

27th March 2006

Dr John Tamblyn
Chairman
Australian Energy Market Commission
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Australia

Dear Dr Tamblyn

Submission on the Compliance and Enforcement with Technical Standards review

Thankyou for the opportunity to make this submission on the Commission's review in relation to the investigative, rectification and penalty provisions used to maintain power system security through technical standards.

In this submission NEMMCO has responded to the issues paper released by the Commission and raised issues relating to:

- NEMMCO's proposed Rule in relation to technical standards for wind;
- governance arrangements for the technical standards process;
- incentive arrangements for the technical standards process; and
- the relationship between performance standards and the plant's capability.

Further details regarding the above are in the attached submission.

NEMMCO would also like to see the underlying principles of the technical standards regime better documented and endorsed by the MCE and the industry as part of the Commission's review. NEMMCO has made an attempt to draft its understanding of these principles, and has found it useful for identifying strategic issues that may be relevant to this review. Our draft of these principles is also attached.

NEMMCO would be pleased if you could have these matters considered by the AEMC. For further details, please do not hesitate to contact Mark Miller on (02) 8838 5620.

Yours sincerely,



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SUBMISSION

1. Introduction

Performance standards are maintained by plant operators in the NEM such that plant is operated within a secure technical envelope. Performance standards, which must be registered with NEMMCO, are the foundation on which compliance and enforcement is based. However, for a variety of reasons not all plant has performance standards, which impacts on the ability to measure, monitor and enforce compliance.

The purpose of this submission is to assist the Commission in their review of the regime of enforcement and compliance with performance standards in the NEM through NEMMCO's experience with the application of performance standards. NEMMCO's submission includes:

- comments on issues arising from NEMMCO's experience as market and system operator;
- responses to the questions posed in the Commission's Issues paper; and
- a draft of what we see as the underlying principles regarding technical standards regimes.

This submission is based on:

- the Commission's Issues Paper ¹: Enforcement and Compliance with technical standards under the National Electricity Rules;
- the MCE direction to the Commission to conduct this review; and
- NEMMCO's review of technical standards (NEMMCO's Rule request ²) of wind generation and review of existing provisions Rule changes endorsed by the MCE and submitted on 10 February 2006.

The technical standards process involves developing and setting performance standards, monitoring and compliance of those standards through a compliance monitoring program and rectification and enforcement of non-compliance. Incentive arrangements are structured to ensure parties comply with the technical standards process.

2. Technical Standards Enforcement and Compliance Issues

Overlap with NEMMCO's Rule request

On the 10th of February 2006, NEMMCO's Rule request to the Commission on technical requirements for connection of generators dealt with the:

- technical requirements for connection of generating plant to make them applicable to other technologies, including those used for wind generation;
- information requirements relating to modelling of generating plant, including testing of plant to verify plant models and performance; and
- process for developing connection agreements and performance standards, and the process when plant is altered.

The technical requirements submission focuses particularly on wind generation technical requirements. NEMMCO's Rule change request does not specifically address compliance or enforcement of technical standards however there are a number of overlaps between NEMMCO's Rule request and the Commission review. The areas of overlap between the Commission review and NEMMCO's Rule request includes:

- procedures for amending performance standards;

¹ AEMC, *Issues Paper: Enforcement and compliance with technical standards under the National Electricity Rules*, January 2006.

² NEMMCO, *Request for Rule: Technical Standards for Wind Generation and Review of Existing Provisions*, 10 February 2006.

- clarification of setting particular technical standards;
- participants that can avoid the performance standards regime;
- confidentiality of performance standards; and
- NEMMCO's powers under clause 5.7.3(e).

Governance Arrangements

The Commission recognised in their Issues paper that an appropriate and effective governance framework is necessary to ensure that technical standards address the security of the power system. Issues were raised throughout the Issues paper regarding the clear lines of responsibility for setting, monitoring, investigating and enforcing the technical standards. Careful consideration of the governance at each stage of the technical standards process is necessary for clear lines of responsibility and accountability. Also in determining the governance arrangements of the technical standards process careful consideration is required to remove any conflicts of interest between the roles of the involved parties. The parties involved in the technical standards process include the plant operators (Generators, Network Service Providers or Market Customers), Network Service Providers (NSP), NEMMCO and the Australian Energy Regulator (AER). NEMMCO's understanding of the governance framework suggests the main roles of each of these bodies include:

