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Australian Energy Markets Commission
Level 16, 1 Margaret Street
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Submission: submissions@aemc.gov.au

26 June 2006

Dear John

TECHNICAL STANDARDS FOR WIND GENERATION - RULE CHANGES PROPOSED BY NEMMCO

VENCorp welcomes the opportunity to comment on changes to the National Electricity Rules (the Rules) proposed by NEMMCO, and notes that these proposed changes address many of the current shortcomings in the Rules.

VENCorp has reviewed the proposed changes and while it supports many of them, it does have concerns over some of the proposed changes and has provided specific comments in the attachment to this letter.

During our review process it has become apparent to us that the Rule changes proposed by NEMMCO are more extensive than would be required to adequately address technical performance requirements applicable to wind farms, and significantly affect the responsibilities of NSPs and other participants in the NEM. Therefore it would seem appropriate that all participants should be given a greater opportunity to review and comment on these proposals. VENCorp suggests that a new Working Group be established, comprising representatives from all classes of NEM participants, to conduct a wider review of the Rules and consider changes to clarify a number of Rule obligations and standards.

Further, VENCorp is taking this opportunity to propose the removal of other significant deficiencies in the Rules by offering amendments to NEMMCO's proposal and additional Rule changes that we consider beneficial and which will provide greater certainty to participants.

Our comments cover five broad categories, as outlined below, with more details and suggested amendments addressing these issues in the attachment:

- A number of the proposed Rule changes would see NEMMCO taking on additional responsibility in the approval of quality of supply performance standards. This is considered neither appropriate nor necessary, as the existing Rules appropriately place this responsibility with NSPs. NEMMCo's primary role is to operate the market and manage system security, not manage quality of supply matters, which is clearly an NSP responsibility. NEMMCOs involvement in quality of supply matters would make accountability uncertain and lead to increased delays in the connection application process.

- Some of the proposed changes would allow NEMMCO unrestricted access to connection agreements. VENCorp accepts that certain technical information should be provided to NEMMCO, such as agreed performance standards and compliance regimes. VENCorp does not, however, support NEMMCO having full access to these documents, as they contain confidential commercial arrangements between NSPs and Network Users.

- VENCorp believes that any proposed Rule changes should also recognise that a number of existing performance standards, particularly those standards for older generating plant, are below the minimum access standards. These plant standards were not registered with NEMMCO in the time frame contemplated by sections 4.13 and 4.14 of the existing Rules. It is suggested that Rule changes need to be included to allow these older generators to finalise their registrations (possibly in a limited time frame). We understand that this issue is currently being addressed by the AEMC in consultation with the AER, NEMMCO, the NGF and others.

- It is considered that neither the existing Rules, nor the proposed changes, have at this stage appropriately captured performance standards for quality of supply in relation to generators (refer S5.2.5.2). The main issue is that well designed synchronous generators should not contribute significantly to quality of supply distortion, therefore it is inappropriate to allocate quality of supply contributions to generators in the same way they are allocated to customer loads, as contemplated by the proposed changes. An approach to this issue is suggested in the attachment.

- Some of the previous Rule changes relating to technical performance standards for excitation systems (refer Rule 5.2.5.13) were implemented primarily to make these requirements non-technology specific. Recognising that these systems are becoming more common, VENCorp is concerned that this will potentially lead to inferior performance being specified for new static self-excitation systems and strongly recommends that this decision be revisited.

If you have any further queries regarding this matter, please do not hesitate to contact Mr Graeme Cook, General Manager - Development, ☎ (03) 8664 6612.

Yours sincerely

M. Zema

Matt Zema
Chief Executive Officer

Att.

VENCorp Comments on NEMMCO Rule Change Proposal for Technical Standards for Wind Generators

Affected clause	Clause with NEMMCO proposed amendments	NEMMCO Reason	VENCorp Comment
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.	In the context of new generation, it is conceivable that NEMMCO might need to register Generators on a conditional basis. This is because NEMMCO's overriding responsibility is to ensure power system security, so it is appropriate that NEMMCO has the power to apply conditions to registration that ensure that that objective can be met. It is also appropriate to give NEMMCO the power to apply conditions to registration that ensure reliability of supply and the quality of network service since these are necessary to ensure that the interests of Network Users are protected. Rather than include a provision that specifically applies to Generators (thereby creating an implication that NEMMCO cannot impose conditions on the registration of other applicants, it is appropriate that a generic power to impose conditions (albeit a conditional power) be inserted.	The proposed draft clause 2.9.2(d) would give NEMMCO unrestrained power with regard to registration. Under this clause it is not appropriate that NEMMCO should have the ability to impose terms and conditions on registration of performance standards relating to quality of supply issues (which is a TNSP responsibility), and quality of supply performance standard issues should therefore be specifically excluded under this clause. In addition, it is suggested that the following words should be added at the end of the clause to ensure that NEMMCO is reasonable, namely ", provided that such terms and conditions are consistent with the Rules."
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*.	This clause has been added to enable NEMMCO to pass on standard system snapshots to power system consultants who have a need for the data.	It is suggested that the proposed clause 3.13.3(k1) should be extended to also require NEMMCO to provide the relevant TNSP (who has provided network data to the applicable party) with a copy of such data, as the TNSP is also likely to be negotiating with the same party.

