corresponding to that *load*, which shall have the following characteristics:
- D.9A.3.1 the MW quantity of the *energy bid* shall equal the quantity for that *dispatch network node* in the *nodal load forecast*; and
- D.9A.3.2 the price of the *energy bid* shall equal $10 \times VoLL$ as specified in Appendix 6J.
- D.9A.4 For each *intertie* for which it has received an *intertie schedule* pursuant to section G.4.5 of Appendix 6G, the EMC shall create either an *energy bid* for the corresponding *dispatch network node*, in the case where the *intertie schedule* represents a planned export of *energy* out of Singapore, or shall create an *energy offer* for the corresponding *dispatch network node*, in the case where the *intertie schedule* represents a planned import of *energy* into Singapore.
- D.9A.5 An *energy bid* created in accordance with section D.9A.4 shall have the following characteristics:
- D.9A.5.1 the MW quantity of the *energy bid* shall equal the quantity in the corresponding *intertie schedule*; and
- D.9A.5.2 the price of the *energy bid* shall equal $10 \times VoLL$ as specified in Appendix 6J.
- D.9A.6 An *energy offer* created in accordance with section D.9A.4 shall have the following characteristics:
- D.9A.6.1 the MW quantity of the *energy offer* shall equal the quantity of the *intertie schedule*; and
- D.9A.6.2 the price of the *energy offer* shall equal EnergyPriceMin, as specified in Appendix 6J.
- D.9A.7 The parameter ReserveGenerationMax_r associated with each *reserve offer* shall equal the smaller of:

D.9A.7.1 the *standing capability data* referred to in section E.1.1.6 of Appendix 6E for the associated *generation registered facility* for the appropriate *reserve class*; and

D.9A.7.2 OfferedCapacity_{g(r)}.

D.9A.8 The parameter RegulationMax_{g(l)} associated with each *regulation offer* shall equal the smaller of:

D.9A.8.1 the *standing capability data* referred to in section E.1.1.9 of Appendix 6E for the associated *generation registered facility*; and

D.9A.8.2 OfferedCapacity_{g(l)}.

D.9B VALIDATION TEST EQUATIONS

The following validation test equations will be used to validate the *reserve envelope data*:

D.9B.1 The parameter, LowLoad_g, must be greater than zero.

$$\text{LowLoad}_{g(r)} > 0$$

{r ∈ GENRESERVEOFFERS}

D.9B.2 The parameter, LowLoad_g, must be less than the parameter, MediumLoad_g.

$$\text{LowLoad}_{g(r)} < \text{MediumLoad}_{g(r)}$$

{r ∈ GENRESERVEOFFERS}

D.9B.3 The LowLoadReserve point must lie on or above the line joining the origin to the MediumLoadReserve point.

$$\text{LowLoadReserve}_r \geq \text{Slope} \times \text{LowLoad}_{g(r)}$$

{r ∈ GENCONRESERVEOFFERS}

where:

$$\text{Slope} = \text{MediumLoadReserve}_r / \text{MediumLoad}_{g(r)}$$

D.9B.4 The MediumLoadReserve point must lie on or above the line joining the LowLoadReserve point to the HighLoadReserve point.

$$\text{MediumLoadReserve}_r \geq \text{LowLoadReserve}_r + \text{Slope} \times (\text{MediumLoad}_{g(r)} - \text{LowLoad}_{g(r)})$$

$\{r \in \text{GENRESERVEOFFERS}\}$

where:

$$\text{Slope} = (\text{HighLoad Reserve}_r - \text{LowLoad Reserve}_r) / (\text{HighLoad}_{g(r)} - \text{LowLoad}_{g(r)})$$

D.9B.5 The HighLoadReserve point must lie on or above the line joining the MediumLoadReserve point to the StandingReserveGenerationMax point.

$$\text{HighLoad Reserve}_r \geq \text{MediumLoad Reserve}_r + \text{Slope} \times (\text{HighLoad}_{g(r)} - \text{MediumLoad}_{g(r)})$$

$\{r \in \text{GENRESERVEOFFERS}\}$

where:

$$\text{Slope} = - \text{MediumLoad Reserve}_r / (\text{Standing ReserveGenerationMax}_{g(r)} - \text{MediumLoad}_{g(r)})$$

Explanatory note: The equations in this section are used to validate convexity of the reserve envelope. This validation is part of the pre-processing of the standing capability data so as to ensure that the MCE receives inputs that will produce valid results.

D.9C TIED OFFERS

D.9C.1 The sets derived in this section D.9C shall be used for the purpose of tie-breaking constraints under D.20A.

D.9C.2 If a *price-quantity pair* (g,j) of GENERATIONOFFERBLOCKS_g and a *price-quantity pair* (g',j') of GENERATIONOFFERBLOCKS_{g'} meet the following condition, they shall be assigned to a set, TIEDENERGYOFFERBLOCKPAIR_o:

$$\text{GenerationOfferPrice}_{(g(o),j(o))} = \text{GenerationOfferPrice}_{(g'(o),j'(o))}$$

$$\begin{aligned} &\{g(o)=g, \in \text{ENERGYOFFERS} \\ &g'(o)=g' \neq g, \in \text{ENERGYOFFERS} \\ &j(o)=j, \in \text{GENERATIONOFFERBLOCKS}_{g(o)} \text{ and} \\ &j'(o)=j', \in \text{GENERATIONOFFERBLOCKS}_{g'(o)}\} \end{aligned}$$

D.9C.3 If a *price-quantity pair* (r,j) of RAWRESERVEBLOCKS_r and a *price-quantity pair* (r',j') of RAWRESERVEBLOCKS_{r'} meet the following condition, they shall be assigned to a set, TIEDRESERVEOFFERBLOCKPAIR_o:

$$\frac{\text{ReserveOfferPrice}_{(r(o),j(o))}}{\text{EstReserveEffectiveness}_{r(o)}} = \frac{\text{ReserveOfferPrice}_{(r'(o),j'(o))}}{\text{EstReserveEffectiveness}_{r'(o)}}$$

$$\begin{aligned} &\{r(o)=r, \in \text{RAWRESERVEOFFERS} \\ &r'(o)=r' \neq r, \in \text{RAWRESERVEOFFERS} \\ &c(r)=c(r'), \in \text{RESERVECLASSES} \\ &j(o)=j, \in \text{RAWRESERVEBLOCKS}_{r(o)} \\ &j'(o)=j', \in \text{RAWRESERVEBLOCKS}_{r'(o)} \\ &\text{EstReserveEffectiveness}_{r(o)} \neq 0 \\ &\text{and EstReserveEffectiveness}_{r'(o)} \neq 0\} \end{aligned}$$

D.9C.4 If a *price-quantity pair* (l,j) of REGULATIONOFFERBLOCKS_l and a *price-quantity pair* (l',j') of REGULATIONOFFERBLOCKS_{l'} meet the following condition, they shall be assigned to a set, TIEDREGULATIONOFFERBLOCKPAIR_o:

$$\text{RegulationOfferPrice}_{(l(o),j(o))} = \text{RegulationOfferPrice}_{(l'(o),j'(o))}$$

$$\begin{aligned} &\{l(o)=l, \in \text{REGULATIONOFFERS} \\ &l'(o)=l' \neq l, \in \text{REGULATIONOFFERS} \\ &j(o)=j, \in \text{REGULATIONOFFERBLOCKS}_{l(o)} \\ &j'(o)=j', \in \text{REGULATIONOFFERBLOCKS}_{l'(o)}\} \end{aligned}$$

D.10 ESTIMATED REACTIVE POWER FLOW

D.10.1 $\text{EstimatedReactivePowerFlow}_k$ shall equal the value for estimated reactive power flow at the beginning of the *dispatch period*, received from the *PSO* in accordance with Appendix 6G section G.4.6.

D.10.2 $\text{LineMaxForward}_k = \sqrt{\text{Max}(\text{LineRatingForward}_k^2 - \text{EstimatedReactivePowerFlow}_k^2, 0)}$
 $\{k \in \text{LINES}, k \notin \text{ARTIFICIALLINES}\}$

D.10.3 $\text{LineMaxReverse}_k = -\sqrt{\text{Max}(\text{LineRatingReverse}_k^2 - \text{EstimatedReactivePowerFlow}_k^2, 0)}$
 $\{k \in \text{LINES}, k \notin \text{ARTIFICIALLINES}\}$

D.11 ESTIMATED RESERVE EFFECTIVENESS

D.11.1 $\text{EstReserveEffectiveness}_{r(g,c)} = \text{Effectiveness}_{s(g,c),l}$

$\{g, c \mid g \in \text{RISKGENERATORS}, c \in \text{RESERVECLASSES}\}$

D.12 RAMPING CONSTRAINTS

D.12.1 In the case where a *real-time dispatch schedule* is being produced, or where the *dispatch period* is the first *dispatch period* of the multiple *dispatch periods* involved in the calculation of a *short-term schedule*, then the values of StartGeneration_g for each *generation registered facility* in the applicable *dispatch period*, except *multi-unit facilities*, shall be the values received from the *PSO* in accordance with section G.3.1 of Appendix 6G.

D.12.1.1 In the event that a value of StartGeneration_g for any *generating unit* that is not part of a *multi-unit facility* is not updated by the *PSO* or provided to the *EMC* during the *dispatch period* for the time being when the calculation of the *real-time dispatch schedule* or the first *dispatch period* of the multiple *dispatch periods* involved in the calculation of a *short-term schedule* commences, the initial generation level of StartGeneration_g for the *generation registered facility* shall be the same as the corresponding value of Generation_g for the same *generation registered facility* in the *real-time dispatch schedule* for the *dispatch period* with respect to the time when the calculation of the *real-time dispatch schedule* commences. In the event that no such *real-time dispatch schedule* is available, then the *EMC* shall use a value of zero for StartGeneration_g for the *generation registered facility*.

Explanatory Note: StartGeneration_g for multi-unit facilities is set out in section D.8.

D.12.2 In the case where the *dispatch period* is the first *dispatch period* of the multiple *dispatch periods* involved in the calculation of the *pre-dispatch schedule*, then the values of StartGeneration_g for each *generation registered facility*, except *multi-unit facilities*, shall be the corresponding values of Generation_g in the *real-time dispatch schedule* for the *dispatch period* current at the time when the calculation of the *pre-dispatch schedule* commences, or, if this *real-time dispatch schedule* is not available, the *real-time dispatch schedule* for the *dispatch period* immediately preceding that which is current at the time when the calculation of the *pre-dispatch schedule* commences.

D.12.3 In the case where the *dispatch period* is the first *dispatch period* of the multiple *dispatch periods* involved in the calculation of the *market outlook scenario*, the initial generation levels of StartGeneration_g for each *generation registered facility*, except *multi-unit facilities*, shall be the same as the corresponding values Generation_g for the same *generation registered facility* in the most recently released *pre-dispatch schedule* with a *nodal load forecast* corresponding to the *market outlook scenario* being calculated, and shall be taken from the *dispatch period* in such *pre-dispatch schedule* immediately preceding the first *dispatch period*

required in the calculation of the *market outlook scenario*, provided that such *pre-dispatch schedule* contains the appropriate *dispatch period*. If such *pre-dispatch schedule* does not contain the appropriate *dispatch period*, then initial generation levels $StartGeneration_g$ for such *generation registered facilities* shall be zero.

D.12.4 In the case where the *dispatch period* is involved in the calculation of a *short-term schedule*, a *pre-dispatch schedule* or a *market outlook scenario*, and is not the *first dispatch period* of the multiple *dispatch periods* involved in the calculation of the *short-term schedule*, *pre-dispatch schedule* or a *market outlook scenario*, the values of $StartGeneration_g$ for each *generation registered facility*, except *multi-unit facilities*, shall be the corresponding values of $Generation_g$ for the immediately preceding *dispatch period* in the *short-term schedule*, *pre-dispatch schedule* or *market outlook scenario* respectively.

D.12.5 Expected $StartGeneration_g$ of a *generation registered facility* associated with an *energy offer g* shall be determined in accordance with the following table:

<p>When the <i>generation registered facility's</i> $StartGeneration_g$ is greater than its $PriorScheduledGeneration_g$, its $ExpectedStartGeneration_g$ shall be the higher of:</p> <p>a) $StartGeneration_g - DownRampRate_{g,t-1} \times RampingTime$; and</p> <p>b) $PriorScheduledGeneration_g$.</p>
<p>When the <i>generation registered facility's</i> $StartGeneration_g$ is less than its $PriorScheduledGeneration_g$, its $ExpectedStartGeneration_g$ shall be the lower of:</p> <p>a) $StartGeneration_g + UpRampRate_{g,t-1} \times RampingTime$; and</p> <p>b) $PriorScheduledGeneration_g$.</p>
<p>When the <i>generation registered facility's</i> $StartGeneration_g$ is equal to its $PriorScheduledGeneration_g$, its $ExpectedStartGeneration_g$ shall be its $PriorScheduledGeneration_g$.</p>

For the purposes of this section D.12.5 only, $DownRampRate_{g,t-1}$ and $UpRampRate_{g,t-1}$, for a given *generation registered facility* for a given *dispatch period t* to which its *energy offer g* relates, shall be determined using the respective values contained in its valid *energy offer* for the *dispatch period* immediately prior to *dispatch period t*.

D.12.6 $GenerationEndMax_g = ExpectedStartGeneration_g + (UpRampRate_g / 60 \times RemainingTime)$

$\{g \in ENERGYOFFERS, g \notin INTERTIEENERGYOFFERS\}$

$$D.12.7 \text{ GenerationEndMin}_g = \text{ExpectedStartGeneration}_g - (\text{DownRampRate}_g / 60 \times \text{RemainingTime})$$

$$\{g \in \text{ENERGYOFFERS}, g \notin \text{INTERTIEENERGYOFFERS}\}$$

$$D.12.8 \text{ PurchaseEndMax}_p = \text{PriorScheduledPurchase}_p + \text{UpRampRate}_p \times \frac{\text{RemainingTime}}{60}$$

$$\{p \in \text{RESTRICTEDENERGYBIDS}\}$$

$$D.12.9 \text{ PurchaseEndMin}_p = \text{PriorScheduledPurchase}_p - \text{DownRampRate}_p \times \frac{\text{RemainingTime}}{60}$$

$$\{p \in \text{RESTRICTEDENERGYBIDS}\}$$

D.12.10 In respect of an *LRF with REB* associated with *energy bid p*, the value of *PriorScheduledPurchase_p* to be used in the calculation of:

- D.12.10.1 a *real-time dispatch schedule* or the first *dispatch period* of a *short-term schedule* shall be the value of *Purchase_p* in the *real-time dispatch schedule* for the immediately preceding *dispatch period*;
- D.12.10.2 the first *dispatch period* of a *pre-dispatch schedule* shall be the value of *Purchase_p* in the *real-time dispatch schedule* for the *dispatch period* current at the time when the calculation of the *pre-dispatch schedule* commences;
- D.12.10.3 the first *dispatch period* of a *market outlook scenario* shall be the value of *Purchase_p* in the most recently released *pre-dispatch schedule* with a *nodal load forecast* corresponding to the *market outlook scenario* being calculated, and shall be taken from the *dispatch period* in such *pre-dispatch schedule* immediately preceding the first *dispatch period* required in the calculation of the *market outlook scenario*, provided that such *pre-dispatch schedule* contains the appropriate *dispatch period*; and
- D.12.10.4 each *dispatch period* that is not the first *dispatch period* of the multiple *dispatch periods* involved in the calculation of a *short-term schedule*, *pre-dispatch schedule* or *market outlook scenario* shall be the corresponding value of *Purchase_p* for the immediately preceding *dispatch period* in the *short-term schedule*, *pre-dispatch schedule* or *market outlook scenario* respectively.

In the event of the unavailability of the *real-time dispatch schedule* or the *pre-dispatch schedule* from which the value of Purchase_p is to be derived for section D.12.10.1, D.12.10.2 or D.12.10.3, then the value of $\text{PriorScheduledPurchase}_p$ shall be the total MW quantities in all *price-quantity pairs* of the *energy bid* for that *LRF with REB* for the first *dispatch period* mentioned in such section D.12.10.1, D.12.10.2 or D.12.10.3 as the case may be, calculated as:

$$\sum_{j \in \text{PURCHASEBDBLOCKS}_p} \text{PurchaseBlockMax}_{p,j} .$$

D.13 COMBINED RAMPING CONSTRAINTS

$$D.13.1 \quad \text{MaxResponse}_r = \text{Max} \left(\frac{\sum_{j \in \text{RAWRESERVEBLOCKS}_r} \text{RawReserveBlockMax}_{r,j}}{\text{UpRampRate}_{g(r)} \times \text{ReserveResponsePeriod}_{c(r)}} \right) \quad \{r \in \text{GENRESERVEOFFERS}\}$$

$$D.13.2 \quad \text{ReserveResponseRatio}_r = \frac{\text{ReserveResponsePeriod}_{c(r)} - \text{ResponseDelay}_r}{\text{DispatchPeriod}} \quad \{r \in \text{GENRESERVEOFFERS}\}$$

$$D.13.3 \quad \text{MaxResponse}_l = \text{Max} \left(\frac{\sum_{j \in \text{REGULATIONOFFERBLOCKS}_l} \text{RegulationBlockMax}_{l,j}}{\text{UpRampRate}_{g(l)} \times \text{RegulationResponsePeriod}} \right) \quad \{l \in \text{REGULATIONOFFERS}\}$$

$$D.13.4 \quad \text{RegulationResponseRatio} = \frac{\text{RegulationResponsePeriod}}{\text{DispatchPeriod}}$$

$$D.13.5 \quad \text{ReserveProportionCombined}_r = \text{Max}(\text{ReserveProportion}_r, \text{ReserveResponseRatio}_r) \quad \{r \in \text{GENRESERVEOFFERS}\}$$

D.13A REGULATION RANGE CONSTRAINTS

D.13A.1 A valid *regulation offer* for a *generation registered facility* for a *dispatch period* shall only be used in the linear program if:

D.13A.1.1 a valid *energy offer* (hereinafter referred to in this section D.13A as *energy offer g*) exists for that *generation registered facility* for that *dispatch period* and the sum of the quantities in that *energy offer g* is greater than RegulationMin_g for that *generation registered facility*;

D.13A.1.2 the $\text{ExpectedStartGeneration}_g$ of that *generation registered facility* is greater than or equal to RegulationMin_g for that *generation registered facility*; and

D.13A.1.3 the $\text{ExpectedStartGeneration}_g$ of that *generation registered facility* is less than or equal to RegulationMax_g for that *generation registered facility*.

D.13B INTERTIE STATUS

D.13B.1 The *EMC* shall assign a value to *EstIntertieContribution* based on the *connection* status of the *intertie* lines advised by the *PSO* in accordance with section G.4.8 of Appendix 6G:

D.13B.1.1 if one or more *intertie* lines are *connected* then *EstIntertieContribution* is assigned the value received from the *PSO* in accordance with section G.5.7 of Appendix 6G; and

D.13B.1.2 if no *intertie* lines are *connected* then *EstIntertieContribution* is assigned the value of 1.0 (one).

D.13B.2 The *EMC* shall assign a value to *AcceptableFreqDeviation_c*, for each *reserve class c*, based on the *connection* status of the *intertie* lines advised by the *PSO* in accordance with section G.4.8 of Appendix 6G:

D.13B.2.1 if one or more *intertie* lines are *connected* then, for each *reserve class c*, *AcceptableFreqDeviation_c* is assigned a value that is calculated as the acceptable frequency deviation for the corresponding *reserve class* received from the *PSO* in accordance with section G.5.8 of Appendix 6G, divided by the nominal frequency as provided by the *PSO* in accordance with section G.5.13 of Appendix 6G; and

D.13B.2.2 if no *intertie* lines are *connected* then, for each *reserve class c*, *AcceptableFreqDeviation_c* is assigned a value that is calculated as the acceptable frequency deviation for the corresponding *reserve class* received from the *PSO* in accordance with section G.5.9 of Appendix 6G, divided by the nominal frequency as provided by the *PSO* in accordance with section G.5.13 of Appendix 6G.

D.13C LINES WITH PHASE-SHIFTING TRANSFORMERS

D.13C.1 The *EMC* shall use the latest tap position of a phase-shifting transformer of a *pst line* advised by the *PSO* in accordance with Section G.4.4A of Appendix 6G when determining the *real-time schedule*. The *EMC* shall also use the latest tap position for *short-term schedules*, *pre-dispatch schedules* and the *market outlook scenarios* unless advised otherwise by the *PSO* from time to time.

APPENDIX E – STANDING CAPABILITY DATA

E.1 GENERATION FACILITY DATA

- E.1.1 The *standing capability data* pertaining to a *generation facility* shall include:
- E.1.1.1 information sufficient to indicate the *generation facility* to which the *standing capability data* pertains;
 - E.1.1.2 the maximum *generation capacity*, in MW, of the *generation facility*;
 - E.1.1.3 the maximum ramp-up rate for the *generation facility* in MW/minute;
 - E.1.1.4 the maximum ramp-down rate for the *generation facility* in MW/minute;
 - E.1.1.5 the maximum *reserve capacity* of the *generation facility* for each *reserve class* which the *generation facility* is or seeks to be registered to provide;
 - E.1.1.6 the maximum combined *generation capacity* and *reserve capacity* for each *reserve class* for which the *generation facility* is or seeks to be registered to provide;

Explanatory Note – The previous clause allows the market participant to specify a capacity limit for the purpose of providing reserve which exceeds the facilities normal, sustainable, capacity.

- E.1.1.7 if the *generation facility* is or seeks to be registered to provide any *reserve class*, the *reserve proportion*, which constrains the maximum *reserve* that may be scheduled from the *generation registered facility* to the specified ratio of *energy* scheduled for the *generation registered facility*. The *reserve proportion* should be specified to minimise the likelihood of the *generation registered facility* being scheduled to provide *reserve* in excess of what can reliably be provided at any given level of scheduled *energy*;
- E.1.1.8 the maximum *regulation capacity* of the *generation facility* if the *generation facility* is or seeks to be registered to provide *regulation*;

- E.1.1.9 the maximum *energy* output at which *automatic generator control (AGC)* or other signals acceptable to the *PSO* can operate the *generation facility* to provide *regulation* capability if the *generation facility* is or seeks to be registered to provide *regulation*;
- E.1.1.10 the minimum *energy* output at which *automatic generator control (AGC)* or other signals acceptable to the *PSO* can operate the *generation facility* to provide *regulation* capability if the *generation facility* is or seeks to be registered to provide *regulation*;
- E.1.1.11 the time delay in seconds before the *generation facility* begins to respond following the standard *contingency event* specified in the *system operation manual*;
- E.1.1.12 the lowest *energy* output level that the *generation facility* is capable of providing *reserve* for all *reserve classes*;
- E.1.1.13 the *reserve* capacity of the *generation facility* at low, medium and high *energy* output levels for each *reserve class* which the *generation facility* is or seeks to be registered to provide; and
- E.1.1.14 the minimum stable load level of the *generation facility* where the *generation facility* has or seeks to have its minimum stable load level registered.

E.2 LOAD FACILITY DATA

- E.2.1 The *standing capability data* pertaining to a *load facility* which is or seeks to be registered to provide or withdraw any *physical service* shall include:
- E.2.1.1 information sufficient to identify the *load facility* to which the *standing capability data* pertains;
 - E.2.1.2 the maximum *reserve* capacity of the *load facility* for each *reserve class* that the *load facility* is or seeks to be registered to provide;
 - E.2.1.3 the aggregate maximum *load curtailment* capacity of the *load facility*, if the *load facility* is or seeks to be registered to be scheduled for *energy* withdrawal for the purposes of *load curtailment*;
 - E.2.1.4 the maximum ramp-up rate for the *load facility* in MW/minute, if the *load facility* is or seeks to be registered to be scheduled for *energy* withdrawal for the purposes of *load curtailment*;
 - E.2.1.5 the maximum ramp-down rate for the *load facility* in MW/minute, if the *load facility* is or seeks to be registered to be scheduled for *energy* withdrawal for the purposes of *load curtailment*;
 - E.2.1.6 the *load zone* associated with the *load facility*, if the *load facility* is or seeks to be registered to be scheduled for *energy* withdrawal for the purposes of *load curtailment*; and
 - E.2.1.7 the set of *dispatch network nodes* associated with the *load facility*, if the *load facility* is or seeks to be scheduled for *energy* withdrawal for the purposes of *load curtailment*.

**APPENDIX F - [DELETED AND INTENTIONALLY
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APPENDIX G – DISPATCH RELATED DATA

G.1 INTRODUCTION

G.1.1 The information listed in sections G.2 to G.7 of this Appendix describes the *dispatch related data* referred to in sections 6.1 and 8.1 of this Chapter which the *PSO* must produce, revise as required, and communicate to the *EMC* in accordance with those sections and the applicable *market manuals*. Except as otherwise specified in these *market rules*, the *EMC* shall utilise the latest *dispatch related data* received from the *PSO*. In the event that such latest *dispatch related data* is not uploaded in time for the imminent *market clearing engine* run, the *EMC* shall utilise the latest available and uploaded *dispatch related data* for that *market clearing engine* run.

Explanatory note: The main area where the EMC may deviate from using the latest available and uploaded dispatch related data received is the StartGeneration of the generation units, for which Appendix 6D contains provisions to use previous dispatch runs to forecast the initial generation of facilities instead of out of date PSO data if necessary.

G.2 **LOAD DATA**

- G.2.1 The *PSO*'s expectation of *non-dispatchable load* for each *dispatch period* within the *market outlook horizon*.

- G.2.2 The *PSO*'s expectation of *dispatch periods* in which there exists a serious risk of any of an *energy*, *reserve* or *regulation* shortfall or of an *energy* surplus within the *market outlook horizon*, together with the amount of the shortfall in each period, and in the case of energy shortfalls, the expected *dispatch network nodes* at which the shortfall will occur.

- G.2.3 The actual distribution of *non-dispatchable load* over all the *dispatch network nodes* for the current *dispatch period*.

G.3 GENERATOR DATA

- G.3.1 The *PSO's* expectation of the MW *energy* output level of each *generating unit* as at the beginning of the upcoming *dispatch period*.
- G.3.2 Any *generation fixing constraints* to be applied in respect of the output level of each *generation registered facility* for each *dispatch period* in the *market outlook horizon*.
- G.3.3 Any additional *generic constraints* to be applied in respect of the output level of any group of *generating units* for the purpose of reflecting real limitations on those *generating units* for each *dispatch period* in the *market outlook horizon*.

Explanatory Note: Generation fixing constraints are a special class of constraints, having the form of security constraints, imposed directly by the MCE on an individual generating facilities output (e.g. to limit output of a generator to a level suitable for voltage support). The additional constraints referred to in the previous clause have the same form as security constraints but may be applied to reflect physical constraints on groups of facilities at a location. These constraints may be required to address real-time outages etc., which are not strictly security related.

G.4 TRANSMISSION DATA

- G.4.1 The set of *dispatch network lines* that are in service in each *dispatch period* of the *market outlook horizon*.
- G.4.2 The thermal line ratings for each *dispatch network line*, for each *dispatch period* of the *market outlook horizon*.
- G.4.3 The operational flow limits on each *dispatch network line* for each direction of flow for each *dispatch period* of the *market outlook horizon*.
- G.4.4 The resistance, reactance and fixed losses for each *dispatch network line*, for each *dispatch period* of the *market outlook horizon*.
- G.4.4A For the phase-shifting transformer of each *pst line*:
- (i) the phase angle shift per one tap position change;
 - (ii) the minimum and maximum tap positions; and
 - (iii) the tap position that results in zero degree phase angle shift, for each *dispatch period* of the *market outlook horizon*; and
 - (iv) the latest tap position of the phase-shifting transformer. The *PSO* shall provide this value to the *EMC* before the start of each *dispatch period*.
- G.4.5 The *intertie schedules* for all *interties* in each *dispatch period* of the *market outlook horizon*.
- G.4.6 The *PSO's* estimate of the reactive power flows on each *dispatch network line* in service in each *dispatch period* of the *market outlook horizon*.
- G.4.7 Such other information as may be required to represent the *dispatch network* for each *dispatch period* of the *market outlook horizon*.
- G.4.8 The *connection* status of the *intertie* lines for each *dispatch period* of the *market outlook horizon*.

G.5 SECURITY, RESERVE AND REGULATION DATA

- G.5.1 The set of all *security constraints* limiting combinations of *dispatch network line flows*, *generation registered facility output levels* and net injections at each *dispatch network node* for each *dispatch period* of the *market outlook horizon*.
- G.5.2 The set of *reserve provider groups* with the *reserve class* and the set of *registered facilities* to which each such *reserve provider group* is associated applicable for each *dispatch period* of the *market outlook horizon*.
- G.5.3 The piece-wise linear effectiveness functions for each *reserve provider group*, describing the expected effectiveness of different levels of *reserve quantity* scheduled from that *reserve provider group* for each *dispatch period* of the *market outlook horizon*.
- G.5.3A The set of *load zones* applicable for each *dispatch period* of the *market outlook horizon*.
- G.5.3B For each *load zone*, the maximum of the aggregate of *reserve response* and *load curtailment* for each *dispatch period* of the *market outlook horizon*.
- G.5.3C For each *reserve class*, the maximum proportion of the risk for that class that can be covered by *reserve* provided by *load registered facilities*, for each *dispatch period* of the *market outlook horizon*.
- G.5.3D The system limit on the maximum of the aggregate of *reserve response* that can be provided by the *load registered facilities* and *load curtailment* that such *load registered facilities* can be subject to for each *dispatch period* of the *market outlook horizon*.
- G.5.3E For each *load zone*, the set of *dispatch network nodes* associated with that *load zone* for each *dispatch period* of the *market outlook horizon*.
- G.5.4 The minimum required *reserve* for each *reserve class* for each *dispatch period* of the *market outlook horizon*.
- G.5.5 For each *reserve class*, a risk adjustment factor that scales the contingency risk determined within the *market clearing engine* to reflect special conditions within each *dispatch period* of the *market outlook horizon*.
- G.5.6 The total *regulation* requirement for each *dispatch period* of the *market outlook horizon*.

- G.5.6A The minimum required *regulation* for each *dispatch period* of the *market outlook horizon*.
- G.5.7 An estimated *inertie* contribution factor that represents the assistance provided by the *inertie* in the event of a frequency drop, when one or more of the *inerties* are *connected*.
- G.5.8 For each *reserve class*, the maximum acceptable frequency deviation for the situation where one or more of the *inerties* are *connected*.
- G.5.9 For each *reserve class*, the maximum acceptable frequency deviation for the situation where none of the *inerties* are *connected*.
- G.5.10 For each *reserve class*, an estimated load damping factor that represents the proportion by which total demand is expected to decrease following a drop in frequency.
- G.5.11 For each *reserve class*, an estimated GT output damping factor that represents the proportion by which GT output is expected to reduce following a drop in frequency.
- G.5.12 The set of all *generation registered facilities* likely to decrease generation output as a result of a drop in system frequency.
- G.5.13 The specified nominal system frequency in Hz.

G.6 VIOLATION COSTS

- G.6.1 The values of all *constraint violation costs* pertaining to *security constraints*, *generation fixing constraints* and other *generic constraints*, as well as to *reserve*, *regulation* and *dispatch network lines* that are specified in Appendix 6J or are established by the *PSO* in accordance with section 2.3 of this Chapter 6.

G.7 GENERAL INFORMATION

G.7.1 Notwithstanding any other provisions of this Appendix, the *PSO* shall advise the *EMC* of any circumstances relating to one or more *registered facilities*, or to the *electricity system* as a whole, which have caused or are likely to cause the *PSO* to do any of the following within the current *pre-dispatch horizon* or *short-term horizon*:

- a. impose *security constraints*, *generation fixing constraints* or *generic constraints* that differ significantly from those that are normally applied;
- b. adjust any *reserve* or *regulation* parameters used as inputs to the *market clearing engine* in ways that differ significantly from the values normally applied by the *PSO* at each time of day;
- c. significantly revise its expectations of *load*, of any *energy surplus* or of any *energy, reserve, or regulation* shortfall; or
- d. impose *constraint violation costs* that differ significantly from the values normally applied by the *PSO* at each time of day.

APPENDIX H – ADVISORY NOTICES

H.1 INFORMATION TO BE INCLUDED

H.1.1 This Appendix sets forth details of the information to be included in *advisory notices* issued by the *EMC* pursuant to section 9.3 of this Chapter.

H.1.2 An *energy surplus advisory notice* shall indicate:

H.1.2.1 the *dispatch periods* for which an *energy surplus* is expected by the *EMC*;

H.1.2.2 the amount by which the output from *generation facilities* is expected to exceed *load* for each *dispatch period* referred to section H.1.2.1; and

H.1.2.3 whether the *energy surplus advisory notice* applies to the *electricity system* as a whole or is localised and, if localised, the *dispatch network nodes* to which the *advisory notice* relates.

