Attachment B Proposed Rule Changes – Technical Standards

Replace clause 2.2.1(e) with the following:

(e) To be eligible for registration as a *Generator*, a person must:

(1) having obtained *NEMMCO's* approval to do so, classify each of the *generating units* that form part of the *generating system* it owns, operates or controls, or from which it otherwise sources electricity, as either a *scheduled generating unit* or a *non-scheduled generating unit*;

(2) satisfy *NEMMCO* that clauses 5.3 or clauses 5.10 and 5.11(if applicable) have been complied with; and

(3) satisfy *NEMMCO* that each *generating system* will be capable of meeting or exceeding its *performance standards.*

Replace clause 2.9.2(a) with the following:

2.9.2 Admission as a Registered Participant

(a) Subject to clause 2.9.2(d), *NEMMCO* must within 15 *business days* after receiving the application, or after receiving the further information or clarification under clause 2.9.1(b), or within 15 *business days* after receiving the information requested under clauses 5.3.7A(b), S5.2.4(b) and 5.11.2, whichever is the later, give notice to the applicant that the applicant is to be admitted in the category of *Registered Participant* applied for if *NEMMCO* is reasonably satisfied that:

(1) an applicant meets the eligibility requirements specified for the category of *Registered Participant* to which the application relates;

(2) if the application relates to registration in one of the categories of *Market Participant,* the applicant is and will be able to fulfil its financial obligations under Chapter 3; and

(3) the applicant has complied with and will continue to be able to comply with the *Rules*.

Replace clause 2.9.2(b) with the following:

(b) If *NEMMCO* is not reasonably satisfied that an applicant satisfies the requirements set out in clause 2.9.2(a), *NEMMCO* must, within *15 business days* after receiving the:

(1) application;

(2) further information or clarification required under clause 2.9.1(b); or -

(3) information requested under clauses 5.3.7A(b), S5.2.4(b) or 5.11.2,

whichever is the later, notify the applicant that it is not qualified to be registered as a *Registered Participant* in the relevant category and provide reasons for that determination.

Insert a new clause 2.9.2(d)

(d) Provided those terms and conditions are reasonably related to ensuring *power system security*, *reliability of supply* or the quality of *network service* to other *Network Users*, or are consistent with the *market objective*, *NEMMCO* may impose such terms and conditions on any registration as *NEMMCO* sees appropriate.

Amend clause 3.11.7(a)

Replace the reference to "clause 4.15" wherever it appears with "clause 5.12"

Replace clause 3.13.3(k) with the following:

(k) Subject to the restrictions and obligations in clause 5.3.8(a) *NEMMCO* must make available to a *Registered Participant*, on request without unreasonable delay, the following information and data if in its possession and control:

(1) *registered bid and offer data*;

(2) the following information, provided that it is reasonably required by the *Registered Participant* to carry out *power system* studies (including, without limitation, load flow and dynamic simulations) for planning and operational purposes:

(i) historical information relating to the operating conditions of the *power system*;

(ii) information and data provided to *NEMMCO* under clauses 3.13.3(f), 3.13.3(g) and S5.2.4(b)(4);

(iii) information and data described in the *generating system model guidelines*, *generating system design data sheet*, and *generating system setting data sheet*;

(iv) information and data described in schedules 5.5.3 and 5.5.4; and

(3) operating procedures and practices for *transmission network* or *distribution network* operation and maintenance that have been developed for the application of schedule 5.1 sufficient to enable *power system* modelling under normal, *outage* and emergency conditions.

Insert a new clause 3.13.3(k1)

(k1) *NEMMCO* may, in its absolute discretion, provide information of the type described in clause 3.13.3(k) to persons who request it for the purpose of undertaking research or providing advice to *Registered Participants or* potential investors in the *power system*.

Insert a new clause 3.13.3(k2)

(k2) Information provided under clause 3.13.3(k)(2) is *confidential information*.

Insert a new clause 3.13.3(k3)

(k3) *NEMMCO* may recover from *Registered Participants* and other persons to whom information and data is provided or to be provided under clauses 3.13.3(k) and 3.13.3(k1), respectively, *NEMMCO's* estimate of the reasonable costs incurred by *NEMMCO*, or to be incurred by *NEMMCO*, in complying with a request under either of those clauses. *NEMMCO* may withhold the information and data until its estimate of reasonable costs is paid.

Amend clause 4.2.5(d)

Replace the reference to "clause 4.15(f)" wherever it appears with "clause 5.12(f)"

Replace clause 4.9.2(b) and (b1) with the following:

(b) Subject to clause 4.9.2(b1), *NEMMCO* may at any time give an instruction to a *Generator* in relation to any of its *generating units* with a *nameplate rating* of 30MW or more, or its *generating systems* of combined *nameplate rating* of 30 MW or more, nominating that:

(1) the *generating unit* or *generating system* transformer is to be set to a nominated tap position (if it has on-load tap changing capability);

(2) the *generating unit's* or *generating system's voltage control system* set-point is to be set to give a nominated voltage; or

(3) the *generating unit* or *generating system* is to be operated to supply or absorb a nominated level of reactive power at its terminals or at its *connection point*.

(b1) Unless otherwise provided under an *ancillary services agreement* or a *connection agreement*, *NEMMCO* must not give an instruction under clause 4.9.2(b) that requires a *generating unit* or *generating system* to supply or absorb *reactive power* at a level outside the *plant's* relevant *performance standard*.

Delete clauses 4.13(a) and (b), clauses 4.14 & 4.15

Replace clause 5.1.2(a) with the following:

5.1.2 Purpose

(a) This Chapter:

(1) provides the framework for *connection* to a *transmission network* or a *distribution network* and access to the *national grid*; and

(2) has the following aims:

(i) to detail the principles and guidelines governing *connection* and access to a *network*;

(ii) to establish the process to be followed by a *Registered Participant* or a person intending to become a *Registered Participant* to establish or

modify a *connection* to a *network* or to alter *generating plant* connected to a *network*;

(iii) to address a *Connection Applicant's* reasonable expectations of the level and standard of *power transfer capability* that the relevant *network* should provide; and

(iv) to establish processes to ensure ongoing compliance with the technical requirements of this Chapter to facilitate management of the *national grid*.

Replace clause 5.1.3(b2) with the following:

(b2) A *Registered Participant or* person intending to become a *Registered Participant* may request *connection* of a *facility*, modification of a *connection*, or alteration of *connected plant* at a standard below an *automatic access standard* if the *connection*, modification to the *connection*, or alteration of *connected plant* does not adversely affect:

(1) *power system security*;

(2) as regards *connection* of a *generating system*, *reliability* of *supply*; or

(3) the quality of *supply* to other *Network Users*.

Replace clause 5.2.2(b) with the following:

(b) The *Rules* apply to all:

(1) *connection agreements* made after 13 December 1998;

(2) deemed *connection agreements* under clause 5.2.2(a); and

(3) requests to establish *connection* after 13 December 1998.

Delete clauses 5.2.2(c) & (d)

Replace clause 5.2.5(a) with the following:

(a) A *Generator* must plan and design its *facilities* and ensure that they are operated to comply with:

(1) the *performance standards* applicable to those *facilities*;

(2) subject to clause 5.2.5(a)(1), its *connection agreement* with a *Network Service Provider;* and

(3) subject to clause 5.2.5(a)(2), the *system standards*.

Replace clause 5.2.5(b)(1) and (2) with the following:

(b) A *Generator* must:

(1) submit an *application to connect* in respect of new *generating plant* owned, operated or controlled by the *Generator*, or to be owned, operated or controlled

by the *Generator*, and enter into a *connection agreement* with a *Network Service Provider* in accordance with clause 5.3 prior to that *generating plant* being *connected* to the *network* of that *Network Service Provider*;

(2) comply with the reasonable requirements of the relevant *Network Service Provider* in respect of design requirements of *generating plant* proposed to be *connected* to the *network* of that *Network Service Provider* in accordance with clause 5.4 and schedule 5.2;

Replace clause 5.3.1 with the following:

5.3.1 Process and procedures

(a) Clause 5.3 must be followed by a *Registered Participant* or person intending to become a *Registered Participant* wishing to establish a *connection* to a *network.*

(b) For the purposes of clause 5.3, the expression "establish a *connection"* includes modifying an existing *connection* or altering *plant* but does not include alterations to *generating plant* in the circumstances set out in clause 5.3.9.

(c) A *Generator* wishing to alter *connected generating plant* must comply with clause 5.3.9.

Replace clause 5.3.2(a) with the following:

5.3.2 Connection Enquiry

(a) A person wishing to lodge or considering lodging an *application to connect* to a *network* must first make a *connection* enquiry by advising the *Local Network Service Provider* of the type, magnitude and timing of the proposed *connection* to the *network* of that *Local Network Service Provider.*

Insert a new clause 5.3.2(e)

(e) For the purposes of clause 5.3.2(d), where the performance or operation of *plant* that is the subject of an *application to connect* could be materially affected by another project, the *Network Service Provider* must provide to the *Connection Applicant* the following information about the other project sufficient to identify the extent of the impact:

(1) if an *application to connect* has been received in respect of the other project, information of the types specified in clause S5.4 but not clauses S5.4(d) or S5.4(i), consistent with the *application to connect* of the other project; and

(2) if an *offer to connect* has been made in respect of the other project, information of the types specified in clauses S5.2.4(b), and S5.5, consistent with the *offer to connect* of the other project.

Replace clause 5.3.3(b)(1)(i) with the following:

(i) will need to be involved in planning to make the *connection* or will be involved under clause 5.3.5(f); and

Replace clause 5.3.4A(a) with the following:

(a) A *negotiated access standard* must:

(1) be no less onerous than the corresponding *minimum access standard* specified by the *Network Service Provider* in accordance with clause 5.3.3(b1)(2);

(2) be set at a level that will not adversely affect *power system security*;

(3) be set at a level that will not adversely affect the quality of *supply* for other *Network Users*;

(4) in respect of *generating plant*, be set at a level that will not adversely affect *reliability* of *supply*; and

(5) in respect of *generating plant*, meet the requirements applicable to a *negotiated access standard* in clauses S5.2.5, S5.2.6, S5.2.8 and S5.2.9.

Replace clause 5.3.4A(b) with the following:

(b) A *Network Service Provider* must, following the receipt of a proposed *negotiated access standard* under clause 5.3.4A(e) or 5.3.4A(f):

(1) consult *NEMMCO* on all matters related to the proposed *negotiated access standard* for which *NEMMCO* must be involved in the negotiation; and

(2) accept *NEMMCO's* advice in respect of those matters in determining its response to each proposed *negotiated access standard* and any applicable terms or conditions of acceptance to be applied to each proposed *negotiated access standard*.

Replace clause 5.3.4A(d) with the following:

(d) A *Network Service Provider* must, within 30 *business days* following the receipt of a proposed *negotiated access standard* in accordance with clause 5.3.4(e) or 5.3.4A(f)(3) accept or reject the proposed *negotiated access standard*. The *Network Service Provider* must reject the proposed *negotiated access standard* if *connection*, or alteration of the *generating plant* (as the case may be), at the *negotiated access standard* proposed by the *Connection Applicant* would:

(1) in *NEMMCO*'s reasonable opinion, adversely affect *power system security;* or

(2) in respect of the *connection* of *generating plant*, in *NEMMCO's* reasonable opinion adversely affect *reliability* of *supply*; or

(3) in the *Network Service Provider's* reasonable opinion, adversely affect quality of *supply* for other *Network Users*; or

(4) in the opinion of *NEMMCO* or the *Network Service Provider*, in respect of a matter allocated to *NEMMCO* or the *Network Service Provider*, respectively, be lower than the corresponding *minimum access standard*; or

(5) in respect of the *connection* of *generating plant*, in *NEMMCO's* reasonable opinion, not satisfy clause 5.3.4A(a)(5).

Delete clause 5.3.4A(g)

Replace clause 5.3.5(a) with the following:

(a) The *Network Service Provider* to whom the *application to connect* is submitted:

(1) at the *automatic access standard* under clause 5.3.4; or

(2) at a *negotiated access standard* that has been accepted by the *Network Service Provider* under clause 5.3.4A(d),

must proceed to prepare an offer to *connect* in response.

Replace clause 5.3.5(d)(1) with the following:

(1) the technical requirements for the equipment to be connected;

Delete clauses 5.3.5(g) & 5.3.6(e)

Replace clause 5.3.7(a) with the following and insert new clauses 5.3.7(a1)-(a3)

(a) If the *Connection Applicant* wishes to accept an offer to *connect*, the *Connection Applicant* must negotiate a proposed *connection agreement* with each relevant *Network Service Provider* identified in accordance with clause 5.3.3(b)(2) and, in doing so, must use its reasonable endeavours to negotiate in good faith with all parties with which the *Connection Applicant* must negotiate such a *connection agreement*.

(a1) The proposed *connection agreement* must include proposed *performance standards* with respect to each of the technical requirements identified in schedules 5.2, 5.3 and 5.3a and each proposed *performance standard* must have been established in accordance with the relevant technical requirement.

(a2) The proposed *performance standards* must be based on the *automatic access standard* or, if the procedures in clause 5.3.4A have been followed, the *negotiated access standard*.

(a3) The *Network Service Provider* and the *Connection Applicant* must not enter into the proposed *connection agreement* until *NEMMCO* has accepted the proposed *performance standard*.

Delete clauses 5.3.7(e) & (f)

Insert new clause 5.3.7A

5.3.7A Submission of Performance Standards

(a) The *Network Service Provider* and the *Connection Applicant* must jointly advise *NEMMCO* when a proposed *connection agreement* has been negotiated between them and submit to *NEMMCO* the proposed *performance standards* for assessment by *NEMMCO*.

(b) The *Network Service Provider* must forward to *NEMMCO* a copy of the proposed *connection agreement* and relevant technical details of the proposed *plant* and *connection*, including, as applicable:

(1) details of all proposed *performance standards* that form part of the terms and conditions of the proposed *connection agreement*; and

(2) in relation to *generating plant*, the arrangements for updating the information required in accordance with clause S5.2.4(b).