VENCorp Comments on NEMMCO Rule Change Proposal for Technical Standards for Wind Generators

Affected clause	Clause with NEMMCO proposed amendments	NEMMCO Reason	VENCorp Comment
5.2.2(c) & (d)	**Delete**	There is no need for clause 5.2.2(c). Its effect is unclear and it is confusing. Chapter 5 no longer contains mandatory technical requirements that could conflict with the connection agreement. There is no need for clause 5.2.2(d). Its operation is unclear given the obligations set out in clauses 5.2.3 (Obligations of Network Service Providers), 5.2.4 (Obligations of Customers) and 5.2.5 (Obligations of Generators).	NEMMCO's proposed deletion of clause 5.2.2(c) is not considered reasonable, as they have no direct involvement in connection agreements. Retention of this clause will assist in preserving the obligations contained in connection agreements.
5.3.4A(a)	(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*; ~~and~~ (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.	Clause 5.3.4A must reference reliability of supply as this concept is also central to the proper operation of the market. Some of the technical requirements impact reliability of supply as well as power system security (notably S5.2.5.9 and S5.2.5.12): a change to the technical envelope is treated as an impact on security in the planning framework, but in operational timeframes may be managed by actions that impact reliability to maintain security. Bases for negotiation have been added to the technical requirements in S5.2.5. These do not form part of the automatic or minimum standards but explain how they are to be applied. The additional wording in 5.3.4A(a)(5) is required to ensure that these bases for negotiation are applied.	It is considered that the proposed clause 5.3.4A(a) should be expanded to allow negotiation of access standards below the minimum access standard for generating plant that was in service prior to 1998 (thereby recognising that not all negotiations on such lower performance standards were completed by December 2004 as contemplated by the existing Rules). It is therefore recommended that a new item 6 should be included in this clause along the lines "for generating plant that was in service prior to 1998 a negotiated standard below the minimum access standard may be agreed, provided it is consistent with the design performance for such generating plant, and documented as agreed performance standards in the relevant Connection Agreement."

VENCorp Comments on NEMMCO Rule Change Proposal for Technical Standards for Wind Generators

Affected clause	Clause with NEMMCO proposed amendments	NEMMCO Reason	VENCorp Comment
5.3.4A(b)	(b) A *Network Service Provider* must, following the receipt of a proposed *negotiated access standard* ~~in accordance with~~ under clause 5.3.4A(e) or 5.3.4A(f)~~.~~: (1) consult *NEMMCO* on all matters ~~allocated to *NEMMCO* under clause 5.3.3(b1)(4) and must~~ 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*.	The change is required to clarify the obligation to consult and where that obligation is referenced.	The proposed clause 5.3.4A(b)(1) fails to recognise that NEMMCO is **not involved** in the negotiation of performance standards (this is an NSP's responsibility). NEMMCO is only involved in the **acceptance** of performance standards. This distinction needs to be made in the drafting of this clause. In item 5.3.4A(b)(2) it is not considered reasonable that an NSP should be obliged to accept NEMMCO's advice in respect of quality of supply performance standards (as these are an NSP's responsibility, not NEMMCO's), and therefore these standards should be excluded from the obligation in this clause. In addition it is suggested that item 5.3.4A(b)(2) should be amended to read "accept NEMMCO's reasonable advice in respect of those matters……"
5.3.4A(d)	(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*	This clause has been re-written to clarify the basis for rejection of proposed access standards. In paragraph (2), a reference to reliability of supply (limited to generating plant) has been added. Previously, NEMMCO could reject an application on the basis of security and the Network Service Provider on the basis of quality of supply but neither had a specific power to reject it on the basis of impact on reliability.	The proposed clause 5.3.4A(d)(4) should also exclude "grandfathered" performance standards, which are below the minimum access standard, where such performance standards are still being negotiated.

Affected clause	Clause with NEMMCO proposed amendments	NEMMCO Reason	VENCorp Comment
	plant (as the case may be), at the *negotiated access standard* proposed by the *Connection Applicant* would: (1) ~~accept the proposed *negotiated access standard*~~ in *NEMMCO*'s reasonable opinion, adversely affect *power system security;* or (2) ~~reject the proposed *negotiated access standard* if *connection* at the *negotiated access standard* proposed by the *Connection Applicant* would:~~in respect of the *connection* of *generating plant*, in *NEMMCO's* reasonable opinion adversely affect *reliability* of *supply*; or ~~(i) in *NEMMCO's* reasonable opinion, adversely affect *power system security*; or~~ ~~(ii) in the *Network Service Provider's* reasonable opinion, adversely affect quality of *supply* for other *Network Users*; or~~ ~~(iii) in the opinion of *NEMMCO* (in respect of a matter allocated to *NEMMCO* under clause 5.3.3(b1)(4)) or in the opinion of the *Network Service Provider* (in respect of a matter not allocated to *NEMMCO* under clause 5.3.3(b1)(4)), not meet the requirements of	There is a grey area between security and reliability impacts. In the operational sense of security something that affects the operating envelope can often be managed by reductions in transfers on interconnectors or other major transmission network elements, which means that a security impact is translated to a reliability impact. See also comments under clause 5.3.4A(a).	