H.1.3 An *energy shortfall advisory notice* shall indicate:

H.1.3.1 the *dispatch periods* for which an *energy shortfall* is expected by the *EMC*;

H.1.3.2 the amount by which the output from *generation facilities* is expected to fall short of *load* for each *dispatch period* referred to section H.1.3.1; and

H.1.3.3 whether the *energy shortage advisory notice* applies to the *electricity system* as a whole or is localised and, if localised, the *dispatch network nodes* to which the *advisory notice* relates.

H.1.4 A *reserve shortfall advisory notice* shall indicate:

H.1.4.1 the *reserve classes* to which the *advisory notice* relates;

H.1.4.2 the *dispatch periods* for which a *reserve shortfall* in respect of each affected *reserve class* referred to in section H.1.4.1 is expected by the *EMC*; and

H.1.4.3 the amount by which the required *reserve* for each affected *reserve class* referred to in section H.1.4.1 is expected to exceed the *reserve* provided for each *dispatch period* referred to section H.1.4.2.

H.1.5 A *regulation shortfall advisory notice* shall indicate:

H.1.5.1 the *dispatch periods* for which a *regulation* shortfall is expected by the *EMC*; and

H.1.5.2 the amount by which the required *regulation* is expected to exceed the *regulation* provided for each for each *dispatch periods* referred to section H.1.5.1.

H.1.6 A system status *advisory notice* pertaining to *load shedding* shall indicate:

Explanatory Note: Load shedding differs from energy shortfalls only in that energy shortfalls are load shedding forecast by the dispatch algorithm, while a system status advisory notice about load shedding need not be related to the dispatch algorithm.

H.1.6.1 the *dispatch periods* for which *load shedding* is expected by the *PSO*;

H.1.6.2 the amount by which the output from *generation facilities* is expected to exceed *load* for each *dispatch period* referred to section H.1.6.1; and

H.1.6.3 whether the system status *advisory notice* applies to the *electricity system* as a whole or is localised and, if localised, the *dispatch network nodes* to which the *advisory notice* relates.

H.1.7 A system status *advisory notice* pertaining to a major equipment *outage*, *load shedding* or any other abnormal *PSO controlled system* conditions that the *PSO* considers material shall indicate:

H.1.7.1 the *dispatch periods* for which a major equipment *outage*, *load shedding* or other abnormal *PSO controlled system* condition is expected by the *PSO*; and

H.1.7.2 the nature of the major equipment *outage*, *load shedding* or abnormal *PSO controlled system* condition.

H.1.8 A communications warning *advisory notice*:

H.1.8.1 pertaining to an existing communications problem, shall indicate the nature and expected duration of the communication problems and provide details of any interim alternative communication methods to be used by the *EMC*, the *PSO* or *market participants*, as the case may be, while the *advisory notice* is in effect; and

H.1.8.2 pertaining to an anticipated communications problem, shall contain the information referred to in section H.1.8.1, an indication of time at which the communications problem is expected to commence if not avoided and the means by which the *EMC* intends to avoid the occurrence of the communications problem.

H.1.9 A price warning *advisory notice* shall indicate:

H.1.9.1 the *dispatch periods* to which the *advisory notice* relates;

H.1.9.2 the nature of the pricing problem; and

H.1.9.3 the actions proposed by the *EMC* to address the problem.

H.1.10 An pricing revision *advisory notice* shall indicate:

H.1.10.1 the *dispatch periods* to which the *advisory notice* relates;

H.1.10.2 the nature of the pricing problem; and

H.1.10.3 the methodology to be used to determine settlement prices and/or quantities.

APPENDIX I – COMPENSATION IN THE EVENT OF LOAD SHEDDING

I.1 COMPENSATION AMOUNTS

I.1.1 For this section I.1 the following definitions apply:

$RMEP^m$ = revised *market energy price* (in \$/MWh) at *MNN* *m* for the relevant *dispatch period*, from the revised *dispatch schedule* resulting from the *MCE* solve described in section 10.2.8 of this Chapter.

OS^m = quantity scheduled for *GRF* *m* in the *dispatch schedule* described in section 9.2.1 of this Chapter.

RS^m = quantity scheduled for *GRF* *m* in the revised *dispatch schedule* resulting from the *MCE* solve described in section 10.2.8 of this Chapter.

spq = index of a specific *price-quantity pair* in an *energy offer*.

pq = index of the *price-quantity pairs* in an *energy offer*, which are ordered by increasing price.

$Q^{m,pq}$ = quantity of the *price-quantity pair* pq for the *energy offer* from the *GRF* *m* for the relevant *dispatch period*.

$P^{m,pq}$ = price of the *price-quantity pair* pq for the *energy offer* from the *GRF* *m* for the relevant *dispatch period*.

$COMP^{m,pq}$ = compensation paid in relation to the *price-quantity pair* pq of the *energy offer* from the *GRF* *m* for the relevant *dispatch period*.

$COMP^m$ = compensation paid in relation to energy offer from the *GRF* *m* for the relevant *dispatch period*.

I.1.2 Subject to I.1.4, for each eligible *generation registered facility* compensation as described in section 10.2.9 of this Chapter shall be calculated as:

$$COMP^m = \sum_{pq=1}^{10} COMP^{m,pq}$$

I.1.3 Subject to I.1.4, the compensation due under each *price-quantity pair* spq of the energy offer shall be calculated as:

I.1.3.1 If $\sum_{pq=1}^{spq} Q^{m,pq} \leq OS^m$, then:

$$COMP^{m,spq} = 0$$

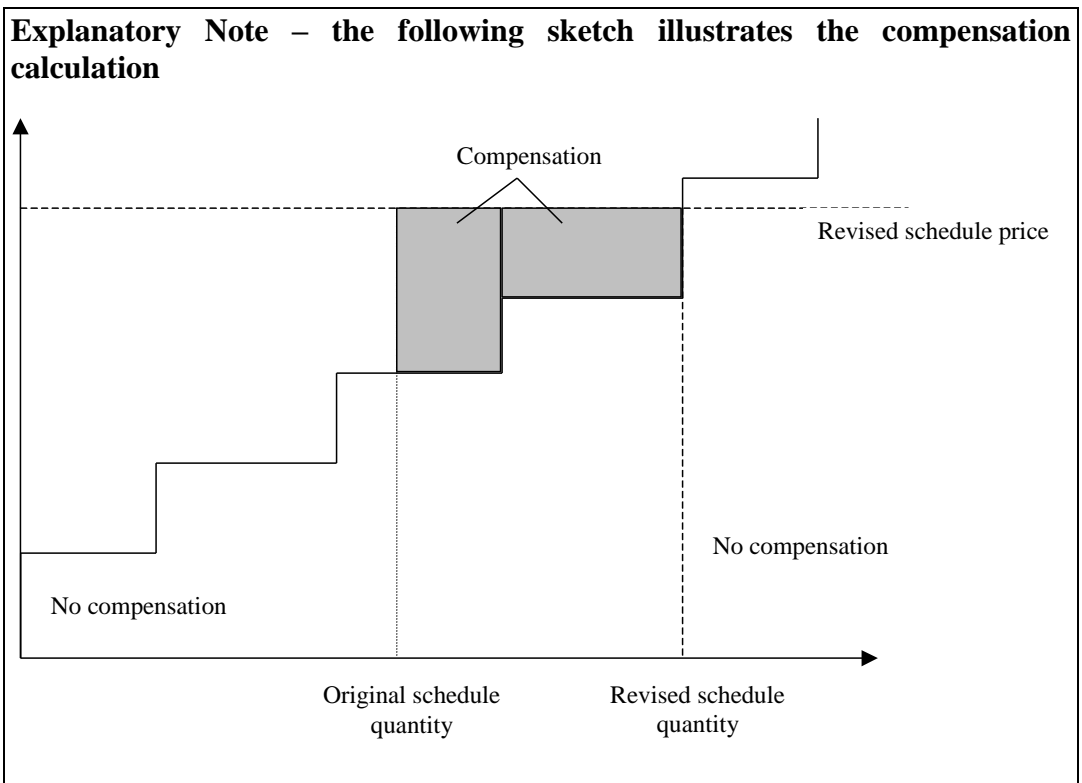
I.1.3.2 If $\sum_{pq=1}^{spq-1} Q^{m,pq} \geq RS^m$, then:

$$COMP^{m,spq} = 0$$

I.1.3.3 Otherwise, compensation paid for *price-quantity pair* spq is:

$$COMP^{m,spq} =$$

$$\left(RMEP^m - P^{m,pq} \right) \times \left(\min \left(\sum_{pq=1}^{spq} Q^{m,pq}, RS^m \right) - \max \left(\sum_{pq=1}^{spq-1} Q^{m,pq}, OS^m \right) \right)$$



- I.1.4 The *market surveillance and compliance panel* shall review the behaviour of *market participants* prior to and during the relevant *dispatch periods* and may revise the compensation amounts of any *market participant* downwards if it finds that the *market participant* deliberately manipulated its *offer variations* in order to receive compensation payments or increase its compensation payments.

I.2 COMPENSATION PAYMENT AND COST RECOVERY

- I.2.1 The compensation payments referred to in section 10.2.9 of this Chapter and calculated in accordance with section I.1, shall appear as an additional item on the *settlements statements* of the *relevant market participants* for the relevant *dispatch day*, and shall be paid by the *EMC* in accordance with the settlement timetable set out in section 5.2 of Chapter 7.
- I.2.2 The total cost of the compensation payments in each relevant *dispatch period*, referred to in section 10.2.9 of this Chapter and calculated in accordance with section I.1, shall be recovered by the *EMC* from *market participants* by allocating the total cost across *market participants* in proportion to the sum of the *WEQs* associated with the *settlement accounts* of that *market participant* in the relevant *dispatch period*, and shall appear as an additional item on the *settlements statements* of *market participants* for the relevant *dispatch day*, and shall accordingly be paid by *market participants* in accordance with the settlement timetable set out in section 5.2 of Chapter 7.

APPENDIX J – PRICE LIMITS AND CONSTRAINT VIOLATION PENALTIES

J.1 MAXIMUM AND MINIMUM PRICES

J.1.1 The lower limit on *energy* prices in *standing offers*, *offer variations* and *settlements* shall be:

EnergyPriceMin

J.1.1A The lower limit on *energy* prices in *standing bids* and *bid variations* in respect of *restricted energy bids* shall be:

REBPriceMin

J.1.2 The upper limit on *energy* prices in *standing offers*, *offer variations* and *settlements*, and the upper limit on *load curtailment prices* shall be:

EnergyPriceMax

J.1.2A The upper limit on *energy* prices in *standing bids* and *bid variations* in respect of *restricted energy bids* shall be:

REBPriceMax

J.1.3 The upper limit on *regulation* prices in *standing offers*, *offer variations* and *settlements* shall be:

RegPriceMax

J.1.4 The upper limit on *reserve* prices for primary *reserve* in *standing offers*, *offer variations* and *settlements* shall be:

ResPriPriceMax

J.1.5 [Deleted and Intentionally Left Blank]

J.1.6 The upper limit on *reserve* prices for contingency *reserve* in *standing offers*, *offer variations* and *settlements* shall be:

ResConPriceMax

Explanatory Note: The lower limit on prices for regulation and all classes of reserve is zero.

J.1.7 Price bound values:

Parameter	Value
EnergyPriceMin	0.9 * CDC
REBPriceMin	1.5 * BVP
EnergyPriceMax	0.9 * VoLL
REBPriceMax	1.00 * VoLL
RegPriceMax	0.06 * VoLL
ResPriPriceMax	0.85 * VoLL
ResConPriceMax	0.65 * VoLL

Explanatory Note:

“Value of Lost Load” (VoLL) is specified in section J.2.

“Cost of Decommitment” (CDC) is specified in section J.2.

“Balance Vesting Price” (BVP) is determined by the MSSL counterparty pursuant to section 2.5.2 of Chapter 7. The rationale for setting the lower bound of the restricted energy bid as such can be found in the Authority’s final determination paper on “Implementing Demand Response in the National Electricity Market of Singapore” dated 28 October 2013.

Price bounds are applied at Market Network Nodes.

Energy price bounds should be less than the first block of the violation penalties for deficit energy, by at least the maximum expected marginal loss between any two points in the system. Otherwise load shedding could be recommended by the market clearing engine at some nodes because of the losses between those nodes and the generation facility nodes, even though not all generation capacity has been utilised.

J.2 VoLL AND CDC

The following information will form part of the input data for the *market clearing engine* in accordance with section B.8 of Appendix 6B:

Value of Lost Load (VoLL)	=	\$5,000/MWh
Cost of Decommitment (CDC)	=	-\$5,000/MWh

J.3 MAPPING OF VIOLATION PENALTIES TO VARIABLES USED IN THE MARKET CLEARING ENGINE FORMULATION

Variable used in MCE formulation	<i>j</i>	Violation Penalty Block Prices	Violation Penalty Block Quantities
DeficitGenerationBlock _{<i>n,j</i>} where <i>n</i> is a dispatch network node other than those dispatch network nodes added to the dispatch network pursuant to section D.6.5 or section D.8.2 of Appendix 6D.		DeficitGenerationPenalty _{<i>n,j</i>} VoLL	DeficitGenerationBlockMax _{<i>n,j</i>} 10,000 MW
<p><u>Explanatory Note:</u></p> <p>These violation variables do not have the same penalty logic as other violations – any violation blocks are penalised directly in the objective function.</p> <p>The purchase bid price is set to a very high level, so that any energy deficit violation will appear in the deficit generation variables, rather than the purchase bid variables.</p> <p>Market Max Energy Price/Max Energy Offer Price should be less than the first block of violation penalties for deficit energy, by at least the maximum expected marginal loss between any two points in the system. Otherwise load shedding could be recommended by the market clearing engine at some nodes because of the losses between those nodes and the generation facility nodes, even though not all generation capacity has been utilised.</p>			
DeficitRegulation	1	0.061 * VoLL	2,000 MW
	2	0.6 * VoLL	2,000 MW
DeficitReserve _{<i>c</i>}	9 Second Class (Primary Reserve):		
	1	0.062 * VoLL	2,000 MW
	2	0.51 * VoLL	2,000 MW
	3	0.9 * VoLL	2,000 MW
	10 Minute Class (Contingency Reserve):		
1	0.037 * VoLL	2,000 MW	

	2	0.39 * VoLL	2,000 MW
	3	0.7 * VoLL	2,000 MW

Explanatory Note:

A shorter term reserve class is more critical than a longer term reserve class, and should have higher violation penalties. Regulation is less critical than reserve, and is hence given a lower violation penalty.

The Violation Penalty Block Quantities for DeficitRegulation and DeficitReserve will be determined by constraints described in section D.21.4.1 (for regulation) and in sections D.21.3.1 and D.21.3.2 (for reserve) of Appendix 6D.

In general, the violation penalties for DeficitRegulation and DeficitReserve are set such that:

- (1) The minimum regulation required constitutes a core requirement. Violation of this requirement will incur the highest violation penalty (i.e. the Violation Penalty Block Price with index $j=2$) for such DeficitRegulation.**
- (2) The minimum reserve required for each reserve class constitutes a core requirement. Violation of this requirement will incur the highest violation penalty (i.e. the Violation Penalty Block Price with index $j=3$) for DeficitReserve for such reserve class.**
- (3) Energy requirements are met before the fulfilment of the first block of reserve quantities (incurring the least penalty, $j=1$). Hence, the sum of the first block of violation penalties for both classes of deficit reserve is set to be less than the difference between the first block of violation penalties for deficit energy and the highest possible marginal energy offer (i.e. EnergyPriceMax).**

Variable used in MCE formulation	Violation Penalty Block Prices	Violation Penalty Block Quantities
ExcessGenerationBlock _{n,j} where <i>n</i> is a dispatch network node other than those dispatch network nodes added to the dispatch network pursuant to section D.6.5 or section D.8.2 of Appendix 6D.	ExcessGenerationPenalty _{n,j} -CDC	ExcessGenerationBlockMax _{n,j} 10,000 MW
ExcessLineFlowForward _k ExcessLineFlowReverse _k DeficitWLineFlow _k ExcessWLineFlow _k where { <i>k</i> ∈ LINES, <i>k</i> ∉ ARTIFICIALLINES}	2.2 * VoLL	10,000 MW
<p><u>Explanatory Note:</u></p> <p>The recommended violation penalty for line flow is derived from the violation penalties for energy, since line flow or node violations trade-off against each other. Generally the deficiency leading to a line flow violation could alternatively result in a nodal violation – load could be shed at the receiving node rather than violating the flow limits. Assuming the flow limits are hard, then the solution that best matches what will happen in reality is for load to be shed at the receiving end of the line. Hence the price for the line flow violation is the maximum difference between energy prices at each end of the line, VoLL and -VoLL, plus an adder.</p>		
Variable used in MCE formulation	Violation Penalty Block Prices	Violation Penalty Block Quantities
ExcessRawReserve _r ExcessResGen _r ExcessResGenSegment1 _r ExcessResGenSegment2 _r ExcessResGenSegment3 _r ExcessResRamp _r	20 * VoLL	10,000 MW

<p>ExcessResPropRamp_r</p> <p>ExcessRegGen_l</p> <p>DeficitRegGen_l</p> <p>ExcessRegRamp_l</p> <p>ExcessUpRamp_g</p> <p>ExcessDownRamp_g</p> <p>ExcessUpRamp_p</p> <p>ExcessDownRamp_p</p> <p>DeficitMulti_s</p> <p>ExcessMulti_s</p> <p>ExcessLineFlowForward_k</p> <p>ExcessLineFlowReverse_k</p> <p>DeficitWLineFlow_k</p> <p>ExcessWLineFlow_k</p> <p>where $\{k \in$ ARTIFICIALLINES1 \cup ARTIFICIALLINES2 $\}$</p> <p>DeficitMSL_g</p> <p>ExcessMSL_g</p>		
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Explanatory Note:

Facility constraints should be the most expensive to violate. They comprise constraints on ramping, reserve capability at low loading, total generation plus reserve plus regulation capacity, combined ramping and reserve capability and regulation capability loading levels. These penalty violations should have large values because they relate to the plant capability specified by market participants, who have the best knowledge of the capability of their plant.

All facility groups should have the same violation penalties unless there is some valid reason to discriminate between facilities.

DeficitGenerationBlock _{n,j} and ExcessGenerationBlock _{n,j} where <i>n</i> is a dispatch network node added to the dispatch network pursuant to section D.6.5 or section D.8.2 of Appendix 6D.	20 * VoLL	10,000 MW
<p><u>Explanatory Note:</u></p> <p>These artificial nodes are a modelling construct created to support the modelling of an individual facility. It is therefore most appropriate to use the penalty scheme applicable to other facility violation variables, and not the scheme applicable to conventional nodes.</p>		
Variable used in MCE formulation	Violation Penalty Block Prices	Violation Penalty Block Quantities
DeficitSecurity _s	6 * VoLL	10,000 MW

APPENDIX K – COMPENSATION WHEN SCHEDULED AT MINIMUM STABLE LOAD LEVEL

K.1 PURPOSE AND DEFINITIONS

K.1.1 This Appendix sets forth the other criteria for compensation referred to in section 10.5.1.2 of Chapter 6, as well as the procedures and timeline for compensation applicable to a *market participant* whose *generation registered facility* has a minimum stable load level registered with the *EMC* (the “registered MSL”).

K.1.2 In this Appendix:

K.1.2.1 “final minimum stable load compensation statement” or “FMCS” in respect of a *market participant* means the *EMC’s* final statement of compensation amounts to be paid to the *market participant* for the purposes of section 10.5.1 of Chapter 6 and this Appendix;

K.1.2.2 “final minimum stable load compensation invoice” or “FMI” shall mean an invoice to be issued by the *EMC* to a *market participant* which sets forth the aggregate compensation amount to be paid by the *EMC* to the *market participant* for the purposes of section 10.5.1 of Chapter 6 and this Appendix 6K;

K.1.2.3 “preliminary minimum stable load compensation statement” or “PMCS” in respect of a *market participant* means the *EMC’s* preliminary statement of compensation amounts to be paid to the *market participant* for the purposes of section 10.5.1 of Chapter 6 and this Appendix 6K;

K.1.2.4 “T” refers to a given *trading day*; and

K.1.2.5 “T+X” refers to the Xth *business day* after a given *trading day* T.

K.1.3 In this Appendix, the following definitions apply:

$COMP_t^m$ = Compensation amount payable to *GRF* m, where it meets all the criteria under section 10.5.1 of Chapter 6 for compensation, for *dispatch period* t.

MEP_h^m = *Market energy price* (in \$/MWh) at *MNN* m for the *settlement interval* h corresponding to *dispatch period* t.

GRF_m = A *GRF* located at MNN_m .

pq = Index of the *price-quantity pairs* in an *energy offer*, which are ordered by increasing price.

$P_t^{m,pq}$ = Price for the *price-quantity pair* pq for the *energy offer* for GRF_m for *dispatch period* t .

IEQ_h^m = Injection *energy quantity* for GRF_m for the *settlement interval* h corresponding to *dispatch period* t .

MSL_t^m = Minimum stable load level for GRF_m that is used in the *real-time dispatch schedule* referred to in section 10.5.1.1 of Chapter 6, for *dispatch period* t .

$DownRampRate_t^m$ = Ramp-down rate for GRF_m used in the *real-time dispatch schedule* referred to in section 10.5.1.1 of Chapter 6, for *dispatch period* t .

$ExpectedStartGeneration_{g,t}$ = Forecast *generation level* of GRF_m at the beginning of *dispatch period* t associated with an *energy offer* g for that *dispatch period*, as determined in accordance with section D.12.5 of Appendix 6D, which is used in the *real-time dispatch schedule* referred to in section 10.5.1.1 of Chapter 6, for *dispatch period* t .

$StartGeneration_{g,t}$ = Forecast *generation level* of GRF_m at the beginning of *dispatch period* t associated with an *energy offer* g for that *dispatch period*, received in accordance with section G.3.1 of Appendix 6G. For *multi-unit facilities*, this is calculated in accordance with section D.8.3 of Appendix 6D.

K.2 CRITERIA FOR COMPENSATION

K.2.1 The other criteria for compensation referred to in section 10.5.1.2 of Chapter 6 for a given *dispatch period* are as follows:

K.2.1.1 it is not scheduled for *reserve* or *regulation* in its *real-time dispatch schedule* referred to in section 10.5.1.1 of Chapter 6 for that given *dispatch period*;

K.2.1.2 the price in the first *price-quantity pair* of its *energy offer* for that given *dispatch period* is higher than the *market energy price* for

the *settlement interval* corresponding to that given *dispatch period* for the *market network node* at which the *generation registered facility* is located;

K.2.1.3 the quantity in the first *price-quantity pair* of its *energy offer* for that given *dispatch period* is more than or equal to its registered MSL; and

K.2.1.4 it was not bounded by its ramp-down rate for that given *dispatch period*, which shall be the case if its $(\text{ExpectedStartGeneration}_{g,t} - \text{DownRampRate}^m \times 30)$ for that given *dispatch period* does not take on a value between zero and its MSL_t^m .

K.3 CALCULATION OF COMPENSATION AMOUNT

K.3.1 For each *generation registered facility* that meets all the criteria under section 10.5.1 of Chapter 6 for a given *dispatch period*, the compensation amount as described in section 10.5 of Chapter 6 for that *dispatch period* shall be calculated as follows:

K.3.1.1 if the $\text{StartGeneration}_{g,t}$ of such *generation registered facility* is higher than or equal to its MSL_t^m ,

$$\text{COMP}_t^m = (P_t^{m,pq=1} - \text{MEP}_h^m) \times \text{Min}(\text{IEQ}_h^m, \text{MSL}_t^m \times 1/2)$$

K.3.1.2 if the $\text{StartGeneration}_{g,t}$ of such *generation registered facility* is lower than its MSL_t^m ,

$$\text{COMP}_t^m = (P_t^{m,pq=1} - \text{MEP}_h^m) \times \text{Min}(\text{IEQ}_h^m, \text{MSL}_t^m \times 1/4)$$

K.4 TIMELINE AND COMPENSATION STATEMENTS

K.4.1 The timeline for the calculation, verification and disbursement of compensation amounts are set out in the following table:

Day	Time of Day	Event	Provided By	Provided To	Frequency
By T+6	By 17:00	The <i>EMC</i> to calculate, in accordance with section K.3, the compensation amount payable to a <i>market participant</i> referred to in section 10.5.1 of Chapter 6 for each <i>dispatch period</i> for <i>trading day T</i> , based on the <i>metering data</i> received by the <i>EMC</i> for such <i>dispatch period</i> on or before 17:00 on T+5. The aggregate compensation amount payable to each such <i>market participant</i> for <i>trading day T</i> shall be posted in the PMCS for that <i>market participant</i> for <i>trading day T</i> .	<i>EMC</i>	The <i>market participant</i>	As required
By T+8	By 17:00	Deadline for a <i>market participant</i> to notify the <i>EMC</i> by way of a notice of dissent of: i) any disagreement with the compensation amount stated in its PMCS (whether due to errors therein or otherwise); or ii) any request to be considered for compensation under section 10.5 of Chapter 6, where it believes that it has a reasonable basis to seek to receive compensation but was not issued a PMCS.	<i>Market participant</i>	<i>EMC</i>	As required
By T+10	By 17:00	The <i>EMC</i> to notify the <i>market participant</i> of its determination in respect of such <i>market participant's</i> notice of dissent above (if any), and to issue the FMCS taking into account its determination (if any), the latest <i>metering data</i> received by the <i>EMC</i> on or before T+9, 17:00, and any other information that the <i>EMC</i> deems appropriate.	<i>EMC</i>	The <i>market participant</i>	Once per <i>business day</i>
Within 90 days after T+10		The <i>EMC</i> pays <i>market participants</i> which have been issued a FMCS and a corresponding FMI the compensation amount stipulated in the FMI, subject always to section 3.12 of Chapter 3.	<i>EMC</i>	<i>Market participants</i>	As required

- K.4.2 The *EMC* shall issue to a *market participant* (referred to in section 10.5.1 of Chapter 6) a PMCS that sets out the aggregate amount of the compensation payable to such *market participant* for all relevant *dispatch periods* for a given *trading day*, in accordance with the timeline set forth in section K.4.1.
- K.4.3 A *market participant* who is issued with a PMCS shall notify the *EMC*, by way of a notice of dissent to the *EMC*, if it disagrees with the compensation amount stated in the PMCS (whether due to errors therein or otherwise) within the timeline set forth in section K.4.1.
- K.4.4 A *market participant* who is not issued a PMCS shall notify the *EMC*, by way of a notice of dissent to the *EMC*, if it believes that it has a reasonable basis to seek to receive compensation, within the timeline set forth in section K.4.1.
- K.4.5 Each notice of dissent shall relate to only one PMCS, if any, or one *trading day* (if there is no such PMCS issued for that *trading day*). Each notice of dissent shall be submitted together with all relevant supporting material, and shall clearly state at least the following information:
- K.4.5.1 the date of issuance of the relevant PMCS, if any, to which the notice of dissent relates;
 - K.4.5.2 the *trading day* to which such notice of dissent relates;
 - K.4.5.3 the nature and particulars of the disagreement with the compensation amount or as to why the *market participant* believes that it has a reasonable basis to seek to receive compensation;
 - K.4.5.4 the reason(s) the *market participant* disagrees with the compensation amount or as to why the *market participant* believes that it has a reasonable basis to seek to receive compensation; and
 - K.4.5.5 to the extent that the *market participant* is able to do so, a proposed correction of the compensation amount or its calculation in the relevant PMCS, if any.
- (A notice of dissent submitted to the *EMC* within the timeline set forth in section K.4.1 and in compliance with all the requirements in this section K.4.5 is referred to in this Appendix as a “duly submitted notice of dissent”.)
- K.4.6 The *EMC* shall acknowledge its receipt of a duly submitted notice of dissent.

- K.4.7 No *market participant* may submit a notice of dissent, and the *EMC* shall not acknowledge receipt or take any further action in respect of a notice of dissent, unless the notice of dissent is a duly submitted notice of dissent.
- K.4.8 The *EMC* shall notify the *market participant* of the *EMC's* determination in respect of the *market participant's* duly submitted notice of dissent, in accordance with the timeline set forth in section K.4.1, taking into account any corrected *metering data* or other information, if any, which the *EMC* receives prior to such determination.
- K.4.9 Whether or not any duly submitted notice of dissent has been received by the *EMC*, the *EMC* shall issue the FMCS to a *market participant* and may, on its own initiative, also issue a FMCS if no PMCS was issued, or make such adjustments to the corresponding FMCS for an existing PMCS as the *EMC* may deem appropriate, based on any corrected *metering data* or other information received by the *EMC* prior to its issuance of such FMCS, in accordance with the timeline set forth in section K.4.1.
- K.4.10 The FMCS shall be the basis for the FMI and the payments to be made thereunder.
- K.4.11 At the same time that the *EMC* issues the FMCS referred to in section K.4.9 to a *market participant*, the *EMC* shall issue an FMI for the aggregate compensation amount stated in the FMCS for that *trading day* to such *market participant*.
- K.4.12 The *EMC* shall pay to a *market participant* the compensation amount stated in the FMI in accordance with the procedures set forth in section 3.12 of Chapter 3.
- K.4.13 If a *market participant* disagrees with the compensation amount stated in the FMCS or has a reasonable basis to believe that a FMCS should have been issued to it, and wishes to dispute the matter, it shall refer the matter to the *dispute resolution counsellor* by filing a *notice of arbitration* pursuant to section 3.9.2 of Chapter 3.
- K.4.14 No *market participant* may submit, and the *dispute resolution counsellor* shall not accept or take any action with respect to, a *notice of arbitration* filed pursuant to section K.4.13 if more than twenty *business days* has elapsed since the date on which the FMCS to which that *notice of arbitration* relates was issued or should have been issued.
- K.4.15 The *dispute resolution counsellor* shall dismiss a *notice of arbitration* filed pursuant to section K.4.13 and shall not take any further action with respect to that *notice of arbitration* if the element of the FMCS that is the subject matter of the *notice of arbitration* is identical to the same element

in the corresponding PMCS for which no disagreement had been raised in any duly submitted notice of dissent, unless the *market participant* demonstrates to the satisfaction of the *dispute resolution counsellor* that the *market participant* could not, with the exercise of due diligence, have submitted a duly submitted notice of dissent in respect of that element in the PMCS.

K.5 COMMUNICATION OF INFORMATION

- K.5.1 All communications between *market participants* and the *EMC* relating to the compensation procedures under section 10.5 of Chapter 6 and this Appendix shall be effected using the *electronic information system*.
- K.5.2 If there is a failure of the *electronic information system*, then the *EMC* or the *market participant*, as the case may be, shall communicate information relating to the compensation procedures under section 10.5 of Chapter 6 and this Appendix by facsimile or other alternative means specified by the *EMC*.
- K.5.3 It is the responsibility of each *market participant* referred to in section 10.5.1 of Chapter 6 to notify the *EMC* if it fails to receive, or it is unable to access the *electronic information system* and obtain, a PMCS, FMCS or FMI on a given *business day*. Each such *market participant* shall be deemed to have received a given PMCS, FMCS or FMI on the *business day* on which the PMCS, FMCS or FMI has been made available in accordance with section K.5.1, unless it notifies the *EMC* to the contrary.
- K.5.4 In the event that a *market participant* referred to in section 10.5.1 of Chapter 6 notifies the *EMC* that it fails to receive, or it is unable to access the *electronic information system* and obtain, a PMCS, FMCS or FMI, the *EMC* shall re-release or make available the PMCS, FMCS or FMI, in which case the PMCS, FMCS or FMI shall be considered to have been issued and received on the date such PMCS, FMCS or FMI is re-released or made available to the *market participant* by the *EMC*.

APPENDIX L – CALCULATION OF LOAD CURTAILMENT QUANTITY AND LOAD CURTAILMENT PRICE

L.1 PURPOSE AND DEFINITIONS

L.1.1 This Appendix describes the procedures that shall be used to determine the *load curtailment price* and *load curtailment quantity* for the *real-time schedules* for *LRFs with REB*.