- *Plant operator*: under clause 4.13 are obliged to establish performance standards for their facilities which are agreed with NEMMCO. These facilities include generation, networks and loads. Most Generators and some MNSPs and Market customers which own, operate and control plant are also required to develop and maintain compliance monitoring plans;
- *Network Service Providers*: are to fulfil their role as plant operators and further should negotiate with proponents to formulate a connection agreement that will be registered as performance standards by NEMMCO and approve compliance monitoring program;
- *NEMMCO*: as the market and system operator are to use best endeavours to operate a secure power system. NEMMCO manages power system security by adjusting the technical envelope in which the power system is operated such that the system can sustain credible contingencies. Part of managing power system security is the compliance regime with performance standards. NEMMCO's role in the compliance regime with performance standards is through registering performance standards, agreeing to compliance programs and receiving advice on breaches in compliance such that potential system security incidents can be averted. Under clause 4.8.1 NEMMCO expects to be advised of all significant anomalies in the power system regardless of the compliance of the plant operator; and
- *AER*: is the primary body for enforce compliance with the provisions of the Rules in relation to technical standards and other matters.

Under section 49 (a) and (e) of the NEL, NEMMCO has the function and powers to operate and administer the wholesale exchange in the NEM and to maintain and improve power system security. NEMMCO's roles in the technical standards process assist in achieving these functions under the NEL. Under section 15 (a) and (b) of the NEL, the AER has the functions and powers to monitor compliance by Registered participants and other persons with the National Electricity Law, the Regulations and the Rules and to investigate breaches or possible breaches of provisions of this Law, the Regulations or the Rules that are not offence provisions.

Therefore NEMMCO considers its involvement in registering performance standards, agreeing to compliance programs and receiving advice on breaches in compliance and investigation of technical standards as necessary to maintain and improve power system security. NEMMCO does not seek to enforce compliance with any breaches of the Rules.

NEMMCO suggests that where efficiencies can be gained through sharing information between NEMMCO and the AER clear provisions should outline these requirements.

Incentive Arrangements

The Commission recognised that an essential element of the operation of the technical standards process includes a structure of appropriate incentives to achieve a high level of compliance with the relevant technical standards. In order to examine the incentive arrangements, initial consideration of the objectives to which incentives are directed and the success of the current arrangements require consideration. NEMMCO believes that the success of any incentive arrangements will be subject to the nature of the arrangement and whether those arrangements provide the correct balance between costs and benefits to the plant operators. The incentive arrangements are aimed at the following objectives, which include that:

- NEMMCO clearly understands the expected behaviour of major plant which can impact of the security of the transmission network;
- the plant operators that are responsible for the operation of such plant have a clear understanding of their obligations;
- these obligations are such that they can be reliably met through reasonable efforts by the plant operators based upon good electricity industry practice;
- stakeholders have confidence that these plant operators are undertaking ongoing testing and monitoring activities to reasonably ensure that the plant will behave as expected;
- a plant operator, upon becoming aware of a problem with its plant that would mean that the plant would not behave as expected, takes action to:
 - advise NEMMCO so that NEMMCO can if necessary adjust the technical envelope; and
 - arrange for action to be taken where possible to address the problem so as to remove the likelihood of unexpected behaviour in a reasonable timeframe.

From NEMMCO's viewpoint as market and system operator the critical issue is to avoid surprises rather than strictly ensure plant is complying with Rule requirements. Any changes to incentives need to encourage behaviour by all plant operators to meet these requirements. Incentives to ensure that preventative measures are carried to avoid an incident are obviously preferable to solely relying upon punitive measures taken after the event. With complex plant, problems will inevitably occur and so to penalise a plant operator simply because it reports a problem is equivalent to "shooting the messenger". Generators should however be accountable for the effective operation of their compliance regime.

Table 1 provides empirical data regarding the success of the current incentive arrangements on plant operators to have performance standards and compliance monitoring programs.

Table 1: Statistical data on Incentive Arrangements

Description	Data
Facilities for which performance standards are required to be proposed under clause 4.13	143 ³ facilities with a total registered capacity of 42,837 MW
Facilities for which proposed performance standards have been submitted	118 facilities with a total registered capacity of 40,361 MW
Facilities where the Registered Participant has no obligation to have performance standards	7 ⁴ facilities with a total capacity of 1570 MW

³ This figure excludes 20 facilities which either NEMMCO has agreed are exempt on the basis of S5.2.1(a) or would likely be so exempt if they applied.

⁴ This figure includes facilities that are currently under construction (ie Kogan Creek) as well as facilities that are operating yet have no obligation to have performance standards.