(c) Following receipt of the information referred to in clauses 5.3.7A(b) and S5.2.4 (if applicable) *NEMMCO* must assess whether, in its reasonable opinion, each proposed *performance standard*:

(1) satisfies the technical requirements set out in schedules 5.1, 5.2, 5.3 and 5.3a subject to any *derogation* applicable to the *plant* to which the proposed *performance standards* apply;

(2) is drafted to enable, in *NEMMCO's* reasonable opinion, a compliance program to be instituted and maintained in respect of the *performance standard* under clause 5.12(c); and

(3) can be complied with, based on the information provided to *NEMMCO* by the *Network Service Provider* and the *Connection Applicant.*

(d) *NEMMCO*, or in respect of a matter concerning the quality of *supply* to *Network Users*, *NEMMCO* in consultation with the relevant *Network Service Provider*, must, when assessing the proposed *performance standard* for a particular requirement based on any provision of schedules 5.1, 5.2, 5.3 and 5.3a, require a *Connection Applicant* to meet or exceed the *minimum access standard* but must not require the *Connection Applicant* to exceed the relevant *automatic access standard* for that requirement.

(e) A *Generator* must forward to *NEMMCO* prior to registration relevant *metering installation* details of the proposed *plant* and *connection*, including:

(1) the proposed *metering installation*;

(2) arrangements for the *Metering Provider* to obtain physical access to the *metering installation.*

(f) NEMMCO must, within 20 *business days* of the receipt of the information referred to in clause 5.3.7A(e), advise the relevant *Network Service Provider* and *Generator* whether the proposed *metering installation* is acceptable for those *metering installations* associated with those *connection points* that are classified as *metering installation* types 1, 2, 3 and 4 as specified in schedule 7.2.

Insert a new clause 5.3.7B

5.3.7B Acceptance of Performance Standards

(a) *NEMMCO* must, if it assesses that the proposed *performance standard* submitted under clause 5.3.7A(a):

(1) satisfies the requirements set out in clause 5.3.7A(c), accept the proposed *performance standard* on the condition that the *connection agreement* is entered into; or

(2) does not satisfy the requirements set out in clause 5.3.7A(c), reject the proposed *performance standard*.

(b) *NEMMCO* must advise the *Connection Applicant* and the *Network Service Provider* of its decision to accept or reject the proposed *performance standard* within 30 *business days*

of the receipt by *NEMMCO* of the information referred to in clauses 5.3.7A(b) and S5.2.4 (if applicable).

(c) If *NEMMCO* rejects a proposed *performance standard* under clause 5.3.7B(a)(2), *NEMMCO* must, when advising the person under clause 5.3.7B(b) also provide the person with detailed reasons for its decision to reject the proposed *performance standard.*

(d) A *Registered Participant* whose proposed *performance standard* is rejected under clause 5.3.7B(a)(2) may dispute *NEMMCO's* decision to reject the proposed *performance standard*.

(e) If a dispute arising under clause 5.3.7B(d) is not resolved in accordance with clause 8.2.4 within 60 *business days*, notwithstanding any other provision in clause 8.2, the *Adviser* must refer the dispute for resolution to a *DRP* for determination in accordance with clauses 8.2.6A to 8.2.6D.

Replace clause 5.3.8(a) and insert new clauses 5.3.8(a1), (a2) an (a3) and replace clause 5.3.8(b) with the following:

5.3.8 Provision and use of information

(a) The data and information to be provided under clause 5.3 must:

(1) be prepared, given and used in good faith;

(2) be treated as *confidential information*; and

(3) not be disclosed or made available by the recipient to a third party except in the circumstances set out in clauses 5.3.2(b), 5.3.8(a1), 5.3.8(a2) and 5.3.8(a3).

(a1) The data and information to be provided under clause 5.3 may be disclosed by a *Network Service Provider* to *NEMMCO* and by *NEMMCO* to a *Network Service Provider* for the purpose of enabling *Network Service Providers* or *NEMMCO* (as the case may be) to:

(1) assess the effect of the proposed *facility* or proposed alteration to *generating plant* (as the case may be) on the performance of the *power system* or another proposed *facility* or another proposed alteration*;*

(2) determine the extent of any required *augmentation* or *extension;* or

(3) advise *NEMMCO* of services described in clause 3.11.4(j).

(a2) Where a technical requirement in clause S5.2.5, S5.2.6, S5.2.8 or S5.2.9 requires a *Network Service Provider* or a *Generator* to take into account a *considered project* when negotiating an *access standard*, the data and information to be provided under clause 5.3 on the *considered project* may be disclosed by the *Network Service Provider* to the *Connection Applicant* to the extent reasonably necessary for the *Connection Applicant* to determine a proposed *access standard* for that technical requirement.

(a3) The data and information to be provided under clause 5.3 may only be disclosed by the recipient to a third party as allowed under clauses 3.13.3(k) and 3.13.3(k1) once:

(1) a person is registered with *NEMMCO* as a *Registered Participant* in respect of the relevant *plant*; and

(2) unless the disclosure is to a *Transmission Network Service Provider*, only if it does not contain data and information from which the load characteristics described in clause S5.5.5 could be derived as an identifiable component.

(b) A person intending to disclose information under clause 5.3.8(a1) must first advise the relevant *Connection Applicant* of the extent of the disclosure.

Insert a new clause 5.3.9

5.3.9 Procedure to be followed by a Generator proposing to alter a Generating System

(a) If a *Generator*:

(1) proposes to alter a *connected generating system*; or

(2) proposes to alter a *generating system* for which *performance standards* have been previously accepted by *NEMMCO*,

in a manner that will affect the performance of the *generating system* relative to any of the technical requirements set out in clauses S5.2.5, S5.2.6, S5.2.8 and S5.2.9, this clause 5.3.9 must first be followed by the *Generator*.

(b) The *Generator* must submit to the *Network Service Provider*, with a copy to *NEMMCO*:

(1) a description of the nature of the alteration and the timetable for implementation;

(2) in respect of the *generating system* as altered, details of the *generating unit* design data and *generating unit* setting data in accordance with schedule S5.5 or the *generating system model guidelines*, *generating system design data sheet*, or *generating system setting data sheet*;

(3) in respect of the *generating system* as altered, the information described in clause S5.2.4(b); and

(4) proposed amendments to the relevant *performance standard* being, for each relevant technical requirement for which the proposed alteration to the equipment will affect the performance of the *generating system*, the applicable *automatic access standard* or a proposed *negotiated access standard* determined by application of clause 5.3.4A as if that clause applied to the submission.

(c) Without otherwise limiting clause 5.3.9(b)(4), for the purposes of that clause, a proposed alteration to the equipment specified in column 1 of the table set out below is taken to affect the performance of the *generating system* relative to technical requirements specified in column 2 thereby necessitating a submission under clause 5.3.9(b)(4):

Column 1 **(altered equipment)**	**Column 2** **(clause)**
machine windings	S5.2.5.1, S5.2.5.2, S5.2.9
power converter	S5.2.5.1, S5.2.5.2, S5.2.5.3C, S5.2.5.12, S5.2.5.13, S5.2.9
reactive compensation plant	S5.2.5.1, S5.2.5.2, S5.2.5.3C, S5.2.5.12, S5.2.5.13

Column 1 (altered equipment)	Column 2 (clause)
excitation control system	S5.2.5.3C, S5.2.5.12, S5.2.5.13
voltage control system	S5.2.5.3C, S5.2.5.12, S5.2.5.13
governor control system	S5.2.5.11, S5.2.5.14
power control system	S5.2.5.11, S5.2.5.14
protection system	S5.2.5.3A, S5.2.5.3B, S5.2.5.3C, S5.2.5.8, S5.2.5.9
auxiliary supplies	S5.2.5.1, S5.2.5.2, S5.2.8
remote control and monitoring system	S5.2.5.14, S5.2.6.1, S5.2.6.3

(e) The *Network Service Provider* may, as a condition of considering the submission made under clause 5.3.9(b), require payment of a fee to meet the reasonable costs anticipated to be incurred by it and any other *Network Service Providers* and *NEMMCO* in the assessment of the submission. The *Network Service Provider* must require payment of such a fee if so requested by *NEMMCO*. On payment of the required fee, the *Network Service Provider* must pay such amounts as are on account of the costs anticipated to be incurred by the other *Network Service Providers* and *NEMMCO* as appropriate.

(f) The *Network Service Provider* and the other party must immediately jointly advise *NEMMCO* when a variation to an existing *connection agreement* has been entered into between them in relation to an alteration to a *generating system*.

Insert new clause 5.3.10

5.3.10 Acceptance of Performance Standards for Generating Plant that is Altered

(a) A *Generator* must not commission altered *generating plant* until the *Generator* has satisfied *NEMMCO* that clause 5.3.9 has been complied with and each amended *performance standard* submitted:

(1) either meets the *automatic access standard* applicable to the relevant technical requirement or, if the *performance standard* does not meet the *automatic access standard*, it would not be rejected if clauses 5.3.4A(a) and 5.3.4A(d) were applied at the time the submission of *performance standards* is received by *NEMMCO*;

(2) is drafted to enable, in *NEMMCO's* reasonable opinion, a compliance program to be instituted and maintained in respect of the *performance standard* under clause 5.12(c); and

(3) can be complied with, based on the information provided to *NEMMCO*.

Replace clause 5.4.1 with the following:

5.4.1 Applicability

Clause 5.4 applies only to new installations and modifications to existing installations (including, without limitation, alterations to existing *generating plant*) after 13 December 1998 (in the case of installations located in *participating jurisdictions* other than Tasmania) and after 29 May 2005 in the case of installations located in Tasmania.

Replace clause 5.4.2 with the following:

(a) At any stage prior to commissioning the *facility* in respect of a *connection*, the *Registered Participant* or the person intending to become a *Registered Participant* must advise the relevant *Network Service Provider* and *NEMMCO* in writing of any inconsistency between the proposed equipment and the relevant *performance standards* and, if necessary, the *Network Service Provider* and the *Registered Participant* or the person intending to become a *Registered Participant* must negotiate in good faith any necessary changes to the relevant *performance standards* under clause 5.3.9.

(b) If there is an inconsistency in a *performance standard* identified in clause 5.4.2(a), the *Registered Participant* or the person intending to become a *Registered Participant* and *Network Service Provider* must not commission the *facility* in respect of a *connection* unless the *facility* or the *performance standard* has been varied to remove the inconsistency.

(c) Nothing in this clause 5.4.2 affects the operation of clause 5.3.6(c1).

Amend clauses 5.7.3(a) and 5.7.3(c)

Replace the reference to "clause 4.15(b)" where it appears with "clause 5.12(b)"

Replace clause 5.7.3(e) with the following:

(e) If *NEMMCO*:

(1) is satisfied that:

(i) a *generating unit* or *generating system* does not comply with its *performance standards* in respect of one or more technical requirements of clauses S5.2.5, S5.2.6, S5.2.8 or S5.2.9 and the relevant *connection agreement*; or

(ii) a *generating unit's* or *generating system's* performance is not adequately represented by the applicable analytical model provided under clause 5.7.6(g) or clause S5.2.4; and

(2) holds the reasonable opinion that there is, or could be, a threat to *power system security* because of the performance of the *generating unit* or *generating system*, or because the inadequacy of its analytical model is adversely affecting *NEMMCO's* ability to assess *power system security*, including *power transfer capabilities*,

NEMMCO may direct the relevant *Generator* to operate the relevant *generating unit* or *generating system* at a particular *generated* output or in a particular mode until the

relevant *Generator* submits evidence reasonably satisfactory to *NEMMCO* that the *generating unit* or *generating system* is complying with the relevant *performance standard* and performing substantially in accordance with its analytical model.

Insert a new clause 5.7.6(a1)

(a1) If *NEMMCO* reasonably considers that:

(1) the analytical parameters for modelling of a *generating unit* or *generating system* are inadequate; or

(2) available information, including results from a previous test of a *generating unit* or *generating system* are inadequate to determine parameters for an applicable model developed in accordance with the *generating system model guidelines*, or otherwise agreed with *NEMMCO* under clause S5.2.4(b1)(2),

NEMMCO may direct a *Network Service Provider* to require a *Generator* to conduct a test under clause 5.7.6(a). *NEMMCO* may witness such tests.

Replace clause 5.7.6(g) with the following:

(g) The *Generator* must provide the test records obtained from a test under clause 5.7.6(a) to the *Network Service Provider*, who must derive the analytical parameters for the applicable model developed in accordance with the *generating system model guidelines*, or otherwise agreed with *NEMMCO* under clause S5.2.4(b1)(2) and provide them to *NEMMCO* and the relevant *Generator*.

Replace clause 5.7.6(h) with the following:

(h) Each of the *Generator*, the *Network Service Provider* and *NEMMCO* must bear its own costs associated with tests conducted under this clause 5.7.6 and no compensation is to be payable for financial losses incurred as a result of these tests or associated activities.

Introduce a new clause 5.10 – Submission of Performance Standards

5.10 Performance Standards – transitional arrangements

5.10.1 Submission of Performance Standards on or about the Performance Standards Commencement Date

(a) A *Generator*, *Customer* or *Market Network Service Provider* who, at the *performance standards commencement date*, engages in the activity of owning, controlling or operating *plant* must, within 30 days of the *performance standards commencement date*, submit to *NEMMCO* proposed *performance standards* for that *plant*, to be:

(1) in the case of a person who is registered as a *Generator* in relation to that *plant* - in accordance with schedule 5.2;

(2) in the case of a person who is registered as a *Customer* in relation to that *plant* - in accordance with schedule 5.3; or

(3) in the case of a person who is registered as a *Market Network Service Provider* in relation to that *plant* -in accordance with schedule 5.3a.

(b) A *Network Service Provider* must, on request by a person who has made a submission under clause 5.10.1(a), 5.10.1(c) or 5.10.1(d) whose *facility* is *connected* to the *Network Service Provider's network*, provide that person with all performance data and other information reasonably required by that person to satisfy its obligations under clauses 5.10.1(a), 5.10.1(c) and 5.10.1(d).

(c) A person who, at the *performance standards commencement date*:

(1) was not registered as a *Generator*, *Customer* or *Market Network Service Provider*; and

(2) was either;

(i) party to a *connection agreement;* or

(ii) negotiating a *connection agreement*, the negotiation of which was not subject to clause 5.3.4A; and

(3) who subsequent to the *performance standards commencement date*, but prior to the date this clause 5.10.1 became effective ("effective date"), registered as a *Generator*, *Customer* or *Market Network Service Provider*,

must, within 30 days of the *effective date*, submit to *NEMMCO* proposed *performance standards* for that *plant* in accordance with clause 5.10.1(e).