L.1.2 In this Appendix,

L.1.2.1 “*deviating load registered facility*” or “*deviating LRF*” means the *LRF with REB* which is deemed as such under section 3.6.3 of Chapter 5;

L.1.2.2 “*LRF p*” refers to a given *load registered facility* associated with *restricted energy bid p*;

L.1.2.3 the use of subscript “*h*” in respect of any value is a reference to the value for a given *dispatch period h* or its corresponding *settlement interval h*, as the case may be; and

L.1.2.4 the following definitions apply:

$USEP_h$ = *uniform Singapore energy price* (in \$/MWh) at the *SHUB* for the *settlement interval* corresponding to *dispatch period h*, which is to be determined as provided in section D.24.6 of Appendix 6D;

$CUSEP_h$ = *counterfactual uniform Singapore energy price* (in \$/MWh) at the *SHUB* for the *settlement interval* corresponding to *dispatch period h*, pursuant to the re-solving of the linear program described in section D.22A of Appendix 6D and calculated in accordance with section D.24.8 of Appendix 6D;

NRQ_h = total non-regulatory withdrawal *energy* quantity (in MWh) for the *settlement interval* corresponding to *dispatch period* h , determined as:

$$(TotalLoadForecast_h \times \frac{1}{2}) - RegulatoryLoadQuantity_h$$

where:

$TotalLoadForecast_h$ = forecast of total *load* (in MW), comprising *non-dispatchable load* forecast received from the *PSO* in accordance with section G.2.1 of Appendix 6G and the aggregate of the quantities in all *price-quantity pairs of restricted energy bids* for the *dispatch period* h ; and

$RegulatoryLoadQuantity_h$ = the aggregate of vesting quantities (in MWh) for the *settlement interval* corresponding to *dispatch period* h across all *settlement accounts* received by the *EMC* from the *MSSL counterparty* in accordance with section 2.5 of Chapter 7;

$LCQ_{p,h}$ = *load curtailment quantity* (in MWh) for *LRF* p for *dispatch period* h , determined in accordance with section L.3.1, subject to section L.3.2;

$NonDispLoad_{p,h}$ = non-dispatchable portion of *load* (in MW) for *LRF* p for *dispatch period* h , determined as:

$$TotalLoad_{p,h} - BidQuantities_{p,h}$$

where $BidQuantities_{p,h}$ is the sum of the quantities in all *price-quantity pairs* of *restricted energy bid* p for *dispatch period* h ;

LCP_h = *load curtailment price* (in \$/MWh) for *dispatch period* h , determined in accordance with section L.4;

$ReferenceEnergyWithdrawal_{p,h-1}$ = reference *energy* withdrawal target (in MW) for *LRF* p for the *dispatch period* immediately preceding *dispatch period* h , given by the value of $ReferenceEnergyWithdrawal_p$ calculated in accordance with section D.23.5 of Appendix 6D;

- ReferenceEnergyWithdrawal_{p,h} = reference *energy* withdrawal target (in MW) for *LRF* p for *dispatch period* h, given by the value of ReferenceEnergyWithdrawal_p calculated in accordance with section D.23.5 of Appendix 6D, subject to section L.3.2;
- TotalLoad_{p,h} = total *load* capacity of *LRF* p as stated in a *restricted energy bid* for *LRF* p under section 5.2A.2.4 of Chapter 6 for *dispatch period* h;
- PurchaseEndMax_{p,h} = projected maximum withdrawal of *energy* of *LRF* p, based on its ramp-up rate as stated in its *restricted energy bid* p for *dispatch period* h, calculated in accordance with section D.12.8 of Appendix 6D;
- EndPeriodLoad_{p,h} = assumed *load* withdrawal quantity (in MW) of *LRF* p for the purposes of calculating its offered implied *energy* consumption for *dispatch period* h, determined in accordance with section L.2.1.2;
- StartLoad_{p,h} = forecast *load* withdrawal quantity (in MW) of *LRF* p at the beginning of *dispatch period* h, determined in accordance with section L.2.1.1;
- OIEC_{p,h} = offered implied *energy* consumption quantity (in MWh) of *LRF* p for *dispatch period* h, which is to be determined in accordance with section L.2.2;
- SIEC_{p,h} = scheduled implied *energy* consumption quantity (in MWh) of *LRF* p for *dispatch period* h, which is to be determined in accordance with section L.2.3;
- UpRampRate_{p,h} = ramp-up rate (in MW/minute) for *LRF* p as stated in its *restricted energy bid* p used in determining the *real-time dispatch schedule* for *dispatch period* h; and
- DownRampRate_{p,h} = ramp-down rate (in MW/minute) for *LRF* p as stated in its *restricted energy bid* p used in determining the *real-time dispatch schedule* for *dispatch period* h.

L.2 CALCULATION OF OFFERED IMPLIED ENERGY CONSUMPTION AND SCHEDULED IMPLIED ENERGY CONSUMPTION QUANTITIES

L.2.1 For each given *LRF* p for a given *dispatch period* h ,

L.2.1.1 its $StartLoad_{p,h}$ shall be:

L.2.1.1.1 if the *restricted energy bids* submitted for the *LRF* have a total *load capacity* of more than zero in the *dispatch period* immediately preceding that given *dispatch period*, then:

$$StartLoad_{p,h} = ReferenceEnergyWithdrawal_{p,h-1};$$

L.2.1.1.2 otherwise,

$$StartLoad_{p,h} = TotalLoad_{p,h}; \text{ and}$$

L.2.1.2 its $EndPeriodLoad_{p,h}$ shall be the lower of its $TotalLoad_{p,h}$ and $[PurchaseEndMax_{p,h} + NonDispLoad_{p,h}]$.

L.2.2 The offered implied *energy consumption* (OIEC) quantity for each given *LRF* p for a given *dispatch period* h shall be calculated as follows:

a. When $StartLoad_{p,h} = EndPeriodLoad_{p,h}$,

$$OIEC_{p,h} = \frac{1}{2} \times StartLoad_{p,h};$$

b. When $StartLoad_{p,h} > EndPeriodLoad_{p,h}$,

$$OIEC_{p,h} = \left(\frac{1}{2} \times EndPeriodLoad_{p,h} \right) + \frac{\frac{1}{2} \times (StartLoad_{p,h} - EndPeriodLoad_{p,h})^2}{DownRampRate_{p,h} \times 60},$$

except where $DownRampRate_{p,h} = 0$, then $OIEC_{p,h} = (\frac{1}{2} \times EndPeriodLoad_{p,h})$; and

c. When $StartLoad_{p,h} < EndPeriodLoad_{p,h}$,

$$OIEC_{p,h} = \left(\frac{1}{2} \times EndPeriodLoad_{p,h} \right) - \frac{\frac{1}{2} \times (EndPeriodLoad_{p,h} - StartLoad_{p,h})^2}{UpRampRate_{p,h} \times 60},$$

except where $UpRampRate_{p,h} = 0$, then $OIEC_{p,h} = (\frac{1}{2} \times EndPeriodLoad_{p,h})$.

L.2.3 The scheduled implied *energy* consumption (SIEC) quantity for each given *LRF* p for a given *dispatch period* h shall be calculated as follows:

a. When $\text{StartLoad}_{p,h} = \text{ReferenceEnergyWithdrawal}_{p,h}$,

$$\text{SIEC}_{p,h} = \frac{1}{2} \times \text{StartLoad}_{p,h};$$

b. When $\text{StartLoad}_{p,h} > \text{ReferenceEnergyWithdrawal}_{p,h}$,

$$\text{SIEC}_{p,h} = \left(\frac{1}{2} \times \text{ReferenceEnergyWithdrawal}_{p,h} \right) + \frac{\frac{1}{2} \times (\text{StartLoad}_{p,h} - \text{ReferenceEnergyWithdrawal}_{p,h})^2}{\text{DownRampRate}_{p,h} \times 60},$$

except where $\text{DownRampRate}_{p,h} = 0$, then $\text{SIEC}_{p,h} = (\frac{1}{2} \times \text{ReferenceEnergyWithdrawal}_{p,h})$; and

c. When $\text{StartLoad}_{p,h} < \text{ReferenceEnergyWithdrawal}_{p,h}$,

$$\text{SIEC}_{p,h} = \left(\frac{1}{2} \times \text{ReferenceEnergyWithdrawal}_{p,h} \right) - \frac{\frac{1}{2} \times (\text{ReferenceEnergyWithdrawal}_{p,h} - \text{StartLoad}_{p,h})^2}{\text{UpRampRate}_{p,h} \times 60},$$

except where $\text{UpRampRate}_{p,h} = 0$, then $\text{SIEC}_{p,h} = (\frac{1}{2} \times \text{ReferenceEnergyWithdrawal}_{p,h})$.

L.3 LOAD CURTAILMENT QUANTITY

L.3.1 The *load curtailment quantity* for each given *LRF* p for *dispatch period* h shall be defined as:

$$\text{LCQ}_{p,h} = \text{OIEC}_{p,h} - \text{SIEC}_{p,h}$$

L.3.2 Notwithstanding section L.3.1, for the purposes of determining whether an *LRF with REB* is a deviating *LRF* under section E.3.1 of Appendix 5E, calculating the financial penalty to be imposed on a *market participant* in respect of each of its deviating *LRFs* under section E.3.2 of Appendix 5E and determining the *settlement* quantity data to be used in section 10.3.7 of Chapter 6, where the *EMC* is notified by the *PSO* pursuant to section 9.1.6A of Chapter 5 that *dispatch instructions* have been issued to an *LRF with REB* between the release of the *real-time dispatch schedule* and the start of the *dispatch period*, then for the purposes of calculating the *load curtailment quantity* of such *LRF with REB*, the value of $\text{ReferenceEnergyWithdrawal}_{p,h}$ shall be recalculated as:

$$\text{ReferenceEnergyWithdrawal}_{p,h} = \text{NonDispLoad}_{p,h} + \text{Max} [\text{Min} (\text{PurchaseEndMax}_{p,h}, \text{BidQuantities}_{p,h}) - \text{PSOCurtailedLoad}_{p,h}, 0]$$

where:

$PSOCurtailedLoad_{p,h}$ is the MW amount of *load curtailment* in the *PSO's dispatch instruction* to the *LRF with REB* provided to the *EMC* pursuant to section 9.1.6A of Chapter 5, and

$BidQuantities_{p,h}$ is the sum of the quantities in all *price-quantity pairs* of *restricted energy bid p* for *dispatch period h*.

L.4 LOAD CURTAILMENT PRICE

L.4.1 The *load curtailment price* (in \$/MWh) for a given *dispatch period h* shall be calculated as:

$$LCP_h = \frac{\text{Max} \left[(CUSEP_h - USEP_h) \times \frac{1}{3} \times NRQ_h, 0 \right]}{\sum_p LCQ_{p,h}}$$

where:

\sum_p = sum over all *LRF p*

L.4.2 If the *load curtailment price* (in \$/MWh) referred to in section L.4.1 exceeds the applicable upper price limit for *energy* specified in section J.1.2 of Appendix 6J, then the *load curtailment price* shall be modified and set to that upper limit.

Explanatory Note: The lower limit on the load curtailment price is zero.

APPENDIX M – COMPENSATION ARISING FROM MARKET ENERGY PRICE REVISION

M.1 PURPOSE AND DEFINITIONS

M.1.1 This Appendix sets forth the criteria and calculations for compensation referred to in section 10.2.10 of Chapter 6. Unless otherwise indicated, the criteria and calculations described in this Appendix shall be applied for each *dispatch period* and to each *generation registered facility*.

M.1.2 In this Appendix, the following definitions apply:

$RMEP^m$ = revised *market energy price* (in \$/MWh) at *MVN* *m* for the relevant *dispatch period*, determined in accordance with section 10 of Chapter 6

IEQ^m = injection *energy quantity* (in MWh) for *GRF* *m* for the *settlement interval* corresponding to the relevant *dispatch period*, based on the *metering data* submitted by the *market support services licensee* for the purposes of the *final settlement statement* in accordance with section B.3.1 of Appendix 7B

OQ^m = *GRF* *m*'s scheduled *energy output* (in MW) for the relevant *dispatch period*, being:

its scheduled *energy output* in the *real-time dispatch schedule* that is deemed to be *dispatch instructions* issued by the *PSO* for the relevant *dispatch period*, or

if the *PSO* did not use the *real-time dispatch schedule* as the *dispatch instructions* or if the *real-time dispatch schedule* was not available, the highest *energy output level* that *GRF* *m* was instructed for the relevant *dispatch period*

spq = index of a specific *price-quantity pair* in an *energy offer*

pq = index of a *price-quantity pair* in an *energy offer*, ordered in ascending order of price

$Q^{m,pq}$ = quantity of a *price-quantity pair* pq of the *energy offer* of *GRF* *m* for the relevant *dispatch period*

$P^{m,pq}$ = price of a *price-quantity pair* pq for the *energy offer* of *GRF* m for the relevant *dispatch period*

$\sum_{pq=1}^{spq-1} Q^{m,pq}$ = 0, for $spq = 1$

$COMP^{m,pq}$ = compensation payable in relation to a *price-quantity pair* pq of the *energy offer* of *GRF* m for the relevant *dispatch period*

$COMP^m$ = compensation payable to *GRF* m for the relevant *dispatch period*

M.2 CRITERIA FOR COMPENSATION

M.2.1 A *generation registered facility* is eligible for compensation referred to in section 10.2.10 of Chapter 6 for a given *dispatch period* if the revised *market energy price* at the *market network node* associated with the *generation registered facility*:

M.2.1.1 is lower than that in the *real-time price schedule*; or

M.2.1.2 in the event that no *real-time price schedule* was produced, is lower than the price in the *price-quantity pair* spq of its *energy offer* that satisfies the following conditions:

a. $\sum_{pq=1}^{spq-1} Q^{m,pq} < OQ^m$; and

b. $\sum_{pq=1}^{spq} Q^{m,pq} \geq OQ^m$.

M.3 CALCULATION OF COMPENSATION AMOUNT

M.3.1 The reference quantity, RQ^m , for a given *dispatch period* in respect of a *generation registered facility*:

M.3.1.1 which was at all relevant times operating under *AGC*, would be $(IEQ^m \times 2)$; and

M.3.1.2 in all other cases, would be the minimum of $(IEQ^m \times 2)$ and OQ^m .

M.3.2 For each *generation registered facility* which meets the criteria in section M.2.1, the compensation amount as described in section 10.2.10 of Chapter 6 for that *dispatch period* shall be calculated as follows:

$$\text{COMP}^m = \sum_{pq=1}^{10} \text{COMP}^{m,pq}$$

M.3.3 For the purposes of section M.3.2, the compensation amount for each *price-quantity pair* spq of the *energy offer* of a *generation registered facility* shall be calculated as follows:

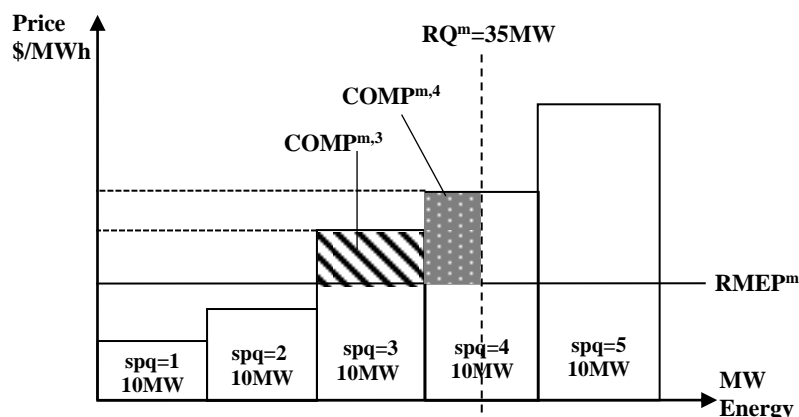
$$\text{M.3.3.1} \quad \text{If } \sum_{pq=1}^{spq-1} Q^{m,pq} \geq RQ^m, \text{ then } \text{COMP}^{m,spq} = 0$$

M.3.3.2 Otherwise,

$$\text{COMP}^{m,spq} = \max[(P^{m,spq} - \text{RMEP}^m), 0] \times [\min(\sum_{pq=1}^{spq} Q^{m,pq}, RQ^m) - \sum_{pq=1}^{spq-1} Q^{m,pq}] \times 0.5$$

Explanatory Note:

The following example illustrates the compensation calculation, assuming GRF m meets the criteria under section M.2.1.



$$\text{COMP}^{m,1} = 0 \text{ (Based on section M.3.3.2, since } P^{m,1} \leq \text{RMEP}^m)$$

$$\text{COMP}^{m,2} = 0 \text{ (Based on section M.3.3.2, since } P^{m,2} \leq \text{RMEP}^m)$$

$$\begin{aligned} \text{COMP}^{m,3} &= \max[(120 - 100), 0] \times [\min(30, 35) - 20] \times 0.5 \\ &= 20 \times 10 \times 0.5 = \$100 \text{ (Based on section M.3.3.2)} \end{aligned}$$

$$\text{COMP}^{m,4} = \max[(130 - 100), 0] \times [\min(40, 35) - 30] \times 0.5$$

$$= 30 \times 5 \times 0.5 = \$75 \text{ (Based on section M.3.3.2)}$$

$\text{COMP}^{m,5} = 0$ (Based on section M.3.3.1, since $\sum_{pq=1}^{5-1} Q^{m,pq} = 40$, which is more than RQ^m)

Hence, total compensation payable to GRF m is:

$$\begin{aligned} \text{COMP}^m &= \text{COMP}^{m,1} + \text{COMP}^{m,2} + \text{COMP}^{m,3} + \text{COMP}^{m,4} + \text{COMP}^{m,5} \\ &= \$0 + \$0 + \$100 + \$75 + \$0 \\ &= \$175 \end{aligned}$$

M.3.4 For each request for compensation under section 10.2.10 of Chapter 6 that is received by the *EMC*, the *EMC* may request that the *PSO* provide the following data to the *EMC* in respect of the *generation registered facility* for the *dispatch period* that the compensation request relates:

M.3.4.1 whether the *generation registered facility* was at all relevant times operating under *AGC*; and

M.3.4.2 if the *generation registered facility* was not at all relevant times operating under *AGC*, provide the *dispatch instruction* relating to the highest *energy output level* (in MW) that is issued by the *PSO* to the *generation registered facility*.

The *PSO* shall provide the aforementioned data within 3 *business days* of the *EMC's* request.

Singapore Electricity Market Rules

Chapter 7 Settlement

Energy Market Authority

1 January 2022

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1 INTRODUCTORY RULES

1.1 PURPOSE

Explanatory Note: For generality, these rules allow for more than one MSSL – although some MSSL functions, most notably the reconciliation of metering data, the allocation of losses, etc., are natural monopoly functions that cannot realistically be decentralised among multiple MSSLs.

- 1.1.1 This chapter sets out the respective rights and obligations of the *EMC*, the *PSO*, *market participants* and *market support services licensees* in determining, billing for and paying financial obligations arising from transactions in the *wholesale electricity markets* and under other provisions of the *market rules* and *applicable law*, including financial obligations arising from or relating to the following:
- 1.1.1.1 the markets for *energy*, *regulation* and *reserve* of each *reserve class*;
 - 1.1.1.2 *financial transmission rights*;
 - 1.1.1.3 *bilateral financial contracts* settled through the *EMC*;
 - 1.1.1.4 *contracted ancillary services*; and
 - 1.1.1.5 *vesting contracts*.
- 1.1.2 Any reference in this Chapter to a *market support services licensee* shall be deemed to be a reference only to a *market support services licensee* that has been authorised to participate by the *EMC* pursuant to section 3 of Chapter 2.
- 1.1.3 The provisions in respect of *load registered facilities* in this Chapter shall not be construed and applied to any *load registered facility* except that, if the *EMC* has *published* a notice referred to in section 5.1.2.2 of Chapter 2, the provisions in respect of *load registered facilities* in this Chapter shall, to the extent applicable and from the effective date specified in that notice, then be construed and applied to the type of *load registered facilities* referred to in that notice.

1.2 TAXES

- 1.2.1 Notwithstanding any other provision of this Chapter, all taxes and government fees, levies or charges applicable to the financial obligations referred to in section 1.1.1 shall be applied by the *EMC* where and in the manner required by *applicable law*. The methodology for the application of any such taxes and government fees, levies or charges shall be *published* by the *EMC* and updated as required.

1.3 TRANSITORY PROVISIONS

- 1.3.1 In relation to dispatch periods commencing before 28 June 2011 (and their corresponding settlement intervals), the following sections in force immediately before 28 June 2011 shall continue to apply, notwithstanding the modifications relating to the following sections taking effect on or from 28 June 2011:

- 1.3.1.1 section 2.1.2;
- 1.3.1.2 section 2.2.3;
- 1.3.1.3 section 3.5.3;
- 1.3.1.4 section 3.7;
- 1.3.1.5 section 4.1.7;
- 1.3.1.6 section 4.1.8;
- 1.3.1.7 section 4.1.9; and
- 1.3.1.8 section 4.4.

2 SETTLEMENT DATA

2.1 RESPONSIBILITIES

- 2.1.1 It shall be the responsibility of a *market support services licensee* to:
- 2.1.1.1 undertake, to the extent required by and in accordance with the *metering code* and any other applicable *code of practice*, all activities necessary to determine the *energy* quantities specified in section 2.2.3;
 - 2.1.1.2 provide to the *EMC*, to the extent required by and in accordance with the *metering code* and any other applicable *code of practice*, the designation and identity of the *RQMs* and the loss factors and other adjustments that will be used to determine *IEQs* at associated *MNNs* or *WEQs* at the *SHUB*;
 - 2.1.1.3 provide to the *EMC* such other metering-related information to the extent required by and in accordance with this Chapter and Appendix 7B, the *metering code* and any other applicable *code of practice*;
 - 2.1.1.4 provide such information to the *EMC* as may be required for the *EMC* to establish and maintain such *settlement accounts* in accordance with section 2.1.2 as may be required to enable the *market support services licensee* to perform its obligations under these *market rules*, any applicable *market manual*, its *electricity licence*, any applicable *code of practice* and any contract that it may have with a person on whose behalf it provides *market support services* pertaining to the *wholesale electricity markets*;
 - 2.1.1.5 establish and maintain such *bank accounts* as may be required to enable it to perform its obligations under these *market rules*, any applicable *market manual*, its *electricity licence*, any applicable *code of practice* and any contract that it may have with a person on whose behalf it provides *market support services* pertaining to the *wholesale electricity markets*;
 - 2.1.1.6 provide such assistance and information as may be requested by the *EMC* for the purposes of assisting the *EMC* to resolve *settlement* disputes where the subject-matter of the *settlement* dispute relates to or involves the accuracy of information provided to the *EMC* by the *market support services licensee*; and
 - 2.1.1.7 perform the activities referred to in sections 2.1.1.1 to 2.1.1.6 in accordance with these *market rules*, any applicable *market*

manual, its electricity licence and any applicable code of practice.

2.1.2 The *EMC* shall establish procedures whereby each *market participant* and *market support services licensee* shall provide to the *EMC* such information as may be required by the *EMC* to establish and maintain a *settlement account* for it, such that:

2.1.2.1 each *settlement account* is associated with a single *market participant* or *market support services licensee*, in the sense that that *market participant* or *market support services licensee* is financially responsible for the *settlement* payments made into or from that *settlement account*; and

2.1.2.2 each *market participant* and each *market support services licensee* is associated with a single *settlement account*, in the sense that the *settlement* payments made with respect to that *market participant* or *market support services licensee* are accounted for, *invoiced* and made through that *settlement account*,

except that,

2.1.2.3 where a *market participant* or *market support services licensee* has *embedded generation facilities*, the *market participant* or *market support services licensee* will be associated with a separate *settlement account* for each of its *EGF groups*, provided always that, where the *market participant* or *market support services licensee* only has one *EGF group*, and has no other *generation facility* that has not been assigned to such *EGF group* and no other *load facility* which *load* has not been assigned as the associated *load* of such *EGF group*, then such *market participant* or *market support services licensee* shall be associated only with a single *settlement account*; and

2.1.2.4 where a *market participant* is registered as a *market participant* for the sole purpose of registering one or more *generation facilities* as one or more *non-exporting embedded intermittent generation facilities*, the *EMC* is not required to establish and maintain a *settlement account* for such *market participant*.

2.1.3 The *EMC* shall be entitled to and shall rely on any *metering data* or corrected *metering data* provided to it by a *market support services licensee* in accordance with this Chapter and Appendix 7B for determining *settlement amounts* in accordance with this Chapter and, notwithstanding section 13 of Chapter 1:

- 2.1.3.1 the *EMC* shall not be required to inform any person of the receipt or use of such *metering data* or corrected *metering data* other than in the ordinary course of determining and reporting *settlement amounts*;
- 2.1.3.2 the *EMC* shall not be liable to any person in respect of the use of such *metering data* or corrected *metering data* where effected in accordance with this Chapter; and
- 2.1.3.3 the *market support services licensee* submitting such *metering data* or corrected *metering data* shall indemnify and hold harmless the *EMC* in respect of any and all claims, losses, costs, liabilities, obligations, actions, judgements, suits, expenses, disbursements and damages incurred, suffered, sustained or required to be paid, directly or indirectly, by, or sought to be imposed upon, the *EMC* arising from the use of such *metering data* or corrected *metering data* where effected in accordance with this Chapter.

2.2 ENERGY, REGULATION AND RESERVE MARKET DATA

- 2.2.1 For the purposes of this Chapter, a reference to “*GRF m*” shall mean a reference to the *GRF* located at “*MNN m*”, a reference to “*GSF m*” shall mean a reference to the *GSF* located at “*MNN m*”, and a reference to “*LRF p*” shall mean a reference to a given *load registered facility* associated with *restricted energy bid p*.
- 2.2.2 The *EMC* shall, for each *dispatch period* and in accordance with section 10 of Chapter 6, determine the following *energy, regulation* and *reserve* prices and quantities for the *settlement interval* corresponding to that *dispatch period*:

MEP_h^m = *market energy price* (in \$/MWh) at *MNN m* for *settlement interval h*

$USEP_h$ = *uniform Singapore energy price* (in \$/MWh) at the *SHUB* for *settlement interval h*

$MRP_{r,h}$ = *market reserve price* (in \$/MWh) for *reserve* from *reserve provider group r* for *settlement interval h*

$GRQ_{r,h}^m$ = *generation registered facility reserve quantity* (in MWh) of *reserve* from *reserve provider group r* for *GRF m* for *settlement interval h*

$LRQ_{r,h}^a$ = *load registered facility reserve quantity (in MWh) of reserve from reserve provider group r for all LRFs associated with settlement account a for settlement interval h*

MFP_h = *market regulation price (in \$/MWh) for settlement interval h*

GFQ_h^m = *generation registered facility regulation quantity (in MWh) for GRF m for settlement interval h*

LCP_h = *load curtailment price (in \$/MWh) for settlement interval h*

$LCQ_h^{p(a)}$ = *load curtailment quantity (in MWh) for LRF p associated with settlement account a for settlement interval h*

2.2.3 Subject to section 1.3, the *market support services licensee* shall, for each *dispatch period*, determine and provide the following *energy quantities* for the *settlement interval* corresponding to that *dispatch period*:

$IEQ_h^{m(a)}$ = *injection energy quantity (in MWh) for GRF m(a) or GSF m(a) associated with settlement account a for settlement interval h*

WEQ_h^a = *withdrawal energy quantity (in MWh), deemed to be withdrawn at the SHUB by all load associated with settlement account a for settlement interval h*

WFQ_h^a = *total withdrawal fee quantity (in MWh) for settlement account a for settlement interval h, being the quantity of energy determined as the sum of:*

- (a) *the sum of net withdrawal or net injection energy quantities for every EGF group and its associated load which are associated with settlement account a for settlement interval h; and*
- (b) *withdrawal energy quantity of any other load associated with settlement account a for settlement interval h, which are not associated with any EGF group.*

WMQ_h^a = total withdrawal MEUC quantity (in MWh) for *settlement account a* for *settlement interval h*, being the quantity of *energy* determined as the sum of:

- (a) sum of net withdrawal *energy* quantities for every *EGF group* and its associated *load* which are associated with *settlement account a* for *settlement interval h*; and
- (b) withdrawal *energy* quantity of any other *load* associated with *settlement account a* for *settlement interval h*, which are not associated with any *EGF group*;

$WPQ_{h(sa)}$ = total withdrawal price quantity (in MWh) determined for the purpose of *price neutralisation*, being the quantity of *energy* deemed to be withdrawn at the *SHUB* for *settlement interval h* by the associated *load* for each *EGF group* associated with *settlement account sa*

IIQ_h^i = net imported *intertie* quantity (in MWh) flowing into or out of the *transmission system* due to *intertie flows* at *MNN i* for *settlement interval h*

WDQ_h^a = total withdrawal *energy* quantity (in MWh) determined for the purposes of recovering *load curtailment* uplift charges, being the quantity of *energy* withdrawn by all *load* associated with *settlement account a* for *settlement interval h*

$WLQ_h^{p(a)}$ = withdrawal *energy* quantity (in MWh) by *LRF p* associated with *settlement account a* for *settlement interval h*

Explanatory Note: For dispatch periods commencing on or after 28 June 2011, WMQ is required for the EMC to determine the amount of MEUC cost to be charged to a settlement account for a settlement interval. Each EGF group (which is comprised wholly of embedded generation facilities) and their associated load will be charged MEUC cost based on ‘net load’. All other load will be charged MEUC cost based on ‘gross load’.

For dispatch periods commencing on or after 28 June 2011, WFQ is required for the EMC to determine the amount of PSO fee and EMC fee to be charged to a settlement account for a settlement interval. Each EGF group (which is comprised wholly of embedded generation facilities) and their associated load will be charged PSO fee and EMC fee based on “net injection” or “net withdrawal”.

Dispatch periods commencing before 28 June 2011 (and their corresponding settlement intervals) will continue to be subject to the market rules specified in section 1.3 in force before 28 June 2011.

WCQ – the total withdrawal charge quantity (in MWh) – for dispatch periods commencing before 28 June 2011 (and their corresponding settlement intervals) will still need to be determined and provided by the MSSL for the purpose of settlement adjustments for metering errors, as per the process and for the period set out in Appendix 7B (which is approximately one year beginning 28 June 2011).

WDQ – total withdrawal energy quantity (in MWh) – In the Authority’s final determination paper, on “Implementing Demand Response in the National Electricity Market of Singapore” dated 28 October 2013, it was intended for WDQ to comprise the withdrawal energy quantity of all contestable consumers. For dispatch periods commencing before 19 March 2018 (and their corresponding settlement intervals), the WDQ comprises the withdrawal energy quantity of all contestable consumers. With the launch of the open electricity market, the Authority has decided to recover load curtailment uplift charges on all consumers instead. For dispatch periods commencing on or after 19 March 2018 (and their corresponding settlement intervals), the WDQ would therefore comprise the withdrawal energy quantity of all consumers, regardless of their contestability status.

2.2.4 The EMC shall, following each *dispatch period*, determine the *reserve responsibility share* (RRS) for each *GRF* for the *settlement interval* corresponding to that *dispatch period*:

$$\text{RRS}_h^m = \text{share of total reserve costs to be paid by GRF } m, \text{ as determined in accordance with Appendix 7A.}$$

2.3 BILATERAL CONTRACT DATA

2.3.1 The EMC shall define, and *publish* in a *market manual*, procedures and schedules whereby a *selling market participant* may submit *bilateral contract data* (and if submitted, such submission shall be made any time prior to but no later than ten days before the *dispatch day* to which such *bilateral contract data* apply) to the EMC that:

2.3.1.1 define quantities of one or more of *energy*, *regulation* and *reserve* that the *selling market participant* is selling to a *buying market participant* in a specified *settlement interval*; and

2.3.1.2 identify the *selling market participant’s settlement account* from which the market value of the *energy* (at the USEP), *regulation* or *reserve* being sold is to be debited and the *buying market participant’s settlement account* to which this market value is to be credited.

2.3.2 For the bilateral sale of *energy*, the *selling market participant* may submit *bilateral contract data* that define a bilateral *energy* quantity (BEQ) as an absolute amount of *energy* (in MWh), as a fraction or multiple of a withdrawal *energy* quantity or an injection *energy* quantity, or as a combination of these, using the following definitions:

$BAQ_h^{s,b}$ = bilateral absolute quantity of *energy* (in MWh) being sold by the *selling market participant* and debited from the *selling market participant's settlement account s* to the *buying market participant* and credited to the *buying market participant's settlement account b* at the *SHUB* for *settlement interval h*, with $BAQ_h^{s,b} \geq 0$

$BWF_h^{s,b}$ = bilateral withdrawal fraction indicating the fraction of the total withdrawal *energy* quantity in the *buying market participant's settlement account b* (WEQ_h^b) that is to be credited to that *settlement account b* and debited from the *selling market participant's settlement account s* at the *SHUB* for *settlement interval h*, with $BWF_h^{s,b} \geq 0$

$BIF_h^{s,b}$ = bilateral injection fraction indicating the fraction of the total injection *energy* quantity in the *selling market participant's settlement account s* (IEQ_h^s) that is to be credited to the *buying market participant's settlement account b* at the *SHUB* for *settlement interval h*, with $BIF_h^{s,b} \geq 0$

2.3.3 The *EMC* shall use properly submitted *bilateral contract data* to compute bilateral *energy* quantities (BEQ, in MWh) in accordance with the following formula:

$$BEQ_h^{s,b} = BAQ_h^{s,b} + BWF_h^{s,b} \times WEQ_h^b + BIF_h^{s,b} \times IEQ_h^s$$

2.3.4 For the bilateral sale of *regulation*, the *selling market participant* may submit *bilateral contract data* that define a bilateral *regulation* quantity (BFQ, in MWh) using the following definition:

$BFQ_h^{s,b}$ = bilateral *regulation* quantity (in MWh) of *regulation* being sold by the *selling market participant* and debited from the *selling market participant's settlement account s* to the *buying market participant* and credited to the *buying market participant's settlement account b* in *settlement interval h*

- 2.3.5 For the bilateral sale of *reserve* from *reserve provider group r*, the *selling market participant* may submit *bilateral contract data* that define a bilateral *reserve* quantity (BRQ, in MWh) using the following definition:

$BRQ_{r,h}^{s,b}$ = bilateral *reserve* quantity (in MWh) of *reserve* from *reserve provider group r* being sold by the *selling market participant* and debited from the *selling market participant's settlement account s* to the *buying market participant* and credited to the *buying market participant's settlement account b* in *settlement interval h*

- 2.3.6 No bilateral *energy* quantities, bilateral *regulation* quantities or bilateral *reserve* quantities determined in accordance with this section 2.3 shall be used by the *EMC* for any purpose under these *market rules* other than for *settlement* purposes in accordance with this Chapter.