Facilities for which all performance standards have been accepted or for which both plant owner and NEMMCO have a common viewpoint on any deemed performance standard	46 facilities with a total registered capacity of 11,903 MW
Facilities which have proposed compliance programs	43 facilities with a total registered capacity of 16,796 MW
Facilities which have compliance programs approved by NEMMCO	2 facilities with a total registered capacity of 760 MW

Performance standard must be fair and accurate

Performance standards record the benchmark performance (the minimum obliged level of performance) of a plant through the registration of access standards of each plant and specific requirements upon which compliance should be enforced. Performance standards are not meant to represent the absolute capability of a plant but rather a benchmark for the acceptable performance of the plant. For effective compliance and monitoring programs the benchmark of performance should be set at a level that NEMMCO sees as fair and accurate for both new and existing plant. NEMMCO believes that a fair and accurate performance standard is high enough to maintain a reliable and secure power system however not too high to constitute a barrier to entry, which increase new entrant costs and jeopardise reliability if those barriers deter or delay new entrant.

While NEMMCO's Rule request attempts to remove impediments to developing fair and accurate performance standards for new generating systems, impediments still exist to setting fair and accurate performance standards for both existing generating systems and plant other than generating systems.

The principal process for setting performance standards is the process of negotiating access to a network for a new or modified facility. When this negotiated access process was changed in 2003, transitional arrangements were necessary to determine performance standards for existing plant, following a different process. The different process was intended to ensure that additional requirements were not placed upon existing plant simply due to the introduction of the new arrangements. A transitional arrangement was designed to develop performance standards for existing plant based upon the following (in order of priority):

1. any derogation applicable to the plant;
2. the existing connection agreement;
3. design performance of the plant at the time of the start of these arrangements; and
4. technical schedules in Chapter 5 of the Rules.

These rules left no discretion and have been difficult to apply because of significant problems with the four underlying processes on which it is based including:

- some derogations which were created at the start of the market are either incorrect , out of date due to subsequent changes in the Code or are inappropriately expressed;
- some existing connection agreements are largely commercial documents with little technical detail;
- for older plant the specific performance, which was assumed as part of their design process, is often now difficult to demonstrate; and
- the existing technical schedules are difficult to apply to less conventional plant.

This can result in situations where the proposed performance standard cannot be accepted by NEMMCO but the minimum standard, which NEMMCO would be able to accept, cannot be agreed to by the plant operators because the operator believes that the plant would be unable to comply.

The rules provide a process to address such a failure to agree, by indicating what would constitute a “deemed” performance standards. The “deemed” performance standard is based upon an order of priority requiring:

- technical characteristics to be set out in the connection agreement;
- connection agreement subject to technical characteristics set out in any relevant derogation; and
- connection requirements are determined in accordance with Rules Clause 5.3.3

However significant problems also exist in determining what is the “deemed” performance standard including:

- the technical characteristics set out in the relevant connection agreement are often inadequate to resolve the issue otherwise agreement would have been reached;
- the Rules do not assign responsibility to anyone to actually determine the “deemed” performance standard therefore there may be no compliance regime for that technical requirement;
- there may be no derogation, the derogation may be inadequate or if the technical characteristics of the connection agreement are inadequate then it may be difficult to apply the derogation to the connection agreement; and
- Older plant are unlikely to have their connection requirements established under Rule Clause 5.3.3.

Consequently some issues regarding performance standards for existing plant cannot be resolved under the current process. Therefore there needs to be some further process to allow for resolution of the existing plant (including plant that was not registered at the performance standards commencement date but for which connection agreements had already been established under the old process). One option might be the appointment of an independent expert to determine a performance standard when agreement between the plant operator and NEMMCO cannot be reached. Alternatively resolution may be achieved through renegotiation of sections of existing connection agreements in accordance with the process set out in 5.3.3 provided this did not involve setting a standard below the current minimum standard.

Otherwise the process can produce outcomes where the determined standard is considerably more stringent than the level of performance, which can be reasonably achieved by certain plant. In such conditions NEMMCO sets its technical envelope at a level based upon what is considered credible which assumes performance in excess of the performance standard. This can create gaps in accountability.

For example 41 Victorian generating units benefit from the derogation in item 6.4 of Schedule 9A3, which effectively replaces all of clause S5.2.5.3 with:

“The *generating unit* must be able to maintain continuous uninterrupted operation in the event of *disconnection* of the single largest *generating unit* on the *power system* provided that system *frequency* does not fall below 49.5 Hz and recovers to above 49.9 Hz within four minutes.”