Affected clause	Clause with NEMMCO proposed amendments	NEMMCO Reason	VENCorp Comment
	~~clause 5.3.4A(a).~~ (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).		
5.3.6(e)	**Delete**	This clause is a legacy of the Code prior to the introduction of negotiated access standards. The concept of variations is now specifically dealt with under the negotiation of access standards between minimum and automatic levels.	NEMMCO's recommended deletion of clause 5.3.6(e) does not appear reasonable, as an NSP may, under exceptional circumstances ,need to negotiate terms and conditions that vary from the Rules, and will need to rely on this clause for relief. For example, a new customer may want to connect to a remote part of a transmission network where historically the quality of supply requirements of Schedule 5.1 have not been met, and cannot easily be met in future without excessive expenditure.

VENCorp Comments on NEMMCO Rule Change Proposal for Technical Standards for Wind Generators

Affected clause	Clause with NEMMCO proposed amendments	NEMMCO Reason	VENCorp Comment
5.3.7 (a1)-(a3)	(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*.		The drafted clause 5.3.7(a3) needs to be amended to recognise that NEMMCO does not need to "accept" performance standards relating to quality of supply, as this is a NSP responsibility. It only needs to receive them for registration purposes.

VENCorp Comments on NEMMCO Rule Change Proposal for Technical Standards for Wind Generators

Affected clause	Clause with NEMMCO proposed amendments	NEMMCO Reason	VENCorp Comment
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	Throughout Chapter 5 the term 'access standard' has been adopted to refer to the automatic or negotiated standards that are recorded in the connection agreement. The standards in the connection agreement are proposed performance standards until they are accepted by NEMMCO and recorded on the register.	In the proposed 5.3.7A(b), it is not considered appropriate (or necessary) that a TNSP should be obliged to submit to NEMMCO a complete copy of the "connection agreement and relevant technical details". The connection agreement will also include commercial arrangements (which are generally confidential) between the parties, and which NEMMCO does not need to know. It is recommended that the wording be modified so that the TNSP is only obliged to submit to NEMMCO technical information relating to performance standards and associated compliance.

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5.3.7A	(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.		In the drafting of 5.3.7A(d), it is not considered appropriate that NEMMCO should be involved with quality of supply standards, as this is a TNSP's area of responsibility, not NEMMCO's. This clause as drafted should also exclude "grandfathered" performance standards which are below the minimum access standard, where such performance standards are still being negotiated.

VENCorp Comments on NEMMCO Rule Change Proposal for Technical Standards for Wind Generators

Affected clause	Clause with NEMMCO proposed amendments	NEMMCO Reason	VENCorp Comment
5.7.3(e)	(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 ~~of schedule 5.2~~ and the relevant *connection agreement*; or (ii) ~~does not have evidence demonstrating that a *generating unit* complies with the technical requirements set out in clause S5.2.5 of schedule 5.2~~ 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 (~~3~~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*,	These amendments are to change the reference to technical requirements to references to performance standards, and to include inadequate models used to assess power system security as grounds for directing the Generator to operate the plant.	In the concluding paragraph of 5.7.3(e) it is recommended that the words be modified to read "……..submits evidence reasonably satisfactory to NEMMCO and the relevant TNSP that the generating unit or generating system is complying……"

VENCorp Comments on NEMMCO Rule Change Proposal for Technical Standards for Wind Generators

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	including *power transfer capabilities*[~~;~~ ~~and~~ ~~(3) holds the reasonable opinion that there is or could be a threat to the *power system security* because of the performance of the *generating unit*]~~, *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 ~~technical requirement(s)~~ *performance standard* and performing substantially in accordance with its analytical model.		
5.10	**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	Clause 5.10.1(b) has been rewritten from 4.13.(b). The words "confidential information" have been removed because some of the information required is considered elsewhere in the Rules to be "confidential information", but nevertheless may need to be provided. Clause 5.10.1(c) is required to correct an anomaly in the current Rules where people with signed connection agreements who were not Registered Participants at the time of the last changes to the Code (preceding the change to Rules), but who subsequently became registered, are not covered by the process to create performance standards either under chapter 5 or chapter 4. This clause ensures that performance standards will now be recorded for these Participants. Clause 5.10.1(e) is required as a transitional arrangement for the introduction of the new process	The proposed clause 5.10.1(a)(1) fails to recognise that negotiated performance standards for several generators were not submitted within 30 days of the Performance Standards Commencement Date The Rules should be amended to still allow negotiation of performance standards, including performance standards below the minimum access standard, for a further limited time period (e.g. for 12 months).