- 2.3.7 The *EMC* shall be entitled to and shall rely on any *bilateral contract data* submitted by a *selling market participant* for determining *settlement amounts* in accordance with this Chapter and, notwithstanding section 13 of Chapter 1:

2.3.7.1 the *EMC* shall not be required to inform a *buying market participant* of the receipt or use of such *bilateral contract data* other than in the ordinary course of determining and reporting *settlement amounts*;

2.3.7.2 the *EMC* shall not be liable to any person in respect of or arising from the use of such *bilateral contract data* where effected by the *EMC* in accordance with this Chapter; and

2.3.7.3 the *selling market participant* submitting such *bilateral contract data* shall indemnify and hold harmless the *EMC* in respect of any and all claims, losses, costs, liabilities, obligations, actions, judgements, suits, expenses, disbursements and damages incurred, suffered, sustained or required to be paid, directly or indirectly, by, or sought to be imposed upon, the *EMC* arising from the use of such *bilateral contract data* where effected by the *EMC* in accordance with this Chapter.

2.4 FINANCIAL TRANSMISSION RIGHT QUANTITIES

Explanatory Note: There will be no allocation of FTRs as part of the vesting of rights. While the following rules describe the settlement of the FTR market in the event that such an allocation is made in the future, these rules do not address the precise structure of such rights.

Once allocated, each generator would hold financial transmission rights (FTRs) from its MNN to the SHUB, with the quantity based on its historical production during constrained periods. While the initial allocation of FTRs will not be the responsibility of the EMC (or MSSL) the EMC would maintain a register of FTR ownership and provide for the transfer of FTR ownership among settlement accounts. The FTR quantities in the FTR register will not vary by settlement interval, but the EMC will from time to time change these quantities to reflect sales of FTRs among market participants or changed transmission capacity.

Because FTRs do not vary by settlement interval, there is no need for a subscript “h” on the FTR quantities in the register – although this does require that changes in FTR quantities are made only between the periods over which settlement amounts are aggregated.

2.4.1 The EMC shall establish and maintain an FTR register that contains current values for the following data for all MNNs and all settlement accounts:

$$FTQ^{m,a} = \text{quantity (in MWh) of FTRs from MNN } m \text{ to the SHUB associated with settlement account } a$$

2.4.2 The EMC shall from time to time make changes in the quantities recorded in the FTR register in the circumstances referred to in this section 2.4 in accordance with such procedures and schedules as may be specified in the applicable market manual.

2.4.3 Two market participants may jointly specify a quantity of FTRs from any MNN m to the SHUB and request that the EMC add this quantity of FTRs to the FTR register entry for the settlement account associated with one of the market participants and subtract this same quantity of FTRs from the FTR register entry for the settlement account associated with the other market participant.

2.4.4 The EMC shall, upon receipt of a request referred to in section 2.4.3 and after verifying the validity of the request in accordance with the applicable market manual, change the FTR register accordingly, with such changes to become effective at a time specified by the EMC in accordance with the applicable market manual.

2.4.5 The EMC shall be entitled to and shall rely on any request submitted by market participants pursuant to section 2.4.3 for determining settlement amounts in accordance with this Chapter and, notwithstanding section 13 of Chapter 1:

2.4.5.1 the EMC shall not be required to inform any person of the receipt of such request or of any change in the FTR register other than in the ordinary course of determining and reporting

settlement amounts or as may be required by the applicable *market manual* for purposes of the verification referred to in section 2.4.4;

2.4.5.2 the *EMC* shall not be liable to any person in respect of or arising from any change in the *FTR* register where such change was effected by the *EMC* in accordance with this Chapter; and

2.4.5.3 the *market participants* submitting such request shall be jointly and severally liable to indemnify and hold harmless the *EMC* in respect of any and all claims, losses, costs, liabilities, obligations, actions, judgements, suits, expenses, disbursements and damages incurred, suffered, sustained or required to be paid, directly or indirectly, by, or sought to be imposed upon, the *EMC* arising from the associated change in the *FTR* register where such change was effected by the *EMC* in accordance with this Chapter.

2.4.6 Section 2.4 shall come into force on a date to be published by the *EMC*.

2.5 VESTING CONTRACT DATA

Explanatory Note: It is assumed that there will only ever be one MSSL that deals with the EMC for the purpose of settling vesting contracts with generators and that no assignment of these contracts will be permitted by the MSSL. This MSSL will be a party to vesting contracts with generators that are intended both to control generator market power and to hedge consumers against “uncontrollable” variations in the USEP. The total vesting contract quantity for each generator may comprise one or more of the following vesting quantity or vesting quantities:

- (i) tender vesting quantity, being the vesting quantity awarded by the Authority pursuant to the Authority’s Tendering Regime and subsequently allocated by the MSSL under a vesting contract;**
- (ii) LNG vesting quantity, being the vesting quantity determined by the Authority pursuant to the Authority’s LNG Vesting Scheme and subsequently allocated by the MSSL under a vesting contract; and**
- (iii) balance vesting quantity, being the vesting quantity allocated as such by the MSSL under a vesting contract.**

“Tendering Regime” means all those agreements and arrangements referred to in the Authority’s final determination paper of “Tendering of a portion of the non-contestable load” circulated to the industry on 26 October 2009 and “LNG Vesting Scheme” means the policy to encourage the uptake of regasified liquefied natural gas (“LNG”) through the existing Vesting Contracts Regime as indicated in the Authority’s final policy of “LNG

Vesting Scheme” dated 30 October 2009 and all subsequent notifications by the Authority.

The MSSL will provide the EMC an electronic file containing vesting quantity and vesting price information for each settlement interval and for each vesting contract generator settlement account for each vesting period (i.e. a calendar quarter).

A generator subject to vesting contracts will receive a positive vesting contract settlement credit when its weighted average MEP (or Vesting Contract Reference Price) is “low” relative to the relevant vesting prices in the vesting contract, and the MSSL will receive a corresponding negative vesting contract settlement credit. Conversely, the generator will receive a negative vesting contract settlement credit when its weighted average MEP (or Vesting Contract Reference Price) is “high” relative to the relevant vesting prices in the vesting contract, and the MSSL will receive a corresponding positive vesting contract settlement credit.

The MSSL will determine the expected cost of these vesting contract payments to generators before the beginning of the 3 month period, modifying this by any shortfall or surplus between what it expected to pay and what it actually paid in the previous 3 months, and will use this information to determine a uniform price for non-contestable consumers and a partial hedge for contestable consumers. Contestable consumers will receive a hedge as it is likely that the required level of contracting of generators to manage market power will exceed the total level of non-contestable load.

2.5.1 The *PSO* and the *EMC* shall, as directed and in such form and at such times as may be specified by the *Authority*, provide to the *MSSL counterparty* such data as the *Authority* may specify as being necessary for the determination by the *MSSL counterparty* of vesting quantities and vesting prices under each *vesting contract* in accordance with section 2.5.2.

2.5.2 The *MSSL counterparty* shall, in accordance with such procedures and at such times as may be specified in the applicable *vesting contract*, determine for each *settlement account* associated with a *market participant* that is subject to a *vesting contract*, each vesting quantity (with its associated vesting price) for that *settlement account* for each *settlement interval* in the *vesting period* as follows:

BVQ_h^a = balance vesting quantity (in MWh) allocated for *settlement interval h* for *settlement account a*

BVP_h^a = balance vesting price (in \$/MWh) associated with a given balance vesting quantity allocated for *settlement interval h* for *settlement account a*

LVQ_h^a = LNG vesting quantity (in MWh) allocated for *settlement interval h* for *settlement account a*

LVP_h^a = LNG vesting price (in \$/MWh) associated with a given LNG vesting quantity allocated for *settlement interval h* for *settlement account a*

$TVQ_{h,b}^a$ = tender vesting quantity (in MWh) allocated for *settlement interval h* for *settlement account a*, for tender tranche *b*

$TVP_{h,b}^a$ = tender vesting price (in \$/MWh) associated with a given tender vesting quantity allocated for *settlement interval h* for *settlement account a*, for tender tranche *b*

where “tender tranche” means a tranche in a tender called by the *Authority* pursuant to the Tendering Regime for the supply of *energy* for non-contestable *load*.

- 2.5.3 The *MSSL counterparty* shall, in accordance with such procedures and at such times as may be specified in the applicable *market manual*, provide the *EMC* with an electronic data file containing all relevant vesting quantities and prices referred to in section 2.5.2 pertaining to each *vesting contract* for a given *vesting period*. Such *vesting contract* data shall describe, for each *vesting contract*, each relevant vesting quantity with its associated vesting price for that *settlement account* for each *settlement interval* in the *vesting period*.
- 2.5.4 Following receipt of the *vesting contract* data referred to in section 2.5.3, the *EMC* shall confirm receipt of such *vesting contract* data to the *MSSL counterparty* in accordance with such procedures and within such time as may be specified in the applicable *market manual*. The *EMC* shall use such *vesting contract* data to determine *vesting contract settlement* credits in accordance with section 3.6.1.
- 2.5.5 Where required, the *MSSL counterparty* may, in accordance with such procedures and within such time as may be specified in the applicable *market manual*, submit to the *EMC* revisions to any *vesting contract* data previously submitted by the *MSSL counterparty* pursuant to section 2.5.3 or this section 2.5.5. Section 2.5.4 shall apply, *mutatis mutandis*, to any such revised *vesting contract* data.
- 2.5.6 The *EMC* shall be entitled to and shall rely on any *vesting contract* data submitted by the *MSSL counterparty* pursuant to section 2.5.3 or 2.5.5 for determining *settlement amounts* in accordance with this Chapter and, notwithstanding section 13 of Chapter 1:

- 2.5.6.1 the *EMC* shall not be required to inform any person of the receipt of such *vesting contract* data other than in the ordinary course of determining and reporting *settlement amounts*;
- 2.5.6.2 the *EMC* shall not be liable to any person in respect of or arising from the use of such *vesting contract* data where effected by the *EMC* in accordance with this Chapter; and
- 2.5.6.3 the *MSSL counterparty* submitting such *vesting contract* data shall be liable to indemnify and hold harmless the *EMC* in respect of any and all claims, losses, costs, liabilities, obligations, actions, judgments, suits, expenses, disbursements and damages incurred, suffered, sustained or required to be paid, directly or indirectly, by, or sought to be imposed upon, the *EMC* arising from use of such *vesting contract* data where effected by the *EMC* in accordance with this Chapter.

2.6 RESERVE AND REGULATION NON-PROVISION EVENT

- 2.6.1 Where the *PSO* suspects that a *non-provision event* may have occurred in respect of a *market participant*, the *PSO* may inform that *market participant* of the *PSO*'s suspicion and request such information from that *market participant* as the *PSO* deems necessary to determine whether a *non-provision event* has occurred.
- 2.6.2 A *market participant* shall, where it receives a request for information from the *PSO* pursuant to section 2.6.1, provide the *PSO* with such information as the *PSO* has requested for, no later than 2 *business days* after the *PSO*'s request.
- 2.6.3 The *PSO* shall use its best endeavours to notify not later than 5.00pm on the fifth *business day* after a given *trading day*:
 - 2.6.3.1 the *EMC* of all *non-provision events* which occurred in that given *trading day*, in the form prescribed in the applicable *market manual*; and
 - 2.6.3.2 each *market participant* of each *non-provision event* which occurred in that given *trading day* in respect of that *market participant*.

2.7 [DELETED AND INTENTIONALLY LEFT BLANK]

2.8 LOAD NON-CURTAILMENT EVENT

- 2.8.1 A *non-curtailed event* in a given *dispatch period* in respect of an *LRF with REB* is deemed to have occurred if, for the given *dispatch period*:

- 2.8.1.1 the *LRF with REB* has been deemed to be a deviating load registered facility pursuant to section 3.6.3 of Chapter 5; or
- 2.8.1.2 the *LRF with REB* was subject to load curtailment but failed to do so, which would be the case if:

$$\text{OIEC}_{p,h} - \text{WLQ}_{p,h} < \text{LCQ}_{p,h}$$

where:

$\text{OIEC}_{p,h}$ = offered implied energy consumption quantity of that *LRF with REB* for the given dispatch period h , determined in accordance with section L.2.2 of Appendix 6L

$\text{WLQ}_{p,h}$ = withdrawal energy quantity for that *LRF with REB*, for the settlement interval corresponding to the given dispatch period h , received from the market support services licensee in accordance with section 2.2.3

$\text{LCQ}_{p,h}$ = load curtailment quantity of that *LRF with REB*, for the given dispatch period h

Explanatory Note: It should be noted that section 2.8.1.1 and section 2.8.1.2 are disjunctive. This means that a non-curtailment event could be deemed to have occurred in respect of an *LRF with REB* for a given dispatch period if either section 2.8.1.1 or section 2.8.1.2 is satisfied. In other words, even if an *LRF with REB* is not deemed to be a deviating load registered facility for the purposes of section 2.8.1.1, a non-curtailment event can still be deemed to have occurred in respect of that *LRF with REB* if such *LRF with REB* satisfies the criteria set out in section 2.8.1.2.

3 NET SETTLEMENT INTERVAL CREDITS

3.1 NET ENERGY SETTLEMENT CREDITS

3.1.1 The *EMC* shall determine the *generation energy settlement* credit (GESC) for each *settlement account* for each *settlement interval* in accordance with the following formula:

$$\text{GESC}_h^a = \sum_{m(a)} \text{MEP}_h^{m(a)} \times \text{IEQ}_h^{m(a)}$$

where:

a = a *settlement account*

h = a *settlement interval*

$\sum_{m(a)}$ = sum over all *GRFs* *m(a)* and *GSFs* *m(a)* associated with *settlement account a*

3.1.2 The *EMC* shall determine the *load energy settlement* debit (LESD) applicable to each *settlement account* for each *settlement interval* in accordance with the following formula:

$$\text{LESD}_h^a = \text{USEP}_h \times \text{WEQ}_h^a$$

where:

a = a *settlement account*

h = a *settlement interval*

Explanatory Note: A WEQ can be negative, indicating that the settlement account includes one or more embedded, non-MSSL-metered generators that, in total, were producing more than all loads in the account were consuming. Because all embedded generators larger than 1MW are GRFs or GSFs and hence must be separately metered by the MSSL, the distortions resulting from ignoring such generators will not be significant.

- 3.1.3 The *EMC* shall determine the bilateral *energy settlement* credit (BESC) applicable to each *settlement account* for each *settlement interval* in accordance with the following formula:

$$\text{BESC}_h^a = \text{USEP}_h \times \sum_j (\text{BEQ}_h^{j,a} - \text{BEQ}_h^{a,j})$$

where:

a = a *settlement account*

h = a *settlement interval*

\sum_j = sum over all *settlement accounts* *j*

- 3.1.4 The *EMC* shall determine the net *energy settlement* credit (NESC) applicable to each *settlement account* for each *settlement interval* in accordance with the following formula:

$$\text{NESC}_h^a = \text{GES}_h^a - \text{LES}_h^a + \text{BESC}_h^a$$

where:

a = a *settlement account*

h = a *settlement interval*

Explanatory Note: The total cost of regulation in each settlement interval is, in general, allocated on a \$/MWh basis across all MWh of consumption plus all MWh of energy produced by each pseudo generation settlement facility and the first CSZ produced by each generation registered facility and generation settlement facility (that is not classified as a pseudo generation settlement facility) in that settlement interval.

CSZ is the critical size and is 5 MWh, the maximum output of a 10 MW unit in a half-hour settlement interval.

Units that are not Secondary Contingency Units and are scheduled for less than 10 MW of energy do not pay a share of reserve costs under the “modified runway formula” used to allocate reserve costs to generators as defined in Appendix 7A.

In accordance with the Authority’s final determination paper titled “Enhancements to the Regulatory Framework for Intermittent Generation Sources in the National Electricity Market of Singapore” dated 25 July 2017, an exception is made for, among others, all residential contestable consumers with embedded intermittent generation facilities that, together with all other intermittent generation facilities directly or indirectly connected to a given substation for the purposes of supplying electricity to a given contestable consumer, have an aggregate name-plate rating of below 1 MW. If such embedded intermittent generation facilities of residential contestable consumers are registered with a market support services licensee and comprised in a pseudo generation settlement facility, net AFP treatment will be granted to the EGF group associated with such pseudo generation settlement facility, where only the net withdrawal or net injection energy quantities, as represented by WFQ and as determined by the market support services licensee, will be allocated regulation costs.

3.2 NET REGULATION SETTLEMENT CREDITS

3.2.1 The *EMC* shall determine the *regulation settlement* credit (FSC) for each *settlement account* for each *settlement interval* in accordance with the following formula:

$$FSC_h^a = MFP_h \times GFQ_h^a$$

where:

a = a *settlement account*

h = a *settlement interval*

3.2.2 The allocated *regulation* price (AFP, in \$/MWh) for a *settlement interval* shall be the sum of the cost of *regulation* (FSC, in \$) over all *settlement accounts* divided by the sum of total *energy* subject to *regulation* charges

(FEQ, in MWh) over all *settlement accounts* in that *settlement interval*, and shall be determined in accordance with the following formula:

$$AFP_h = \Sigma_i FSC_h^i / \Sigma_j FEQ_h^j$$

where:

h = a *settlement interval*

Σ_i = sum over all *settlement accounts* i

Σ_j = sum over all *settlement accounts* j

FEQ_h^j = total *energy* (in MWh) associated with *settlement account* j that is subject to *regulation* payments for *settlement interval* h , determined in accordance with sections 3.2.2.1 to 3.2.2.3

3.2.2.1 For a *settlement account* which is not associated with any *pseudo generation settlement facility*:

$$FEQ_h^a = WEQ_h^a + \Sigma_{m(a)} | \text{MIN} [IEQ_h^{m(a)}, \text{CSZ}] |$$

where:

a = a *settlement account* which is not associated with any *pseudo generation settlement facility*

h = a *settlement interval*

$\Sigma_{m(a)}$ = sum over all *MNNs* $m(a)$ of *GRFs* and *GSFs* associated with *settlement account* a

$\text{MIN}[X, Y]$ = Minimum of X or Y

$|X|$ = positive value for a real number, disregarding the sign

CSZ = the cut-off size (in MWh) described in Appendix 7A

3.2.2.2 For a *settlement account* which is associated with a *pseudo generation settlement facility* and *net AFP treatment* is not granted to the *EGF group* to which such *pseudo generation settlement facility* is assigned:

$$FEQ_h^a = WEQ_h^a + \Sigma_{n(a)} | IEQ_h^{n(a)} |$$

where:

a = a *settlement account* which is associated with a *pseudo generation settlement facility* and *net AFP treatment* is not granted to the *EGF group* to which such *pseudo generation settlement facility* is assigned

h = a *settlement interval*

$\Sigma_{n(a)}$ = sum over all *MNNs* $n(a)$ of *pseudo generation settlement facilities* associated with *settlement account* a

$|X|$ = positive value for a real number, disregarding the sign

3.2.2.3 For a *settlement account* which is associated with a *pseudo generation settlement facility* and *net AFP treatment* has been granted under section 5.5A.4 of Chapter 2 to the *EGF group* to which such *pseudo generation settlement facility* is assigned:

$$FEQ_h^a = WFQ_h^a$$

where:

a = a *settlement account* which is associated with a *pseudo generation settlement facility* and *net AFP treatment* has been granted to the *EGF group* to which such *pseudo generation settlement facility* is assigned

h = a *settlement interval*

3.2.3 The *EMC* shall determine the *regulation settlement debit* (FSD) for each *settlement account* for each *settlement interval* in accordance with the following formula:

$$FSD_h^a = AFP_h \times FEQ_h^a$$

where:

a = a *settlement account*

h = a *settlement interval*

3.2.4 The *EMC* shall determine the *regulation contract credit* (FCC) for each *settlement account* for each *settlement interval* in accordance with the following formula:

$$FCC_h^a = MFP_h \times \sum_j (BFQ_h^{j,a} - BFQ_h^{a,j})$$

where:

a = a *settlement account*

h = a *settlement interval*

\sum_j = sum over all *settlement accounts* j

- 3.2.5 The *EMC* shall determine the net *regulation settlement credit* (NFSC) for each *settlement account* for each *settlement interval* in accordance with the following formula:

$$NFSC_h^a = FSC_h^a - FSD_h^a + FCC_h^a$$

where:

a = a *settlement account*

h = a *settlement interval*

3.3 NET RESERVE SETTLEMENT CREDITS

- 3.3.1 The *EMC* shall determine the *reserve settlement credit* (RSC) for each *reserve provider group* r for each *settlement account* for each *settlement interval* in accordance with the following formula:

$$RSC_{r,h}^a = MRP_{r,h} \times (\sum_{m(a)} GRQ_{r,h}^{m(a)} + LRQ_{r,h}^a)$$

where:

r = a *reserve provider group*

a = a *settlement account*

h = a *settlement interval*

$\sum_{m(a)}$ = sum over all *MNNs* $m(a)$ associated with *settlement account* a

- 3.3.2 The *EMC* shall determine the *reserve settlement debit* (RSD) for each *settlement account* for each *settlement interval* in accordance with the following formula:

$$RSD_h^a = \sum_{m(a)} RRS_h^{m(a)} \times \sum_j \sum_r RSC_{r,h}^j$$

where:

$RRS_h^{m(a)}$ = *reserve responsibility share for GRF m(a) for settlement interval h as determined in accordance with Appendix 7A*

h = *a settlement interval*

$\sum_{m(a)}$ = *sum over all GRFs m(a) associated with settlement account a*

\sum_r = *sum over all reserve provider groups r*

\sum_j = *sum over all settlement accounts j*

- 3.3.3 The EMC shall determine the *reserve contract credit (RCC)* for each *reserve provider group* for each *settlement account* for each *settlement interval* in accordance with the following formula:

$$RCC_{r,h}^a = MRP_{r,h} \times \sum_j (BRQ_{r,h}^{j,a} - BRQ_{r,h}^{a,j})$$

where:

a = *a settlement account*

h = *a settlement interval*

r = *a reserve provider group*

\sum_j = *sum over all settlement accounts j*

- 3.3.4 The EMC shall determine the *net reserve settlement credit (NRSC)* for each *settlement account* for each *settlement interval* in accordance with the following formula:

$$NRSC_h^a = \sum_r (RSC_{r,h}^a + RCC_{r,h}^a) - RSD_h^a$$

where:

a = *a settlement account*

h = *a settlement interval*

\sum_r = *sum over all reserve provider groups r*

3.4 NET TRANSMISSION RIGHTS SETTLEMENT CREDITS

- 3.4.1 The EMC shall determine the net *financial transmission right settlement* credit (NTSC) for each *settlement account* for each *settlement interval* in accordance with the following formula:

$$NTSC_h^a = \sum_m \{FTQ_h^{m,a} \times (USEP_h - MEP_h^m)\}$$

where:

a = a *settlement account*

h = a *settlement interval*

\sum_m = sum over all *MNNs* m

Explanatory Note: The NTSC may be positive or negative for any settlement account/generator, i.e., generators located where the nodal price exceeds the USEP will have to pay the difference multiplied by their FTR quantities. If FTR holdings are approximately equal to actual generation during constrained periods, total NTSC payments to generators should be positive and should approximate the constraint-related component of the settlement surplus.

3.4A NET LOAD CURTAILMENT SETTLEMENT CREDIT

- 3.4A.1 The EMC shall determine the net *load curtailment settlement* credit (LCSC) for each *settlement account* for each *settlement interval* in accordance with the following formula:

$$LCSC_h^a = LCP_h \times \sum_{p(a)} LCQ_h^{p(a)}$$

where:

a = a *settlement account*

h = a *settlement interval*

$\sum_{p(a)}$ = sum over all *LRFs* p associated with *settlement account* a

- 3.4A.2 The hourly *load curtailment uplift* (HLCU, in \$/MWh) for a *settlement interval* shall be the total over all *settlement accounts* of the cost of *load curtailment* (LCSC, in \$) for that *settlement interval*, divided by, the aggregate of the *energy withdrawn* (in MWh) by all *load* over all *settlement accounts* for that *settlement interval*, determined in accordance with the following formula:

$$HLCU_h = \sum_a LCSC_h^a / \sum_a WDQ_h^a$$

where:

a = a *settlement account*

h = a *settlement interval*

Σ_a = sum over all *settlement accounts* a

3.5 SETTLEMENT INTERVAL ENERGY UPLIFT CHARGES

3.5.1 The *EMC* shall determine the *settlement interval energy* uplift amount (HEUA) for each *settlement interval* in accordance with the following formula:

$$\text{HEUA}_h = \Sigma_a (\text{NESC}_h^a + \text{NRSC}_h^a + \text{NTSC}_h^a + \text{NFSC}_h^a + \text{NMEA}_h^a)$$

where:

a = *settlement account* a

h = a *settlement interval*

Σ_a = sum over all *settlement accounts* a

NMEA_h^a = net *metering error* adjustment for *settlement account* a computed in accordance with Appendix 7B.

3.5.2 The *EMC* shall determine the hourly *energy* uplift rebate (HEUR) for each *settlement interval* in accordance with the following formula:

$$\text{HEUR}_h = \text{HEUA}_h / \Sigma_a \text{WEQ}_h^a$$

where:

h = a *settlement interval*

Σ_a = sum over all *settlement accounts* a

3.5.2A The *EMC* shall determine the hourly *energy* uplift charge (HEUC) for each *settlement interval* in accordance with the following formula:

$$\text{HEUC}_h = \text{HEUR}_h + \text{HLCU}_h$$

where:

h = a *settlement interval*

3.5.3 Subject to section 1.3, the *EMC* shall, prior to the start of each calendar month, estimate the monthly *energy* uplift charge (MEUC) for the immediately following calendar month in accordance with section 4.1.

MEUC = the charge (in \$/MWh) to recover the costs estimated to be incurred by the *EMC* in respect of the elements referred to in sections 4.1.1 to 4.1.6 , adjusted to reflect any over- or under-recovery in the MEUC applied in the previous month. The MEUC shall be applied in a constant manner over all *settlement intervals* in the calendar month.

3.6 VESTING CONTRACT SETTLEMENT CREDITS

3.6.1 The *EMC* shall determine the *vesting contract settlement credit* (VCSC) for each *settlement account* for each *settlement interval* in accordance with the following formula:

$$\text{VCSC}_h^a = \left(\text{LVP}_h^a - \text{VCRP}_h^a \right) \times \text{LVQ}_h^a + \left(\text{BVP}_h^a - \text{VCRP}_h^a \right) \times \text{BVQ}_h^a + \sum_{b=1}^n \left[\left(\text{TVP}_{h,b}^a - \text{VCRP}_h^a \right) \times \text{TVQ}_{h,b}^a \right]$$

for all $a \neq k$

where:

$$\text{VCRP}_h^a = \frac{\sum_{m(a)} \text{MEP}_h^{m(a)} \times \text{MAX}[\text{IEQ}_h^{m(a)}, 0]}{\sum_{m(a)} \text{MAX}[\text{IEQ}_h^{m(a)}, 0]}$$

= Vesting Contract Reference Price (VCRP) for *settlement interval* h for *settlement account* a , and

if $\sum_{m(a)} \text{MAX}[\text{IEQ}_h^{m(a)}, 0] = 0$, then VCRP_h^a equals to the simple average of its MEPs.

$$\text{MAX}[\text{IEQ}_h^{m(a)}, 0] = \text{maximum of } \text{IEQ}_h^{m(a)} \text{ or } 0$$

a = a *settlement account*

b = a tender tranche as defined in section 2.5.2

h = a *settlement interval*

k = the *settlement account* associated with the *MSSL counterparty*

$\sum_{m(a)}$ = sum over all *GRFs* $m(a)$ and *GSFs* $m(a)$ associated with *settlement account* a

Explanatory Note: VCRP_h^a is infinite when the sum of $\text{MAX}[\text{IEQ}_h^{m(a)}, 0]$ is zero. In this instance, the VCRP_h^a will be the simple average of the settlement account's MEPs.

$$VCSC_h^k = -\sum_{a \neq k} VCSC_h^a$$

where:

a = a *settlement account*

h = a *settlement interval*

k = the *settlement account* associated with the *MSSL* counterparty

Explanatory Note: To enable the *MSSL* to allocate $VCSC_h^k$ among the relevant parties, the *EMC* will compute a uniform vesting contract reference price for the *MSSL*'s $VCRP_h^k$ as follows:

$$VCRP_h^k = \frac{\sum_{a \neq k} [(VCRP_h^a)(LVQ_h^a + BVQ_h^a)]}{\sum_{a \neq k} (LVQ_h^a + BVQ_h^a)}$$

3.7 NET SETTLEMENT INTERVAL CREDITS

3.7.1 Subject to section 1.3, the *EMC* shall determine the net account *settlement* credit (*NASC*) for each *settlement account* for each *settlement interval* in accordance with the following formula:

$$NASC_h^a = NESCh^a + NFSC_h^a + NRSC_h^a + LCSC_h^a + NTSC_h^a + VCSC_h^a - (HEUR_h \times WEQ_h^a) - (MEUC \times WMQ_h^a) - (HLCU_h \times WDQ_h^a)$$

where:

a = a *settlement account*

h = a *settlement interval*

Explanatory Note: The above definition allocates uplift based on consumption net only of any unmetered generation. Because all generators larger than 1 MW must be registered, at least for settlements purposes, and hence must be metered, this is as close to a gross-load allocation as one can realistically get. The uplift amount should not be large (and may even be negative), given that congestion is priced, *FTRs*, once made available, should redistribute most congestion rentals (except during grid outages), reserve and regulation costs are recovered from generators and loads outside of uplift, and net imports should equal zero over time.

3.7.2 Subject to section 1.3, the *EMC* shall determine the net participant *settlement credit* (NPSC) for each *market participant* and *market support services licensee* for each *settlement interval* in accordance with the following formula:

$$\text{NPSC}_h^k = \sum_{a(k)} \text{NASC}_h^{a(k)}$$

where:

h = a *settlement interval*

k = a *market participant* or *market support services licensee*

$a(k)$ = the *settlement account* $a(k)$ associated with *market participant* or *market support services licensee* k

$\sum_{a(k)}$ = sum over all *settlement accounts* $a(k)$ associated with *market participant* or *market support services licensee* k

4 RECOVERY OF NON-SETTLEMENT-INTERVAL COSTS

4.1 THE MONTHLY ENERGY UPLIFT CHARGE

- 4.1.1 Prior to the beginning of each calendar month, the *EMC* shall calculate for that calendar month the monthly amount for compensation and other payments (MACP), which shall be the sum of:
- 4.1.1.1 an estimate of the amounts that has or may be invoiced by the *ancillary service providers* under *ancillary service* contracts;
 - 4.1.1.2 an estimate of the costs that may be incurred by the *PSO* in testing related to the procurement of *ancillary services*;
 - 4.1.1.2A an estimate of the costs that may be incurred by the *EMC* and the *Authority* in engaging a consultant to conduct any audit and/or services related to the procurement of *ancillary services* and *refurbishment works* under sections 8.3.4 and 8.2B of Chapter 5;
 - 4.1.1.2B an estimate of the *Authority funding costs* that are or may be due or payable to the *Authority* under the *framework agreement*;
 - 4.1.1.2C the amount of compensation and/or costs that have been awarded against the *Authority* under any *ancillary service funding agreement*, *AS financing documents*, *tripartite agreement* and/or *framework agreement* or otherwise payable by the *Authority* in connection with the resolution of any disputes or appeals under, arising out of or in connection with any of these contracts (including in connection with any consolidation of proceedings or joinder to any proceedings);
 - 4.1.1.2D an estimate of the costs and expenses (including legal costs and taxes) that are or may be incurred by the *Authority* to make any claims against, or defend any claims made by, a counterparty to any *ancillary service funding agreement*, *AS financing documents*, *tripartite agreement* and/or *framework agreement* under, arising out of or in connection with any of these contracts (including in connection with any consolidation of proceedings or joinder to any proceedings);
 - 4.1.1.3 the amounts of compensation claims to be paid by the *EMC* or the *PSO* under section 3.11 of Chapter 3, and the compensation

amounts to be paid by the *EMC* under section 10.5 of Chapter 6;

- 4.1.1.4 the amount of compensation and/or costs that have been awarded against the *EMC* and/or the *PSO* under the *market rules* or otherwise payable by the *EMC* and/or the *PSO* in connection with the resolution of any disputes or appeals under, arising out of or in connection with these *market rules*;
- 4.1.1.4A the amount of financial penalties to be refunded to *market participants* pursuant to any award made by an *arbitration tribunal* under these *market rules* or as directed by the *market surveillance and compliance panel* under section D.5.4 of Appendix 5D or section E.5.4 of Appendix 5E or a court in Singapore;
- 4.1.1.4B the amount of compensation and/or costs that have been awarded against the *EMC* under any *ancillary service contract*, *tripartite agreement* and/or the *framework agreement* or otherwise payable by the *EMC* in connection with the resolution of any disputes or appeals under, arising out of or in connection with any of these contracts (including in connection with any consolidation of proceedings or joinder to any proceedings);
- 4.1.1.4C an estimate of the costs and expenses (including legal costs and taxes) that are or may be incurred by the *EMC* to make any claims against, or defend any claims made by, a counterparty to any *ancillary service contract*, *tripartite agreement* and/or the *framework agreement* under, arising out of or in connection with any of these contracts (including in connection with any consolidation of proceedings or joinder to any proceedings); and
- 4.1.1.4D save to the extent that such costs and expenses are set out in the other sub-paragraphs of this section 4.1.1, an estimate of the costs and expenses that are or may be incurred by the *EMC* in connection with the performance of its obligations (including any payment obligations) under any *ancillary service contract*, *tripartite agreement* and/or *framework agreement* including the costs and expenses (including legal costs and taxes) incurred by the *EMC* in connection with the preparation, negotiation, printing, and execution of any *ancillary service contract*, *tripartite agreement* and/or the *framework agreement*;

Less the aggregate of:

- 4.1.1.5 the amount of compensation and/or costs received by the *EMC* and/or the *PSO* pursuant to any award made by an *arbitration tribunal* under these *market rules* or otherwise received by the

EMC and/or the *PSO* in connection with the resolution of any disputes or appeals under, arising out of or in connection with these *market rules*;

- 4.1.1.5A the amount of *ASFA liabilities* received by the *Authority* under any *ancillary service funding agreement* and/or *tripartite agreement* (including in the event of termination of an *ancillary service funding agreement*, the *refurbishment cost* recovered from an *ancillary service provider*);
- 4.1.1.5B the amount of any compensation and/or costs received by the *EMC* from an *ancillary service provider* under any *ancillary service contract* and/or *tripartite agreement* (including in the event of termination of an *ancillary service contract*, any refund of payment recovered from an *ancillary service provider*);
- 4.1.1.6 the amount received by the *EMC* in the form of financial penalties imposed by the *market surveillance and compliance panel* under these *market rules* and financial penalties imposed by the automatic financial penalty scheme under section 3.6.3 of Chapter 5 and Appendix 5E or under section 3.7.3 of Chapter 5 and Appendix 5D;
- 4.1.1.7 the amount of insurance monies received by the *EMC* for any compensation claims awarded against the *EMC* under these *market rules*, and
- 4.1.1.8 the amount of *fixed market-related charge* received by the *EMC* under sections 5.4B.2 and 5.4B.4 of Chapter 2.