(d) A person who at the *effective date* was not registered as a *Generator*, *Customer* or *Market Network Service Provider*, but was party to a *connection agreement* must, within 30 days of the *effective date*, submit to *NEMMCO* proposed *performance standards* for that *plant* in accordance with clause 5.10.1(e).

(e) The *performance standards* required to be submitted under clause 5.10.1(c) and (d) must be in accordance with:

(1) schedule 5.2 if they are to be registered by a *Generator* in relation to relevant *plant*,;

(2) schedule 5.3 if they are to be registered by a *Customer* in relation to relevant *plant*,; or

(3) schedule 5.3a if they are to be registered by a *Market Network Service Provider* in relation to relevant *plant*.

5.10.2 Submission of Performance Standards where the Technical Requirements Change

(a) If, subsequent to the establishment of the *performance standards* a technical requirement against which those *performance standards* were assessed changes, or has changed in any respect, or a new technical requirement is inserted into the *Rules*, the relevant *Generator*, *Customer* or *Market Network Service Provider* must submit to *NEMMCO* a proposed *performance standard* for each of the changed technical requirements.

(b) A *Network Service Provider* must, on request by a person who has made a submission under clause 5.10.2 whose *facility* is *connected* to the *Network Service Provider's network*, provide that person with all performance data and other information reasonably required by that person to enable it to satisfy its clause 5.10.2(a) obligations.

5.10.3 Standard of Proposed Performance Standards

A proposed *performance standard* submitted by a *Generator* or *person* under clauses 5.10.1 or 5.10.2 must be at a standard at least equal to:

(a) where there is already a relevant registered *performance standard*, that registered *performance standard;*

(b) where there is no relevant registered *performance standard*, the relevant technical requirement set out in the relevant *connection agreement;* and

(c) where there is no relevant registered *performance standard* and no relevant technical requirement in the *connection agreement*, the relevant design performance of the *plant*.

Insert a new clause 5.11

5.11 Acceptance of Performance Standards

5.11.1 Acceptance of Performance Standards lodged at or about the Performance Standards Commencement Date or in response to a change in the Technical Requirements

(a) Following receipt of a proposed set of *performance standards* under clauses 5.10.1(a), 5.10.1(c), 5.10.1(d) 5.10.2(a) or 5.11.1(g), *NEMMCO* must assess whether, in its reasonable opinion, each proposed *performance standard*:

(1) satisfies clause 5.10.3 and the technical requirements set out in schedules 5.1, 5.2, 5.3 and 5.3a as at the *performance standards commencement date* subject to any *derogation* applicable to the *plant* to which the proposed *performance standards* apply;

(2) is drafted to enable, in *NEMMCO's* reasonable opinion, a compliance program to be instituted and maintained in respect of the *performance standard* under clause 5.12(c); and

(3) can be complied with, based on the information provided to *NEMMCO* by the *Network Service Provider* and the *Connection Applicant.*

(b) In respect of a submission under clause 5.10.1(a), 5.10.1(c), 5.10.1(d), 5.10.2, or 5.11.1(b) to 5.11.1(l) shall apply to *NEMMCO* and the person making the submission except that the references to the "*performance standards commencement date*" shall be read as referring to the date that the changes to the technical requirements, being the changes referred to in clause 5.10.2, take effect in each relevant circumstance.

(c) To the extent of any inconsistency between:

(1) a *performance standard* determined in accordance with a *derogation* in force at the *performance standards commencement date* and a *performance standard* determined in accordance with:

(i) the technical requirements set out in schedules 5.1, 5.2, 5.3 and 5.3a;

(ii) the *connection agreement* applicable to the *plant* to which the *performance standard* applies; or

(iii) the design performance of the *plant* at the *performance standards commencement date*,

the *performance standard* determined in accordance with the *derogation* will prevail;

(2) a *performance standard* determined in accordance with an existing *connection agreement* and a *performance standard* determined in accordance with:

(i) the technical requirements set out in schedules 5.1, 5.2, 5.3 and 5.3a; or

(ii) the design performance of the *plant* at the *performance standards commencement date*,

the *performance standard* determined in accordance with the *connection agreement* will prevail; and

(3) a *performance standard* determined in accordance with the design performance of the *plant* at the *performance standards commencement date* and a *performance standard* determined in accordance with the technical requirements set out in schedules 5.1, 5.2, 5.3 and 5.3a, the *performance standard* determined in accordance with the design performance of the *plant* will prevail.

(d) *NEMMCO* must, if it assesses that a proposed *performance standard*:

(1) meets the criteria set out in clause 5.11.1(a), accept the proposed *performance standard*; or

(2) does not meet the criteria set out clause 5.11.1(a), reject the proposed *performance standard*.

(e) *NEMMCO* must advise the person who submitted a proposed *performance standard*, under clause 5.10.1(a) or 5.10.1(c), 5.10.1(d) or 5.10.2 or 5.11.1(g) of its decision to accept or reject the proposed *performance standard* under clause 5.11.1(d), within 60 *business days* of submission of the proposed *performance standard* to *NEMMCO* in accordance with clause 5.10.1(a), 5.10.1(c), 5.10.1(d), 5.10.2 or 5.11.1(g) (as the case may be).

(f) If *NEMMCO* rejects a proposed *performance standard* under clause 5.11.1(d)(2), *NEMMCO* must, when advising the person under clause 5.11.1(e), also provide the person with detailed reasons for its decision.

(g) If *NEMMCO* rejects a proposed *performance standard* under clause 5.11.1(d)(2), the person who submitted the proposed *performance standard* to *NEMMCO* must, within 20 *business days* of the date on which *NEMMCO* made its decision to reject the proposed *performance standard*, resubmit an amended proposed *performance standard* under clause 5.10.1(a), 5.10.1(c), 5.10.1(d) or 5.10.2 (as the case may be), taking *NEMMCO's* comments into consideration.

(h) If, 11 months from the date that a person is required under clause 5.10.1(a), 5.10.1(c), 5.10.1(d) or 5.10.2 (as the case may be) to submit a proposed *performance standard* a *performance standard* has not been approved under clause 5.11.1(d)(1), the *performance standard* for the *plant* to which the proposed *performance standard* related is deemed to be (in order of priority):

(1) the technical characteristics set out in the relevant *connection agreement* or, in the case of a submission made under clause 5.10.2, if there is an existing *performance standard* registered with *NEMMCO*, that *performance standard*;

(2) if a *derogation* is in place, the *connection agreement* subject to the technical characteristics set out in the relevant *derogation*; or

(3) the *connection* requirements of the *connection point* determined under schedule 5.2, 5.3 or 5.3a as applicable to the *plant* and where there is an *automatic access standard* for a technical requirement, that standard.

(i) For the purposes of clause 5.11.1, *NEMMCO* must accept a *performance standard* materially based on and consistent with a *derogation* applicable to the *plant* to which the *performance standard* applies.

(j) A person whose proposed *performance standard* is rejected under clause 5.11.1(d)(2) may dispute *NEMMCO's* decision to reject the proposed *performance standard* and will be taken to be a *Connection Applicant* for the purposes of the dispute.

(k) If a dispute arising under clause 5.11.1(j) is not resolved in accordance with clause 8.2.4 within 60 *business days*, notwithstanding any other provision in clause 8.2, the *Adviser* must refer the dispute for resolution to a *DRP* for determination in accordance with clauses 8.2.6A to 8.2.6D.

(l) *NEMMCO*, or in respect of a matter concerning the quality of *supply* to *Network Users*, *NEMMCO* in consultation with the relevant *Network Service Provider*, must, when determining the applicable *performance standard* for a particular requirement based on any provision of schedules 5.1, 5.2, 5.3 and 5.3a, require a person to meet or exceed the *minimum access standard* but must not require that person to exceed the relevant *automatic access standard* for that requirement.

5.11.2 Access to Information for Assessment of Proposed Performance Standards

(a) *NEMMCO* may request that a person who has submitted a proposed *performance standard* in accordance with clauses 5.3.7A (1), 5.10.1(a), 5.10.1(c), 5.10.2, 5.10.3, 5.10.2 or 5.11.1(g) provides additional supporting information including, without limitation, an up-to-date version of the *connection agreement*, to facilitate *NEMMCO's* assessment of the *performance standard* submitted.

(b) A person who receives a request from *NEMMCO* under clause 5.11.2(a) must comply with the request within 5 *business days* of the request or such further time as agreed by *NEMMCO*.

(c) If a clause 5.11.2(a) request relates to a clause 5.3.7A(a) submission, *NEMMCO* must make the request within 5 *business days* of receiving the information referred to in clauses 5.3.7A(b) and S5.2.4.

(d) A *connection agreement* submitted under clause 5.11.2(b) or 5.3.7A(b) is *confidential information*.

(e) *Performance standards* and proposed *performance standards* are *confidential information*.

5.11.3 Register of Performance Standards

(a) This clause 5.11.3(a) does not apply to *generating plant*. An *automatic access standard* or, if the procedures in clause 5.3.4A have been followed, a *negotiated access standard* included in a *connection agreement*, is taken to be the *performance standard* applicable to the *connected plant* for the relevant technical requirement. If there is no *automatic access standard* and no *minimum access standard* for a technical requirement, the *access standard* set out in schedule 5.1, 5.3 or 5.3a (as the case may be) that is relevant to that technical requirement is taken to be the *performance standard* applicable to the *connected plant* for that technical requirement.

(b) From the *performance standards commencement date*, *NEMMCO* must establish, maintain and update a register of the *performance standards* applicable to *plant*. *NEMMCO* must record on the register *performance standards* once they are accepted by *NEMMCO* under clauses 5.3.7B(a) or 5.11.1(d) or deemed to be *performance standards* under clause 5.11.1(h).

(c) If a person becomes aware that the information utilised to obtain the acceptance of a *performance standard* is incorrect or incomplete in a material respect, that person must immediately notify *NEMMCO* of the details. If *NEMMCO* receives such a notice, or itself considers that the information used is incorrect or incomplete in a material respect, *NEMMCO* may recommence an assessment of that *performance standard* and clauses 5.3.7A, 5.3.7B, 5.10 and 5.11 and 5.12 shall apply and operate as if a submission had been made under clause 5.3.7A or 5.10 (as the case may be). This clause 5.11.3(e) operates notwithstanding that the relevant *performance standard* is registered.

(d) A *performance standard* may be amended at any time by agreement between *NEMMCO*, the relevant *Registered Participant* and *Network Service Provider* provided it does not adversely affect *power system security*.

Insert a new clause 5.12

5.12 Performance Standard Compliance

(a) A *Registered Participant* must:

(1) ensure that its *plant* meets or exceeds each applicable *performance standard*;

(2) ensure that its *plant* is not likely to cause a material adverse effect on *power system security*; and

(3) immediately ensure that its *plant* ceases to be likely to cause a material adverse effect on *power system security*, if:

(i) the *Registered Participant* reasonably believes that its *plant* is likely to cause a material adverse effect on *power system security*; or

(ii) *NEMMCO* advises the *Registered Participant* that the *Registered Participant's plant* is likely to cause a material adverse effect on *power system security*.

(b) A *Registered Participant* who engages in the activity of planning, owning, controlling or operating *plant* to which a *performance standard* applies must, within 6 months of the later of the date of the acceptance of the *performance standard* by *NEMMCO* or the commencement of operation of the *plant*, institute and maintain a compliance program under clause 5.12(c).

(c) A compliance program instituted and maintained in accordance with clause 5.12(b) must:

(1) monitor the performance of the *plant* in accordance with the compliance program;

(2) ensure that the *plant* complies with the relevant *performance standards*;

(3) be in accordance with *good electricity industry practice*; and

(4) provide reasonable assurance of ongoing compliance with each applicable *performance standard*.

(d) The *AER* may request that a *Registered Participant* who is required to institute and maintain a compliance program under clause 5.12(b) or 5.7.4(a1), deliver to the *AER*:

(1) the compliance program records setting out the results of the performance monitoring conducted under clause 5.12(f); and

(2) any other records maintained under clause 5.7.3 or 5.7.4, if applicable.

(e) Each *Registered Participant* must maintain the compliance program records and any other records developed or maintained under clause 5.7.3 or 5.7.4 for 7 years and deliver such records to the *AER* under clause 5.12(d) within 2 *business days* of the date of a request or such further period as the *AER* requires.

(f) A *Registered Participant* who engages in the activity of planning owning, controlling or operating *plant* to which a *performance standard* applies must immediately notify *NEMMCO* if:

(1) the *Registered Participant* becomes aware that the *plant* is breaching a *performance standard* applicable to the *plant*; or

(2) the *Registered Participant* reasonably believes that the *plant* is likely to breach a *performance standard* applicable to the *plant.*

(g) A clause 5.12(f) notice must detail:

(1) the reason for actual or likely non-conformance of the *plant* with the relevant *performance standard*;

(2) the actual or likely time of commencement of non-conformance of the *plant* with the relevant p*erformance standard*;

(3) the expected duration of non-conformance of the *plant* with the relevant *performance standard*; and

(4) the expected performance of the *plant* in comparison with the relevant *performance standard*.

(h) A *Registered Participant* who has notified *NEMMCO* under clause 5.12(f) must notify *NEMMCO* that its *plant* has returned to compliance with the *performance standard* immediately following the return of the *plant* to compliance.

(i) Subject to clause 5.12(g), if:

(1) a *Registered Participant* notifies *NEMMCO* in accordance with clause 5.12(f); or

(2) *NEMMCO* otherwise reasonably believes that the *plant* of a *Registered Participant* in respect of which a *performance standard* applies is in breach of that *performance standard*,

NEMMCO must, determine the period of time within which a *Registered Participant* must rectify a *performance standard* breach under clause 5.12(j), and advise the *Registered Participant* of that period.