Affected clause	Clause with NEMMCO proposed amendments	NEMMCO Reason	VENCorp Comment
	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	where performance standards are assessed before the connection agreement is signed.	

Affected clause	Clause with NEMMCO proposed amendments	NEMMCO Reason	VENCorp Comment
	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*.	The existing Rules are deficient in that they do not deal with the situation where the technical requirements change. It is important that Generators address any changes in the technical requirements to ensure system security, reliability and quality of supply are maintained. Clause 5.10.2 is inserted to correct this omission. This clause is required so that the performance standards submitted are not of a lesser standard than what currently is agreed or if there is no agreement, then what is technically achievable by the plant.	

Affected clause	Clause with NEMMCO proposed amendments	NEMMCO Reason	VENCorp Comment
	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		

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	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*.		
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~~ 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	Clause 5.11 reiterates the existing clause 4.14 with the necessary amendments. Clause 5.11.1(a1) deals with the situation regarding the requirement to lodge performance standards when the technical requirements change. The intent of this clause is that existing process of registering performance standards is continued for subsequent changes to performance standards (including the current proposals).	In the proposed section 5.11.1(l), it is not considered appropriate that NEMMCO should be involved in approval of performance standards for quality of supply matters, as this is a TNSP's area of responsibility, not NEMMCO's.

Affected clause	Clause with NEMMCO proposed amendments	NEMMCO Reason	VENCorp Comment
	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		

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	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		

Affected clause	Clause with NEMMCO proposed amendments	NEMMCO Reason	VENCorp Comment
	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),	This clause is required to ensure NEMMCO has access to the information it requires to assess proposed performance standards. Appropriate safeguards are inserted to ensure that certain information is regarded as confidential information and so attracts the protection that the Rules afford such information.	

Affected clause	Clause with NEMMCO proposed amendments	NEMMCO Reason	VENCorp Comment
	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*		

Affected clause	Clause with NEMMCO proposed amendments	NEMMCO Reason	VENCorp Comment
	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 p*erformance 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 clause~~s~~ 5.3.7A (1), 5.10.1(a),		In item 5.11.2 (a) it is not considered appropriate that NEMMCO be given access to a complete version of the connection agreement, as there are commercial matters not relevant to NEMMCO within the agreements.

Affected clause	Clause with NEMMCO proposed amendments	NEMMCO Reason	VENCorp Comment
	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*.		
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	S5.2.5.2 Quality of electricity generated cross-references S5.1.7, but it doesn't specify minimum and automatic access standards. This clause has been added to give distinct minimum and automatic access levels for negative phase sequence voltage for generating units.	The draft clause S5.1.7(c) fails to recognise that if the Automatic Access Standard was applied as drafted in item (1) of this clause, and the generator made full use of the allocated allowance, then it is highly likely that the TNSP would be unable to meet its unbalance obligations to other network users, defined in this clause, particularly at locations remote from generation. To avoid this problem, an "Automatic Access

Affected clause	Clause with NEMMCO proposed amendments	NEMMCO Reason	VENCorp Comment
	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*.		Standard" considerably tighter than specified in Table s5.1a.1 would need to be defined (e.g. possibly 0.1%, or a plant standard if available). Alternatively, reliance on the Minimum Access Standard could be applied here, so that the TNSP can fulfil its obligations at connection points for all network users.
S5.2.4	**S5.2.4 Provision of information** (a) ~~The~~ 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 ~~of the kinds~~ specified in schedule 5.5 ~~reasonably required by NEMMCO of the Network Service Provider~~ or the *generating system model guidelines, generating system design data sheet,* or *generating system setting data sheet* about its *generating systems*. (b) ~~Three months before first *synchronisation* a *Generator* must, in respect of each proposed~~	The term "scheduled" generating unit has been changed to "generating system comprised of generating units with combined nameplate rating of 30 MW or more" to extend the clause to cover large non-scheduled generating systems (eg some wind farms). The term *generating system* has also been extended to cover reactive power equipment. The obligation in clause S5.2.4(a) has been extended to an intending Generator that has entered into a connection agreement, because the information is required before registration. The references to schedules S5.5.1 and S5.5.2 have been changed to refer to the documents to be made under clause S5.5.7. The requirement for information in S5.2.4(b) has been	Draft clause S5.2.4(b)(5) appears to be somewhat unreasonable. Various parties within the NEM (NEMMCO and TNSPs) use various tools to carry out their modelling and it would be unreasonable to impose a specific standard for generators to provide data in a form that would meet each party's modelling needs. VENCorp does see value in standardising the data requirements as far as possible and suggests that an industry work group be formed to develop appropriate guidelines for the provision of data to all relevant parties (eg NEMMCO and TNSPs).

Affected clause	Clause with NEMMCO proposed amendments	NEMMCO Reason	VENCorp Comment
	~~*scheduled generating unit,* provide~~ 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*) ~~and any relevant *Distribution Network Service Provider*~~ with the following information about the ~~*generating unit's*~~ *control systems* ~~for *frequency* control and *voltage* control~~ of the *generating system*: (i) a set of functional block diagrams, including all functions between feedback	extended to cover control systems that are applied to the generating system (as well as those applying to the generating unit), and including controls of such things as Statcoms and SVCs that contribute to the performance of the generating system.	