4.1.2 [Deleted and Intentionally Left Blank]

4.1.3 Prior to the beginning of each calendar month, *EMC* shall calculate the monthly *transitional payment* amount (MTRA), as directed and in the manner specified by the *Authority*

MTRA = *transitional payments* (in dollars) for a calendar month

Explanatory note: The transitional payments are a number of arrangements approved by the EMA for licensees in operation before market start which allow these parties to continue under similar arrangements into the future.

4.1.4 Prior to the beginning of each calendar month, the *EMC* shall estimate any monthly miscellaneous costs (MISC) that the *EMC Board* has determined should be recovered through the monthly *energy uplift charge* in that calendar month.

MISC = estimated miscellaneous costs (in dollars) to be recovered in that calendar month

- 4.1.5 Prior to the beginning of each calendar month, the *EMC* shall estimate the monthly *energy* uplift shortfall (MEUS) to be recovered (if positive) or deducted (if negative) in that calendar month as the aggregate of the over-recovery or the under-recovery of the MEUA in the preceding calendar month.

MEUS = estimated *energy* uplift shortfall (in dollars) to be recovered or deducted in that calendar month

- 4.1.6 Prior to the beginning of each calendar month, the *EMC* shall determine the monthly *energy* uplift amount (MEUA) for that calendar month as follows:

MEUA = MACP + MTRA + MISC + MEUS

- 4.1.7 Subject to section 1.3, prior to the beginning of each calendar month, the *EMC* shall project the monthly withdrawal MEUC quantities (MWMQ) for that calendar month.

MWMQ = projected $\sum_h \sum_a WMQ_h^a$,

where:

\sum_h = sum over all *settlement intervals* h in a calendar month

\sum_a = sum over all *settlement accounts* a

- 4.1.8 Subject to section 1.3, prior to the beginning of each calendar month, the *EMC* shall estimate the monthly *energy* uplift charge (MEUC) for that calendar month as follows:

MEUC = MEUA/MWMQ

- 4.1.9 Subject to section 1.3, within 1 *business day* of the beginning of each calendar month, the *EMC* shall *publish* the value established for each of MACP, MTRA, MISC, MEUS and MWMQ for that calendar month.

4.2 EMC AND PSO ADMINISTRATIVE COSTS AND ASSOCIATED FEES

- 4.2.1 The *EMC* shall recover its administrative costs in any given *EMC* fiscal year by means of the imposition of fees on each applicable *market participant, market support services licensee* and other person. Subject to

sections 4.2.2, such fees shall be levied in such manner, at such times, in such amounts and on such *market participants, market support services licensees* and other persons as may be specified in:

- 4.2.1.1 the schedule of fees approved by the *Authority* for that *EMC* fiscal year and referred to in section 11.1.5 or 11.1.6 of Chapter 2, as the case may be; or
 - 4.2.1.2 the schedule of fees referred to in section 11.1.5.2(a) of Chapter 2 prepared by the *EMC* for that *EMC* fiscal year on the basis of the methodology approved by the *Authority* pursuant to section 11.1.5 of Chapter 2 for that *EMC* fiscal year.
- 4.2.2 Where, in respect of any given *EMC* fiscal year, the *Authority* has approved a methodology rather than a schedule of fees pursuant to section 11.1.5 of Chapter 2 and the *EMC* has not prepared the corresponding schedule of fees referred to in section 4.2.1.2, the *EMC* shall levy the fees referred to in section 4.2.1 in such manner, at such times, in such amounts and on such *market participants, market support services licensees* and other persons as may be directed by the *Authority* or, in the absence of such direction, as the *EMC* determines appropriate on the basis and consistent with the methodology approved by the *Authority* for that *EMC* fiscal year.
- 4.2.3 The *EMC* shall recover, on behalf of the *PSO*, the *PSO's* administrative costs (referred to in section 12.1.1.1 of Chapter 2) in any *Authority* fiscal year by means of the imposition of fees on each applicable *market participant, market support services licensee* and other person. Such fees shall be levied in such manner, at such times, in such amounts and on such *market participants, market support services licensees* and other persons as may be specified in the then prevailing *PSO's* schedule of fees provided by the *PSO* to the *EMC* under section 12.1 of Chapter 2 as may be applicable to that *Authority* fiscal year. Where and to the extent the manner, time or amount of any such fees or the persons on which such fees are to be levied is not specified in such *PSO's* schedule of fees, the *EMC* shall recover such fees in such manner, at such times, in such amounts or on such persons as may be directed by the *Authority* or, in the absence of such direction, as the *EMC* determines appropriate on the basis of and consistent with such *PSO's* schedule of fees.

4.3 AUTHORITY APPROVAL

- 4.3.1 Nothing in this section 4 shall authorise the *EMC* to recover, in respect of a given charge and over a given period of time, any amount that would result in the recovery by the *EMC*, other than on behalf of the *PSO*, of an amount that exceeds, in the aggregate for that period of time, the amount approved for recovery by the *Authority* for that charge and for that period

of time where such approval is required to be obtained as a condition of the *EMC's electricity licence*.

4.4 (USEP+HEUC)/NODAL PRICE NEUTRALISATION

Explanatory note: This section applies to an EGF group which the EMC is required to grant such price neutralisation under section 5.5 or 5.5A of Chapter 2. Each such EGF group of a market participant or market support services licensee will be associated with a single settlement account of such market participant or market support services licensee. The associated load for such an EGF group may be associated with either the settlement account of such market participant or market support services licensee for that EGF group, the settlement account of another market participant or a combination of two or more such settlement accounts.

4.4.1 Subject to section 1.3, the provisions of this section 4.4 shall apply only to an *EGF group* which the *EMC* is required to grant *price neutralisation* under section 5.5 or 5.5A of Chapter 2.

4.4.2 Subject to section 4.4.1, for each *settlement interval*, if the sum of positive injections of an *EGF group* into the *transmission system* is less than or equal to its associated *load*, the *EMC* shall determine the net *energy load credit* (NELC) for that group as follows:

$$NELC_h^{sa} = \sum_{m(sa)} [IEQ_h^{m(sa)} \times (USEP_h + HEUC_h - MEP_h^{m(sa)})]$$

where:

sa = the *settlement account* assigned to that group

h = the *settlement interval*

$\sum_{m(sa)}$ = sum over all *MNNs* m(sa) associated with *settlement account* sa, excluding *MNNs* at which the injection *energy* quantity for *settlement interval* h is negative

4.4.3 Subject to section 4.4.1, for each *settlement interval*, if the sum of positive injections of an *EGF group* into the *transmission system* is greater than its associated *load*, the *EMC* shall determine the net *energy generation credit* (NEGC) for that group in accordance with sections 4.4.3.1 to 4.4.3.4.

4.4.3.1 The *EMC* shall rank all *MNNs* associated with the *settlement account* assigned to that group (excluding *MNNs* at which the injection *energy* quantity for the *settlement interval* is negative) in increasing injection *energy* quantity at each *MNN* in the *settlement interval*, such that:

z = the index position of the ranked *MNN*

$m(z)$ = the *MNN* ranked at index position z

Explanatory Note: The ranking of the Market Network Nodes is meant to be used to identify the Market Network Nodes so that allocation of withdrawal quantities to the nodal prices at the respective Market Network Nodes can be done. It is not for indication of any preference shown by ranking. The allocation of the withdrawal quantity to the nodal prices of the Market Network Nodes is based on the IEQs of the Market Network Nodes. The allocation methodology is on a proportionate basis with nodal prices of Market Network Nodes having greater injection quantities being assigned a greater withdrawal quantity, the quantity assigned being the total withdrawal quantity multiplied by the fraction of total injection that is being injected at the particular Market Network Node.

4.4.3.2 The *EMC* shall determine an index size function $S(z)$ such that:

$S(z)$ = injection *energy* quantity at the *MNN* ranked at index position z under section 4.4.3.1

$$S(z) \leq S(z+1)$$

4.4.3.3 The *EMC* shall determine $T(z)$ such that:

$$T(z) = S(z) / \sum_{j=1}^Z S(j)$$

Z = total number of *MNNs* for *settlement account sa*, excluding *MNNs* at which the injection *energy* quantity for the *settlement interval* is negative

4.4.3.4 The *EMC* shall determine the *NEGC* for that group for the *settlement interval* as follows:

$$NEGC_h^{sa} = \sum_{z=1}^Z [T(z) \times (USEP_h + HEUC_h - MEP_h^{m(z)})] \times WPQ_{h(sa)}$$

where:

sa = the *settlement account* associated with that group

h = the *settlement interval*

Z = total number of *MNNs* for *settlement account sa*, excluding *MNNs* at which the injection *energy* quantity for the *settlement interval* is negative

$WPQ_{h(sa)}$ = associated *load* for that group

4.4.4 Subject to section 4.4.1, the *NEGC* and *NELC* determined for each *settlement interval* of a given *trading day* and payable to a given *market participant* or *market support services licensee*, shall be aggregated and

included in that *market participant's* or *market support services licensee's* preliminary settlement statement for that trading day.

- 4.4.5 Subject to section 4.4.1, the *EMC* shall determine the net energy adjustment amount (NEAA) for each *settlement interval* as follows:

$$NEAA_h = \sum_{sa} [NELC_h^{sa} + NEGC_h^{sa}]$$

where:

h = a *settlement interval*

\sum_{sa} = sum over the *settlement accounts* sa of all *EGF* groups

- 4.4.6 Subject to section 4.4.1, for each *settlement interval*, the *EMC* shall determine the net energy adjustment debit (NEAD) applicable to each *market participant* or *market support services licensee* who has withdrawn energy from the *transmission system* in that *settlement interval* as follows:

$$NEAD_h^a = NEAA_h \times [(WEQ_h^a - \sum_{sa(a)} R_{h(sa)}^a) / (\sum_j WEQ_h^j - \sum_l \sum_{sa(l)} R_{h(sa)}^l)]$$

where:

a = *settlement account* of a *market participant* or *market support services licensee* who has withdrawn energy in *settlement interval* h

h = a *settlement interval*

\sum_j = sum over all *settlement accounts* j

$R_{h(sa)}^a$ = minimum of $WPQ_{h(sa)}^a$ or $\sum_{m(sa)} IEQ_h^{m(sa)}$, if *settlement account* a is associated with the associated load for an *EGF* group associated with *settlement account* sa that is required to be granted *price neutralisation* under section 5.5 or 5.5A of Chapter 2

$R_{h(sa)}^a = 0$, if *settlement account* a is not associated with any associated load for an *EGF* group associated with *settlement account* sa that is required to be granted *price neutralisation* under section 5.5 or 5.5A of Chapter 2

$WPQ_{h(sa)}^a$ = associated load, associated with *settlement account* a , for an *EGF* group associated with *settlement account* sa that is required to be granted *price neutralisation* under section 5.5 or 5.5A of Chapter 2

$\sum_{sa(a)}$ = sum over all *settlement accounts* sa of all *EGF groups* whose associated *loads* are associated with *settlement account* a

$\sum_{m(sa)}$ = sum over all *MNNs* $m(sa)$ associated with *settlement account* sa , excluding *MNNs* at which the injection *energy* quantity for *settlement interval* h is negative

\sum_1 = sum over all *settlement accounts* 1

- 4.4.7 Subject to section 4.4.1, the NEAD determined for each *settlement interval* of a given *trading day* and payable by a given *market participant* or *market support services licensee*, shall be aggregated and included in that *market participant's* or *market support services licensee's* *preliminary settlement statement* for that *trading day*.

5 SETTLEMENT STATEMENTS

5.1 COMMUNICATION OF SETTLEMENT INFORMATION

- 5.1.1 All communications between *market participants* and the *EMC* relating to the *settlement* process shall be effected using the *electronic information system* or such other means of communication as may be specified in the applicable *market manual*.
- 5.1.2 If there is a failure of a communication system and it is not possible to communicate using the *electronic information system* or, where applicable, the alternate means of communication specified in the applicable *market manual*, then the *EMC* or the *market participant*, as the case may be, shall communicate information relating to the *settlement* process by facsimile or other alternative means specified by the *EMC*.

5.2 SETTLEMENT TIMETABLE

- 5.2.1 The *preliminary settlement statement* for each *trading day* in the *real-time markets* shall be issued six *business days* after the *trading day*.
- 5.2.2 After the *preliminary settlement statement* referred to in section 5.2.1 is issued, each *market participant* shall, within three *business days* and prior to such time as may be specified in the applicable *market manual*, notify the *EMC* of errors in the *preliminary settlement statement* in accordance with section 5.5.

- 5.2.3 The *final settlement statement* for each *trading day* in the *real-time markets* shall be issued ten *business days* after each *trading day* and shall reflect the outcome of the validation procedure undertaken in accordance with section 5.5.
- 5.2.4 The *final settlement statement* shall be the basis for *invoicing* and billing.
- 5.2.5 At the same time as the *EMC* issues to a *market participant* one or more *final settlement statements* referred to in section 5.2.3, the *EMC* shall issue a single *invoice* to that *market participant* for the *trading days* to which the *final settlement statements* relate.
- 5.2.6 The *market participant payment date* for each *invoice* shall be the twentieth day after the *trading day* subject to *business day convention*.
- 5.2.7 The *EMC* shall initiate the *electronic funds transfer* process in accordance with the provisions of section 5.10 so as to ensure that the *market participant's* payments for each *invoice* reach the *EMC settlement clearing account* no later than the *close of banking business* on the *market participant payment date* for that *invoice*. For the avoidance of doubt, a *market participant's* payment obligations under section 5.9.1 shall not be discharged merely by the initiation of such *electronic funds transfer* process by the *EMC*.
- 5.2.8 The *EMC payment date* for each *invoice* shall be one day after the *market participant payment date*, subject to *business day convention*, for that *invoice*.
- 5.2.9 The *EMC* shall initiate the *electronic funds transfer* process in accordance with the provisions of section 5.10 so as to ensure that the sums owing to each *market participant* for each *invoice* reach the *market participant's bank account* no later than the *close of banking business* on the *EMC payment date* for that *invoice*.

5.3 SETTLEMENT STATEMENT PROCESS

- 5.3.1 The *EMC* shall issue *settlement statements* to each *market participant* to cover each *trading day* in accordance with sections 5.2 and 5.6, and shall include the *settlement* information described in section 5.4.2 or sections 5.6.2 and 5.6.3, as the case may be.
- 5.3.2 For each *settlement statement*, the *EMC* shall calculate a net *settlement amount* for each *market participant* for the *trading day*. The net *settlement amount* shall be comprised of the aggregate of the *settlement amounts* from each transaction in each *settlement interval* in the *trading day*, adjusted to reflect any fees payable by the *market participant* and

any other adjustment amounts payable or receivable pursuant to these *market rules*.

5.3.3 The net *settlement amount* referred to in section 5.3.2 shall be a positive or negative dollar amount for each *market participant* and:

5.3.3.1 where the net *settlement amount* for a *market participant* is negative, the absolute value of the *settlement amount* shall be an amount payable by the *market participant* to the *EMC*; or

5.3.3.2 where the net *settlement amount* for a *market participant* is positive, the *settlement amount* shall be an amount receivable by the *market participant* from the *EMC*.

5.3.4 *Settlement statements* shall be considered issued to *market participants* when released in accordance with the applicable *market manual*.

5.3.5 It is the responsibility of each *market participant* to notify the *EMC* if it fails to receive, or it is unable to access and obtain, a *settlement statement* on a given *business day* in the manner specified in the applicable *market manual*. Each *market participant* shall be deemed to have received a given *settlement statement* on the *business day* on which the *settlement statement* has been made available in accordance with section 5.3.4, unless it notifies the *EMC* to the contrary in accordance with the applicable *market manual*.

5.3.6 In the event that a *market participant* notifies the *EMC* that it has failed to receive, or it is unable to access and obtain, a *settlement statement* in accordance with the applicable *market manual*, the *EMC* shall re-release or make available the *settlement statement*, in which case the *settlement statement* shall be considered to have been issued and received on the date such *settlement statement* is re-released or made available to the *market participant* by the *EMC*.

5.4 PRELIMINARY STATEMENT COVERAGE

5.4.1 In accordance with the timelines set forth in section 5.2.1, the *EMC* shall issue *preliminary settlement statements* to each *market participant* to cover transactions in the *real-time markets*.

5.4.2 *Preliminary settlement statements* related to each *market participant* for the *real-time markets* shall include, in electronic format, for the relevant *trading day*:

5.4.2.1 the aggregate *energy* produced or withdrawn by each of that *market participant's registered facilities* and *generation*

- settlement facilities* in each *settlement interval* in that *trading day*;
- 5.4.2.2 the aggregate *reserve* provided in respect of each *reserve provider group* by that *market participant's registered facilities* in each *settlement interval* in that *trading day*;
- 5.4.2.3 the aggregate *regulation* provided by that *market participant's registered facilities* in each *settlement interval* in that *trading day*;
- 5.4.2.4 the aggregate adjustment amounts payable or receivable pursuant to these *market rules*;
- 5.4.2.5 the bilateral *energy* quantities for that *market participant* in each *settlement interval* in that *trading day*;
- 5.4.2.6 the bilateral *reserve* quantities in respect of *reserve* from each *reserve provider group* for that *market participant* in each *settlement interval* in that *trading day*;
- 5.4.2.7 the bilateral *regulation* quantities for that *market participant* in each *settlement interval* in that *trading day*;
- 5.4.2.8 the credits and charges associated with *FTRs* applying to a *market participant's settlement account* in each *settlement interval* in that *trading day*;
- 5.4.2.9 the *energy* price applying to each of that *market participant's registered facilities* and *generation settlement facilities* in each *settlement interval* in that *trading day*;
- 5.4.2.10 the *reserve* price in respect of *reserve* from each *reserve provider group* applicable to that *market participant's registered facilities* in each *settlement interval* in that *trading day*;
- 5.4.2.11 the *regulation* price applying to that *market participant's registered facilities* in each *settlement interval* in that *trading day*;
- 5.4.2.12 all vesting prices and vesting quantities, referred to in section 2.5 applying to each applicable *market participant's settlement account* in each *settlement interval* in that *trading day*;
- 5.4.2.13 the monthly *energy* uplift charge and the hourly *energy* uplift charge to be applied per MWh in each *settlement interval* in that *trading day*;
- 5.4.2.14 [Deleted and Intentionally Left Blank]

- 5.4.2.15 the total of each type of non-interval *settlement* charge or credit allocated to that *trading day* and the *market participant's* share;
- 5.4.2.16 all taxes, fees, levies, charges and payments applicable to the *market participant*; and
- 5.4.2.17 for each type of charge listed, the total *trading day's* charges.

The basis for deriving the *market participant's* share of each type of non-interval *settlement charge* or credit under section 5.4.2.15 shall be communicated to each *market participant* in accordance with section 5.1 of Chapter 7.

5.5 VALIDATION OF PRELIMINARY SETTLEMENT STATEMENT

- 5.5.1 Each *market participant* shall have the opportunity to review its *preliminary settlement statements*. A *market participant* may register a disagreement with the *EMC* with respect to any such *preliminary settlement statement* in accordance with the timelines set forth in section 5.2.2 and the other provisions of this section 5.5.
- 5.5.2 Subject to sections 5.5.8 and 5.5.9, if a *market participant* disagrees with any item or calculation set forth in a *preliminary settlement statement* that it has received, it may provide the *EMC* with a *notice of disagreement* in such form as may be specified in the applicable *market manual* which shall clearly state, with supporting material, the nature of the disagreement and a proposed resolution of it. Such *notice of disagreement* shall relate to only one *preliminary settlement statement* and shall include at least the following information:
 - 5.5.2.1 the date of issuance of the *preliminary settlement statement* in question;
 - 5.5.2.2 the *trading day* in question;
 - 5.5.2.3 the item(s) in question;
 - 5.5.2.4 the reason(s) for the disagreement;
 - 5.5.2.5 where applicable, the proposed adjustment to the data used to calculate any relevant *settlement amount* on the *preliminary settlement statement*; and
 - 5.5.2.6 where applicable, the proposed correction to any calculation of the relevant *settlement amount* on the *preliminary settlement statement*.
- 5.5.3 Where a *notice of disagreement* includes a proposed adjustment to bilateral *energy* quantities, bilateral *reserve* quantities, *FTR* quantities or

vesting contract quantities referred to in section 2.5 which will impact the allocation of quantities between *market participants*, the *EMC* shall notify any other directly affected *market participant* of such proposed adjustment prior to taking any action under section 5.5.6.

5.5.4 The *notice of disagreement* issued by the *market participant* shall be acknowledged by the *EMC* upon receipt.

5.5.5 Subject to sections 5.5.8 and 5.5.9, the *EMC* shall investigate the subject-matter of, and reach a final determination on, the disagreement specified in a *notice of disagreement* no later than 15 *business days* after the issuance of the corresponding *final settlement statement* (i.e. the *final settlement statement* that corresponds to the *preliminary settlement statement* referred to in the *notice of disagreement*). If the final determination is not reached before the time for issuing the corresponding *final settlement statement*, the *EMC* may issue that *final settlement statement* without taking into account the disagreement in the *notice of disagreement*.

5.5.6 Before reaching a final determination on the disagreement specified in a *market participant's notice of disagreement*, the *EMC* shall inform the *market participant* of the *EMC's* initial assessment of the disagreement and provide the *market participant* an opportunity to respond. If, in respect of the *preliminary settlement statement* to which the *notice of disagreement* relates, the *EMC's* final determination is that:

5.5.6.1 no error has occurred, the *EMC* shall so notify the *market participant* and take no further action; or

5.5.6.2 an error has occurred, the *EMC* shall so notify the *market participant* and make the appropriate correction or adjustment:

a. to the corresponding *final settlement statement*, if that *final settlement statement* has not yet been issued; or

b. in the next available *preliminary settlement statement*, if the corresponding *final settlement statement* has already been issued without reference to the *notice of disagreement*.

5.5.7 Any changes required to be made in the *final settlement amounts* as a result of the validation process described in this section 5.5 shall, subject to section 5.14.3, be included as a debit or credit in the *final settlement statement* issued for each affected *market participant* on the date on which the *final settlement statement* that reflects an adjustment made pursuant to section 5.5.6 is issued.

- 5.5.8 No *market participant* may submit a *notice of disagreement*, and the *EMC* shall not investigate the subject-matter of a *notice of disagreement*, unless the *notice of disagreement* is submitted to the *EMC* within the time specified in section 5.2.2.
- 5.5.9 No *market participant* may submit a *notice of disagreement* in respect of the calculation of:
- 5.5.9.1 the *market energy price* applicable to any *market participant* for any *settlement interval*;
 - 5.5.9.2 the *market reserve price* applicable to any *reserve provider group* of any *market participant* for any *settlement interval*; or
 - 5.5.9.3 the *market regulation price* applicable to any *market participant* for any *settlement interval*,
- and the *EMC* shall not investigate the subject-matter of a *notice of disagreement* to the extent that it relates to any of the elements noted in sections 5.5.9.1 to 5.5.9.3
- 5.5.10 Nothing in section 5.5.9 shall prevent a *market participant* from submitting, or the *EMC* from investigating, a *notice of disagreement* that relates to the manner in which any of the elements noted in sections 5.5.9.1 to 5.5.9.3 have been applied for purposes of the calculation of the *market participant's net settlement amount*.

5.6 FINAL SETTLEMENT STATEMENT COVERAGE

- 5.6.1 In accordance with the timelines set forth in section 5.2.3, the *EMC* shall issue *final settlement statements* to each *market participant* to cover transactions in the *real-time markets*.
- 5.6.2 The *final settlement statement* shall be in the same form as the *preliminary settlement statement* and shall include all of the information provided in the *preliminary settlement statement*, except as amended following the validation procedure set forth in section 5.5, and/or as adjusted based on any corrected *metering data* received by the *EMC* pursuant to Appendix 7B, where applicable.
- 5.6.3 In accordance with the provisions of sections 5.5.6 and 5.5.7, *final settlement statements* shall include any required adjustments as a credit or debit to each affected *market participant* resulting from *settlement disagreements* that have been resolved prior to the date of issuance of the *final settlement statements*.

- 5.6.4 Each *market participant* that receives a *final settlement statement* is required to pay any net debit on the corresponding *market participant payment date* and shall be entitled to receive any net credit shown in the *final settlement statement* on the corresponding *EMC payment date*, whether or not there is any outstanding disagreement regarding the amount of the debit or credit.
- 5.6.5 If a *market participant* disagrees with an item or calculation set forth on a *final settlement statement*, other than in respect of the calculation of the element referred to in sections 5.5.9.1 to 5.5.9.3, the provisions of section 5.6.6 shall apply. No *market participant* may refer to the *dispute resolution counsellor* under section 5.6.6 a dispute that relates to the calculation of the elements referred to in sections 5.5.9.1 to 5.5.9.3, provided that nothing in this section 5.6.5 shall prevent a *market participant* from referring to the *dispute resolution counsellor* a dispute that relates to the manner in which any such elements have been applied for the purposes of the calculation of the *market participant's* net *settlement amount*.
- 5.6.6 If a *market participant*, after having made reasonable efforts to resolve with the *EMC* any disagreement pertaining to a *final settlement statement*, wishes to continue to dispute the matter it shall, subject to section 5.6.7, refer the matter to the *dispute resolution counsellor* pursuant to section 3.9.2 of Chapter 3 and shall indicate, in the *notice of arbitration* submitted to the *dispute resolution counsellor* for such purpose, the contested amount.
- 5.6.7 No *market participant* may submit, and the *dispute resolution counsellor* shall not accept or take any action with respect to, a notice filed pursuant to section 5.6.6 if:
- 5.6.7.1 where the dispute relates to the accuracy of *metering data*, more than forty *business days* has elapsed since the date on which the *final settlement statement* to which the *notice of arbitration* relates was issued; or
- 5.6.7.2 in all other cases, more than twenty *business days* has elapsed since the date on which the *final settlement statement* to which the *notice of arbitration* relates was issued.
- 5.6.8 The *dispute resolution counsellor* shall dismiss a notice filed pursuant to section 5.6.6 and shall not take any further action with respect to the notice if the element of the *final settlement statement* that is the subject-matter of the notice is one referred to it in violation of section 5.6.5 or is identical to the same element in the corresponding *preliminary settlement statement* unless the *market participant* demonstrates that it could not,

with the exercise of due diligence, have filed a *notice of disagreement* in respect of that *preliminary settlement statement*.

5.7 FINAL SETTLEMENT STATEMENT RECALCULATIONS

5.7.1 The *EMC* shall not recalculate *final settlement statements*. Except where section 5.8.6 applies,

5.7.1.1 any adjustments required to reflect the resolution of a dispute commenced pursuant to section 5.6.6 shall appear as a separate line item in the applicable *preliminary settlement statements* issued on the *business day* immediately following the date of resolution of the dispute; and

5.7.1.2 any adjustments to be made pursuant to Appendix 7B in respect of a *trading day* for which a *final settlement statement* has already been issued shall appear as a separate line item in the applicable *preliminary settlement statements* in accordance with Appendix 7B.

5.8 SETTLEMENT INVOICES

5.8.1 Each *invoice* issued by the *EMC* to a *market participant* shall be based on any *final settlement statements* that have not otherwise been *invoiced* at that time. In each *invoice*:

5.8.1.1 each line item shall correspond to a distinct commodity or service for transactions effected on the *trading days* to which the *invoice* relates; and

5.8.1.2 the *settlement ID* appearing on the *invoice* shall allow *invoice* line items to be cross-referenced to the relevant *final settlement statements*.

5.8.2 Each *invoice* issued by the *EMC* to a *market participant* shall show:

5.8.2.1 the dollar amounts which are to be paid by or to the *market participant*, according to the *settlement statements* as specified in section 5.8.1;

5.8.2.2 the *market participant payment date* by which such dollar amounts, if any, are to be paid by the *market participant* no later than the *close of banking business*;

5.8.2.3 the *EMC payment date* by which the *EMC* is to make payments, if any, to the *market participant* no later than the *close of banking business*; and

- 5.8.3 *Invoices* shall be considered issued to *market participants* when released by the *EMC* in accordance with the applicable *market manual*.
- 5.8.4 It is the responsibility of each *market participant* to notify the *EMC* if it fails to receive, or it is unable to access and obtain, an *invoice* on a given *business day* in the manner specified in the applicable *market manual*. Each *market participant* shall be deemed to have received its *invoice* on the *business day* on which the *invoice* has been made available in accordance with section 5.8.3, unless it notifies the *EMC* to the contrary in accordance with the applicable *market manual*.
- 5.8.5 In the event that a *market participant* notifies the *EMC* that it has failed to receive, or it is unable to access and obtain, an *invoice* in accordance with the applicable *market manual*, the *EMC* shall re-release or make available the applicable *invoice* and the *invoice* shall be considered issued and received on the date such *invoice* is re-released or made available to the *market participant* by the *EMC*.
- 5.8.6 Notwithstanding any provision in the *market rules*, the *EMC* may issue an *invoice* to:
- 5.8.6.1 any person whose registration as a *market participant* has expired pursuant to section 4.1.4 of Chapter 2; or
- 5.8.6.2 any person who is a *terminated market participant*,
- in respect of all adjustment amounts payable by or to such person pursuant to these *market rules* and the *EMC* shall not be required to issue a *preliminary settlement statement* or a *final settlement statement* in respect of any such adjustment amounts. For each such *invoice*, the *EMC* shall calculate a net *invoice* amount, being the aggregate of all amounts stated therein as payable by or to such person. Such net *invoice* amount shall be a positive or negative dollar amount for that person and:
- a. where such net *invoice* amount is negative, the absolute value of the net *invoice* amount shall be an amount payable by that person to the *EMC*; or
 - b. where such net *invoice* amount is positive, the absolute value of the net *invoice* amount shall be an amount receivable by that person from the *EMC*.

5.9 PAYMENT OF INVOICES

- 5.9.1 Subject to section 5.9.2, each *market participant* shall pay the full net *invoice* amount by the *close of banking business* on the *market participant payment date* shown on that *invoice* regardless of whether or not the

market participant has initiated or continues to have a dispute respecting the net *invoice* amount payable.