(j) When determining the period of time within which a *Registered Participant* must rectify a *performance standard* breach under clause 5.12(i), *NEMMCO* must take into consideration:

(1) the time necessary, in *NEMMCO's* reasonable opinion, to provide the *Registered Participant* with the opportunity to remedy the breach; and

(2) the need to act to remedy the breach given the nature of the breach.-

(k) If *plant* remains in breach of a *performance standard* for a period of time greater than that advised under clause 5.12(i), *NEMMCO* must notify the *AER* of the breach.

(l) The effectiveness of a compliance program established under clause 5.12(b) must be taken into consideration in any proceeding against a *Registered Participant* for a breach of clause 5.12(a).

(m) Any clause 5.7.3(c) obligation imposed on a *Generator* ceases to operate upon commencement of a compliance program by the *Generator* under this clause 5.12.

Insert new clauses S5.1.7(c) and (d)

(c) A *Network Service Provider* must include conditions in *connection agreements* to ensure that each *Generator* will balance the voltage generated in each phase of its *generating units* and, when not generating, the current drawn in each phase, so as to achieve average levels of negative sequence voltage at each of the *generating unit connection points* due to phase imbalances within the *generating plant* not more than:

(1) *Automatic access standard*: the values set out in Table S5.1a.1 and clause S5.1a.7*;*

(2) *Minimum access standard*: the values determined by the *Network Service Provider* to achieve average levels of negative sequence voltage at the *connection points* of other *Network Users* of not more than the values set out in Table S5.1a.1 and clause S5.1a.7.

(d) The *Network Service Provider* and *Generator* may include in the *connection agreement* a requirement to upgrade performance to an agreed level not higher than the *automatic access standard* if, at any time in the future, another *Network User* is adversely affected by negative sequence voltage or current imbalance because of this *generating plant*.

Replace clause S5.2.1(a) with the following:

(a) This schedule sets out details of additional requirements and conditions that (subject to clause 5.2) *Generators* must satisfy as a condition of *connection* of a *generating unit* to the *power system.* It does not apply to any *generating unit* that is:-

(1) subject to an exemption from registration under clause 2.2.1(c); or

(2) eligible for exemption under any guidelines issued under clause 2.2.1(c),

and which is *connected* or intended for use in a manner the *Network Service Provider* considers is unlikely to cause a material degradation in the quality of *supply* to other *Network Users.*

Delete clause S5.2.1(d)

Replace clause S5.2.3 with the following:
S5.2.3 Technical matters to be co-ordinated

(a) A Generator and the relevant Network Service Provider must use all reasonable endeavours to agree upon relevant technical matters in respect of each new or altered connection of a generating unit or *generating system* to a network *including*:

(1) design at the connection point;

(2) physical layout adjacent to the connection point;

(3) primary protection and backup protection (clause S5.2.5);

(4) control characteristics (clause S5.2.5);

(5) communications facilities (clause S5.2.6);

(6) insulation co-ordination and lightning protection (clause S5.2.3(b));

(7) fault levels and fault clearance (clause S5.2.9);

(8) switching and *isolation facilities* (clause S5.2.9);

(9) interlocking and synchronising arrangements; and

(10) *metering installations*.

(b) A *Generator* must ensure that in designing a *generating system's* electrical *plant* operating at the same *nominal voltage* as at the *connection point*, including any *substation* for the *connection* of the *generating system* to the *network*:

(1) the *plant* complies with the relevant *Australian Standards* unless a provision of these *Rules* allows or requires otherwise;

(2) the earthing of the *plant* complies with the Electricity Supply Association of Australia Safe Earthing Guide to reduce step and touch potentials to safe levels;

(3) the *plant* is capable of withstanding, without damage the voltage impulse levels specified in the *connection agreement*;

(4) the insulation levels of the *plant* are co-ordinated with the insulation levels of the *network* to which the *generating system* is *connected* as specified in the *connection agreement*; and

(5) safety provisions in respect of the *plant* comply with requirements applicable to the *participating jurisdiction* in which the *generating system* is located, as notified by the *Network Service Provider*.

Replace clause S5.2.4 with the following:

S5.2.4 Provision of information

(a) A *Generator* or person who has negotiated a proposed *connection agreement* for *connection* of a *generating system* and advised *NEMMCO* of this under clause 5.3.7A(a) must promptly on request by *NEMMCO* or the *Network Service Provider* provide all data specified in schedule 5.5 or the *generating system model guidelines*, *generating system design data sheet*, or *generating system setting data sheet* about its *generating systems*.

(b) In respect of an existing or proposed *generating system* comprised of *generating units* with a combined *nameplate rating* of 30 MW or more, by the earlier of:

(1) the date on which proposed *performance standards* or amendments to *performance standards* are submitted to *NEMMCO* under clause 5.3.7A(a), 5.3.9(b). 5.10.1(a), 5.10.1(c) or 5.10.1(d);

(2) three months before commissioning of a *generating system* or planned alteration to a *generating system ;* and

(3) 5 *business days* before commissioning of an unplanned alteration to a *generating system;*

the *Generator*, or person required under the Rules to register as the *Generator*, must provide:

(4) to *NEMMCO* and the relevant *Network Service Providers* (including the relevant *Transmission Network Service Provider* in respect of an *embedded generating unit*) with the following information about the *control systems* of the *generating system*:

(i) a set of functional block diagrams, including all functions between feedback signals and *generating unit* output;

(ii) the parameters of each functional block, including all settings, gains, time constants, delays, deadbands and limits; and

(iii) the characteristics of non-linear elements; and

(5) to *NEMMCO* only, simulation source code in an unencrypted form suitable for at least one of the software simulation products nominated by *NEMMCO* and in a form that would allow conversion for use with other software simulation products by *NEMMCO*,

sufficient for *NEMMCO* and *Network Service Providers* to perform load flow and dynamic simulation studies.

(b1) The information provided under clause S5.2.4(b) must:

(1) encompass all *control systems* that respond to voltage or frequency disturbances on the *power system*, and which are either integral to the *generating units* or otherwise part of the *generating system*, including, without limitation, those applying to *reactive power* equipment that forms part of the *generating system;*

(2) conform with the applicable models developed in accordance with the *generating system model guidelines*, or an alternative model agreed with *NEMMCO* to be necessary to adequately represent the *generating plant* to carry out load flow and dynamic simulations.

(b2) The *Generator* must update the information provided under clause S5.2.4(b) within 3 months after commissioning tests or other tests undertaken in accordance with clause 5.7.3 are completed.

(c) For the purposes of clause 5.3.2(d), the technical information that a *Network Service Provider* must, if requested, provide to a *Connection Applicant* in respect of the proposed *connection* for a *generating unit* includes:

(1) the highest expected single phase and three phase fault levels at the *connection point* with the *generating unit* not *synchronised*;

(2) the clearing times of the existing *protection systems* that would clear a fault at the location at which the new *connection* would be connected into the existing *transmission system* or *distribution system*;

(3) the expected limits of voltage fluctuation, harmonic voltage distortion and voltage unbalance at the *connection point* with the *generating unit* not *synchronised*;

(4) technical information relevant to the *connection point* with the *generating unit* not *synchronised* including equivalent source impedance information, sufficient to estimate fault levels, voltage fluctuations, harmonic voltage distortion (for harmonics relevant to the *generating system*) and voltage unbalance; and

(5) information relating to the performance of the *national grid* that is reasonably necessary for the *Connection Applicant* to prepare an *application to connect*, including, without limitation:

(i) a model of the *power system*, including relevant *considered projects* and the range of expected operating conditions, sufficient to carry out load flow and dynamic simulations; and

(ii) information on *inter-regional* and *intra-regional power transfer capabilities* and relevant *plant* ratings.

(d) All information provided under this clause S5.2.4 must be treated as *confidential information*.

Replace clause S5.2.5.1 with the following:

S5.2.5.1 Reactive power capability

(a) *Automatic access standard*: Each *generating unit* or *generating system*, while operating at any level of *active power output* and any voltage at the *connection point* within the limits established under clause S5.1a.4 without a *contingency event*, must be capable of supplying and capable of absorbing, continuously at its *connection point* an amount of *reactive power* of at least the amount equal to the product of the *rated active power* of the *generating unit* or *generating system* and 0.395.

(b) *Minimum access standard*: No capability is required to supply or absorb *reactive power* at the *connection point.*

(c) When negotiating an *access standard* the *Generator* and the *Network Service Provider:*

(1) must, subject to any agreement under clause S5.2.5.1(d)(4), ensure that the *reactive power capability* of the *generating unit* or *generating system* is sufficient to ensure that all relevant *system standards* are met before and after *credible contingency events* under normal and planned *outage* operating conditions of the *power system*, taking into account at least existing and *considered projects*;

(2) may negotiate either a range of *reactive power* absorption and supply, or a range of *power factor*, at the *connection point*, within which the *plant* must be operated; and;

(3) may negotiate a limit that describes how the *reactive power capability* varies as a function of *active power output* due to a design characteristic of the *plant.*

(d) If the proposed *generating system* is not capable of the level of performance established under clause S5.2.5.1(c)(1), the *Network Service Provider* may:

(1) require the *Generator* to pay compensation to the *Network Service Provider* for the provision of the deficit of *reactive power* (supply and absorption) from within the *network*;

(2) allow the *Generator* to install additional equipment *connecting* at the *generating system's connection point* or another location, to provide the deficit of *reactive power* (supply and absorption), which equipment is deemed to be part of the *generating system*;

(3) allow the *Generator* to reach a commercial arrangement with a *Registered Participant* to provide the deficit of *reactive power* (supply and absorption)*;* or

(4) if the inability to meet the performance level only occurs for particular operating conditions, agree to and document as part of the *access standard*, operational arrangements by which the *plant* can achieve an agreed level of performance for those operating conditions.

(e) The *access standard* must record, the agreed value for *rated active power* and where relevant the method of determining the value. The value for a *generating system* must take into account its in-service *generating units* and additional *reactive power* equipment that is part of the *generating system*.

(f) The *access standards* for consumption of *energy* by a *generating system* when not supplying or absorbing *reactive power* under an *ancillary services agreement* are to be established under clause S5.3.5 as if the *Generator* were a *Market Customer*.

Replace clause S5.2.5.2 with the following:

S5.2.5.2 Quality of electricity generated

(a) *Automatic access standard*:

Each *generating system*, when *generating* and when not *generating*, must not produce at any of its *connection points* for *generation*:

(i) voltage fluctuation greater than the limits allocated by the *Network Service Provider* under clause S5.1.5(a);

(ii) harmonic *voltage* distortion greater than the emission limits specified by a *plant standard* under clause S5.2.5.2(d) or allocated by the *Network Service Provider* under clause S5.1.6(a); and

(iii) voltage unbalance greater than the limits allocated by the *Network Service Provider* in accordance with clause S5.1.7(c)(1).

(b) *Minimum access standard*: Each generating system, *when* generating and when not generating, must not produce at any of its *connection points* for *generation*:

(1) voltage fluctuations greater than limits determined under clause S5.1.5(b);

(2) harmonic voltage distortion more than the lesser of the emission limits determined by the relevant *Network Service Provider* under clause S5.1.6(b) and specified by a *plant standard* under clause S5.2.5.2(d); and

(3) voltage unbalance more than limits determined under clause S5.1.7(c)(2).

(c) The *access standard* negotiated under clause S5.2.5.2 must not prevent the *Network Service Provider* meeting the *system standards* or contractual obligations to existing *Network Users*.

(d) *Plant standard*: In respect of a synchronous generating unit, AS 1359.101 and IEC 60034-1 are *plant standards* for harmonic voltage distortion.

Delete clause S5.2.5.3

Insert new clause S5.2.5.3A

S5.2.5.3A Generating unit response to frequency disturbances

(a) For the purposes of clause S5.2.5.3A, a reference to "*normal operating frequency band*", "*operational frequency tolerance band*" or "*extreme frequency excursion tolerance limits*" is a reference to the widest range specified for that term for any condition (including an "island" condition) in the *frequency operating standards* that apply to the *region* in which the *generating unit* is located.

(b) A*utomatic access standard*: Each *generating unit* must be capable of *continuous uninterrupted operation* for frequencies in the following ranges provided that the rate of change of *frequency* is less than 4 Hz per second:

(1) the lower bound of the *extreme frequency excursion tolerance limits* to the lower bound of the *operational frequency tolerance band* for at least 2 minutes;

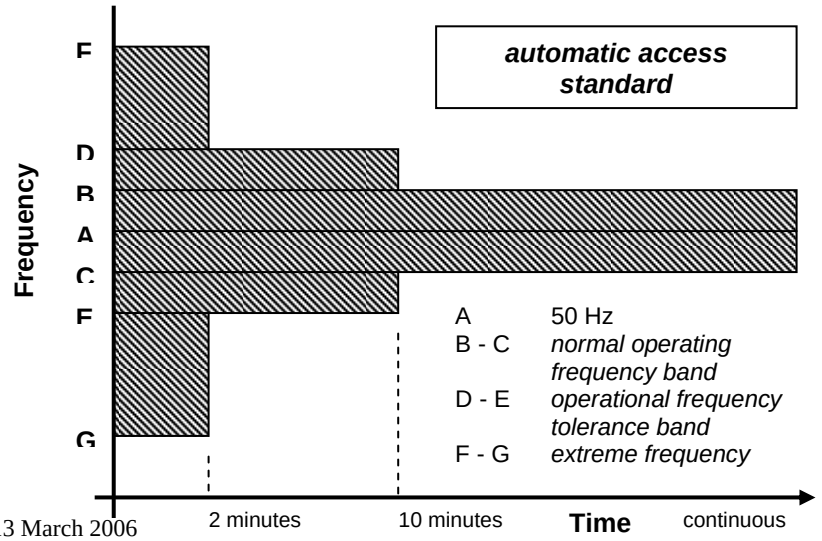
(2) the lower bound of the *operational frequency tolerance band* to the lower bound of the *normal operating frequency band*, for at least 10 minutes including any time spent in the range under clause S5.2.5.3A(b)(1);

(3) the *normal operating frequency band* for an indefinite period;

(4) the upper bound of the *normal operating frequency band* to the upper bound of the *operational frequency tolerance band*, for at least 10 minutes including any time spent in the range under clause S5.2.5.3A(b)(5); and

(5) the upper bound of the *operational frequency tolerance band* to the upper bound of the *extreme frequency excursion tolerance limits* for at least 2 minutes.