Affected clause	Clause with NEMMCO proposed amendments	NEMMCO Reason	VENCorp Comment
	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. ~~The information provided must be updated within 3 months after commissioning tests or other tests undertaken in accordance with clause 5.7.3 of the *Rules* are completed. The *connection agreement* must record the process for subsequently changing this information. Conformance with the requirements described in this clause is the responsibility of the *Generator* and is subject to the provisions of clause 5.7.3(f) of the *Rules* for each *generating unit*.~~ (b1) The information provided under clause S5.2.4(b)	Clause S5.2.4(c) covers the information that the NSP is required to give to the Connection Applicant if requested. It has been extended to cover power system modelling information necessary to perform assessments required under clause S5.2.5.	

Affected clause	Clause with NEMMCO proposed amendments	NEMMCO Reason	VENCorp Comment
	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) ~~of the *Rules*~~, 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*;	Clause S5.2.4(d) reiterates the requirement from clause 5.3.8 that recipients must treat information provided as confidential.	

Affected clause	Clause with NEMMCO proposed amendments	NEMMCO Reason	VENCorp Comment
	(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) ~~any other~~ information ~~or data not being *confidential information*~~ relating to the performance of the ~~*Network Service Provider's facilities*~~ *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		

Affected clause	Clause with NEMMCO proposed amendments	NEMMCO Reason	VENCorp Comment
	and dynamic simulations; and (ii) information on *inter-regional* and *intra-regional power transfer capabilities* and relevant *plant* ratings. ~~except where the *Connection Applicant* agrees the *Network Service Provider* may provide alternative or less detailed technical information in satisfaction of this clause S5.2.4(c).~~ (d) All information provided under this clause S5.2.4 must be treated as *confidential information*.		
S5.2.5.2	**Quality of electricity generated** (a) *Automatic access standard*: ~~(1) The *plant standard* in accordance with clause S5.2.5.2(c); or~~ ~~(2)~~ Each *generating system*~~*unit*~~, when generating ~~must *generate* a constant *voltage* level,~~ and when not generating, must not produce at any of its *connection points* for *generation*~~draw electricity, with~~: (i) voltage fluctuation ~~equal to or less~~greater than the limits ~~determined~~allocated by the *Network Service Provider* ~~in accordance with~~ under clause S5.1.5(a); ~~and~~ (ii) harmonic voltage distortion ~~equal to or less~~greater than the	To allow for the possibility that the generating system has multiple connection points. The words 'for generation' are necessary to distinguish between auxiliary supply connection points and generation connection points.	VENCorp has concerns with regard to how to reasonably apply the Automatic Access standards of Clause S5.2.5.2 as drafted, knowing that synchronous generators should normally contribute very little to quality of supply distortion. If quality of supply (QoS) contributions are allocated to customers according to S5.1 and S5.2 of the Rules, and all customers were to make full use of their allocations, there would potentially be very little quality of supply "headroom" left to allocate to generators (and it should not really be needed in any case). If a QoS allocation was made to a generator according to part (a) of this draft clause, and the generator fully utilised its allocation, the TNSP could potentially have difficulty in meeting its QoS obligations in Schedule 5.1.

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Affected clause	Clause with NEMMCO proposed amendments	NEMMCO Reason	VENCorp Comment
	emission limits ~~determined~~ specified by a *plant standard* under clause S5.2.5.2(d) or allocated by the *Network Service Provider* ~~in accordance with~~under clause S5.1.6(a); and (iii) voltage unbalance ~~equal to or less~~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 ~~unit~~system*, when generating and when not generating, must not produce at any of its *connection points* for *generation*: (1) ~~must *generate* a constant~~ voltage fluctuations greater than limits determined under clause S5.1.5(b); ~~level with balanced phase *voltages* and~~ (2) harmonic voltage distortion ~~equal to or less~~more than the lesser of the emission limits determined by the relevant *Network Service Provider* ~~in accordance with~~under clause~~s S5.1.5(b) and~~ S5.1.6(b) and ~~clause S5.1a.7 of the *system standards*~~ 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	The AS 1359.101 refers to a superseded version of IEC 60034-1. Amendment is to include current version of IEC 60034-1	To limit a TNSP's exposure (i.e. to a potential breach under Schedule 5.1) under this clause a TNSP would always need to carefully consider part (c) of the clause when making QoS allocations to generators. This would mean that part (a) could not generally be applied as proposed. It is also recommended that this clause be modified to treat generator QoS requirements separately from auxiliary load QoS impact. The clause should recognise that generator auxiliary load is like any other form of customer load, and QoS allocations should be made for this auxiliary load on a similar basis to customer load, based on the maximum auxiliary load (which normally corresponds to maximum generator output).