- 5.9.1A For the avoidance of doubt, a *market participant*'s payment liability under the *market rules* shall be deemed to have been incurred by the *market participant* at the time of the relevant act, omission or event in respect of which such payment liability accrues to the *market participant* under the *market rules*, subject only to the determination, at a later date in accordance with the *market rules*, of the quantum to be paid by that *market participant* therefor.
- 5.9.2 A *market participant* may pay at an earlier date than the *market participant payment date* in accordance with the following:
- 5.9.2.1 notification must be given to the *EMC* before submitting such prepayment or before converting an existing overpayment by the *market participant* into a prepayment;
- 5.9.2.2 the prepayment notification shall specify the dollar amount prepaid;
- 5.9.2.3 a prepayment shall be made by the *market participant* into the *EMC settlement clearing account*;
- 5.9.2.4 the *EMC* shall keep a separate ledger balance of the aggregate of such prepayments at any point in time; and,
- 5.9.2.5 subject to section 7.5.3 of Chapter 2, funds under such a ledger balance may be applied by the *EMC* to any outstanding financial obligations of that *market participant* to the *EMC* for transactions carried out in the *wholesale electricity markets*.
- 5.9.3 With respect to the recovery of the *EMC*'s administrative costs referred to in section 4.2.1, the *EMC* may instruct the bank where the *EMC settlement clearing account* is held to debit the *EMC settlement clearing account* and transfer to the relevant *EMC operating account* sufficient funds to pay in full the amount of such costs falling due on any *EMC payment date* in priority to any other payments to be made on that *EMC payment date* or on subsequent days out of the *EMC settlement clearing account*.
- 5.9.4 The *EMC* shall, by any *EMC payment date*, determine the amounts available in the *EMC settlement clearing account* for distribution to *market participants* and make payment accordingly no later than the *close of banking business* on the *EMC payment date*.
- 5.9.5 A person who is issued an *invoice* under section 5.8.6 shall, notwithstanding the expiration or termination of such person's

registration as a *market participant*, pay to the *EMC* the net *invoice* amount payable by that person under such *invoice* within 20 *business days* of the date of such *invoice*. Where the net *invoice* amount under the *invoice* issued under section 5.8.6 is payable by the *EMC* to such person, the *EMC* shall pay to that person the net *invoice* amount within 20 *business days* of the date of such *invoice*.

5.10 FUNDS TRANSFER

- 5.10.1 All payments by *market participants* in respect of *settlement* matters shall be made to the applicable *EMC bank account* via *electronic funds transfer* and shall be effected by the dates and times specified in this Chapter.
- 5.10.2 All payments by the *EMC* to *market participants* in respect of *settlement* matters shall be made to each *market participant's market participant bank account* via *electronic funds transfer* and shall be effected by the dates and times specified in this Chapter.
- 5.10.3 In the event of failure of any *electronic funds transfer* system affecting the ability of either a *market participant* or the *EMC* to make payments, the affected party shall arrange for alternative means of payment so as to ensure that payment is effected by the dates and times specified in this Chapter.
- 5.10.4 Each *electronic funds transfer* shall only comprise amounts attributable to one *invoice* or prepayment, unless such *electronic funds transfer* is in such form as may be specified in the applicable *market manual*.

5.11 CONFIRMATION NOTICES

- 5.11.1 At the end of each month, the *EMC* shall issue a *monthly confirmation notice* to each *market participant* which shall contain statements of the amounts received from or paid out to the *market participant* on each *market participant payment date* and *EMC payment date* in that month and any payments outstanding.

5.12 PAYMENT DEFAULT

- 5.12.1 The *EMC* shall ascertain if the full amount due by any *market participant* has been remitted to the *EMC settlement clearing account* by the end of the *business day* following the *market participant payment date*.
- 5.12.2 A *market participant* shall notify the *EMC* immediately if it becomes aware that a payment for which it is responsible will not be remitted to the *EMC settlement clearing account* on time and shall provide the reason for the delay in payment.

- 5.12.3 If the full amount due by a *market participant* has not been remitted after accounting for any prepayments made by the *market participant* pursuant to section 5.9.2, the provisions of section 7.3 of Chapter 3 shall apply and *default interest* shall accrue on all amounts outstanding.
- 5.12.4 The *EMC* shall be authorised to borrow short-term funds to clear the credits in any *settlement cycle* only if the following conditions are met:
- 5.12.4.1 there are insufficient funds remitted into the *EMC settlement clearing account* to pay all *market creditors* due for payment from the funds in the *EMC settlement clearing account*, and clear the *EMC settlement clearing account* on a given *EMC payment date*, due to payment default by one or more *market participants* in the *real-time markets*; and
- 5.12.4.2 after taking the action described section 5.12.6, the *EMC* has no funds available to it in other accounts which it is permitted to transfer to the *EMC settlement clearing account*.
- 5.12.5 If the *EMC* borrows short-term funds pursuant to section 5.12.4, it shall recover this borrowing by taking all steps against the *defaulting market participant* as provided for in these *market rules* and as referred to in section 9.1.2.2 of Chapter 2 and then, if necessary, by imposing the *default levy* in accordance with section 9 of Chapter 2.
- 5.12.6 If there are insufficient funds remitted into the *EMC settlement clearing account* to pay all *market creditors* due for payment from the funds in the *EMC settlement clearing account*, and clear the *EMC settlement clearing account* on a given *EMC payment date* due to default by one or more *market participants* in the *real-time markets* the *EMC* shall transfer funds from the *EMC settlement reserve account* to the *EMC settlement clearing account* to clear it no later than the *close of banking business* on that *EMC payment date*.
- 5.12.7 If there is still insufficient funds to pay all *market creditors* after the application of rule 5.12.6 in relation to amounts payable by the *EMC* on a particular *EMC payment date*, then *EMC* shall pro-rata all payments due to *market creditors* calculated in accordance with the following formula:

$$(TIF_{sd} / TOF_{sd}) \times AO_{mp, sd}$$

Where:

TIF_{sd} = Total amount actually received for a settlement date

TOF_{sd} = Total amount owed to *market creditors* for a settlement date

$AO_{mp, sd}$ = Amount owed to a *market creditor* for a settlement date

5.13 PAYMENT ERRORS, ADJUSTMENTS, AND INTEREST

- 5.13.1 If a *market participant* receives an overpayment on any *EMC payment date*:
- 5.13.1.1 the *market participant* shall notify the *EMC* of such overpayment within two *business days* of the overpayment or immediately as soon as the *market participant* thereafter becomes aware of the situation;
 - 5.13.1.2 if the *EMC* determines or becomes aware of the overpayment prior to being notified by the *market participant*, the *EMC* shall notify the *market participant* of the overpayment;
 - 5.13.1.3 the *market participant* receiving the overpayment shall, until it has repaid the overpayment to the *EMC*, be deemed to be holding the amount of such overpayment in trust for any other *market participants* that may have been underpaid in consequence of such overpayment, pro rata to the amount of the underpayment;
 - 5.13.1.4 if not repaid fully within two *business days* of receiving the overpayment, the *EMC* shall be entitled to treat the overpayment and any interest accruing thereon as an unpaid amount to which section 5.12 applies; and
 - 5.13.1.5 if not repaid fully within two *business days* of receiving the overpayment, the unpaid amount of any overpayment shall bear interest at the *default interest rate* from the date of overpayment until the date on which repayment is credited to the *EMC's* relevant *bank account*.
- 5.13.2 The *EMC* shall be responsible for identifying any *market participants* who have been underpaid as a result of an overpayment to another *market participant*.
- 5.13.3 The *EMC* shall pay any underpaid *market participant* for the amounts of their underpayment, including interest calculated from the date the *market participant* should have been paid, as soon as practicable following repayment by the overpaid *market participant*.
- 5.13.4 If a *market participant* has overpaid the *EMC* on any *market participant payment date*:
- 5.13.4.1 the *market participant* shall notify the *EMC* of such overpayment within two *business days* or immediately as soon

- as the *market participant* thereafter becomes aware of the situation;
- 5.13.4.2 if the *EMC* determines or becomes aware of such overpayment prior to being notified by the *market participant*, the *EMC* shall notify the *market participant* accordingly;
- 5.13.4.3 the *market participant* may request that the overpaid amount be either refunded or treated as a prepayment in accordance with section 5.9.2; and
- 5.13.4.4 any related administration and transaction costs incurred by the *EMC* in managing and resolving the overpayment shall be charged to the account of the *market participant* involved.
- 5.13.5 If the *EMC* underpays any *market participant* on any *EMC payment date*:
- 5.13.5.1 the *market participant* shall notify the *EMC* of such underpayment within two *business days* or immediately as soon as the *market participant* thereafter becomes aware of the situation;
- 5.13.5.2 if the *EMC* determines or becomes aware of the underpayment prior to being notified by the *market participant*, the *EMC* shall notify the *market participant* accordingly; and
- 5.13.5.3 the *EMC* shall use all reasonable endeavours to promptly correct any underpayments, including interest thereon at the *default interest rate*.
- 5.13.6 If the *EMC* is underpaid by a *market participant* on any *market participant payment date*, the provisions of section 5.12 shall apply.
- 5.13.7 If the *EMC* debits the *EMC settlement reserve account* on an *EMC payment date* because a payment due from a *market participant* was received too late to be credited to the *EMC settlement clearing account* by the *close of banking business* on the *market participant payment date* when such payment was due, then such remittance when it does arrive shall be credited to the *EMC settlement reserve account* to replenish the debited amount. Any such late payments shall be charged interest at the *default interest rate*.
- 5.13.8 If the *EMC* holds or has under its control after five *business days* from receipt in the *EMC settlement clearing account* amounts which it ought properly to have paid to *market participants*, such *market participants* shall be entitled to interest on such amounts at the *default interest rate* from the date on which the *EMC* commenced to improperly hold or have such amounts under its control to the date on which such amounts are paid to the relevant *market participants*.

- 5.13.9 Monies in the *EMC bank accounts* at the end of each year which have been earned from interest on funds in the *EMC bank accounts* and which are not attributable to any incomplete *settlement process* or outstanding *settlement* dispute shall be used to off-set the *EMC's* administrative costs referred to in section 4.2.1 in the following year.

5.14 SETTLEMENT FINANCIAL BALANCE/MAXIMUM AMOUNT PAYABLE BY EMC

- 5.14.1 The *EMC* shall provide and operate a *settlement* control process to monitor the financial balance of the calculated charges and payments so as to ensure that, subject to section 5.14.3:
- 5.14.1.1 for *settlement interval* transactions the sum of all payments for all *market creditors* involved in such *settlement interval* transactions exactly equal the sum of all charges for *market debtors* involved in such *settlement interval* transactions for each *trading day*; and
- 5.14.1.2 for all non-*settlement interval* transactions, the sum of all payments to *market creditors* of those transactions exactly equals the sum of all charges to *market debtors* of those transactions.
- 5.14.2 Subject to the provisions of section 5.12, the *EMC* shall not be liable to make payments in excess of the amount it receives for transactions in the *real-time markets*.
- 5.14.3 If there is an aggregate imbalance for all transactions for a given *trading day* the *EMC* shall, in accordance with section 5.14.4 or by such other means as the *EMC* determines appropriate, recover that portion of the imbalance that arises by virtue of the rounding of *settlement amounts* or of an adjustment to the *settlement statement* of one *market participant* that is too small to be reflected in corresponding *settlement statements* of other *market participants* provided that:
- 5.14.3.1 the manner of calculation of that portion of the imbalance can be evidenced in a manner satisfactory for purposes of the audit referred to in section 5.15; and
- 5.14.3.2 that portion of the imbalance has accumulated to an amount which is sufficient to permit recovery.
- 5.14.4 The *EMC* may recover the portion of an aggregate imbalance referred to in section 5.14.3 by means of an adjustment to a *settlement statement* applied:

- 5.14.4.1 to each *market participant* to whom *energy* uplift charges may be allocated pursuant to these *market rules*;
- 5.14.4.2 in the same manner as *energy* uplift charges; and
- 5.14.4.3 in respect of all *settlement intervals* of the *trading day* in which the portion of such aggregate imbalance is determined to arise and be recoverable pursuant to section 5.14.3.

5.15 AUDIT

- 5.15.1 The audit of *settlement* functions referred to in this section 5.15 shall serve to examine and evaluate compliance with management control objectives and operational effectiveness of *settlement processes* and procedures.
- 5.15.2 The audits referred to in section 5.15.3 shall be performed by an external, independent auditing firm at least annually and more often if requested by the *EMC Board*.
- 5.15.3 Notwithstanding the *market commencement date*, the *EMC* shall direct a comprehensive external audit of the *settlement processes* and procedures with respect to the period commencing on the *market commencement date* and ending on the financial year end of the *EMC*. Subsequent external audits for similar purposes shall be conducted with respect to the period of time that coincides with the *EMC's* financial year. All external audits shall include the following tasks:
 - 5.15.3.1 gauge the performance of the *settlement process* in meeting the objectives of these *market rules*;
 - 5.15.3.2 review the accuracy and timeliness of the production of *settlement statements*, including *settlement* calculations and financial allocations;
 - 5.15.3.3 review the accuracy and timeliness of the production of *invoices* and supporting market and system information;
 - 5.15.3.4 review the reliability and integrity of the market and system operational data used in the *settlement processes* and procedures;
 - 5.15.3.5 review the reliability and security of the information technology system infrastructure used to measure, validate, classify, compute and report *settlement* information;
 - 5.15.3.6 review the adequacy of *settlement processes* and procedures to safeguard *confidential information* relating to *settlement processes*; and

- 5.15.3.7 review the adequacy and effectiveness of risk management controls of the *settlement processes* and tools.
- 5.15.4 *Settlement statements*, financial *settlement* records and any documentation pertaining to the *EMC's settlement* activities shall be kept in secure storage for a period of at least six years and made available for auditing purposes.
- 5.15.5 An audit report shall be prepared by the auditors in respect of each audit conducted pursuant to this section 5.15 and shall be commissioned on the basis that the audit report must be provided to the *EMC* within one month after completion of the audit activities.
- 5.15.6 Each audit report prepared pursuant to this section 5.15 shall be provided to all *market participants*, the *PSO* and the *Authority*, subject to such measures as may be required to be taken to safeguard any *confidential information* contained in such audit report.

5.16 BANK ACCOUNTS

- 5.16.1 The *EMC* shall establish and maintain the *bank accounts* described in this section 5.16 for the operation of its *settlement* and *invoicing* processes and for such other purposes as may be prescribed or contemplated under the *market rules* or any *market manual*.
- 5.16.2 The *EMC* shall maintain its *bank accounts* at a single bank or financial institution in Singapore approved by the *EMC Board*. The *EMC* shall *publish* the name of such bank or financial institution.
- 5.16.3 The *EMC* may change the bank or financial institution or the details of any of its *bank accounts*, on the condition that the bank or financial institution is reasonably acceptable to the *EMC Board* and that all *market participants* are notified by the *EMC* in writing at least 60 *business days* before the change takes effect.
- 5.16.4 The *EMC* shall obtain lines of credit and other banking facilities it deems necessary for the operation of the *bank accounts* described in this section 5.16, which lines of credit and other banking facilities shall not exceed an aggregate amount approved by the *EMC Board*.
- 5.16.5 In addition to those *bank accounts* referred to in this section 5.16 as may be necessary to implement the *settlement* and *invoicing* processes outlined in this Chapter, the *EMC* may establish *bank accounts* at its bank or financial institution described in section 5.16.2. *Market participants* shall be notified 60 *business days* prior to any such additional *bank accounts* becoming operational.

- 5.16.6 The *EMC* shall open and maintain the *EMC settlement clearing account* as a single *bank account* to and from which all *settlement* payments shall be made in accordance with the provisions of this Chapter.
- 5.16.7 The *EMC* shall open and maintain the *EMC settlement reserve account*, which *bank account* shall operate as follows:
- 5.16.7.1 the *EMC settlement reserve account* shall be a single *bank account* established to provide, in the event of default in payment by a *market participant*, the transfer of necessary funds from this *bank account* to clear the *EMC settlement clearing account*; and
- 5.16.7.2 when required, funds shall be transferred to the *EMC settlement clearing account* to cover or reduce any deficits in accordance with the provisions of section 5.12.6.
- 5.16.8 The *EMC* shall open and maintain the *EMC adjustment account*, which *bank account* shall operate as follows:
- 5.16.8.1 the *EMC adjustment account* shall be a single *bank account* established to receive and disburse payments related to financial penalties, damages, fines and payment adjustments arising from resolved *settlement* disputes, and to reimburse the *EMC* for any associated costs or expenses;
- 5.16.8.2 any amounts paid into the *EMC adjustment account* by *market participants* shall first be applied to reimburse the *EMC* in respect of any costs or expenses described in section 5.16.8.1 which it has or will incur. Any remaining amount shall be credited to the *EMC adjustment account*; and
- 5.16.8.3 if the credit balance of the *EMC adjustment account* exceeds an amount specified by the *EMC Board*, such excess shall be used to reduce the *EMC's* administrative costs referred to in section 4.2.1 in the following year.
- 5.16.9 Unless otherwise specified, the *EMC* shall recover all banking costs reasonably incurred in opening and operating the *EMC's bank accounts* as part of the recovery of the *EMC's* administrative costs referred to in section 4.2.1.
- 5.16.10 Each *market participant* shall be required to open and maintain a *market participant bank account* at the bank or financial institution at which the *EMC* maintains its *bank accounts* at any given time.

Explanatory Note –The previous clause allows the continuation of the existing arrangement whereby all market participants maintain their bank accounts at a single bank. However, the EMC has the choice of which bank to use, and market participants are required to follow suit.

5.16.11 Each *market participant* shall inform the *EMC* of all applicable information required for the *EMC* to make payment to or from the *market participant's market participant bank account*.

5.16.12 Subject to section 5.16.10, any *market participant* may change details of its *bank account*, on the condition that the *EMC* is notified in writing at least 20 *business days* before the change takes effect.

5.17 APPLICATION TO MSSL

5.17.1 The provisions of sections 5.1 to 5.16 shall apply to a *market support services licensee* that, on its own behalf or on behalf of any person in respect of which it provides *market support services* pertaining to the *wholesale electricity markets*, is or may be entitled to receive a *settlement amount* from, or required to pay a *settlement amount* to, the *EMC* and, for this purpose, all references in those sections to a *market participant* shall be deemed to include a reference to a *market support services licensee*.

5.17A APPLICABILITY TO MARKET PARTICIPANTS OF NON-EXPORTING EMBEDDED INTERMITTENT GENERATION FACILITIES

5.17A.1 The provisions of sections 5.1 to 5.16 shall not apply to a *market participant* that is registered as a *market participant* for the sole purpose of registering one or more *generation facilities* as one or more *non-exporting embedded intermittent generation facilities*. All references in those sections to a *market participant* shall be deemed to exclude a reference to a *market participant* that is registered as a *market participant* for the sole purpose of registering one or more *generation facilities* as one or more *non-exporting embedded intermittent generation facilities*.

5.18 AGGREGATE INTERTIE AMOUNTS

5.18.1 The *EMC* shall, determine *intertie energy* quantities for the *settlement interval* corresponding to each *dispatch period*, as follows:

IMQ_h^i = Aggregate *intertie* import quantities (in MWh) flowing into the *transmission system* due to *intertie flows* at *MNN i* in *settlement interval h*

IXQ_h^i = Aggregate *intertie* export quantities (in MWh) flowing out of the *transmission system* due to *intertie flows* at *MNN i* in *settlement interval h*

5.18.2 The *EMC* shall, determine aggregate *intertie* amounts for the *settlement interval* corresponding to each *dispatch period* using the quantities determined in section 5.18.1 and applicable *energy prices*, as follows:

IMA_h = $\sum_i MEP_h^i \times IMQ_h^i$

where:

h = a *settlement interval*

\sum_i = sum over all *MNNs i* associated with *interties*

IXA_h = $\sum_i USEP_h \times IXQ_h^i$

where:

h = a *settlement interval*

\sum_i = sum over all *MNNs i* associated with *interties*

5.18.3 The *EMC* shall on a monthly basis produce and submit a report containing the values in sections 5.18.1 and 5.18.2 to the *Authority*.

APPENDIX A - CALCULATION OF RESERVE RESPONSIBILITY SHARES

A.1 PURPOSE

A.1.1 This Appendix describes the procedure that the *EMC* shall use to determine *reserve responsibility shares* (RRSs) for the purpose of allocating the costs of *reserves* among *GRFs* in each *settlement interval* as contemplated in section 2.2.4 of this Chapter. Unless otherwise indicated, each procedure described in this Appendix shall be applied for each *settlement interval*.

A.2 DEFINITIONS

A.2.1 In this Appendix:

A.2.1.1 a reference to the “size” of a *GRF* in the *settlement interval* corresponding to a *dispatch period* shall be designated by *SZ*, where, subject to section 10.3.3 of Chapter 6:

$$SZ = (\frac{1}{2}\text{-hour}) \times \text{energy scheduled (in MW) from the real-time dispatch schedule for that GRF in that dispatch period}$$

A.2.1.2 “*secondary contingency unit*” or *SCU* means a *GRF* that is expected to *disconnect automatically* from the *transmission system* if the frequency of the *transmission system* falls due to failure of the largest *GRF*, and “*SCU m*” refers to the *SCU* at *MNN m*;

A.2.1.3 “*cut-off size*” or *CSZ* (in MWh) means the size below which a *GRF* that is not a *secondary contingency unit* will not pay a share of the cost of *reserve* but will pay for *regulation*. *CSZ* is 5 MWh;

A.2.1.4 “*primary contingency unit*” or *PCU* means a *GRF* whose size is greater than *CSZ* and that is not a *secondary contingency unit*, and:

a. “*PCU m*” refers to the *PCU* at *MNN m*; and

b. “*PCU z*” refers to the *PCU* with size index *z*; and

A.2.1.5 “*probability of failure*”, in respect of a *GRF*, means the probability that that *GRF* will, after being *dispatched* by the *PSO* for a *dispatch period*, cease operating, *disconnect* from the *transmission system*, or both in that *dispatch period* even if no other *GRF* fails.

Explanatory Note: System reserve requirements are determined by the largest contingency, defined as the loss of the largest PCU with the consequent loss of all SCUs, so the total reserve requirement (TRQ) is the size of the largest PCU plus the sizes of all SCUs. The RRS for each SCU is that unit’s size as a fraction of the TRQ, which means that each SCU pays the full cost of the reserve necessary to protect the system against its own outage, whether from primary or secondary causes, and hence need not contribute again as a primary contingency.

All PCUs share the remaining reserve costs – which pays for enough reserve to cover the loss of the largest unit – according to a “modified runway” formula. The basic concept behind this formula is that no unit should pay for reserves that are necessary only to protect against loss of a unit larger than itself, but each unit should pay a share of the costs of each “tier” of the reserve requirement that is protecting against loss of units its size or smaller. The RRS for each PCU is determined as follows:

- The first tier of the total reserve requirement (in MWh) is defined as the difference between the sizes of the largest and the second-largest PCUs. The largest PCU is allocated all of this first tier of reserves, on the grounds that this tier is necessary only because the largest unit is producing more than the second-largest unit.
- The second tier of reserves is defined as the difference between the sizes of the second- and the third-largest units. The largest two units share the costs of this tier on the grounds that this tier of reserves is necessary only because these two units are larger than the third-largest unit. The sharing of costs is in proportion to failure probabilities on the grounds that a less reliable unit should pay more than a more reliable unit.

The “nth” tier of reserves is defined as the difference between the sizes of the nth- and the (n+1)th-largest unit. The first nth-largest units share the cost of this tier in proportion to their individual failure probabilities.

This process is repeated until all PCUs are allocated a share of the total cost of reserves. The shares of all SCUs and all PCUs add up to 1.0.

Units that are not SCUs and with size less than CSZ do not pay for operating reserves, but all units pay for regulation (at the same \$/MWh charge paid by loads) in proportion to their IEQ up to CSZ.

A.3 IDENTIFICATION OF SECONDARY CONTINGENCY UNITS

- A.3.1 The *EMC* shall, in consultation with the *PSO*, establish criteria for identifying *SCUs*, and shall, from time to time but not for each *settlement interval*, use such criteria to identify the *GRFs* designated as *SCUs*.
- A.3.2 The *EMC* shall maintain and update as required a register indicating which *GRFs* are designated as *SCUs*.
- A.3.3 If *GRF n* has been designated as an *SCU*, it may be referred to as “*SCU n*”.

A.4 IDENTIFICATION AND ORDERING OF PRIMARY CONTINGENCY UNITS

A.4.1 If the size of a *GRF* is greater than *CSZ* and the *GRF* is not designated as an *SCU* pursuant to section A.3.1, the *GRF* shall be designated as a *PCU*.

A.4.2 The *EMC* shall order all *PCUs* by decreasing size to determine a size-index ($z(m)$) and the ordered size function ($OSZ(z)$), such that:

$$\begin{aligned} z(m) &= \text{integer size-index for PCU } m \\ m(z) &= \text{the } MNN \text{ } m \text{ for the PCU with size-index } z(m) \\ OSZ(z) &= SZ(m(z)) \\ OSZ(z) &\geq OSZ(z+1) \\ Z &= \text{Largest value of } z \text{ such that } OSZ(z) \geq CSZ \end{aligned}$$

A.4.3 If *GRF* m has been designated as a *PCU*, *GRF* m may be referred to equivalently as “*PCU* m ” or “*PCU* z ”, where $z = z(m)$ and $m = m(z)$.

A.5 RESERVE REQUIREMENTS

A.5.1 The primary *reserve* requirement or PRQ (in MWh) shall be defined as follows:

$$\text{PRQ} = \text{SZ}(m(1)) = \text{OSZ}(1) = \text{size of largest PCU}$$

A.5.2 The secondary *reserve* requirement or SRQ (in MWh) shall be defined as follows:

$$\text{SRQ} = \sum_s \text{SZ}(s), \text{ where } s = \text{all } MNNs \text{ corresponding to } SCUs \text{ having } \text{SZ}(s) > 0$$

A.5.3 The total *reserve* requirement (TRQ, in MWh) shall be defined as follows:

$$\text{TRQ} = \text{SRQ} + \text{PRQ}$$

A.6 RESERVE TIERS AND RESERVE TIER SHARES

A.6.1 That amount of the primary *reserve* requirement referred to in section A.5.1 which is in excess of *CSZ* shall be divided into “tiers” defined by the sizes of the *PCUs*. The term “*reserve tier z*” shall mean the portion of the primary *reserve* requirement between the size of *PCU z+1* and the size of *PCU z*.

A.6.2 The *reserve tier* quantity for *reserve tier z* or *RTQ(z)* shall be defined as follows:

$$RTQ(z) = OSZ(z) - OSZ(z+1), \text{ with } OSZ(Z+1) \equiv CSZ$$

A.6.3 The *reserve tier* share for *reserve tier z* or *RTS(z)* shall be defined as follows:

$$RTS(z) = RTQ(z) / (PRQ - CSZ)$$

A.7 FAILURE PROBABILITIES AND WEIGHTS

A.7.1 The *EMC* shall, in consultation with the *PSO*, establish procedures for determining and updating from time to time, but not for each *settlement interval*, the *probability of failure* of each *GRF* based on operating experience with that *GRF* and similar *GRFs*.

A.7.2 The *EMC* shall maintain and update as required a register indicating the standing *probability of failure* of each *GRF*, with:

$$\text{SPF}(m) = \text{Standing probability of failure of GRF } m$$

A.7.3 For each *settlement interval*, the *EMC* shall use the data in the *probability of failure* register referred to in section A.7.2 and the size-ordering of *PCUs* for that *settlement interval* determined in accordance with section A.4 to determine the interval *probabilities of failure* or *IPF(z)* and interval probability weights or *IPW(z)* for each *PCU* as follows:

$$\text{IPF}(z) = \text{SPF}(m(z))$$

where:

$$z = \text{PCU } z$$

$$\text{IPW}(z) = \sum_{i=1 \text{ to } z} \text{IPF}(i)$$

where:

$$z = \text{PCU } z$$

A.7.4 The *EMC* shall provide the standing *probability of failure* of each *GRF* to all *market participants* and the *MSSL*.

A.8 RRSs FOR SECONDARY CONTINGENCY UNITS

A.8.1 The *EMC* shall determine the *reserve responsibility share* (RRS) for an *SCU* in a *settlement interval* in accordance with the following formula:

$$\text{RRS}_{R,h}^m = 0 \text{ in cases where } \text{SZ}(m) \leq 0; \text{ and } \text{SZ}(m)/\text{TRQ}, \text{ otherwise,}$$

where:

$m = \text{SCU } m$

$h = \text{settlement interval } h$

$\text{SZ}(m)$ is determined for *SCU* m in accordance with in this Appendix for *settlement interval* h .

A.9 RRSs FOR PRIMARY CONTINGENCY UNITS

A.9.1 The ordered *reserve* share for a *PCU* or $ORS(z)$ shall be defined as follows:

$$ORS(z) = [PRQ/TRQ] \times IPF(z) \times \sum_{j=z \text{ to } Z} RTS(j)/IPW(j)$$

where:

$$z = PCU \ z$$

A.9.2 The *EMC* shall determine the *reserve responsibility share* (RRS) for a *PCU* in a *settlement interval* in accordance with the following formula:

$$RRS_{R,h}^m = ORS(z(m)),$$

where:

$$m = PCU \ m$$

$$h = \textit{settlement interval} \ h$$

$z(m)$ is the size-index of $PCU \ m$

$ORS(z(m))$ is determined for $PCU \ z(m)$ in accordance with this Appendix for *settlement interval* h .

APPENDIX B - PROCESS FOR SETTLEMENT ADJUSTMENTS FOR METERING ERRORS

B.1 PURPOSE

B.1.1 This Appendix describes the procedure for settlement adjustments to be carried out for *metering errors*.

B.1.2 In relation to *dispatch periods* commencing before 28 June 2011 (and their corresponding *settlement intervals*), the following sections in force immediately before 28 June 2011 shall apply, notwithstanding the *modifications* relating to the following sections taking effect on or from 28 June 2011:

B.1.2.1 section B.3.1;

B.1.2.2 section B.4.2; and

B.1.2.3 section B.4.2A.

B.2 **DEFINITIONS**

B.2.1 In this Appendix:

B.2.1.1 “affected *settlement account*” refers to the *settlement account* affected by a *metering error* and in respect of which corrected *metering data* has been provided by the *market support services licensee* to the *EMC* in accordance with Chapter 7 and this Appendix.

B.2.1.2 “settlement adjustment” means the computation by the *EMC* of adjustments necessitated by and relating to *metering errors* in accordance with this Appendix.

B.2.1.3 “T” refers to a given *trading day*.

B.2.1.4 “first nominated day” refers to the 45th *business day* after a given *trading day*, i.e. T+45.

B.2.1.5 “second nominated day” refers to the 250st *business day* after a given *trading day*, i.e. T+250.

B.2.1.6 “T+5 submission” means the submission of *metering data* by the *market support services licensee* to the *EMC* on or before 5pm on T+5.

B.2.1.7 “T+9 submission” means the submission of *metering data* and/or corrected *metering data* by the *market support services licensee* to the *EMC* in respect of *settlement accounts* affected by *metering errors* discovered on or before T+9.

B.2.1.8 “first nominated day submission” means the submission of *metering data* and/or corrected *metering data* by the *market support services licensee* to the *EMC* within the relevant submission time stated in section B.3.1 in respect of *settlement accounts* affected by *metering errors* discovered on or before the first nominated day.

B.2.1.9 “second nominated day submission” means the submission of *metering data* and/or corrected *metering data* by the *market support services licensee* to the *EMC* within the relevant submission time stated in section B.3.1 in respect of *settlement accounts* affected by *metering errors* discovered on or before the second nominated day.

B.2.2 For the avoidance of doubt, unless otherwise expressly indicated, a reference in this Appendix to “T+X” is a reference to the Xth *business day* after a given *trading day* T.

B.3 **SCHEDULE OF METERING DATA TO BE SUBMITTED BY THE
MARKET SUPPORT SERVICES LICENSEE TO THE EMC FOR
SETTLEMENT PURPOSES**

- B.3.1 Subject to section B.1.2, the *market support services licensee* shall, in accordance with the schedule below, submit the relevant *metering data* or corrected *metering data* to the *EMC*:

Submission Time	Content of <i>Metering Data</i>	Purpose	The change in IEQ (Δ IEQ), WEQ (Δ WEQ), WDQ (Δ WDQ), WFQ (Δ WFQ) or WMQ (Δ WMQ) for affected <i>settlement accounts</i> to be used for settlement adjustment in B.4.
On T+5, no later than 5.00pm	<i>Metering data</i> for all <i>settlement accounts</i> for trading day T.	<i>Preliminary settlement statement</i> for trading day T as set out in section 5.4 of this Chapter.	NA
On T+9, no later than 5.00pm	<p><i>Metering data</i> for all <i>settlement accounts</i> for trading day T corrected for all <i>metering errors</i> discovered up to T+9.</p> <p>The <i>market support services licensee</i> shall not submit any <i>metering data</i> on T+9 unless one or more correction is/are to be made to the <i>metering data</i> of the T+5 submission due to <i>metering errors</i> discovered up to T+9.</p>	<i>Final settlement statement</i> for trading day T as set out in section 5.6 of this Chapter.	NA

<p>First nominated day submission</p> <p>After 5.00pm on T+9 to no later than 5.00pm on T+47</p>	<p><i>Metering data</i> for all <i>settlement accounts</i> for <i>trading day T</i> corrected for all <i>metering errors</i> (if any) discovered on or before the first nominated day.</p>	<p>Settlement adjustment for <i>trading day T</i> in respect of <i>metering errors</i> discovered on or before the first nominated day but not previously reported to the <i>EMC</i> on or before 5:00pm on T+9 pursuant to this Appendix.</p>	<p>Difference between the value in the latest first nominated day submission and the value used for the <i>final settlement statement</i> for <i>trading day T</i>.</p>
<p>Second nominated day submission</p> <p>After 5.00pm on T+47 to no later than 5.00pm on T+252</p>	<p><i>Metering data</i> for all <i>settlement accounts</i> for <i>trading day T</i> corrected for all <i>metering errors</i> (if any) discovered on or before the second nominated day.</p>	<p>Settlement adjustment for <i>trading day T</i> discovered on or before the second nominated day but not previously reported to the <i>EMC</i> on or before 5:00pm on T+47 pursuant to this Appendix.</p>	<p>Difference between the value in the latest second nominated day submission and the value in the latest first nominated day submission, and if there is no first nominated day submission, the value used for the <i>final settlement statement</i> for <i>trading day T</i>.</p>

- B.3.2 The *market support services licensee* shall not submit any further *metering data* for *trading day T* after 5.00pm on T+252.
- B.3.3 The *EMC* shall not effect any settlement adjustment for *trading day T* in respect of any *metering data* for *trading day T* submitted after 5.00pm on T+252.