(c) The *automatic access standard* is illustrated in the following diagram. To the extent of any inconsistency between the diagram and clause S5.2.5.3A(b), clause S5.2.5.3A(b) prevails.



(d) *Minimum access standard:* Each *generating unit* must be capable of *continuous uninterrupted operation* for frequencies in the following ranges provided the rate of change of *frequency* does not exceed 1 Hz per second:

(1) lower bound of the *extreme frequency excursion tolerance limits* to 47.5 Hz for at least 10 seconds;

(2) 47.5 Hz to lower bound of the *operational frequency tolerance band* for at least 2 minutes;

(3) lower bound of the *operational frequency tolerance band* to the lower bound of the *normal operating frequency band* for at least 10 minutes including any time spent in the ranges under clauses S5.2.5.3A(d)(1) and (2);

(4) *normal operating frequency band* for an indefinite period;

(5) upper bound of the *normal operating frequency band* to the upper bound of the *operational frequency tolerance band* for at least 10 minutes including any time spent in the ranges under clause S5.2.5.3A(d)(6); and

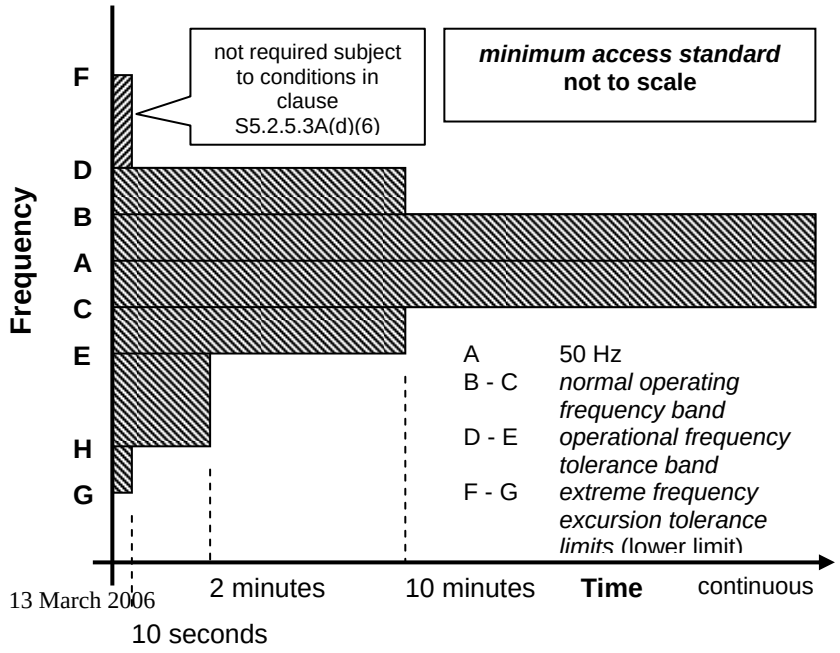
(6) in respect of a *generating unit* that:

(i) is part of a *generating system* comprised of *generating units* with a combined *nameplate rating* of 30 MW or more; or

(ii) does not have a *protection system* to trip the *generating unit* if the *frequency* exceeds a level agreed with *NEMMCO*,

the upper bound of the *operational frequency tolerance band* to the upper bound of the *extreme frequency excursion tolerance limits* (including islanded conditions) for at least 10 seconds.

(e) The *minimum access standard* is illustrated in the following diagram. To the extent of any inconsistency between the diagram and clause S5.2.5.3A(d), clause S5.2.5.3A(d) prevails.



(f) A *negotiated access standard* can be accepted by the *Network Service Provider* provided that *NEMMCO* and the *Network Service Provider* agree that:

(1) the proposed *access standard* is as close as practicable to the *automatic access standard* while respecting the need to protect the *plant* from damage;

(2) the *frequency* would be unlikely to fall below the lower bound of the *operational frequency tolerance band* as a result of over-frequency tripping of *generating units*; and

(3) there would be no material adverse impact on quality of *supply* to other *Network Users* or on *inter-regional* or *intra-regional power transfer capability*.

(g) *NEMMCO* must be involved in the negotiation of *access standards* under clause S5.2.5.3A.

Insert new clause S5.2.5.3B

S5.2.5.3B Generating unit response to voltage disturbances

(a) *Automatic access standard*: Each *generating unit* must be capable of *continuous uninterrupted operation* during the occurrence voltage at the *connection point*:

(1) in the range of over-voltages for the durations permitted under clause S5.1a.4;

(2) in the range 90% to 100% of *normal voltage* continuously;

(3) in the range 80% to 90% of *normal voltage* for a period of at least 10 seconds; and

(4) in the range 70% to 80% of *normal voltage* for a period of at least 2 seconds.

(b) *Minimum access standard*: Each *generating unit* must be capable of *continuous uninterrupted operation* for voltages at the *connection point* in the range 90% to 110% of *normal voltage*, provided that the ratio of voltage to *frequency* (as measured at the *connection point* and expressed as percentage of *normal voltage* and a percentage of 50 Hz) does not exceed:

(1) 115% for more than two minutes or

(2) 110% for more than 10 minutes.

(c) Each *generating unit* must be capable of *continuous uninterrupted operation* for the range of voltages specified in the *automatic access standard* except where *NEMMCO* and the *Network Service Provider* agree that:

(1) the proposed *access standard* is as close as practicable to the *automatic access standard* while respecting the need to protect the *plant* from damage;

(2) the *generating plant* that would be tripped, as a result of any voltage excursion within levels specified by the *automatic access standard*, is not more than 100 MW; and

(3) there would be no material adverse impact on the quality of *supply* to other *Network Users* or on *inter-regional* or *intra-regional power transfer capability*.

(d) The *access standard* must include any operational arrangements necessary to ensure the *generating unit* will meet its agreed performance levels under abnormal *network* or *generating system* conditions.

(e) In carrying out assessments of proposed *access standards* under clause S 5.2.5.3B, *NEMMCO* and the *Network Service Provider* must take into account, without limitation

(1) the expected performance of existing *networks* and *network* developments that are *considered projects*;

(2) the expected performance of existing *generating plant* and *generation* projects that are *considered projects*, and

(3) any corresponding *performance standard* (or where no *performance standard* has been registered, the *access standard*) that allows *generating plant* to trip for voltage excursions in ranges specified under the *automatic access standards*.

(f) *NEMMCO* must be involved in the negotiation of *access standards* under clause S5.2.5.3B.

Insert new clause S5.2.5.3C

S5.2.5.3C Generating unit response to disturbances following contingency events

(a) In clause S5.2.5.3C:

(1) a fault includes without limitation:

(A) a *short circuit fault* of the relevant type; and

(B) a fault of the relevant type resulting from reclosure onto a fault by the operation of *automatic reclose equipment*; and

(2) "fault type" means one or more of the following types:

(A) three-phase fault;

(B) two phase to ground fault;

(C) phase to phase fault; and

(D) phase to ground fault.

(b) The *automatic access standard* is*:*

(1) Each *generating unit* must remain in *continuous uninterrupted operation* for the disturbance caused by any of the events described below, provided that the event is not one that would disconnect the *generating unit* from the *power system* by removing *network elements* from service:

(i) a *credible contingency event;*

(ii) a three phase fault in a *transmission system* cleared by all relevant primary *protection systems*;

(iii) a two phase to ground, phase to phase or phase to ground fault in a *transmission system* cleared in the longest time expected to be taken for a relevant *breaker fail protection system* to clear the fault or, if such protection is not installed, the greater of the time specified in column 4 of Table S5.1a.2 (or if none is specified, 430 milliseconds) and the longest time expected to be taken for all relevant primary *protection systems* to clear the fault; and

(iv) a three phase, two phase to ground, phase to phase or phase to ground fault in a *distribution network* cleared in the longest time expected to be taken for the *breaker fail protection system* to clear the fault or, if such protection is not installed, the greater of 430 milliseconds and the longest time expected to be taken for all relevant primary *protection systems* to clear the fault.

(2) Each *generating unit* and *generating system* must, in respect of any fault of the types described in clause S5.2.5.3C(b)(1)(ii) to (iv), subject to any changed *power system* conditions or energy source availability beyond the *Generator's* reasonable control:

(i) to assist the maintenance of *power system* voltages during the application of the fault, deliver to the *network* capacitive reactive current of at least the greater of its pre-disturbance reactive current and 4% of the maximum continuous current of the *generating unit* (in the absence of a disturbance) for each 1% reduction (from its pre-fault level) of *connection point* voltage during the fault;

(ii) from 100 milliseconds after *disconnection* of the faulted element, deliver to the *network active power* of at least 95% of the level existing just prior to the fault; and

(iii) after *disconnection* of the faulted element, deliver to the *network reactive power* sufficient to ensure that the *connection point* voltage is within the range for *continuous uninterrupted operation* under clause S5.2.5.3B.

(c) The *minimum access standard* is:

(1) Each *generating unit* must remain in *continuous uninterrupted operation* for the disturbance caused by any of the events described below, provided that the event is not one that would disconnect the *generating unit* from the *power system* by removing *network elements* from service:

(i) a *credible contingency event*;

(ii) a single phase to ground, phase to phase or two phase to ground fault in a *transmission system* cleared in the longest time expected to be taken for all relevant primary *protection systems* to clear the fault; and

(iii) a single phase to ground, phase to phase or two phase to ground fault in a *distribution network*, cleared in the longest time expected to be taken for all relevant primary *protection systems* to clear the fault, unless *NEMMCO* and the *Network Service Provider* agree that:

(A) the total reduction of *generation* in the *power system* due to that fault would not exceed 100 MW;

(B) there is unlikely to be an adverse impact on quality of *supply* to other *Network Users*; and

(C) there is unlikely to be a material adverse impact on *inter-regional* or *intra-regional power transfer capability*.

(2) Each *generating system* must, in respect of any fault of the types described in clause S5.2.5.3C(c)(1)(ii) and (iii), subject to any changed *power system* conditions or energy source availability beyond the *Generator's* reasonable control after *disconnection* of the faulted element, deliver to the *network active power* and *reactive power* sufficient to ensure that the *connection point* voltage is within the range for *continuous uninterrupted operation* agreed under clause S5.2.5.3B.

(d) In carrying out assessments of proposed *access standards* under clause S5.2.5.3C, the *Network Service Provider* and *NEMMCO* must take into account, without limitation

(1) the expected performance of existing *networks* and *network* developments that are *considered projects*;

(2) the expected performance of existing *generating plant* and *generation* projects that are *considered projects*;

(3) the expected range of *power system* operating conditions; and

(4) the expected performance of *control systems* and *protection systems*, including auxiliary systems and *automatic reclose equipmen*t.

(e) The *access standard* must include any operational arrangements to ensure the *generating unit* will meet its agreed performance levels under abnormal network or *generating system* conditions

(f) A proposed *negotiated access standard* may be accepted if the *connection* of the *plant* at the proposed access level would not cause other *generating plant* or loads to trip as a result of an event, when they would otherwise not have tripped for the same event.

(g) *NEMMCO* must be involved in the negotiation of *access standards* under clause S5.2.5.3C.

Delete clause S5.2.5.4

Replace clause S5.2.5.8 with the following:

S5.2.5.8 Protection of generating units from power system disturbances

(a) The *minimum access standard* is:

(1) Subject to clauses S5.2.5.8(b)(2) and S5.2.5.8(b)(3), if a *Generator* or *Network Service Provider* requires a *generating unit* to be automatically disconnected from the *power system* in response to abnormal conditions arising from the *power system*, the relevant *protection system* or *control system* must not disconnect the *generating*

unit for conditions, for which it must remain in *continuous uninterrupted operation* or conditions it must withstand under the *Rules*.

(2) Each *generating unit* with a *nameplate* rating of 30MW or more, or *generating system* comprised of *generating units* with combined *nameplate rating* of 30 MW or more, *connected* to a *transmission system* must have *facilities* to automatically and rapidly reduce its *generation:*

(i) by at least half if the *frequency* at the *connection point* exceeds a level nominated by *NEMMCO* (not less that the upper limit of the *operational frequency tolerance band*) and the duration above this *frequency* exceeds a value nominated by *NEMMCO*. The reduction may be achieved:

(A) by reducing the output of the *generating unit* within six seconds, and holding the output at the reduced level until the *frequency* returns to within the *normal operating frequency band*; or

(B) by disconnecting the *generating unit* from the *power system*; or

(ii) in proportion to the difference between the *frequency* at the *connection point* and a level nominated by *NEMMCO* (not less than the upper limit of the *operational frequency tolerance band*), such that the *generation* is reduced by at least half, if the *frequency* reaches the upper limit of the *extreme frequency excursion tolerance limits*.

(3) *NEMMCO* or the *Network Service Provider* may require that an *access standard* include a requirement for the *generating unit* or *generating system* to automatically *disconnect* whenever the part of the *network* to which it is *connected* has been disconnected from the *national grid*, forming an island that *supplies* a *Customer*. The *access standard* must include specification of conditions for which the *generating unit* or *generating system* must trip and must not trip.

(4) Notwithstanding clauses S5.2.5.3A, S5.2.5.3B and S5.2.5.3C a *generating unit* or *generating system* may be automatically disconnected from the *power system* under any of the following conditions:

(i) in accordance with an *ancillary services agreement* between the *Generator* and *NEMMCO*;

(ii) where a load that is not part of the *generating system* has the same *connection point* as the *generating system* and *NEMMCO* and the *Network Service Provider* agree that the disconnection would in effect be under-frequency load shedding;

(iii) where the *generating unit* is automatically disconnected under clauses S5.2.5.8(b)(3) or S5.2.5.9;

(iv) where the *generating unit* is automatically disconnected under clause S5.2.5.10 due to a failure of the *generating plant*; or

(v) in accordance with an agreement between the *Generator* and a *Network Service Provider* (including an agreement in relation to an emergency control scheme under clause S5.1.8) to provide a service that *NEMMCO* agrees is necessary to maintain or restore *power system* security in the event of a specified *contingency event*.

(b) There is no *automatic access standard* for protection of *generation units* from *power system* disturbances.

(c) *NEMMCO* must be involved in the negotiation of *access standards* under clause S5.2.5.8.