Affected clause	Clause with NEMMCO proposed amendments	NEMMCO Reason	VENCorp Comment
	contractual obligations to existing *Network Users*. (d) *Plant standard*: In respect of a ~~When operating *unsynchronised*, each~~ *synchronous generating unit*, AS 1359.101 and IEC 60034-1 are *plant standards* for ~~must *generate* a constant *voltage* level with balanced phase *voltages* and~~ harmonic voltage distortion~~equal to or less than permitted in accordance with *Australian Standard AS* 1359 "General Requirements for Rotating Electrical Machines~~".		
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;	Clause S5.2.5.3A(a) is required to clarify which of the various values of the frequency standard terms applies in a particular situation. Note that many frequency bands and limits in Tasmania are different compared with those in the other regions. The automatic access standard is based on the existing mandatory standard, but more explicit in terms of how the various frequencies are to be applied. The partial load rejection clause (S5.2.5.4) has been deleted, and instead, in S5.2.5.3A rate of change of frequency has been specified for automatic and minimum standards. This is more technology neutral than the partial load rejection concept, and is more appropriate for wind generation.	In clause S5.2.5.3A/B/C it is suggested that references to "generating unit" in isolation should generally be changed to "generating unit and generating system" to better cover windfarms. In addition to the requirements drafted in this clause S5.2.5.3, it is recommended that an additional requirement "D" be added such that "generating plant must be capable of continuous uninterrupted operation at distortion levels up to the maximum voltage fluctuation, harmonic voltage distortion and voltage unbalance conditions outlined in S5.1a5, S5.1a.6 and S5.1a.7 of the System Standards.", so that generator operation could not be potentially constrained at times of the highest distortion levels that would be allowed by the Rules in Schedule 5.1.

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Affected clause	Clause with NEMMCO proposed amendments	NEMMCO Reason	VENCorp Comment
	(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. ***automatic access*** Frequen A 50 Hz B - C *normal operating*		In part (g) of this clause it is considered that NEMMCO should only be involved in the "acceptance" of access standards under this clause, rather than "negotiation" of access standards under this clause.

Affected clause	Clause with NEMMCO proposed amendments	NEMMCO Reason	VENCorp Comment
	(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 minimum standard allows a relaxation of the durations for which the generating unit must operate. The value of 47.5 Hz comes from the IEC60034 standard as the minimum frequency level for continuous operation. The value of 4 Hz/sec is based on expected performance in Tasmania for loss of high Basslink import. Small generating systems that are fitted with settable trip relays are permitted to trip for over-frequencies above the upper bound of the operational frequency tolerance band. This will ensure that they do not trip for credible contingency events.	

Affected clause	Clause with NEMMCO proposed amendments	NEMMCO Reason	VENCorp Comment
	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.	The minimum standard allows a relaxation of the durations for which the generating unit must operate. The value of 47.5 Hz comes from the IEC60034 standard as the minimum frequency level for continuous operation. The value of 4 Hz/sec is based on expected performance in Tasmania for loss of high Basslink import. Small generating systems that are fitted with settable trip relays are permitted to trip for over-frequencies above the upper bound of the operational frequency tolerance band. This will ensure that they do not trip for credible contingency events.	

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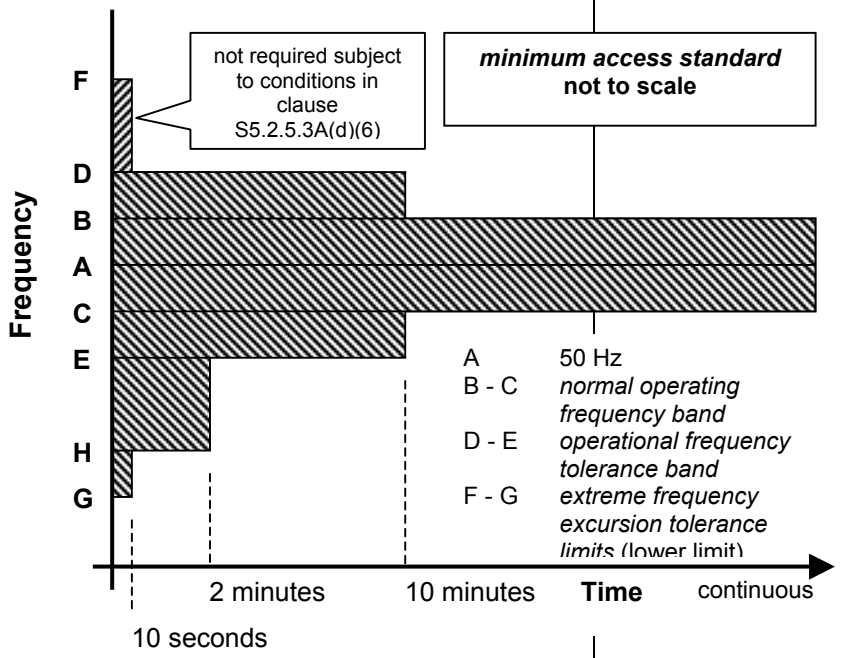
Affected clause	Clause with NEMMCO proposed amendments	NEMMCO Reason	VENCorp Comment
	 (f) A *negotiated access standard* can be accepted by the *Network Service Provider* provided that *NEMMCO* and the *Network Service Provider* agree that: (1) the proposed *access standard* is as close as practicable 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		