B.4 METHODOLOGY OF SETTLEMENT ADJUSTMENT

B.4.1 Settlement adjustment shall be effected by the *EMC* only for affected *settlement accounts*.

B.4.2 Subject to section B.1.2, the *metering error* adjustments for each affected *settlement account* for each *settlement interval* shall be determined as follows:

Generation *metering error* adjustment for *energy* (GMEE) and generation *metering error* adjustment for fees (GMEF) shall be determined as follows:

$$GMEE_h^a = \sum_{m(a)} (MEP_h^{m(a)} \times \Delta IEQ_h^{m(a)})$$

$$GMEF_h^a = \sum_{m(a)} (PSOA_h + EMCA_h) \times \Delta IEQ_h^{m(a)}$$

Load metering error adjustment (LMEA) shall be determined as follows:

$$LMEA_h^a = [(USEP_h + AFP_h + HEUR_h) \times \Delta WEQ_h^a] + [HLCU_h \times \Delta WDQ_h^a] + [MEUC_h \times \Delta WMQ_h^a] + [(PSOA_h + EMCA_h) \times \Delta WFAQ_h^a]$$

Net *metering error* adjustment (NMEA) shall be determined as follows:

$$NMEA_h^a = GMEE_h^a - GMEF_h^a - LMEA_h^a$$

Where:

- (i) $MEP_h^{m(a)}$, $USEP_h$, AFP_h , $HEUR_h$, $HLCU_h$, $MEUC_h$, $PSOA_h$ and $EMCA_h$ are rates computed in the *final settlement statement* for *trading day T*
- (ii) a = a *settlement account*
- (iii) h = a *settlement interval*
- (iv) $MEP_h^{m(a)}$ = *MEP* for *settlement interval h* for a *market network node* associated with *settlement account a*.
- (v) $\sum_{m(a)}$ = sum over all *GRFs m(a)* and *GSFs m(a)* associated with *settlement account a*.
- (vi) $\Delta IEQ_h^{m(a)}$, ΔWEQ_h^a , ΔWDQ_h^a , $\Delta WFAQ_h^a$ and ΔWMQ_h^a are computed based on section B.3.1 above.

- (vii) $PSOA_h$ = the rate of *PSO*'s administrative costs to be recovered from a *settlement account* for a *settlement interval* under section 4.2 of this Chapter.
 - (viii) $EMCA_h$ = the rate of *EMC*'s administrative costs to be recovered from a *settlement account* for a *settlement interval* under section 4.2 of this Chapter.
- B.4.2A Subject to section B.1.2, generation *metering error* adjustment for fees (GMEF) shall not be applicable to a *settlement account* associated with an *EGF group*.
- B.4.3 The NMEA for an affected *settlement account* for a given *trading day* shall be aggregated and shall appear as a separate line item in the relevant *market participant's preliminary settlement statement* issued on the *business day* immediately following the date of completion of settlement adjustment relating to the first nominated day or second nominated day, as the case may be.
- B.4.4 Where the sum of NMEA for all affected *settlement accounts* for a *settlement interval* is not a zero value, such imbalance shall be allocated through HEUA as set out in Section 3.5.1 of this Chapter in the *preliminary settlement statements* issued on the *business day* immediately following the date of completion of settlement adjustment relating to the first nominated day or the second nominated day, as the case may be.

Explanatory Note: The sum of NMEA for all affected settlement accounts in a settlement interval may not be zero. This may, for example, happen when the amount of NMEA for an affected settlement account cannot be exactly offset by a corresponding amount of NMEA for another affected settlement account.

Singapore Electricity Market Rules

Chapter 8 Definitions

Energy Market Authority

1 January 2022

1 DEFINITIONS

- 1.1 In the *market rules*:
- 1.1.1 *adequacy* means the ability of the *electricity system*, or the *power system* or the *transmission system*, as the case may be, to *supply* electrical demand and *energy* requirements at all times, taking into account *planned outages* and *forced outages* of equipment or components;
- 1.1.2 *advisory notice* means a notice issued by the *EMC* pursuant to section 9.3 of Chapter 6 to describe the incidence and extent of certain events in respect of certain *dispatch periods*;
- 1.1.3 *affiliate* means, with respect to a corporation, any corporation that is related to the first-mentioned corporation in terms of Section 6 of the Companies Act 1994;
- 1.1.4 *agent* means a service provider or other agent referred to in section 6.4.1 of Chapter 1;
- 1.1.5 *ancillary service* means a service required or provided for the *security* or *reliability* of the *electricity system*;
- 1.1.6 *ancillary service contract* means an agreement entered into between a *market participant* and the *EMC* in accordance with to section 8 of Chapter 5;
- 1.1.7 *ancillary service financier* means any person who provides financing, credit, advances or loans (or any refinancing thereof) to the *Authority* to fund the *refurbishment cost* pursuant to any *AS financing documents*;
- 1.1.8 *ancillary service funding agreement* means an agreement entered or to be entered into between the *Authority* and an *ancillary service provider* pursuant to section 8.2A.1 of Chapter 5;
- 1.1.9 *ancillary service provider* means a person that provides an *ancillary service*;
- 1.1.10 *applicable law* means all laws, regulations, subsidiary legislation, other statutory instruments and rules and other documents of a

legislative nature which apply to the *EMC*, the *PSO*, *market participants* or *market support services licensees*, and all orders of a government, governmental body, authority or agency having jurisdiction over the *EMC*, the *PSO*, a *market participant* or a *market support services licensee*, including any *electricity licence* issued to the *EMC*, a *market participant* or a *market support services licensee*, provided that the *PSO* shall not, for the purposes of this definition, be considered a governmental body, authority or agency;

- 1.1.11 *application for authorisation* means the form by which a *market support services licensee* may apply for authorisation to participate in the *wholesale electricity markets* or to cause or permit a *physical service* to be conveyed into, through or out of the *transmission system*;
- 1.1.12 *approved annual outage plan* means the plan prepared by the *PSO* in accordance with section 7.2 of Chapter 5 that lists the *planned outages* that have received *planning approval* from the *PSO* as of a given date in a year;
- 1.1.13 *arbitration complainant* has the meaning ascribed thereto in section 3.9.2 of Chapter 3;
- 1.1.14 *arbitration panel* means the person or persons appointed pursuant to section 3.5.1.2 of Chapter 3;
- 1.1.15 *arbitration tribunal* means a person or persons selected from the *arbitration panel* and appointed to resolve a dispute through arbitration pursuant to section 3.9.11 or 3.9.13 of Chapter 3;
- 1.1.16 *AS financing documents* means all financing agreements entered or to be entered into by the *Authority* and other documents in relation thereto, for or in connection with the financing of the *refurbishment cost* for the purpose of procurement of *contracted ancillary services* and any refinancing thereof provided by one or more *ancillary service financiers*;
- 1.1.17 *ASC payments* means any payments or monies due (or as may become due) to an *ancillary service provider* under one or more *ancillary service contracts* entered into by that *ancillary service provider* (including fees for the provision of any *contracted ancillary service* and compensation and any other payment arising from the termination of any *ancillary service contract*);
- 1.1.18 *ASFA liabilities* means any damages, losses, costs, expenses and liabilities due (or as may become due) to the *Authority* under an *ancillary service funding agreement* (including liquidated damages for

any delay in the completion of the *refurbishment works* and liabilities arising from termination of the *ancillary service funding agreement*);

1.1.19 *Authority* means the Energy Market Authority of Singapore established under the *EMA Act 2001*;

1.1.20 *Authority funding costs* means the total of:

- (a) the fees, costs and expenses (including pre-assessment inspection, technical consultation, legal costs and taxes) incurred by the *Authority* to procure, negotiate and/or execute the *framework agreement*, the *ancillary service funding agreements*, the *tripartite agreements*, the *AS financing documents* and all other ancillary documents in relation thereto;
- (b) any *refurbishment cost*, interests, charges, fees, damages, losses, costs, liabilities and expenses which are incurred and/or payable by the *Authority* under the *ancillary service funding agreements*;
- (c) if the *Authority* elects to fund all or any part of the *refurbishment cost* using its own funds, any interests, charges, fees, taxes, costs and expenses which are imposed, prescribed, incurred and/or payable by the *Authority* with respect to such funding;
- (d) if the *Authority* elects to fund all or any part of the *refurbishment cost* using any financing, credit, advances or loans (or any refinancing thereof) granted to the *Authority* by an *ancillary service financier*, the principal amount of loans, interests, charges, fees, taxes, costs, liabilities (if any) and expenses which are incurred and/or payable by the *Authority* under the *AS financing documents* (including any charges, fees, costs and expenses payable by the *Authority* to an *ancillary service financier* in the event of any termination or cancellation of the *AS financing documents* or any part thereof);
- (e) the fees, costs and expenses (including legal costs and taxes) incurred by the *Authority* in connection with the performance of any of its obligations or the exercise of any of its rights (including the exercise of any step-in rights by the *Authority*) under the *framework agreement*, the *ancillary service funding agreements*, the *tripartite agreements* and/or the *AS financing documents*, and/or all other ancillary documents in relation thereto; and

- (f) such other costs and/or compensation amount as the *Authority* determines to be fair and reasonable under the circumstances.
- 1.1.21 *automatic generator control* or *AGC* means the process that allows the *PSO* to centrally adjust the output of *generation registered facilities automatically* via electronic commands so as to balance generation and load in real-time. A *generation registered facility* is considered to be operating under *AGC* when it is operating within its registered *AGC* minimum and maximum output level and is responding to *AGC* commands from the *PSO*;
- 1.1.22 *automatic* means, in respect of a facility or equipment, including governor control equipment, being under the control of systems such as *automatic generator control* equipment, governor systems or protection systems designed to respond without human intervention and, without limiting the generality of section 7.1.1.3 of Chapter 1, "*automatically*" shall be interpreted accordingly;
- 1.1.23 *bank account* means a bank account held by the *EMC* or a *market participant* for *settlement* or other purposes as may be prescribed or contemplated under the *market rules* or any *market manual* and has, where applicable, the extended meaning ascribed thereto in section 5.17 of Chapter 7;
- 1.1.24 *bid* means an *energy bid*;
- 1.1.25 *bid variation* means an *energy bid* submitted to the *EMC* for a *load registered facility* that varies the terms of a previous *energy bid* submitted to the *EMC* for that *load registered facility* for the same *dispatch period*;
- 1.1.26 *bilateral contract data* means the data in respect of a *bilateral financial contract* that a *selling market participant* provides to the *EMC* for *settlement* purposes;
- 1.1.27 *bilateral financial contract* means a contract pursuant to which a *selling market participant* is selling *energy, reserve or regulation* to a *buying market participant*;
- 1.1.28 *black start capability* means the capability of a *generation facility* to start without an outside electrical *supply* so as to be used to energise a defined portion of the *transmission system*;

- 1.1.29 *business day* means, where expressed by reference to a person in Singapore, any day other than a Saturday, a Sunday or a day on which banks are authorised or required to be closed in Singapore and, where expressed by reference to the jurisdiction of a person other than Singapore, means any day other than a Saturday, a Sunday or a day on which banks are authorised or required to be closed in the jurisdiction of that person;
- 1.1.30 *business day convention* means that if the *market participant* or the *EMC's payment date* falls on a non-*business day*, payment will be made on the next *business day*;
- 1.1.31 *buying market participant* means a *market participant* that is purchasing *energy, reserve* or *regulation* under a *bilateral financial contract*;
- 1.1.32 *claimant* has the meaning ascribed thereto in section 3.11.1 of Chapter 3;
- 1.1.33 *close of banking business* means 5:00 p.m.;
- 1.1.34 *code of practice* means a code issued or approved by the *Authority* under section 16 of the *Electricity Act*;
- 1.1.35 *commissioning generation facility* means a *generation facility* located within Singapore that (a) is either newly constructed, significantly redesigned, or significantly rebuilt; (b) is registered by the *EMC* as a *commissioning generation facility*; and (c) has not yet completed the commissioning tests referred to in section 5.3.4.2 of Chapter 2;
- 1.1.36 *conditional registration* means a conditional registration granted by the *EMC* pursuant to section 3.1.4.2 of Chapter 2;
- 1.1.37 *confidential information* means information which is or has been provided pursuant to the *market rules, a market manual* or the *system operation manual* which is (a) stated by the *market rules, a market manual* or the *system operation manual* to be confidential information; (b) otherwise confidential or commercially sensitive; or (c) derived from information referred to in (a) or (b), but shall not include information that is required by the *market rules, a market manual* or the *system operation manual* to be *published* by the *EMC* or the *PSO* or otherwise made available to all *market participants*;
- 1.1.38 *connect* means to form a physical link to or with the *transmission system* for the purpose of enabling the flow of *electricity* at the

boundary between the *transmission system* and a facility or other equipment and, without limiting the generality of section 7.1.1.3 of Chapter 1, and “*reconnect*” shall be interpreted accordingly;

- 1.1.39 *connection agreement* means an agreement pertaining to the conditions for *connection* and access to the *transmission system*, entered into between the *transmission licensee* and any person whose plant, apparatus, structure, equipment or thing used for the *generation, transmission, supply* or use of *electricity* is *connected* or intended to be *connected* directly or indirectly to the *transmission system*, and to the terms and conditions relating to changes for services provided by the *transmission licensee* pursuant to section 20(2) of the *Electricity Act*;
- 1.1.40 *constituent documents* means the memorandum and articles of association of the *EMC*;
- 1.1.41 *constraint violation cost* means a cost applied by the *market clearing engine* to ensure that certain constraints may be violated at an associated cost established to discourage such violation and to control its extent;
- 1.1.42 *consumer* means a person (a) to whom *electricity* is *supplied* and sold for consumption on that person’s own premises; or (b) whose premises are for the time being connected to any system for the purpose of purchasing a *supply of electricity* for consumption on that person’s own premises;
- 1.1.43 *contingency event* means the unexpected failure of a single component or multiple components *connected* to the *transmission system*;
- 1.1.44 *contracted ancillary service* means an *ancillary service* procured by contract rather than in the *real-time markets* in accordance with section 8 of Chapter 5;
- 1.1.45 *contracted ancillary service resource* means a facility that is subject to an *ancillary service contract*;
- 1.1.46 *cost of decommitment* or *CDC* means a *constraint violation cost* representing the level to which prices for *energy* determined by the *market clearing engine* will be allowed to fall before the forced *desynchronisation* of *generation facilities* can be recommended;
- 1.1.47 *credit support* means the obligations owed to the *EMC* by a third party and other forms of security or support for the financial obligations of a

- market participant*, in a form set forth in section 7.6.2 of Chapter 2, and has, where applicable, the extended meaning ascribed thereto in section 7.1.4 of Chapter 2;
- 1.1.48 *credit support provider* means a person that has provided *credit support* in relation to or on behalf of a *market participant*, and has, where applicable, the extended meaning ascribed thereto in section 7.1.4 of Chapter 2;
- 1.1.49 *credit support value* in relation to a *market participant* means the value calculated in accordance with section 7.3.2 of Chapter 2;
- 1.1.50 *cut-off size* or *CSZ* has the meaning ascribed thereto in Appendix 7A;
- 1.1.51 *deemed flow* means a flow of *energy* measured by one or more *revenue quality meters* that is deemed, for *settlement* purposes, to represent the flow of *energy* at a *market network node* that does not have a *revenue quality meter* associated with it;
- 1.1.52 *default amount* means a dollar amount by which a *defaulting market participant* has defaulted upon its obligations to settle with the *EMC* and shall, for purposes of the imposition of a *default levy*, be calculated in accordance with section 9.3.1 of Chapter 2;
- 1.1.53 *default interest* means interest at the *default interest rate*;
- 1.1.54 *default interest rate* means the rate calculated as 2% above the base lending rate (as at the date on which the relevant *default interest* accrues) that the bank where the *EMC's bank accounts* are maintained charges for commercial loans to its best and most creditworthy commercial customers;
- 1.1.55 *default levy* means a levy imposed by the *EMC* in accordance with sections 9.2 to 9.7 of Chapter 2;
- 1.1.56 *default notice* means a notice issued by the *EMC* to a *market participant* pursuant to section 9.2.1.1 of Chapter 2 or section 7.3.3.1, 7.3.3A.1 or 7.3.3B.1 of Chapter 3, and has, where applicable, the extended meaning ascribed thereto in section 9.1.5 of Chapter 2;
- 1.1.57 *default recovery measures* means the steps taken by the *EMC* or on its behalf under section 9.8.1 of Chapter 2 to recover from the *defaulting market participant* all amounts owing to the *EMC* under the *market rules* in respect of the *defaulting market participant's* default in payment and any costs and expenses incurred by the *EMC* in

connection with or in relation to the recovery of such amounts owing by the *defaulting market participant* (including but not limited to costs and expenses incurred by the *EMC* in investigating the default in payment, in realising any applicable *credit support*, in implementing the *default levy* or *multiple default levy*, and in taking any steps under section 9.8.1 of Chapter 2);

- 1.1.58 *defaulting market participant* means a *market participant* that is in default of payment in respect of monies owing to the *EMC* under the *market rules* and has, where applicable, the extended meaning ascribed thereto in section 9.1.5 of Chapter 2;
- 1.1.59 *derogation applicant* means a person that applies for a derogation pursuant to section 14 of Chapter 1 and has, where applicable, the extended meaning ascribed thereto in section 14.1.3 or 14.6.5 of Chapter 1;
- 1.1.60 *derogation application* means an application for a derogation submitted to the *EMC* by a *derogation applicant* pursuant to section 14.2.1 of Chapter 1;
- 1.1.61 *desynchronise* means the process of *disconnecting* a *generation facility* from the *transmission system*;
- 1.1.62 *disconnect* means to sever physical links to or with the *transmission system* for the purpose of preventing the flow of *electricity* at the boundary between the *transmission system* and a facility or other equipment;
- 1.1.63 *disconnection order* means an order issued to direct a *transmission licensee* to *disconnect* one or more facility(ies) or other equipment from the *transmission system*;
- 1.1.64 *dispatch* means, in respect of the *PSO*, the act of instructing a *registered facility* as to the level of physical operation required in a given *dispatch period* and, in respect of a *registered facility*, means the act of receiving an instruction as to the level of its physical operation required in a given *dispatch period*, of operating in accordance with such instruction, or both, as the context may require;
- 1.1.65 *dispatch coordinator* means a *market participant* that is registered with the *EMC* to submit *dispatch data* with respect to a *registered facility*;

Explanatory Note: The dispatch coordinator will typically be a role within a market participant that deals with real-time and dispatch communications with the EMC.

- 1.1.66 *dispatch data* means the *offers, bids, standing offers, standing bids, offer variations* and *bid variations* submitted to the *EMC* in accordance with these *market rules*;
- 1.1.67 *dispatch day* means a period from midnight to the following midnight;
- 1.1.68 *dispatch error* means an error made by the *PSO* in the real-time *dispatch* process in circumstances where the *market rules*, a *market manual* or the *system operation manual* do not admit of any deviation or departure from such real-time *dispatch* process;
- 1.1.69 *dispatch instruction* means a physical operating instruction issued or deemed to be issued to a *registered facility* by the *PSO* in the real-time *dispatch* process;
- 1.1.70 *dispatch network data* means a representation of all *dispatch network lines, dispatch network nodes* and certain facilities forming part of or *connected* to the *PSO controlled grid* prepared and updated by the *PSO* pursuant to section 2.1 of Chapter 6;
- 1.1.71 *dispatch network line* means any line that is determined to be required to represent the dispatch network in the *MCE*, being either an *electric line* that is determined by the *PSO* to be required to be represented in *dispatch network data* pursuant to section 2.1 of Chapter 6, or an artificial line added by the *EMC* pursuant to Section D.6.3.4, D.6.5.2 or D.8.2 of Appendix 6D;
- 1.1.72 *dispatch network node* means a node that is either determined to be required to be represented in *dispatch network data* pursuant to section 2.1 of Chapter 6, or is an artificial node added by the *EMC* pursuant to section D.6.5.1 or D.8.2 of Appendix 6D;
- 1.1.73 *dispatch period* means a thirty-minute time interval beginning on the hour or the half-hour;
- 1.1.74 *dispatch related data* means the data referred to in Appendix 6G relating to the *dispatch* process, determined and updated by the *PSO* in accordance with sections 6.1.1 and 8.1.1 of Chapter 6;
- 1.1.75 *dispatch schedule* means a schedule produced by the *market clearing engine* and provided to the *PSO* that indicates the target *energy*,

- regulation and reserve levels of output of registered facilities at the end of a dispatch period;*
- 1.1.76 *dispute management system* means the system for managing disputes that each *market participant*, each *market support services licensee*, the *EMC* and the *PSO* must adopt and implement pursuant to section 3.6.1 of Chapter 3;
- 1.1.77 *dispute resolution and compensation panel* means the persons appointed pursuant to section 3.5.1 of Chapter 3;
- 1.1.78 *dispute resolution counsellor* means the person appointed by the *EMC Board* pursuant to section 3.4.1 of Chapter 3;
- 1.1.79 *DMS contact* means a person nominated by the *EMC*, the *PSO*, a *market participant* or a *market support services licensee* in its *dispute management system* as the first point of contact for the notification of disputes pursuant to section 3.6.1.1 of Chapter 3;
- 1.1.80 *EGF group* means a group comprising of one or more *embedded generation facilities* assigned to such group under section 5.5 or section 5.5A of Chapter 2;
- 1.1.81 *electric line* means any line which is used for carrying *electricity* for any purpose and includes (a) any support for the line, that is to say, any structure, pole or other thing in, on, by or from which the line is or may be supported, carried or suspended; (b) any apparatus connected to the line for the purposes of carrying *electricity*; (c) any wire, cable, tube, pipe or other similar thing (including its casing or coating) which surrounds or supports, or is surrounded or supported by, or is installed in close proximity to, or is supported, carried or suspended in association with, the line; and (d) any electricity cable;
- 1.1.82 *electricity* means electrical power when *generated, transmitted, supplied* or used for any purpose except the transmission of any communication or signal;
- 1.1.83 *Electricity Act* means the *Electricity Act (Cap.89A)* and any subsidiary legislation made thereunder;
- 1.1.84 *electricity licence* means a licence granted or extended by the *Authority* under section 9 of the *Electricity Act*, and *electricity licensee* means a person who holds an *electricity licence*;

- 1.1.85 *Electricity Market Company* or *EMC* means the company, referred to in the *Electricity Act* as the “Market Company”, which holds an *electricity licence* authorising it to operate any *wholesale electricity market*;
- 1.1.86 *electricity system* means a system comprising the *transmission system* and *generating stations connected* directly or indirectly to the *transmission system*;
- 1.1.87 *electronic communications system* means the communication network that is used for the exchange of information pertaining to *standing offers, standing bids, offer variations* and *bid variations*;
- 1.1.88 *electronic funds transfer* means the transfer of funds between *bank accounts* by electronic means;
- 1.1.89 *electronic information system* means the communication network that is used for the exchange of *settlement* information and such other information as may be prescribed or contemplated under the *market rules* or any *market manual*;
- 1.1.90 *EMA Act 2001* means the *Energy Market Authority of Singapore Act 2001*;
- 1.1.91 *embedded generation facility* means a *generation facility* which is classified as such by the *EMC* under section 5.5 or section 5.5A of Chapter 2;
- 1.1.92 *EMC adjustment account* means the *settlement account* operated by the *EMC* which is used to disburse and receive payments related to financial penalties, damages and payment adjustments arising from resolved *settlement* disputes and to reimburse the *EMC* for associated costs and expenses;
- 1.1.93 *EMC Board* means the Board of Directors of the *EMC*;
- 1.1.94 *EMC Board Committee* means any committee of members of the *EMC Board* created by the *EMC Board*, and to which the *EMC Board* may delegate certain issues;
- 1.1.88A *EMC operating account* means the *bank account* operated by the *EMC* which is designated by the *EMC* to receive payments of the *EMC*'s and the *PSO*'s administrative costs referred to in section 4.2 of Chapter 7;

- 1.1.95 *EMC payment date* means a date on which the *EMC* is to make *settlement* payments to *market participants* and has, where applicable, the extended meaning ascribed thereto in section 5.17 of Chapter 7;
- 1.1.96 *EMC prepayment account* means the *bank account* operated by the *EMC* to hold payments by *market participants* prior to the relevant *market participant payment date* to which such payments apply and has, where applicable, the extended meaning ascribed thereto in section 5.17 of Chapter 7;
- 1.1.97 *EMC settlement clearing account* means the *bank account* operated by the *EMC* for holding *settlement* payments, other than the prepayments required to be held in the *EMC prepayment account*, made to the *EMC*;
- 1.1.98 *EMC settlement reserve account* means the *bank account* operated by the *EMC* in which the *EMC* maintains reserve funds to protect against a shortfall in funds required to effect *settlement*;
- 1.1.99 *EMC/PSO agreement* means the agreement required to be executed between the *EMC* and the *PSO* as required by the conditions of the *EMC's electricity licence* and pursuant to which the *EMC* and the *PSO* agree, among other matters, to be bound by the *market rules*.
- 1.1.100 *emergency operating state* means the state described in section 2.3 of Chapter 5;
- 1.1.101 *energy* means real energy only;
- 1.1.102 *energy bid* means either a *bid* submitted to the *EMC* for an *LRF with REB* to withdraw *energy*, or a *bid* to purchase *energy* created by the *EMC* in accordance with sections D.9A.3 and D.9A.4 of Appendix 6D, as applicable;
- 1.1.103 *energy offer* means a *standing offer* or an *offer variation* submitted to the *EMC* for a *generation registered facility* to provide *energy* to the *real-time market for energy*;
- 1.1.104 *energy price ceiling* or *ENPC* means the upper limit on the *energy price* that may be used for *settlement* purposes, as specified in Appendix 6J;

- 1.1.105 *energy price floor* or *ENPF* means the lower limit on the *energy price* that may be used for *settlement* purposes, as specified in Appendix 6J;
- 1.1.106 *equipment limit* means a limit on the operating range of *market participant* facilities established by the *PSO* pursuant to and on the basis of the factors referred to in section 5.2.3.2 of Chapter 5 reflecting the capabilities of the equipment;
- 1.1.107 *event of default* means an event referred to in section 7.3.1 of Chapter 3;
- 1.1.108 *existing support* has the meaning ascribed thereto in section 7.6.6 of Chapter 2;
- 1.1.109 *export limit* means the limit on net *energy* flows out of Singapore across all *connections*, including *interties*, to facilities outside of Singapore established by the *Authority* in accordance with section 2.2 of Chapter 6;
- 1.1.110 *fast start service* means the service whereby a *generation registered facility* provides the capability to *synchronise* and commence *generating* at a defined level within a specified time;
- 1.1.111 *final approval* means the approval granted by the *PSO* in respect of a *planned outage* pursuant to section 7.3.2 of Chapter 5 following confirmation of the *outage* by the *PSO* pursuant to section 7.3.1 of Chapter 5;
- 1.1.112 *final settlement statement* means the *EMC's* final statement of the payments to be made by or to a *market participant* and has, where applicable, the extended meaning ascribed thereto in section 5.17 of Chapter 7;
- 1.1.113 *financial transmission right* or *FTR* means a right to receive a *settlement amount* determined in the manner described in section 3.4 of Chapter 7 on the basis of the information contained in the *FTR* register referred to in section 2.4 of Chapter 7;
- 1.1.114 *fixed market-related charge* means the amount, as calculated in accordance with the methodology approved by the *Authority*, that is payable by a *market participant* (a) in respect of each of its *non-exporting embedded intermittent generation facilities*; or (b) as a condition of obtaining the registration of a *generation facility* as a *non-exporting embedded intermittent generation facility*, as the case may be;

- 1.1.115 *force majeure event* means, in relation to a person, any event or circumstance, or combination of events or circumstances, (a) that is beyond the reasonable control of the person; (b) that adversely affects the performance by the person of its obligations under these *market rules*, a *market manual* or the *system operation manual*; and (c) the adverse effects of which could not have been foreseen and prevented, overcome, remedied or mitigated in whole or in part by the person through the exercise of diligence and reasonable care, and includes, but is not limited to, acts of war (whether declared or undeclared), invasion, armed conflict or act of a foreign enemy, blockade, embargo, revolution, riot, insurrection, civil disobedience or disturbances, vandalism or act of terrorism; strikes, lockouts, restrictive work practices or other labour disturbances; unlawful arrests or restraints by governments or governmental, administrative or regulatory agencies or authorities; orders, regulations or restrictions imposed by governments or governmental, administrative or regulatory agencies or authorities unless the result of a violation by the person of a permit, licence or other authorisation or of any *applicable law*; and acts of God including lightning, earthquake, fire, flood, landslide, unusually heavy or prolonged rain or lack of water arising from weather or environmental problems; provided however, for greater certainty, that (i) the lack, insufficiency or non-availability of funds shall not constitute a *force majeure event*, (ii) an act of the *EMC* or the *PSO* effected in accordance with the *market rules*, a *market manual* or the *system operation manual* shall not constitute a *force majeure event* in respect of a *market participant*, (iii) an act of a *market participant* effected in accordance with the *market rules*, a *market manual* or the *system operation manual* shall not constitute a *force majeure event* in respect of the *EMC* or the *PSO*; and (iv) the *PSO* shall not, for the purposes of this definition, be considered a governmental, administrative or regulatory agency or authority;
- 1.1.116 *forced outage* means an unanticipated intentional or *automatic* removal from service of equipment or the temporary de-rating of, restriction of use or reduction in performance of equipment;
- 1.1.117 *framework agreement* means a contract entered or to be entered into between the *EMC* and the *Authority* pursuant to section 8.2D.1 of Chapter 5;
- 1.1.118 *funded contracted ancillary service resource* means a *registered facility* that is subject to both an *ancillary service funding agreement* and an *ancillary service contract* which is concluded at or about the same time as such *ancillary service funding agreement* pursuant to section 8.2B.2;

- 1.1.119 *generate* means to produce *electricity* by means of a *generating station* for the purpose of giving a *supply* to any premises or enabling a *supply* to be so given;
- 1.1.120 *generating station* means any installation used for, or for purposes connected with, the production of *electricity*;
- 1.1.121 *generating unit* means any apparatus used for, or for purposes connected with, the production of *electricity*;
- 1.1.122 *generation capacity* means the maximum power that a *generation facility* or other electrical apparatus can produce, usually expressed in megawatts;
- 1.1.123 *generation facility* means one or more *generating units* at the same *generating station*;
- 1.1.124 *generation fixing constraint* means a class of *generic constraint* imposed by the *PSO* on the output of a *generation facility*;
- 1.1.125 *generation licensee* means a person who is authorised by an *electricity licence to generate electricity*;
- 1.1.126 *generation registered facility* or *GRF* means a *generation facility* that has been registered as a *registered facility* to provide one or more of *energy, reserve, regulation* or *contracted ancillary services*;
- 1.1.127 *generation settlement facility* or *GSF* means a *generation facility* that has been registered for settlement purposes only in accordance with section 5.4 or section 5.4A of Chapter 2;
- 1.1.128 *generic constraint* means a constraint on any one or more of the flows on a transmission line, the output of a *generation facility* or the net injections at a *dispatch network node*, and includes a *security constraint* and a *generation fixing constraint*;
- 1.1.129 *high-risk operating state* means the state described in section 2.2 of Chapter 5;
- 1.1.130 *import limit* means the limit on net *energy* flows into Singapore across all *connections*, including *interties*, from facilities outside of Singapore established by the *Authority* in accordance with section 2.2 of Chapter 6;