(d) The *Network Service Provider* is not liable for any loss or damage incurred by the *Generator* or any other person as a consequence of a fault on either the *power system*, or within the *Generator's facility*.

Replace clause S5.2.5.9 with the following:

S5.2.5.9 Protection systems that impact on power system security

(a) The *automatic access standard* is:

(1) Primary *protection systems* must be provided to disconnect from the *power system* any faulted element in the *generating system* and in protection zones that include the *connection point* within the applicable *fault clearance time* determined under clause S5.1.9(a)(1), but subject to clauses S5.1.9(k) and S5.1.9(l).

(2) Each primary *protection system* must have sufficient redundancy to ensure that a faulted element within its protection zone is disconnected from the *power system* within the applicable *fault clearance time* with any single protection element (including any communications facility upon which that *protection system* depends) out of service.

(3) *Breaker fail protection systems* must be provided to clear faults that are not cleared by the circuit breakers controlled by the primary *protection system* within the applicable *fault clearance time* determined under clause S5.1.9(a)(1).

(b) The *minimum access standard* is:

(1) *Protection systems* must be provided to disconnect from the *power system* any faulted element within the *generating system* and in protection zones that include the *connection point* within the applicable *fault clearance time* determined under clause S5.1.9(a)(2), but subject to clauses S5.1.9(k) and S5.1.9(l).

(2) If a *fault clearance time* determined under clause S5.1.9(a)(2) for a protection zone is less than 10 seconds, a *breaker fail protection system* must be provided to clear from the *power system* any fault within that protection zone that is not cleared by the circuit breakers controlled by the primary *protection system* within the applicable *fault clearance time* determined under clause S5.1.9(a)(3).

(c) The *Network Service Provider* and the *Generator* must cooperate in the design and implementation of *protection systems* to comply with clause S5.2.5.9, including cooperation on:

(1) the use of *current transformer* and *voltage transformer* secondary circuits (or equivalent) of one party by the *protection system* of the other;

(2) tripping of one party's circuit breakers by a *protection system* of the other party; and

(3) co-ordination of *protection system* settings to ensure inter-operation.

(d) The *protection system* design must:

(1) be coordinated with other *protection systems* already existing in the *power system* or to be provided as part of a *considered project;*

(2) avoid consequential disconnection of other *Network Users' facilities*; and

(3) take into account existing obligations of the *Network Service Provider* under *connection agreements* with other *Network Users*.

(e) The *Generator* must provide redundancy in the primary *protection systems* under clause S5.2.5.9(a)(2) and provide *breaker-fail protection systems* under clause S5.2.5.9(a)(3) if *NEMMCO* or the *Network Service Provider* consider that a lack of these *facilities* could result in a material adverse impact on *power system security* or quality of *supply* to other *Network Users*, or a reduction in *inter-regional* or *intra-regional power transfer capability*, through any mechanism including:

(1) consequential tripping of, or damage to, other *network* equipment or *facilities* of other *Network Users*, that would have a *power system security* impact; or

(2) instability that would not be detected by other *protection systems* in the *network*.

(f) *NEMMCO* must be involved in the negotiation of *access standards* under clause S5.2.5.9.

Replace clause S5.2.5.10 with the following:

S5.2.5.10 Protection to trip plant for unstable operation

(a) The *automatic access standard* is:

(1) Each *synchronous generating unit* must have a *protection system* to *disconnect* it promptly in order to prevent pole slipping or other conditions where the *generating unit* causes *active power*, *reactive power* or voltage at the *connection point* to become unstable as assessed in accordance with the *power system* stability guidelines established under clause 4.3.4(h);

(2) Each *generating unit* that is not a *synchronous generating unit* must have a *protection system* to *disconnect* it promptly for conditions where the *active power*, *reactive power* or voltage at the *connection point* become unstable as assessed in accordance with the *power system* stability guidelines established under clause 4.3.4(h).

(b) The *minimum access standard* is: Each *generating unit* must not cause a voltage disturbance at the *connection point* due to sustained unstable behaviour of more than the maximum level specified in Table 7 of *Australian Standard* AS/NZS 61000.3.7:2001.

(c) If the *Network Service Provider* and the *Generator* agree, a *protection system* proposed to meet a *negotiated access standard* may also trip any other part of the *generating system* in order to cease the instability.

(d) A *protection system* to trip the affected *generating unit* must be provided where:

(1) the *Network Service Provider* considers it necessary to prevent consequential tripping of, or damage to, other *generating units*, *network* equipment or other *Network Users' facilities*, or

(2) *NEMMCO* considers it necessary to prevent unstable operation having an adverse impact on *power system security*.

(e) *NEMMCO* must be involved in the negotiation of *access standards* under clauses S5.2.5.10(c) and S5.2.5.10(d).

Replace clause S5.2.5.11 with the following:

S5.2.5.11 Frequency control

(a) For the purpose of clause S5.2.5.11:

"*maximum operating level*" means, in relation to:

(1) a *non-scheduled generating unit*, the maximum *sent out generation* consistent with its *nameplate rating*;;

(2) a *scheduled generating unit*, the maximum *sent out generation* (but not emergency *generation)* consistent with its registered bid and offer data;

(3) a *non-scheduled generating system*, the combined maximum *sent out generation* consistent with the *nameplate ratings* of its in-service *generating units*; and

(4) a *scheduled generating system*, the maximum combined *sent out generation* (but not emergency *generation*) of its in-service *generating units*, consistent with its *registered bid* and *offer data*.

"*minimum operating level*" means, in relation to:

(1) a *non-scheduled generating unit*, its minimum *sent out generation* for continuous stable operation;

(2) a *scheduled generating unit*, its minimum *sent out generation* for continuous stable operation consistent with its *registered bid and offer data*;

(3) a *non-scheduled generating system*, the combined *minimum operating level* of its in-service *generating units*; and

(4) a *scheduled generating system*, the minimum combined *sent out generation* of its in-service *generating units*, consistent with its *registered bid and offer data*.

"*system frequency*" means the frequency of the *transmission system* or *distribution system* to which the *generating unit* is *connected*;

"*pre-disturbance level*" means, in relation to a *generating unit* and a *frequency* disturbance, the *generating unit's* level of output just before the *system frequency* first exceeds the upper or lower limit of the *normal operating frequency band* during the *frequency* disturbance.

(b) *Automatic access standard*:

(1) Each *generating system's active power* transfer to the *power system* must not:

(i) increase in response to a rise in *system frequency*; and

(ii) decrease in response to a fall in *system frequency*

(2) Each *generating system* must be capable of automatically reducing its *active power* transfer to the *power system*:

(i) whenever the *system frequency* exceeds the upper limit of the *normal operating frequency band*;

(ii) by an amount that equals or exceeds the least of:

(A) 20% of its *maximum operating level* times the percentage *frequency* difference between *system frequency* and the upper limit of the *normal operating frequency band*;

(B) 10% of its *maximum operating level*; and

(C) subject to the *frequency* recovering gradually, the difference between the *generating unit's pre-disturbance level* and *minimum operating level*, but zero if the difference is negative.

(iii) sufficiently rapidly for the *Generato*r to be in a position to offer measurable amounts of lower services to the *spot market* for *market ancillary services*.

(3) Each *generating unit or generating system* must be capable of automatically increasing its *active power* transfer to the *power system*:

(i) whenever the *system frequency* falls below the lower limit of the *normal operating frequency band*;

(ii) by the amount that is equal or exceeds the least of:

(A) 20% of its *maximum operating level* times the percentage *frequency* difference between the lower limit of the *normal operating frequency band* and *system frequency*;

(B) 5% of its *maximum operating level*; and

(C) subject to the *frequency* recovering gradually, one third of the difference between the *generating unit's maximum operating level* and *pre-disturbance level*, but zero if the difference is negative; and

(iii) sufficiently rapidly for the *Generator* to be in a position to offer measurable amounts of raise services to the *spot market* for *market ancillary services*.

(c) *Minimum access standard*:

For each *generating system*, *active power* transfer to the *power system* must not:

(1) increase in response to a rise in *system frequency*; and

(2) decrease more than 2% per Hz in response to a fall in *system frequency*.

(d) Each *control system* used to satisfy clause S5.2.5.11 must be *adequately damped*.

(e) A *Generator* proposing a *negotiated access standard* in respect of clause S5.2.5.11(c)(2) must demonstrate to *NEMMCO* that the proposed increase and decrease in *active power* transfer to the *power system* are as close as practicable to the *automatic access standard* for that *plant*.

(f) The *access standard* must record the agreed values for *maximum operating level* and *minimum operating level*, and where relevant the method of determining the values. The values for a *generating system* must take into account its in-service *generating units*.

(g) The amount of a relevant *market ancillary service* for which the *plant* may be registered must not exceed the amount that would be consistent with the *performance standard* registered in respect of this requirement.

(h) *NEMMCO* must be involved in the negotiation of *access standards* under clause S5.2.5.11.

Replace clause S5.2.5.12 with the following:

S5.2.5.12 Impact on network capability

(a) *Automatic access standard*: Each *generating unit* must have plant capabilities and *control systems*, sufficient not to reduce any *inter-regional* or *intra-regional power transfer capability* below the level that would apply if the *generating unit* were disconnected.

(b) *Minimum access standard*: The *generating system* must have plant capabilities and *control systems* and operational arrangements sufficient to not reduce:

(1) the ability to *supply Customer* load as a result of a reduction in *power transfer capability*;

(2) *power transfer* capabilities into a *region* by more than the combined *sent out generation* of its *generating units* ; and

(3) *power transfer capabilities* into another *region* by more than the lesser of 15 per cent of the combined *nameplate rating* of its *generating units* and 30 MW, unless *NEMMCO* considers that the *connection* of that *generating system* is likely to result in a net improvement in *supply reliability* across all *regions*,

(c) In carrying out assessments of proposed *access standards* under clause S5.2.5.12, the *Network Service Provider* and *NEMMCO* must at least take into account, without limitation:

(1) the expected performance of existing *networks* and *network* developments that are *considered projects*;

(2) the expected performance of existing *generating plant* and *generation* projects that are *considered projects*;

(3) the expected range of *power system* operating conditions; and

(4) the expected performance of *control systems* and *protection systems*, including *automatic reclose equipment*.

(d) The *access standard* must include operational arrangements, including curtailment of *generation* if necessary, to the satisfaction of *NEMMCO*, to ensure that the *generating plant* is operated in a way that meets at least the *minimum access standard* under abnormal *network* and *generating system* conditions, so that *power system security* can be maintained.

(e) The *Generator* must take measures, to the satisfaction of *NEMMCO* and the *Network Service Provider*, to minimise any reduction in *power transfer capabilities*. The following matters must be considered in the design of the *generation system*, and implemented, where

they would have a material impact on *power transfer capability* to the extent that the total cost of mitigation measures does not exceed 5% of the capital cost of the *generation* project, where the capital cost is based on a project design that would at least meet the *minimum access standard*:

(1) *control system* functions and settings;

(2) dynamic *reactive power capability* of the *generating unit* or additional *plant* such as SVC or STATCOM;

(3) choice of technology and *plant* parameters;

(4) *transmission network augmentation* or *distribution network augmentation;* and

(5) location and manner of *connection* to the *network*.

(f) The *access standard* under clause S5.2.5.12 must detail the *plant* capabilities, *control systems* and operational arrangements that will be maintained by the *Generator*, notwithstanding that changes to the *power system*, but not changes to the *generating system*, may reduce the efficacy of the *plant* capabilities, *control systems* and operational arrangements over time.

(g) If a *Network Service Provider* considers that *power transfer capabilities* of its *network* would be increased through provision of additional *control system* facilities to a *generating system* (such as a *power system* stabiliser), the *Network Service Provider* and the *Generator* may negotiate for the provision of such additional *control system* facilities as a commercial arrangement.

(h) The negotiation of access standards under clause S5.2.5.12 must involve *NEMMCO* in accordance with clause 5.3.4A(b).

Replace clause S5.2.5.13 with the following:

S5.2.5.13 Control systems and stability

(a) For the purpose of clause S5.2.5.13:

'*settling time'* means, in relation to a step response test or simulation of a *control system*, the time measured from initiation of a step change in an input quantity to the time when the magnitude of error between the output quantity and its final settling value remains less than 10% of:

(1) if the sustained change in the quantity is less than half of the maximum change in that output quantity, the maximum change induced in that output quantity; and

(2) otherwise the sustained change induced in that output quantity; and

'*rise time'* means, in relation to a step response test or simulation of a *control system*, the time taken for an output quantity to rise from 10% to 90% of the maximum change induced in that quantity by a step change of an input quantity.

(b) The *automatic access standard* is:

(1) Each *generating unit* must have *plant* capabilities and *control systems* sufficient to ensure that:

(i) *power system* oscillations, for the frequencies of oscillation of the *generating unit* against any other *generating unit*, are *adequately damped*;

(ii) operation of the *generating unit* does not degrade the damping of any mode of oscillation of the *power system*; and

(iii) operation of the *generating unit* does not cause instability (including hunting of *tap-changing transformer control systems*) that would adversely impact other *Registered Participants*.

(2) Each *control system* must have:

(i) permanently installed and operational monitoring and recording facilities for key variables including each input and output, for disturbance monitoring and testing purposes; and

(ii) facilities for testing the *control system* sufficient to establish its dynamic operational characteristics.

(3) Each *synchronous generating unit must have* an excitation control system *that:*

(i) regulates voltage at the *connection point* or another agreed location in the *power system* (including within the *generating system*) to within 0.5% of the setpoint.