Affected clause	Clause with NEMMCO proposed amendments	NEMMCO Reason	VENCorp Comment
	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.	Clause S5.2.5.3A(f) provides a basis for negotiation to prevent power system performance being eroded.	
S5.2.5.4	**Deleted**.	This clause has been the cause of considerable confusion. A more practical concept is to require that plant operate continuously provided the rate of change of frequency is within a specified limit. This has been incorporated in S5.2.5.3A.	VENCorp does not support the proposed deletion of clause S5.2.5.4 as the requirements are not adequately covered by S5.2.5.3A. This clause needs to be retained to cover sudden load change events (e.g. sudden load change on a generator caused by load shedding,

Affected clause	Clause with NEMMCO proposed amendments	NEMMCO Reason	VENCorp Comment
			or loss of an interconnector). While it is recognised that sudden load change events will generally be followed a few seconds later by a consequential frequency change, some generator control systems will initially move in the wrong direction in response to a sudden load change, making the disturbance more arduous from a generator viewpoint than a pure frequency disturbance.
S5.2.5.12	~~**Stability**~~**Impact on network capability** (a) *Automatic access standard*: Each ~~A~~ *generating unit* must have plant capabilities and *control systems*, ~~including, but not limited to inertia, short circuit ratio and power system stabilisers,~~ sufficient not to~~:~~ ~~(1) not cause any *inter-regional* or *intra-regional power transfer capability* based on:~~ ~~(i) transient stability;~~ ~~(ii) oscillatory stability; or~~ ~~(iii) *voltage* stability,~~ ~~to be reduced below the level that would apply if the *generating unit* were disconnected;~~ reduce any *inter-regional* or *intra-regional power transfer capability* below the level that would apply if the *generating unit* were disconnected. ~~(2) not cause instability that would adversely impact on other *Registered Participants*.~~	The requirement in the automatic access standard not to 'cause instability that would adversely impact other Registered Participants' has been moved to clause S5.2.5.13 to combine this requirement with the other power system stability requirement. The clause has been extended to include all types of network impact (including impact on thermal transfer limits). This arose out of situations arising with some new wind farm installations, in which generation from the wind farm reduced import capability (associated with a thermal limit) by a ratio greater than 1:1.)	The drafting of clause S5.2.5.12(e) is somewhat confusing. It is suggested that the requirements of this clause should be added to clause (b), as it is effectively an extension of the minimum access standard.

Affected clause	Clause with NEMMCO proposed amendments	NEMMCO Reason	VENCorp Comment
	(b) *Minimum access standard*: The *generating* ~~*unit*~~ *system* must have plant capabilities and *control systems*~~, including, but not limited to inertia, short-circuit ratio and power system stabilisers, sufficient to not reduce any *inter-regional* or *intra-regional power transfer capability* to import into the *generating unit's region* by more than its *loading level* whenever it is *synchronised*~~ 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) ~~The relevant requirements for short-circuit ratio in IEC 60034-3 are a *plant standard* in relation to clause S5.2.5.12(a)(1)(i).~~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:	Clause (b)(2) relates to the impact on intra-regional flow paths. The clause has been extended in the minimum standard to cover a reduction in import capability into another region (where generation may reduce the reliability of another region.) The focus of this clause has been changed to be on equipment, facilities and control mechanisms that will achieve minimum impact on network transfer capability. A problem with the original wording of the clause was that it applied an on-going risk to the Generator – on-	

Affected clause	Clause with NEMMCO proposed amendments	NEMMCO Reason	VENCorp Comment
	(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*:	going compliance with the clause depended on factors outside the Generator's control, including design and configuration of the network, new generation plant and load growth. To avoid this consequence the current wording makes it clear that the assessment is to be based on the current system, considered projects and expected network developments only. The access standard (and therefore the performance standard) documents the facilities equipment and control systems agreed to be provided. The clause also allows for the Network Service Provider and the Generator to negotiate for additional control system facilities on a commercial basis.	

Affected clause	Clause with NEMMCO proposed amendments	NEMMCO Reason	VENCorp Comment
	(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. (~~d~~h) The negotiation of access standards ~~in relation to~~ under ~~this~~ clause S5.2.5.12 must involve *NEMMCO* in accordance with ~~under~~ clause 5.3.4A(b)~~of the *Rules*~~.		