- 1.1.131 *interconnected system* means a system of interconnected electric lines that is located outside of Singapore and is *connected* to the *transmission system*;
- 1.1.132 *interconnected system operator* means the person who is responsible for the operation of an *interconnected system*;
- 1.1.133 *intermittent generation facility* means any *generation facility* whose power output, in the course of its ordinary and proper operation, cannot be predicted or be directly or indirectly controlled or varied at will. For the avoidance of doubt, a *generation facility* that is integrated with one or more *energy storage facilities* shall not be considered to be an *intermittent generation facility*;
- 1.1.134 *intertie* means a transmission interconnection between the *transmission system* and an *interconnected system*;
- 1.1.135 *intertie schedule* means a schedule of the *energy flow* across an *intertie* between the *transmission system* and an *interconnected system*;
- 1.1.136 *invoice* means an invoice from the *EMC* to a *market participant* which sets forth one or more *settlement amounts* and has, where applicable, the extended meaning ascribed thereto in section 5.17 of Chapter 7;
- 1.1.137 *islanded* in relation to a *generating unit* means a *generating unit* that is not represented as *synchronised* in the *dispatch network data*, and neither its designated main nor alternate default buses, as determined in accordance with section D.7 of Chapter 6, is *connected* to the *PSO controlled system*;
- 1.1.138 *land lease extension* means any extension of the term of the *registered facility lease* to enable a *funded contracted ancillary service resource* to provide the *contracted ancillary service* for the period required under the applicable *ancillary service funding agreement*;
- 1.1.139 *load* means the withdrawal of *energy* from the *transmission system* or from any *embedded generation facility* otherwise than through the *transmission system*;
- 1.1.140 *load curtailment* means a reduction in the *energy* scheduled to be withdrawn in a *dispatch period* by an *LRF with REB* relative to the total quantity in all the *price-quantity pairs* of the *restricted energy bid* of such *LRF with REB* submitted to the *EMC* for that *dispatch period*;

- 1.1.141 *load curtailment price* or *LCP* means the market price applicable in respect of the *load curtailment quantity* of *LRFs with REB*;
- 1.1.142 *load curtailment quantity* or *LCQ* means the MWh quantity of *energy* withdrawal deemed to have been reduced by a given *LRF with REB*, calculated in accordance with Appendix 6L;
- 1.1.143 *load facility* means a facility that may withdraw *energy* from (a) the *transmission system*; (b) any *embedded generation facility* otherwise than through the *transmission system*; or (c) both (a) and (b);
- 1.1.144 *load registered facility* or *LRF* means a *load facility* that has been registered as a *registered facility* to either (a) provide *reserve* or be scheduled for *energy* withdrawal for the purposes of *load curtailment*; or (b) provide *reserve* and be scheduled for *energy* withdrawal for the purposes of *load curtailment*;
- 1.1.145 *load registered facility with a restricted energy bid* or *LRF with REB* means a *load registered facility* which has been registered with the *EMC* to be scheduled for *energy* withdrawal for the purposes of *load curtailment*;
- 1.1.146 *load shedding* means a reduction of *load* ordered by the *PSO*, or by means of *automatic* under-frequency response equipment;
- 1.1.147 *load zone* means a group of *load registered facilities* that have been grouped by the *PSO* for the purpose of maintaining the *security* of the *power system*;
- 1.1.148 *market assessment unit* means the entity established by the *EMC* pursuant to section 4.2 of Chapter 3;
- 1.1.149 *market clearing engine* means the software provided by the *EMC* pursuant to section 3.3 of Chapter 6 to implement the formulation described in Appendix 6D and to perform the other functions assigned to it under Chapter 6;
- 1.1.150 *market commencement date* means the date on which the first of the *real-time markets* commences operation, as determined by the *Authority* pursuant to section 3.3.2 of Chapter 1;
- 1.1.151 *market creditor* means a person that is owed monies by the *EMC* as a result of transactions effected in the *wholesale electricity markets* and has, where applicable, the extended meaning ascribed thereto in section 5.17 of Chapter 7;

- 1.1.152 *market debtor* means a person that owes monies to the *EMC* as a result of transactions effected in the *wholesale electricity markets*;
- 1.1.153 *market energy price* or *MEP* means the market price for *energy* for a *dispatch period* for a *market network node* determined in accordance with section 10.2 of Chapter 6;
- 1.1.154 *market entity* means the *EMC*, the *PSO*, a *market participant* or a *market support services licensee*;
- 1.1.155 *market manual* means a *published* document that (a) is entitled as such, (b) is created and adopted by the *EMC* in accordance with section 8 of Chapter 1 and (c) that contains requirements to be followed, met or performed by one or more of the *PSO*, the *EMC*, *market participants* and *market support services licensees* in support of the obligations contained in these *market rules* relating to the operation of the *wholesale electricity markets*;
- 1.1.156 *market network node* or *MNN* means a point of *settlement* uniquely associated with a single *dispatch network node* and with a single *market participant*, or in the case of an *MNN* assigned by the *EMC* pursuant to section D.7.9 of Appendix 6D, a point of *settlement* at which all *energy* injected onto the *transmission system* by all *pseudo generation settlement facilities* is deemed to be injected;
- 1.1.157 *market operations timetable* means the timetable set forth in Appendix 6A;
- 1.1.158 *market outlook horizon* has the meaning ascribed thereto in section 7.1.1 of Chapter 6;
- 1.1.159 *market outlook scenario* means a schedule containing the information described in section 7.7 of Chapter 6, as determined by the *EMC* in accordance with sections 7.3, 7.5 and 7.6 of Chapter 6 for a given *load scenario* over the *market outlook horizon*;
- 1.1.160 *market participant* means a person (a) authorised by an *electricity licence*; and (b) registered in accordance with these *market rules*, to trade in any *wholesale electricity market* and includes a *transmission licensee*
- 1.1.161 *market participant bank account* means, in respect of a *market participant*, a *bank account* designated by that *market participant* as the *bank account* from and into which *settlement* and other payments as may be prescribed or contemplated under the *market rules* or any

market manual, are made and has, where applicable, the extended meaning ascribed thereto in section 5.17 of Chapter 7;

1.1.162 *market participant payment date* means a date on which *market participants* are to make *settlement* payments to the *EMC* and has, where applicable, the extended meaning ascribed thereto in section 5.17 of Chapter 7;

1.1.163 *market regulation price* or *MFP* means the market price for *regulation* for a *dispatch period* determined in accordance with section 10.2 of Chapter 6;

1.1.164 *market reserve price* or *MRP* means the market price for *reserve* for a *dispatch period* and for a *reserve provider group* determined in accordance with section 10.2 of Chapter 6;

1.1.165 *market rules* means the rules made or modified under section 46 of the *Electricity Act*;

1.1.166 *market schedule* means a *market outlook scenario*, *pre-dispatch schedule*, *short-term schedule* or *real-time schedule*;

1.1.167 *market support services* means any of the following activities in connection with the *supply of electricity*:

- (a) the reading of the register of any *electricity* meter and the management of data relating to meter reading;
- (b) the facilitation of access to any *wholesale electricity market* for the purposes of obtaining *supply of electricity* for contestable *consumers* and *retail electricity licensees*;
- (c) the provision of customer transfer services for *retail electricity licensees* and *consumers* to facilitate the transfer of contestable *consumers* between one *retail electricity licensee* and another or between *retail electricity licensees* and *market support services licensees*;
- (d) the provision of other services related to access to any *wholesale electricity market* and the *retail electricity market*; and
- (e) the *supply* and sale of *electricity* to non-contestable *consumers*,

in so far as they pertain to the *wholesale electricity markets*;

- 1.1.168 *market support services licensee* means a person who is authorised by an *electricity license* to provide *market support services*;
- 1.1.169 *market surveillance and compliance panel* means the *panel* established by the *EMC* pursuant to section 2.6 of Chapter 3;
- 1.1.170 *mediation complainant* has the meaning ascribed thereto in section 3.8.1 of Chapter 3;
- 1.1.171 *mediation panel* means the person or persons appointed pursuant to section 3.5.1.1 of Chapter 3;
- 1.1.172 *mediator* has the meaning ascribed thereto in section 3.8.8 of Chapter 3;
- 1.1.173 *metering code* means the *code of practice* that sets forth requirements relating to meters and metering in the *wholesale electricity market* and the retail *electricity market*;
- 1.1.174 *metering data* means electrical quantities measured and recorded by a metering installation;
- 1.1.175 *metering error* means an error in the *metering data* or in the corrected *metering data* in respect of a given *trading day* provided by the *market support services licensee* to the *EMC* pursuant to section 2.1 of Chapter 7;
- 1.1.176 *modification* includes any amendment, addition, alteration and variation;
- 1.1.177 *modification proposal* means a request by a *proposer* under section 5.2.1 or 5.2.4 of Chapter 3 for a *modification* or review of the *market rules* or a notice given by the *rules change panel* on its own initiative under section 5.2.3 of Chapter 3 of its intention to consider a *modification* or review of the *market rules*;
- 1.1.178 *monthly confirmation notice* means a notice issued by the *EMC* to a *market participant* containing statements of amounts received from or paid to that *market participant* in a month and has, where applicable, the extended meaning ascribed thereto in section 5.17 of Chapter 7;
- 1.1.179 *MSSL counterparty* means the *market support services licensee* that is party to a *vesting contract*. Such *market support services licensee* must be authorised to participate in the *wholesale electricity markets* in accordance with section 3 of Chapter 2;

- 1.1.180 *multiple default levy* means the levy implemented by the *EMC* under section 9.10 of Chapter 2 for the purposes of recovering costs and expenses incurred in connection with or in relation to steps taken by the *EMC* pursuant to section 9.8.1 of Chapter 2 in respect of one or more defaults by the *defaulting market participant*;
- 1.1.181 *multi-unit facility* means a *generation registered facility* or *generation settlement facility* that comprises more than one *generating unit* at the same *generating station*;
- 1.1.182 *net AFP treatment* means the determination of the total *energy* associated with a *settlement account* that is subject to *regulation* payments in accordance with section 3.2.2.3 of Chapter 7;
- 1.1.183 *nodal load forecast* means a forecast of *load* prepared on a nodal basis in accordance with section 7.2.1 of Chapter 6 and revised, where applicable, in accordance with section 9.1.1 of chapter 6;
- 1.1.184 *non-curtailment event* has the same meaning ascribed thereto in section 2.8 of Chapter 7;
- 1.1.185 *non-defaulting market participant* means, for purposes of the imposition of the *default levy*, each *market participant* other than the *defaulting market participant* whose default in payment has triggered the imposition of the *default levy* and has, where applicable, the extended meaning ascribed thereto in section 9.1.5 of Chapter 2;
- 1.1.186 *non-dispatchable load* means *load* which is not subject to *dispatch* by the *PSO* and whose level is not selected or set based on the price of *energy* in the *real-time market*;
- 1.1.187 *non-exporting embedded intermittent generation facility* means a *generation facility* that has been registered in accordance with section 5.4B of Chapter 2;
- 1.1.188 *non-provision event* means a failure by a *market participant*, as determined by the *PSO*, to provide *reserve* or *regulation* from its *generation registered facility* or *load registered facility* for any duration in a *dispatch period* in accordance with the *market rules* and the *system operation manual*;
- 1.1.189 *normal operating state* means the state described in section 2.1 of Chapter 5;

- 1.1.190 *notice of arbitration* has the meaning ascribed thereto in section 3.9.2 of Chapter 3;
- 1.1.191 *notice of default levy* means a notice issued by the *EMC* to a *non-defaulting market participant* in accordance with section 9.2.3 or 9.4.1 of Chapter 2;
- 1.1.192 *notice of disagreement* means a notice provided by a *market participant* to the *EMC* pursuant to section 5.5.2 of Chapter 7 with respect to a disagreement relating to a *preliminary settlement statement* and has, where applicable, the extended meaning ascribed thereto in section 5.17 of Chapter 7;
- 1.1.193 *notice of dispute* has the meaning ascribed thereto in section 3.7.1.1 of Chapter 3;
- 1.1.194 *notice of mediation* has the meaning ascribed thereto in section 3.8.1 of Chapter 3;
- 1.1.195 *offer* means an *energy offer*, a *reserve offer* or a *regulation offer*;
- 1.1.196 *offer variation* means an *energy offer*, a *reserve offer* or a *regulation offer* submitted to the *EMC* for a *generation registered facility* or a *reserve offer* submitted to the *EMC* for a *load registered facility* that varies the terms of a previous *energy offer*, *reserve offer* or *regulation offer* (as the case may be) submitted to the *EMC* for that *generation registered facility* or *load registered facility* for the same *dispatch period*;
- 1.1.197 *operating agreement* means an agreement between the *PSO* and the *transmission licensee* which gives the *PSO* the authority to direct the operations of the *PSO controlled grid*;
- 1.1.198 *outage* means the removal of equipment from service, unavailability for *connection* of equipment or temporary de-rating, restriction of use or reduction in performance of equipment for any reason and includes a *planned outage*, a *forced outage* or both, as the context may require;
- 1.1.199 *outage submission* means a submission made by a *market participant* to the *PSO* in respect of an *outage*;
- 1.1.200 *panel* means the *rules change panel*, the *market surveillance and compliance panel* or both, as the context may require;

- 1.1.201 *participant registration application* means the form by which a person may apply for registration as a *market participant* or for authorisation to cause or permit a *physical service* to be conveyed into, through or out of the *transmission system*;
- 1.1.202 *participation applicant* means a person filing a *participant registration application* pursuant to section 3.1.1 of Chapter 2 and, where applicable, shall have the extended meaning ascribed to it in section 3.1.11.3 of Chapter 2;
- 1.1.203 *physical service* means one or more of *energy, reserve, regulation* or a *contracted ancillary service*;
- 1.1.204 *planned outage* means an *outage* that is planned, including where such planning is merely indicative;
- 1.1.205 *planning approval* means the approval granted by the *PSO* in respect of a *planned outage* pursuant to section 7.2 of Chapter 5 (for the avoidance of doubt, other than the indicative *planned outages* that have been submitted to the *PSO* in accordance with section 7.2.4.2 of Chapter 5 in respect of a *pro forma biennial outage plan*) prior to confirmation of the *outage* by the *PSO* pursuant to section 7.3.1 of Chapter 5;
- 1.1.206 *pool meter* means a meter used for *settlement* purposes in the *wholesale electricity markets* that measures aggregate *loads*, at various points on the *transmission system* having voltages below 66 kV;
- 1.1.207 *power system* means the system comprising the *transmission system* and *generation facilities* and *load facilities connected* to the *transmission system*;
- 1.1.208 *pre-dispatch horizon* has the meaning ascribed thereto in section 7.1.2 of Chapter 6;
- 1.1.209 *pre-dispatch schedule* means a schedule containing the information described in section 7.7 of Chapter 6, as determined by the *EMC* in accordance with sections 7.4, 7.5 and 7.6 of Chapter 6 for a given *load scenario* over the *pre-dispatch horizon*;
- 1.1.210 *preliminary settlement statement* means the *EMC's* preliminary statement of the payments to be made by or to a *market participant* and has, where applicable, the extended meaning ascribed thereto in section 5.17 of Chapter 7;

- 1.1.211 *price neutralisation* means (USEP+HEUC)/nodal price neutralisation under section 4.4 of Chapter 7;
- 1.1.212 *price schedule* means a schedule produced by the *market clearing engine* that contains prices for *energy*, *reserve* or *regulation*;
- 1.1.213 *price-quantity pair* means a price and an associated quantity stated in an *offer* or *bid*;
- 1.1.214 *primary contingency unit* or *PCU* has the meaning ascribed thereto in Appendix 7A;
- 1.1.215 *principal* means the *market participant* or *market support services licensee* that uses any information system, communication system, business process, personnel or *agent* to assist in performing the *market participant's* or *market support services licensee's* obligations under the *market rules*, any *market manual* or the *system operation manual*;
- 1.1.216 *pro forma biennial outage plan* means the plan prepared by the *PSO* in accordance with section 7.2 of Chapter 5 that lists the indicative *planned outages* that have been submitted to the *PSO* pursuant to section 7.2.4.2 of Chapter 5 covering a consecutive period of two calendar years, which period commences immediately after the end of the calendar year to which a given *approved annual outage plan* relates (referred to as its “related *approved annual outage plan*”);
- 1.1.217 *probability of failure* has the meaning ascribed thereto in Appendix 7A;
- 1.1.218 *procurement market* means any one of the markets operated for the procurement of *contracted ancillary services*;
- 1.1.219 *proposer* has the meaning ascribed thereto in section 5.2.1 of Chapter 3;
- 1.1.220 *pseudo generation settlement facility* means a *generation settlement facility* that is classified as such by the *EMC* under section 5.4A.4 or 5.4C.6 of Chapter 2;
- 1.1.221 *PSO* or *Power System Operator* means the *Authority* acting in its capacity as the person responsible for ensuring the security of *supply of electricity to consumers* and arranging for the *secure* operation of the *transmission system* as described in subsection 3(3)(e) of the *Electricity Act*;

- 1.1.222 *PSO controlled grid* means the *transmission system* at voltage levels of 66kV and above, that is controlled by the *PSO*;
- 1.1.223 *PSO controlled system* means the system of *registered facilities* comprising *transmission facilities* at voltage levels of 66kV and above, *generation facilities* and *load facilities connected* to the *transmission system*;
- 1.1.224 *PSO/MP agreement* means the agreement required to be executed between the *PSO* and each *market participant* referred to in section 1.2.2.3 of Chapter 2 and pursuant to which the *PSO* and the *market participant* agree, among other matters, to be bound by the *market rules*;
- 1.1.225 *pst line* means a *dispatch network line* with a phase-shifting transformer;
- 1.1.226 *publish* means, in respect of a document or information, to place that document or information on the *EMC's* website and has, where applicable, the extended meaning ascribed thereto in section 12.1.3 of Chapter 1 and, without limiting the generality of section 7.1.1.3 of Chapter 1, *publication* shall be interpreted accordingly;
- 1.1.227 *reactive support and voltage control* or *reactive support and voltage control service* means an *ancillary service* provided by a *market participant* so as to allow the *PSO* to maintain the voltage levels around the *PSO controlled system* at prescribed levels;
- 1.1.228 *real-time dispatch schedule* means a schedule determined by the *market clearing engine* that contains the quantities of *energy*, *reserve* and *regulation* scheduled in respect of a *registered facility*;
- 1.1.229 *real-time market* means any one of the *wholesale electricity markets* operated by the *EMC* for *energy*, *reserve* or *regulation* pursuant to Chapter 6;
- 1.1.230 *real-time price schedule* means a schedule determined by the *market clearing engine* that contains the prices referred to in section 9.2.1.2 of Chapter 6;
- 1.1.231 *real-time schedule* means a *real-time dispatch schedule* and a *real-time price schedule*;
- 1.1.232 *refurbishment cost* means the costs of the *refurbishment works* (including insurance costs) and if applicable, *land lease extension*;

- 1.1.233 *refurbishment works* means the works and services procured or to be procured by an *ancillary service provider* to enable its *funded contracted ancillary service resource* to provide *contracted ancillary services* in accordance with the performance standards and other applicable requirements referred to in section 4 of Chapter 5;
- 1.1.234 *registered facility* means a facility that is registered with the *EMC* pursuant to section 5.1A.1.1 of Chapter 2;
- 1.1.235 *registered facility lease* means the agreement for lease or if issued, the lease with respect to the land on which a *funded contracted ancillary service resource* is located;
- 1.1.236 *registration terms* means the terms and conditions which the *EMC* may impose on the registration of a *participation applicant* as a *market participant* under section 3.1.4.1 or 3.1.6 of Chapter 2 (as the case may be);
- 1.1.237 *regulation* means, in relation to a *generation registered facility*, the frequent adjustment to its output so that any *power system* frequency variations or imbalances between *load* and the output from *generation facilities* can be corrected;
- 1.1.238 *regulation compromise price* or *RGCP* means a *constraint violation cost* representing the level to which the price determined by the *market clearing engine* for *regulation* will be allowed to rise before the compromise of *regulation* requirements can be recommended;
- 1.1.239 *regulation offer* means a *standing offer* or an *offer variation* submitted to the *EMC* for a *generation registered facility* to provide *regulation* to the *real-time market* for *regulation*;
- 1.1.240 *regulation price* means the price of *regulation* determined by the *market clearing engine* for a given *dispatch period*;
- 1.1.241 *regulation price ceiling* or *RGPC* means the upper limit on the *regulation price* that may be used for *settlement* purposes, as specified in Appendix 6J;
- 1.1.242 *related corporation* in respect of a *generation licensee* shall mean companies that are i) at least 50% owned by the *generation licensee* or ii) at least 50% owned by another company that also owns at least 50% of the *generation licensee*;

- 1.1.243 *reliability* means, in respect of *electricity* service, the ability to deliver *electricity* within *reliability standards* and in the amount desired and means, in respect of the *electricity system*, the *power system* or the *transmission system*, the ability of the *electricity system*, the *power system* or the *transmission system* to operate within *reliability standards* in an *adequate* and *secure* manner;
- 1.1.244 *reliability must-run service* means an *ancillary service* provided by a *generation licensee* that allows the *PSO* to call on that *generation licensee's generation facilities* in order to maintain reliability of the *electricity system*;
- 1.1.245 *reliability standards* means the criteria, standards and requirements relating to *reliability* established by a *standards authority*, together with those set forth in these *market rules* or the *system operation manual* or otherwise established by the *PSO* pursuant to these *market rules*;
- 1.1.246 *reserve* means *generation capacity* or *load reduction capacity* that can be called upon to replace scheduled *energy supply* that is unavailable as a result of a *forced outage* or to augment scheduled *energy* as a result of unexpected demand or other contingencies;
- 1.1.247 *reserve class* means a class of *reserve* differentiated based on the response time required of *reserve providers* for that class;
- 1.1.248 *reserve compromise price* or *RSCP* means a *constraint violation cost* representing the level to which the price determined by the *market clearing engine* for any *reserve class* will be allowed to rise before the compromise of *reserve requirements* can be recommended;
- 1.1.249 *reserve offer* means a *standing offer* or an *offer variation* submitted to the *EMC* for a *generation registered facility* or a *load registered facility* to provide *reserve* of any *reserve class* to the *real-time market* for *reserve*;
- 1.1.250 *reserve price* means the price of *reserve* for a given *reserve class* determined by the *market clearing engine* for a given *dispatch period*;
- 1.1.251 *reserve price ceiling* or *RSPC* means the upper limit on the *reserve price* that may be used for *settlement* purposes, as specified in Appendix 6J;

- 1.1.252 *reserve provider* means a *generation registered facility* or a *load registered facility* that provides *reserve* to the *real-time market* for *reserve*;
- 1.1.253 *reserve provider group* means a group of *reserve providers* that have similar effectiveness characteristics;
- 1.1.254 *reserve responsibility share* means, in respect of a *generation registered facility*, the costs to be paid by that *generation registered facility* for *reserve*, determined in accordance with Appendix 7A;
- 1.1.255 *residential premises* has the same meaning ascribed thereto in the *Electricity Act*;
- 1.1.256 *residual default amount* means a dollar amount calculated in accordance with section 9.5.1 of Chapter 2;
- 1.1.257 *restoration plan market participant* means a *market participant* that is designated as such by the *PSO*;
- 1.1.258 *restricted energy bid* means an *energy bid* which is submitted for a *load registered facility* to withdraw *energy*, for the purposes of *load curtailment*;
- 1.1.259 *restricted standing bid* means a *standing bid* which is submitted for an *LRF with REB*;
- 1.1.260 *retail electricity licensee* means a person who is authorised by an *electricity licence* to retail *electricity* to a contestable *consumer*;
- 1.1.261 *revenue quality meter* or *RQM* means a meter used for settlement purposes on the *wholesale electricity markets* that measures aggregate *loads* at various high-tension points on the *transmission system* and meets the requirements of the *metering code*;
- 1.1.262 *revocation order* means an order issued pursuant to sections 7.4 and 7.5 of Chapter 3 revoking the registration of one or more of a *market participant's registered facilities*;
- 1.1.263 *rules change panel* means the *panel* established by the *EMC* pursuant to section 2.2 of Chapter 3;
- 1.1.264 *secondary contingency unit* or *SCU* has the meaning ascribed thereto in Appendix 7A;

- 1.1.265 *security* means the ability of the *electricity system*, the *power system* or the *transmission system* to withstand sudden disturbances including, without limitation, electric short circuits or unanticipated loss of equipment or components;
- 1.1.266 *security constraint* means a *generic constraint* defined by the *PSO* to be used as input data to the *market clearing engine* to restrict *dispatch* solutions for the purpose of maintaining the *security* of the *power system*;
- 1.1.267 *security limit* means a limit on the operating range of *market participant* facilities established by the *PSO* pursuant to and on the basis of the factors referred to in section 5.2.3.1 of Chapter 5 so as to prevent, contain or alleviate the effects of *contingency events*;
- 1.1.268 *selling market participant* means a *market participant* who is selling *energy*, *reserve* or *regulation* under a *bilateral financial contract*;
- 1.1.269 *settlement* means the process of calculating *settlement amounts* and transferring payments from those who are required to make payment to those who are required to be paid under the *market rules*;
- 1.1.270 *settlement account* means an accounting balance maintained by the *EMC* in respect of a given *market participant* to and from which the *EMC* transfers or allocates *settlement amounts* for *settlement* purposes in accordance with Chapter 7 and has, where applicable, the extended meaning ascribed thereto in section 5.17 of Chapter 7;
- 1.1.271 *settlement amount* means any amount of money to be credited to, debited from or paid by or to a *market participant*, determined in accordance with Chapter 7 and has, where applicable, the extended meaning ascribed thereto in section 5.17 of Chapter 7;
- 1.1.272 *settlement ID* means a designation that identifies a particular *settlement amount* on an *invoice*;
- 1.1.273 *settlement interval* means a thirty-minute time interval beginning on the hour or the half-hour;
- 1.1.274 *settlement statement* means a *preliminary settlement statement*, a *final settlement statement* or both, as the context may require;
- 1.1.275 *short-term horizon* has the meaning ascribed in section 7.1.2A of Chapter 6;

- 1.1.276 *short-term schedule* means a schedule containing the information described in section 7.7 of Chapter 6, as determined by the *EMC* in accordance with sections 7.4A, 7.5 and 7.6.1B of Chapter 6 for a given *load* scenario over the *short-term horizon*;
- 1.1.277 *shut-down* in respect of a *generation registered facility* means the time its scheduled *generation* output falls below its minimum stable load, as specified in its facility registration form submitted to the *PSO* for the purpose of facility registration, to the time it is de-synchronised from the *transmission system*;
- 1.1.278 *Singapore electricity emergency plan* means the plan describing the responsibilities of, and coordinating the actions of, *market participants*, the *EMC* and the *PSO* for the purpose of alleviating the effects of an emergency on the *power system*;
- 1.1.279 *Singapore hub* or *SHUB* means the *MNN* at which all *energy* taken from the *transmission system* by *load facilities* is deemed to be withdrawn and all *energy* injected onto the *transmission system* by *generation facilities* referred to in section 5.1.3 of Chapter 2 is deemed to be injected;
- 1.1.280 *Singapore power system restoration plan* means the plan for restoring the *security* of the *power system* following a major *contingency event* or emergency;
- 1.1.281 *standards authority* means any agency or body that recommends standards or criteria relating to the *reliability* of *power systems*;
- 1.1.282 *standing bid* means a *bid* required to be submitted to the *EMC* for a *load registered facility* in accordance with section 5 of Chapter 6;
- 1.1.283 *standing capability data* means the data described in Appendix 6E;
- 1.1.284 *standing offer* means an *offer* required to be submitted to the *EMC* for a *generation registered facility* or a *load registered facility* in accordance with section 5 of Chapter 6;
- 1.1.285 *start-up* in respect of a *generation registered facility* means the time of its *synchronisation* to the *transmission system* to the time its scheduled *generation* output first attains its minimum stable load, as specified in its facility registration form submitted to the *PSO* for the purpose of facility registration;

- 1.1.286 *supply* means the supply of *electricity* through *electric lines* and includes (a) the supply of *electricity generated* outside Singapore to any person or premises in Singapore; and (b) the supply of *electricity generated* in Singapore to any person or premises outside Singapore;
- 1.1.287 *suspended market participant* means a *market participant* that is the subject of a *suspension order* and has, where applicable, the extended meaning ascribed thereto in section 7.1.7 of Chapter 3;
- 1.1.288 *suspension order* means an order issued pursuant to section 7.3 of Chapter 3 suspending all or part of the rights of a *market participant* to participate in the *wholesale electricity markets* or to cause or permit a *physical service* to be conveyed into, through or out of the *transmission system*;
- 1.1.289 *synchronise* means the process of *connecting* a *generation facility* or its *generating unit(s)* to the *transmission system* after matching their respective frequencies, voltages and voltage angles;
- 1.1.290 *system operation manual* means the *published* document that (a) is entitled as such, (b) is created and adopted by the *PSO* in accordance with section 9 of Chapter 1 and (c) that contains requirements to be followed, met or performed by one or more of the *PSO*, the *EMC*, *market participants* and *market support services licensees* in support of the obligations contained in these *market rules* relating to the *reliable* operation of the *PSO controlled system*;
- 1.1.291 *technical assessment*, in respect of the cancellation of registration of a *registered facility*, means a technical assessment of the impact of the cancellation of the registration of the *registered facility* on the *reliability* or *security* of the *PSO controlled system* referred to in section 6.1.2 of Chapter 2;
- 1.1.292 *terminated market participant* means a *market participant* that is the subject of a *termination order* and has, where applicable, the extended meaning ascribed thereto in section 7.1.7 of Chapter 3;
- 1.1.293 *termination order* means an order issued pursuant to section 7.4 of Chapter 3 terminating the rights of a *market participant* to participate in the *wholesale electricity markets* or to cause or permit a *physical service* to be conveyed into, through or out of the *transmission system* and has, where applicable, the extended meaning ascribed thereto in section 7.1.7 of Chapter 3;
- 1.1.294 *trade* means (a) to sell *electricity*, *ancillary services* or any other *electricity* related product or service to a person other than a *consumer*

- who is being *supplied* and sold *electricity* by a *retail electricity licensee* or a *market support services licensee*; or (b) to purchase *electricity, ancillary services* or any other *electricity* related product or service, where such purchase is made by a person other than a *consumer* who is being *supplied* and sold *electricity* by a *retail electricity licensee* or a *market support services licensee*;
- 1.1.295 *trading day* means a period from midnight to the following midnight;
- 1.1.296 *transitional payment* means any payment which the *EMC* is required by the *Authority* to make to a *market participant* in relation to arrangements that existed prior to the *market commencement date*;
- 1.1.297 *transmission code* means the *code of practice* issued by the *Authority* that describes the minimum standards of performance which a *transmission licensee* and those *electricity licensees* subject to such *code of practice* are required to observe with respect to the provision or use of transmission services;
- 1.1.298 *transmission facility* means assets and equipment forming part of the *transmission system*;
- 1.1.299 *transmission licensee* means a person authorised by an *electricity licence* to transmit *electricity*;
- 1.1.300 *transmission system* means the system of interconnected electric lines owned by a *transmission licensee* for the purpose of conveying *electricity*;
- 1.1.301 *transmit* means to convey *electricity* by means of a system which consists wholly or mainly of electric lines and electrical plants and is used for conveying *electricity* (a) from an electrical plant to a substation; (b) from one electrical plant to another or from one substation to another; or (c) from a substation or electrical plant to the electrical installation serving the premises of a *consumer* or, where such premises are not served by an electrical installation, from a substation or electrical plant directly to such premises;
- 1.1.302 *tripartite agreement* means an agreement entered or to be entered into between the *Authority*, the *EMC* and an *ancillary service provider* pursuant to section 8.2A.2 of Chapter 5.
- 1.1.303 *uniform Singapore energy price* or *USEP* means the uniform price of *energy* that applies for *settlement* purposes for all *energy* injections or withdrawals that are deemed to occur at the *Singapore hub* or *SHUB*;

- 1.1.304 *updated outage plan* means a plan prepared by the *PSO* in accordance with section 7.2 of Chapter 5 that lists the *planned outages* that have received *planning approval* from the *PSO* or have been withdrawn or cancelled, subsequent to the *publication* of the most recent *approved annual outage plan*;
- 1.1.305 *urgent modification* means a *modification* to the *market rules* that is urgently required (a) to avoid, reduce the risk of or mitigate the effects of one or more of (i) conditions that affect the ability of the *power system* to function normally, (ii) the abuse of market power, or (iii) an unintended adverse effect of a provision of the *market rules*; or (b) to implement standards or criteria of a *standards authority*;
- 1.1.306 *urgent rule modification committee* means the committee established by the *EMC Board* pursuant to section 5.10 of Chapter 3 for the purpose of making *urgent modifications* to the *market rules*;
- 1.1.307 *value of lost load* or *VoLL* means a *constraint violation cost* representing the level to which prices for *energy* determined by the *market clearing engine* will be allowed to rise before *load shedding* can be recommended;
- 1.1.308 *vesting contract* means a contract or other financial arrangement between a *market support services licensee* and a *generation licensee* in a form approved by, and designated as a vesting contract by, the *Authority*;
- 1.1.309 *vesting period* means a period of three months commencing on the first day each of January, April, July and October in any year; and
- 1.1.310 *wholesale electricity market* means an electricity market established by these *market rules* for the trading of *electricity*, *ancillary services* or any other *electricity* related products or services.