(ii) is able to operate the stator continuously at 105% of *nominal voltage* with *rated active power* output;

(iii) regulates voltage in a manner that helps to support *network* voltages during faults and does not prevent the *Network Service Provider* from achieving the requirements of clause S5.1a.3 and S5.1a.4;

(iv) allows the voltage setpoint to be continuously controllable in the range of at least 95% to 105% of *normal voltage* at the *connection point* or the agreed location, without reliance on a *tap-changing transformer*;

(v) has limiting devices to ensure that a voltage disturbance does not cause the *generating unit* to trip at the limits of its operating capability;

(vi) has an excitation ceiling voltage *of* at least 2 times the *excitation* required to achieve *generation* at *nameplate rating* for rated power factor, rated speed and *nominal voltage*;

(vii) has *settling times* for a step change of voltage setpoint or voltage at the location agreed under clause S5.2.5.13(b)(3)(i) of:

(A) generated voltage less than 2.5 seconds for a 5% voltage disturbance with the *generating unit* not *synchronised*;

(B) active power, reactive power and voltage less than 5.0 seconds for a 5% voltage disturbance with the *generating unit synchronised*, from an operating point where the voltage disturbance would not cause any limiting device to operate; and

(C) in respect of each limiting device, active power, reactive power and voltage less than 7.5 seconds for a 5% voltage disturbance with the *generating unit synchronised*, when operating into a

limiting device from an operating point where a voltage disturbance of 2.5% would just cause the limiting device to operate;

(viii) is able to increase field voltage from rated field voltage to the excitation ceiling voltage in less than 0.5 second;

(ix) has a *power system* stabiliser with sufficient flexibility to enable damping performance to be maximised, with characteristics as described in clause S5.2.5.13(d); and

(x) has reactive current compensation settable for boost or droop.

(4) Each *generating unit*, other than a *synchronous generating unit*, must have a voltage *control system* that:

(i) regulates voltage at the *connection point* or an agreed location in the *power system* (including within the *generating system*) to within 0.5% of its setpoint;

(ii) regulates voltage in a manner that helps to support *network* voltages during faults and does not prevent the *Network Service Provider* from achieving the requirements of clauses S5.1a.3 and S5.1a.4;

(iii) allows the voltage setpoint to be continuously controllable in the range of at least 95% to 105% of *normal voltage* at the *connection point* or agreed location in the *power system*, without reliance on a *tap changing transformer*;

(iv) has limiting devices to ensure that a voltage disturbance does not cause the *generating unit* to trip at the limits of its operating capability;

(v) with the *generating system* connected to the *power system*, has *settling times* for active power, reactive power and voltage due to a step change of voltage setpoint or voltage at the location agreed under clause S5.2.5.13(b)(4)(i), of less than:

(A) 5.0 seconds for a 5% voltage disturbance with the *generating unit connected* to the *power system*, from an operating point where the voltage disturbance would not cause any limiting device to operate; and

(B) 7.5 seconds for a 5% voltage disturbance with the *generating unit connected* to the *power system*, when operating into any limiting device from an operating point where a voltage disturbance of 2.5% would just cause the limiting device to operate;

(vi) has reactive power *rise time*, for a 5% step change in the voltage set point, of less than 2 seconds;

(vii) has a *power system* stabiliser with sufficient flexibility to enable damping performance to be maximised, with characteristics as described in clause S5.2.5.13(d); and

(viii) has reactive current compensation.

(c) The *minimum access standard* is:

(1) Each *generating unit* must have *plant* capabilities and *control systems*, including if appropriate, a *power system* stabiliser, sufficient to ensure that:

(i) *power system* oscillations, for the frequencies of oscillation of the *generating unit* against any other *generating unit*, are *adequately damped*;

(ii) operation of the *generating unit* does not degrade any mode of oscillation that is within 0.3 nepers per second of being unstable, by more than 0.01 nepers per second and does not degrade any other mode of oscillation to within 0.29 nepers per second of being unstable; and

(iii) operation of the *generating unit* does not cause instability (including hunting of *tap-changing transformer control systems*) that would adversely impact other *Registered Participants*.

(2) Each *generating system* comprised of *generating units* with combined *nameplate rating* of 30 MW or more must have *facilities* for testing its *control systems* sufficient to establish their dynamic operational characteristics.

(3) Each *generating unit* or *generating system* must have facilities:

(i) where the *connection point nominal voltage* is 100 kV or more, to regulate voltage in a manner that does not prevent the *Network Service Provider* from achieving the requirements of clauses S5.1a.3 and S5.1a.4;

(ii) where the *connection point nominal voltage* is less than 100 kV, to regulate voltage or reactive power or power factor in a manner that does not prevent the *Network Service Provider* from achieving the requirements of clauses S5.1a.3 and S5.1a.4; and

(iii) in either case, sufficient to achieve the performance agreed in respect of clauses S5.2.5.1, S5.2.5.2, S5.2.5.3A, S5.2.5.3B, S5.2.5.3C and S5.2.5.12.

(4) Each *synchronous generating unit*, that is part of a *generating system* comprised of *generating units* with a combined *nameplate rating* of 30 MW or more, must have an *excitation control system* that:

(i) regulates voltage at the *connection point* or an agreed location in the *power system* (including within the *generating system*), to within 0.5% of its setpoint or, where the *connection point nominal voltage* is less than 100 kV, regulates voltage, power factor or reactive power as agreed with the *Network Service Provider* and *NEMMCO*;

(ii) has excitation ceiling voltage of at least 1.5 times the excitation required to achieve *generation* at the *nameplate rating* for rated power factor, rated speed and *nominal voltage* ;

(iii) subject to coordination under clause S5.2.5.13(g), has a *settling time* of less than 5.0 seconds for a 5% voltage disturbance with the *generating unit* synchronised, from an operating point where such a voltage disturbance would not cause any limiting device to operate; and

(iv) has over- and under-excitation limiting devices sufficient to ensure that a voltage disturbance does not cause the *generating unit* to trip at the limits of its operating capability.

(5) Each *generating system* comprised of *generating units* with combined *nameplate rating* of 30 MW or more and which are not *synchronous generating units*, must have a *control system* that:

(i) regulates voltage at the *connection point* or an agreed location in the *power system* (including within the *generating system*) to within 0.5% of its setpoint or, where the *connection point nominal voltage* is less than 100 kV, regulates voltage, power factor or reactive power as agreed with the *Network Service Provider* and *NEMMCO*;

(ii) subject to coordination under clause S5.2.5.13(g), has settling time less than 7.5 seconds for a 5% voltage disturbance with the *generating unit* electrically connected to the *power system* from an operating point where such a voltage disturbance would not cause any limiting device to operate; and

(iii) has limiting devices to ensure that a voltage disturbance would not cause the *generating unit* to trip at the limits of its operating capability.

(d) A *power system* stabiliser provided under clause S5.2.5.13(b) must have the following characteristics:

(i) for a *synchronous generating unit*, measurements of rotor speed and active power output of the *generating unit* as inputs, and otherwise measurements of *power system frequency* and active power output of the *generating unit* as inputs;

(ii) two washout filters for each input, with ability to bypass one of them if necessary;

(iii) sufficient (and not less than two) lead-lag transfer function blocks (or equivalent number of complex poles and zeros) with adjustable gain and time-constants, to compensate fully for the phase lags due to the *generating plant*;

(iv) an output limiter, which for a *synchronous generating unit* is continually adjustable over the range of –10% to +10% of stator voltage;

(v) monitoring and recording facilities for key variables including inputs, output and the inputs to the lead-lag transfer function blocks; and

(vi) facilities to permit testing of the *power system* stabiliser in isolation from the *power system* by injection of test signals, sufficient to establish the transfer function of the *power system* stabiliser.

(e) A limiting device provided under clauses S5.2.5.13(b) or S5.2.5.13 (c) must:

(1) not detract from the performance of any *power system* stabiliser; and

(2) be coordinated with all *protection systems*.

(f) If a *generating unit* cannot meet the *automatic access standard*, the *Generator* must demonstrate why that standard could not be reasonably achieved. The *negotiated access standard* proposed by the *Generator* must then be the highest level that the *generating*

system can reasonably achieve, including by installation of additional dynamic reactive power equipment, and through optimising its *control systems*.

(g) The *Network Service Provider* may require that the design and operation of the *control systems* of a *generating unit* or *generating system* be coordinated with the existing voltage *control systems* of the *Network Service Provider* and of other *Network Users*, in order to avoid or manage interactions that would adversely impact on the *Network Service Provider* and other *Network Users*. The *access standards* must record such requirements.

(h) The assessment of impact of the *generating units* on *power system* stability and damping of *power system* oscillations shall be in accordance with the *power system* stability guidelines established under clause 4.3.4(h).

(i) *NEMMCO* must be involved in the negotiation of *access standards* under clause S5.2.5.13.

Inert new clause S5.2.5.14:

S5.2.5.14 Active power control

(a) *Automatic access standard:* A *generating system* comprised of *generating units* with a combined *nameplate rating* of 30 MW or more must have an active power *control system* capable of:

(1) for each *scheduled generating unit* or, if subject to aggregation approved by *NEMMCO* under clause 3.8.3, *scheduled generating system*:

(i) maintaining and changing its active power output in accordance with its *dispatch instructions*; and

(ii) ramping its active power output linearly from one dispatch level to another, and

(2) for each *non-scheduled generating unit* or *non-scheduled generating system*, subject to the energy source availability:

(i) subject to clause S5.2.5.14(a)(2)(iii), automatically reducing or increasing its active power output within five minutes, at a constant rate, to below the level specified in an instruction electronically issued by a *control centre*;

(ii) automatically limiting its active power output, to below the level specified in clause S5.2.5.14(a)(2)(i); and

(iii) not changing its active power output within five minutes by more than the raise and lower amounts specified in an instruction electronically issued by a *control centre*.

(b) *Minimum access standard:* A *generating system* comprised of *generating units* with combined *nameplate rating* of 30 MW or more must have an active power *control system* capable of:

(1) for each *scheduled generating unit* or, if subject to aggregation approved by *NEMMCO* under clause 3.8.3, *scheduled generating system*, maintaining and changing its active power output in accordance with its *dispatch instructions*.

(2) for each *non-scheduled generating system*:

(i) reducing its active power output, within five minutes, to or below the level required to manage *network* flows that is specified in a verbal instruction issued by the *control centre*;

(ii) limiting its active power output to or below the level specified in clause S5.2.5.14(b)(2)(i);

(iii) ensuring that the change of active power output in a five minute period does not exceed a value specified in a verbal instruction issued by the *control centre*; and

(iv) being upgraded to receive electronic instructions from the *control centre* and respond within five minutes.

(c) Each *control system* used to satisfy the requirements of clauses S5.2.5.14(a) and S5.2.5.14(b) must be *adequately damped*.

(d) The *access standard* must document to *NEMMCO's* satisfaction any operational arrangements necessary to manage *network* flows, that may include a requirement for the *generating system* to be operated in a manner that prevents its output changing within five minutes by more than an amount specified by a *control centre*.

(e) A *negotiated access standard* may provide that if the number or frequency of verbal instructions becomes difficult for a *control centre* to manage, *NEMMCO* may require the *Generator* to upgrade its *facilities* to receive electronic instructions and act automatically on those instructions.

(f) *NEMMCO* must be involved in the negotiation of *access standards* under clause S5.2.5.14.

Replace clause S5.2.6.1 with the following:

S5.2.6.1 Remote Monitoring

(a) The *automatic access standard* is:

(1) Each *scheduled generating unit* or *non-scheduled generating unit* with a *nameplate rating* of 30 MW or more or *non-scheduled generating system* with a combined *nameplate rating* of 30 MW or more, must have *remote monitoring equipment* to transmit to *NEMMCO's control centres* in real time in accordance with clause 4.11, the quantities that *NEMMCO* reasonably requires to discharge its *market* and *power system security functions* set out in Chapters 3 and 4.

(2) The quantities that *NEMMCO* may request include:

(i) in respect of each *scheduled generating unit* or *non-scheduled generating unit* with a *nameplate rating* of 30 MW or more, current, voltage, active power and reactive power in respect of *generating unit* stators or power conversion systems (as applicable), the status of all switching devices that carry the *generation*, *tap-changing transformer* tap position, and aggregate active power if subject to aggregation approved by *NEMMCO* under clause 3.8.3;

(ii) in respect of each *non-scheduled generating system* that includes a *generating unit* with a *nameplate rating* of less than 30 MW, its connected status, *tap-changing transformer* tap position and voltages, active power and reactive power aggregated for groups of identical *generating units*, and either the numbers of identical *generating units* operating or the operating status of each non-identical *generating unit*;

(iii) in respect of each auxiliary supply system with capacity of 30 MW or more associated with a *generating unit* or *generating system*, active power and reactive power;

(iv) in respect of reactive power equipment that is part of a *generating system* but not part of a particular *generating unit*, its reactive power,

(v) in respect of each wind farm, wind speed, wind direction and ambient temperature; and

(vi) any other quantity that *NEMMCO* reasonably requires to discharge its *market* and *power system security functions* as set out in Chapters 3 and 4.

(b) *Minimum access standard*: Each *scheduled generating unit* or, if subject to aggregation approved by *NEMMCO* under clause 3.8.3, *scheduled generating system*, or *non-scheduled generating system* with a combined *nameplate rating* of 30 MW or more must have *remote monitoring equipment* to transmit to *NEMMCO's control centres* in real time in accordance with clause 4.11:

(1) the active power output of the *generating unit, scheduled generating system* or *non-scheduled generating system* (as applicable);

(2) if *connected* to a *transmission system*, the reactive power output of the *generating unit*, *scheduled generating system* or *non-scheduled generating system* (as applicable); and

(3) if a wind farm, number of units operating, wind speed and wind direction.

(c) *NEMMCO* must be involved in the negotiation of *access standards* under clause S5.2.6.1.

Replace clause S5.2.6.3 with the following:

S5.2.6.3 Communications Equipment

(a) The *automatic access standard* is:

(1) A *Generator* must provide and maintain two separate telephone facilities using independent telecommunications service providers, for the purposes of *operational communications* between the *Generator's* responsible operator under clause 4.11.3(a) and *NEMMCO's control centre*.

(2) A *Generator* must provide electricity supplies for *remote monitoring equipment* and *remote control equipment* installed in relation to its *generating units* or *generating system* capable of keeping such equipment available for at least three hours following total loss of *supply* at the *connection point* for the relevant *generating unit*.

(b) The *minimum access standard* is:

(1) A *Generator* must provide and maintain a telephone facility for the purposes of *operational communications* between the *Generator's* responsible operator under clause 4.11.3(a) and *NEMMCO's control centre*.

(2) A *Generator* must provide electricity supplies for *remote monitoring equipment* and *remote control equipment* installed in relation to its *generating units* or *generating system* capable of keeping such equipment available for at least one hour following total loss of *supply* at the *connection point* for the relevant *generating unit*.