VENCorp Comments on NEMMCO Rule Change Proposal for Technical Standards for Wind Generators

Affected clause	Clause with NEMMCO proposed amendments	NEMMCO Reason	VENCorp Comment
S5.2.5.13	**Control systems and stability~~Excitation control system~~** [Replace entirely with the following] (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*	Some of the definitions used in this clause were not fully specified in the previous clause, and have been amended so that they apply to a test or a simulation, and "settling time" can be applied to responses that are largely oscillatory. The automatic and minimum standards have been written in terms of scheduled and non-scheduled plant. The mandatory requirements have been translated into the automatic access standard requirements. (The exception to this is ceiling voltage which is slightly higher in the automatic and slightly lower in the minimum standard than the original mandatory standard.) A power system stabiliser specification has been added for the automatic access standard. The existing version of this clause is written around synchronous generating units. The criteria for synchronous plant are well developed, and equivalent	In item S5.2.5.13(b)(1)(ii), it is recommended that the draft words "any mode of oscillation" should be changed to "any critical mode of oscillation",

Affected clause	Clause with NEMMCO proposed amendments	NEMMCO Reason	VENCorp Comment
	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	subclauses for asynchronous plant which will usually apply to wind farms have been added, rather than attempting to make the existing clauses non-technology specific. The clause was written previously with most of the requirements mandatory. The clause has been reworded as automatic and minimum access standards. The previous automatic access standard requirement from S5.2.5.12 not to cause instability that would adversely affect other Registered Participants has been moved to this clause, and has been included in both minimum and automatic access, because the causing of instability that would adversely affect other participants is not acceptable even at minimum access level.	so that slight degradation of any heavily damped mode of oscillation is excluded from this consideration. In item S5.2.5.13(b)(3)(vi), a ceiling voltage of 2 is considered unnecessarily high for ac exciter systems, but is not considered high enough for static self-excitation systems, where generator stator voltage would be severely depressed for close-in EHV faults. It is recommended that two categories of excitation system be included in the rules for this requirement (static self-excitation systems and rotating exciter systems), with a ceiling voltage of 2.3 p.u. for static self-excitation systems and 1.5 p.u. for rotating exciter systems. In item S5.2.5.13(b)(3)(viii), while a 0.5 second rise time would be acceptable for ac exciter systems, it would be undesirably slow for static self-excitation systems, resulting in undesirable generator flux decay during this time period, potentially impacting on generator transient stability. It is recommended that two categories of excitation system be included in the rules for this requirement (static self-excitation systems and rotating exciter systems), with a rise time of 0.05 seconds for static self-excitation systems and 0.5 seconds for rotating exciter systems. In item S5.2.5.13(b)(4)(v) (A) and (B), and item S5.2.5.13(c), the step size should be changed to

Affected clause	Clause with NEMMCO proposed amendments	NEMMCO Reason	VENCorp Comment
	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		2.5%, as 5% is considered unnecessarily large (it would cause a large reactive power change of typically 20%, around 120 MVAr on a 500MW generator). On-line step changes more than 2.5% are never used for generator testing in Victoria.

Affected clause	Clause with NEMMCO proposed amendments	NEMMCO Reason	VENCorp Comment
	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,		

Affected clause	Clause with NEMMCO proposed amendments	NEMMCO Reason	VENCorp Comment
	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	In the minimum standard, the control system parameters are specified only for generating systems >30 MW, and taking into account the allowance for plant connected at voltages below 100 kV to have power factor control. Models are not required for plant less than 30 MW, and therefore it is not possible to assess (as part of the access standards) whether the plant is capable of complying with these performance levels. Allowance is made in the minimum standard for plant that is distribution-connected (<100 kV) to operate with power factor control or reactive power control instead of voltage control.	

Affected clause	Clause with NEMMCO proposed amendments	NEMMCO Reason	VENCorp Comment
	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		

Affected clause	Clause with NEMMCO proposed amendments	NEMMCO Reason	VENCorp Comment
	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		

Affected clause	Clause with NEMMCO proposed amendments	NEMMCO Reason	VENCorp Comment
	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		

Affected clause	Clause with NEMMCO proposed amendments	NEMMCO Reason	VENCorp Comment
	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		

Affected clause	Clause with NEMMCO proposed amendments	NEMMCO Reason	VENCorp Comment
	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		

Affected clause	Clause with NEMMCO proposed amendments	NEMMCO Reason	VENCorp Comment
	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*		

Affected clause	Clause with NEMMCO proposed amendments	NEMMCO Reason	VENCorp Comment
	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		

Affected clause	Clause with NEMMCO proposed amendments	NEMMCO Reason	VENCorp Comment
	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:		

Affected clause	Clause with NEMMCO proposed amendments	NEMMCO Reason	VENCorp Comment
	(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.		
S5.2.9	**Fault current**	The requirement needs to consider generating systems	

Affected clause	Clause with NEMMCO proposed amendments	NEMMCO Reason	VENCorp Comment
	[replace entirely with the following] (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	as well as individual generating units. The requirement for the Network Service Provider to consider alternative network configurations applies to the automatic access standard. The terms "*network users*" and "*generator*" need to be capitalised.	It is recommended that the meaning of this clause (ii) be clarified by adding the following to the beginning of this sentence: "the contribution level that will ensure that the total fault current can be safely interrupted …." .

Affected clause	Clause with NEMMCO proposed amendments	NEMMCO Reason	VENCorp Comment
	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		

Affected clause	Clause with NEMMCO proposed amendments	NEMMCO Reason	VENCorp Comment
	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*.		