(c) Where the *Network Service Provider* or *NEMMCO* reasonably requiresthat a back-up telephone facility be independent of commercial telephone service providers, the *Network Service Provider* must provide and maintain the separate facility on a cost-recovery basis only through the charge for *connection*.

(d) A *Generator* must provide communications paths (with appropriate redundancy) from the *remote monitoring equipment* or *remote control equipment* installed for each of its *generating units*, or *generating system* as appropriate, to a communications interface in a location reasonably acceptable to the *Network Service Provider* at the relevant *generation facility*. Communications systems between this communications interface and the *control centre* must be the responsibility of the *Network Service Provider* unless otherwise agreed by the *Generator* and the *Network Service Provider*. The *Generator* must provide accommodation and secure power supplies for communications facilities provided by the *Network Service Provider* under clause S5.2.6.3.

(e) *NEMMCO* must be involved in the negotiation of *access standards* under clause S5.2.6.3.

Replace clause S5.2.8 with the following:

S5.2.8 Power station auxiliary supplies

In cases where a *generating system* takes its auxiliary supplies via a *connection point* through which its *generation* is not transferred to the *network*, the *access standards* must be established under clause S5.3.5 as if the *Generator* were a *Market Customer*.

Replace clause S5.2.9 with the following:

S5.2.9 Fault current

(a) The *automatic access standard* is:

(1) The contribution of the *generating system* to the fault current on the *connecting network* through its *connection point* must not exceed the lesser of:

(i) three times the combined maximum continuous current of the operating *generating units* of the *generating system*; and

(ii) the level that can be safely interrupted by the circuit breakers of the *connecting network* and safely carried by the *connecting network* for the duration of the applicable *breaker fail protection system fault clearance times*, as specified for the relevant *connection point* by the *Network Service Provider*.

(2) A *generating system's connected plant* must be capable of withstanding fault current through the *connection point* up to the higher of:

(i) the level specified in clause S5.2.4(c)(1); and

(ii) the highest level of current at the *connection point* that can be safely interrupted by the circuit breakers of the *connecting network* and safely carried by the *connecting network* for the duration of the applicable *breaker fail protection system fault clearance times*, as specified by the *Network Service Provider*.

(3) A circuit breaker provided to isolate a *generating unit* or *generating system* from the *network* must be capable of breaking, without damage or restrike, the maximum fault currents that could reasonably be expected to flow through the circuit breaker for any fault in the *network* or in the *generating unit* or *generating system*, as specified in the *connection agreement*.

(b) The *minimum access standard* is:

(1) The *generating system* does not need to limit fault current contribution.

(2) A *generating system's connected plant* must be capable of withstanding fault current through the *connection point* up to the level specified in clause S5.2.4(c)(1)

(3) A circuit breaker provided to isolate a *generating unit* or *generating system* from the *network* must be capable of breaking, without damage or restrike, the maximum fault currents that could reasonably be expected to flow through the circuit breaker for any fault in the *network* or in the *generating unit* or *generating system*, as specified in the *connection agreement*.

(c) The *Network Service Provider* must consider alternative *network* configurations in the determination of the applicable fault current level and must prefer those options that maintain an equivalent level of service to other *Network Users* and which, in the opinion of the *Generator*, impose the least obligation on the *Generator*.

(d) In carrying out assessments of proposed *access standards* under clause S5.2.9, the *Network Service Provider* must take into account, without limitation:

(1) the expected performance of existing *networks* and *network* developments that are *considered projects*;

(2) the expected performance of existing *generating plant* and *generation* projects that are *considered projects*; and

(3) the expected range of *power system* operating conditions.

(e) The *Network Service Provider* is not liable for any loss or damage incurred by the *Generator* or any other person as a consequence of a fault on either the *power system*, or within the *Generator*'s *facility*.

Replace the first paragraph under the heading "Preliminary system planning data" in clause S5.5.2 with the following:

This data is required for submission with the *application to connect*, to allow the *Network Service Provider* to prepare an offer of terms for a *connection agreement* and to assess the requirement for, and effect of, *network augmentation* or *extension* options. Such data is normally limited to the items denoted as Standard Planning Data (S) in the *generating system model guidelines generating system design data sheet*, *generating system setting data sheet* and in schedules 5.5.3 to 5.5.5.

Replace clause S5.5.4 with the following:

Schedules 5.5.3 to 5.5.5 cover the following data areas:

(a) schedule 5.5.3 - Network Plant Technical Data. This comprises fixed electrical parameters.

(b) schedule 5.5.4 - Plant and Apparatus Setting Data. This comprises settings which can be varied by agreement or by direction of the Network Service Provider or NEMMCO.

(c) schedule 5.5.5 - Load Characteristics. This comprises the estimated design parameters of loads.

The documents and schedules applicable to each class of *Registered Participant* are as follows:

(1) *Generators:* the *generating system model guidelines, generating system design data sheet* and *generating system setting data sheet*;

(2) *Customers* and *Network Service Providers:* schedules 5.5.3 and 5.5.4; and

(3) *Customers:* schedule 5.5.5.

Replace clause S5.5.5 with the following:

S5.5.5 A *Generator* that connects a *generating unit*, that is not a *synchronous generating unit*, must be given exemption from complying with those parts of the *generating system model guidelines, generating system design data sheet* and *generating system setting data sheet* that are determined by the *Network Service Provider* to be not relevant to such *generating units*, but must comply with those parts of schedules 5.5.3, 5.5.4, and 5.5.5 that are relevant to such *generating units*, as determined by the *Network Service Provider*.

Replace clause S5.5.6 with the following:

S5.5.6 A *Generator* that connects a *synchronous generating unit* equal to or smaller than 30 MW or a number of *synchronous generating units* totalling less than 30 MW to a *connection point* to a *distribution network* will usually be required to submit less registered system planning data and less registered data than is indicated in the *generating system model guidelines, generating system design data sheet* and *generating system setting data sheet.* In general these data will be limited to confirmation of the preliminary system planning data, marked (S), but other data must be supplied if required by the *Network Service Provider* or *NEMMCO*.

Codes:

S = Standard Planning Data

D = Detailed Planning Data

R = Registered Data (R1 pre-*connection*, R2 post-*connection*)

Insert a new clause S5.5.7

(a) *NEMMCO* must, subject to clause S5.7.7(b), *publish* in accordance with the *Rules consultation procedures:*

(1) a *generating system design data sheet* describing, for relevant technologies, the *generating system* design parameters of *generating unit*s and *generating systems* including, without limitation, *plant* configurations, impedances, time constants, non-linearities, ratings and capabilities, to be provided under clauses S5.2.4 and S5.5,

(2) a *generating system setting data sheet* describing, for relevant *generation* and *control system* technologies, the *protection system* and *control system* settings of *generating unit*s and *generating systems* including, without limitation, configurations, gains, time constants, delays, deadbands, non-linearities and limits, to be provided under clauses S5.2.4 and S5.5; and

(3) *generating system model guidelines*, describing, for relevant *generation* and *control system* technologies, *NEMMCO's* requirements when developing mathematical models for *generating units* and *generating systems*, including, without limitation, the impact of their *control systems* and *protection systems* on *power system* security.

(b) If the first version of:

(1) the *generating system design data sheet published* under paragraph (a) is identical to schedule 5.5.1;

(2) the *generating system setting data sheet published* under paragraph (a) is identical to schedule 5.5.2,

as each of those respective schedules existed one day before the *Rules* changes that give effect to this clause S5.5.7 take effect, *NEMMCO* is not required to comply with the *Rules consultation procedures* in *publishing* them.

(c) The purpose of making the *generating system design data sheet, generating system setting data sheet* and *generating system model guidelines*, is to:

(1) allow *generating units* and *generating systems* to be mathematically modelled by *NEMMCO* and relevant *Registered Participants* in load flow and dynamic stability assessments with sufficient accuracy to permit:

(i) the *power system* operating limits for ensuring *power system security* to be quantified with the lowest practical operating margins;

(ii) proposed *access standards* and *performance standards* of *generating units* and *generating systems* to be assessed; and

(iii) settings of *control systems* and *protection systems* of *generating units*, *generating systems* and *networks* to be assessed and quantified for maximum practical performance of the *power system;* and

(2) identify for each type of data its category in terms of clause S5.5.2.

(d) Any consultation commenced by *NEMMCO* in accordance with the *Rules consultation procedures* prior to this clause coming into effect is taken to have been conducted in accordance this clause S5.7.7.

Delete schedules 5.5.1 and 5.5.2

Replace schedule 5.6(c1) with the following:

(c1) details of each *access standard* agreed between the *Network Service Provider* and the *Registered Participant* and all related conditions of agreement resulting from the application of any access provisions contained in schedule 5.1 for *Network Service Providers*, or schedule 5.2 for *Generators*, or schedule 5.3 for *Customers*, or schedule 5.3a for *Market Network Service Providers*;

Replace clause 8.6.2(m) with the following:

(m) **(modelling):** the disclosure, use or reproduction of data held by *NEMMCO* or a *Network Service Provider* for the purpose of modelling the operation of the *power system*, to the extent reasonably necessary to enable a *Connection Applicant* to develop an *application to connect*.

Insert a new clause 8.6.2(n)

(n) the disclosure of a *performance standard* to a *Network Service Provider* for the purpose of establishing a compliance monitoring program, or if *connection* at that *performance standard*, in *NEMMCO's* opinion, affects, or is likely to affect, the performance of that *Network Service Provider's network*.

Insert the following new definitions in the Glossary chapter 10.

access standard

Either an *automatic access standard* or a *negotiated access standard* for a particular technical requirement as recorded in a *connection agreement*.

adequately damped

In relation to a *control system*, when tested with a step change of a feedback input or corresponding reference, or otherwise observed, any oscillatory response at a frequency of:

(a) 0.05 Hz or less has a damping ratio of at least 0.4;

(b) between 0.05 Hz and 0.6 Hz has a halving time of 5 seconds or less (equivalent to a damping coefficient –0.14 nepers per second or less); and

(c) 0.6 Hz or more has a damping ratio of at least 0.05 in relation to a *minimum access standard* and a damping ratio of at least 0.1 otherwise.

considered project

In respect of a *generating system*, a project that meets both of the following criteria:

(a) A *connection agreement* has been entered into.

(b) An *offer to connect* has been made and the *Network Service Provider* considers that if the *offer to connect* were accepted that project might adversely affect the *Connection Applicant's* proposed *generating system*.

In respect of a *transmission network* augmentation, a project that meets all of the following criteria:

(a) The *Network Service Provider* has acquired the necessary land and easements.

(b) The *Network Service Provider* has obtained all necessary planning and development approvals.

(c) As applicable:

  (i) the augmentation project has passed the *regulatory test;* or

  (ii) in respect of a *new small transmission network asset*, an intention to proceed with the project has been published in the *Network Service Provider's Annual Planning Report*; or

  (iii) in respect of a *funded augmentation* the arrangements have been made for its funding.

(d) Construction has either commenced or the *Network Service Provider* has set a firm date for it to commence.

In respect of a *distribution network* augmentation, a project that meets all of the following criteria:

(a) The *Network Service Provider* has acquired the necessary land and easements;

(b) The *Network Service Provider* has obtained all necessary planning and development approvals;

(c) Construction has either commenced or the *Network Service Provider* has set a firm date for it to commence.

continuous uninterrupted operation

In respect of a *generating unit* operating during a *power system* disturbance, not disconnecting from the *power system* and, after clearance of any associated electrical fault, delivering *active power* and *reactive power* in accordance with its *performance standards*, with all essential auxiliary and reactive *plant* remaining in service, so as to not exacerbate or prolong the disturbance for other *connected plant*.

generating system design data sheet

The data sheet published by *NEMMCO* under clause S5.5.7(a)(1).

generating system model guidelines

The guidelines published by *NEMMCO* under clause S5.5.7(a)(3).

generating system setting data sheet

The data sheet published by *NEMMCO* under clause S5.5.7(a)(2).

nominal voltage

The design *voltage* level, nominated for a particular location on the *power system*, such that power lines and circuits that are electrically connected other than through transformers have the same nominal *voltage* regardless of operating *voltage* and *normal voltage*

non-scheduled generating system

A *generating system* comprising *non-scheduled generating units.*

normal voltage

In respect of a *connection point*, its *nominal voltage* or such other voltage up to 10% higher or lower than *nominal voltage*, as approved by *NEMMCO*, for that *connection point* at the request of the *Network Service Provider* who provides *connection* to the *power system*

rated active power

(1) in relation to a *generating unit*, the maximum amount of *active power* that the *generating unit* can continuously deliver at the *connection point* when operating at its *nameplate rating*; and

(2) in relation to a *generating system*, the combined maximum amount of *active power* that its in-service *generating units* can deliver at the *connection point*, when its in-service *generating units* are operating at their *nameplate ratings.*

scheduled generating system

A *generating system* comprising *scheduled generating units.*

Replace the following definitions in Chapter 10:

generating system

A system comprising one or more *generating units* and includes auxiliary or reactive *plant* that is located on the *Generator's* side of the *connection point* and is necessary for the *generating system* to meet its *performance standards*.

Generator

A person who engages in the activity of owning, controlling or operating a *generating system* that is *connected* to, or who otherwise *supplies* electricity to, a *transmission* or *distribution system* and who is registered by *NEMMCO* as a *Generator* under Chapter 2 and, for the purposes of Chapter 5 (other than clause 5.10), the term includes a person who is required to, or intends to register in that capacity.

nameplate rating

The maximum continuous output or consumption in MW of an item of equipment as specified by the manufacturer, or as subsequently modified.

performance standard

In relation to a technical requirement of access for a particular *plant*, a standard of performance recorded on the register by *NEMMCO* under clause 5.11.3.

performance standards commencement date

For *Generators*, *Customers* and *Network Service Providers* who plan, own, operate or control a *facility* located in:

(a) a *participating jurisdiction* other than Tasmania, the *performance standards commencement date* is, in relation to that facility, 16 November 2003; and

(b) Tasmania, the *performance standards commencement date* is, in relation to that facility, 29 May 2005.

reliability

In respect of equipment, the probability of its performing its function adequately for the period of time intended under the operating conditions encountered.

In respect of *supply*, the probability that it is sufficient to satisfy the demand for that *supply*, taking into account available *generation*, *power transfer capability* and other demand.