Five more Victorian generating units benefit from the derogation in item 6.3 of Schedule 9A3, which effectively replaces all of clause S5.2.5.3 with the clause above plus:

“The *generating unit* must be able to maintain continuous uninterrupted operation in the event of a two-phase to ground line fault adjacent to the power station switch yard cleared in primary protection time.”

In principle, none of these generating units would be in breach of their performance standard if they tripped after any loss of multiple generating units regardless of their size, resulting from a remote fault or after a 5% voltage disturbance at their switchyard. The actual

capability of the plant is much better than this performance standard. The requirement to operate continuously during a fault on any or all phases cleared in 175 ms was originally based on the Victorian System Code but the plant on which it was based has a derogation that they do not need to operate continuously through any fault.

As part of their review the Commission should consider whether:

- there should be a mechanism to modify a performance standard, either at the request of the participant or to take account of changes in the requirements on the power system; and
- there are any aspects of the content of the various technical standards specified in the Rules that require clarification.

Uncertainty also exists regarding the process of altering performance standards once they have been established. NEMMCO's Rule request includes a provision to allow amendment of the performance standard if the plant operator, the Network Service Provider and NEMMCO all agree. The AER should make note of this Rule request when considering the alterations of performance standards.

3. Response to the Commissions Issue Paper

3.1 What are Technical Standards?

Overlap with NEMMCO's Rule request

Question 1 of the Commission's Issues Paper seeks comment on whether the scope of the technical standards review should be extended. The scope of the technical standards within this review should consider all those standards involved in connection to the grid and the process of enforcing and complying with those standards. There may be further issues with the specific performance standards that do not specifically relate to the compliance and enforcement process, which are outside the scope of this review. For example the accuracy of representing technical requirements as performance standards. NEMMCO's Rule request considers a number of these issues in representing technical requirements through performance standards and details can be found in the Rule request.

3.2 Setting Performance Standards

Overlap with NEMMCO's Rule request

Question 2 of the Commission's Issues paper, seeks comment on whether NEMMCO's role in the process of setting new performance standards is effective and clearly defined. NEMMCO's Rule request identifies a number of deficiencies in NEMMCO's process of setting performance standards and proposes a number of changes to the Rules to remedy the process. NEMMCO refers the Commission to NEMMCO's technical standards Rule request for further information.

3.3 Monitoring and Compliance

Governance Arrangements

Questions 6 to 10 of the Commission's Issues paper, seeks comment on the monitoring and compliance with performance standards. Clause 5.7.3 (b) requires generators to negotiate with NEMMCO and NSPs to agree on a compliance monitoring program to confirm ongoing compliance with the applicable technical requirements of clauses S5.2.5, S5.2.8 and S5.2.9 of schedule 5.2, the relevant connection agreement and the performance standards for that generating unit.

NEMMCO's objective in agreeing to the compliance monitoring program is to improve the secure operation of the power system and to gain confidence that the plant will perform to at least the prescribed standard, not to enforce any non-compliance with performance standards or the compliance monitoring program. The participants are given the role of establishing and maintaining a compliance monitoring program and will ultimately be held accountable for breaches of the program or the standards. The AER have the role of enforcing compliance of performance standards and compliance monitoring programs by the plant operators. The plant operator's incentives to compliance with the performance standards are related to the level of penalty faced for non-compliance. Therefore by adjusting the level of penalty that is faced by a plant operator when a breach occurs, incentives can be placed on the plant operator to cooperate with the AER and NEMMCO.

To satisfy an obligation for a strict compliance regime would require significant monitoring, testing of the proponents facilities and auditing of technical standards. Such an obligation would require significant cost and expertise to apply.

NEMMCO notes that currently no obligation to produce a compliance monitoring program applies to Market Customers (except where those customers directly control plant), Market Network Service Providers or Generators behaving as Customers. NEMMCO believes that these questions raise fundamental governance issues that require clarification as part of this review.

Question 11 of the Commission's Issues paper, seeks comment regarding the appropriateness of NEMMCO's role and the level of guidance provided in determining the timeframe for rectification of a breach. Currently under clauses 4.15(i) and (j) of the Rules when NEMMCO's is advised or becomes aware of a failure to meet performance standards then NEMMCO has an obligation to set a deadline by which time the breach must be rectified.

In order to determine a timeframe for a participant to rectify a breach, initially it has to be determined that a breach has occurred and secondly the timeframe and remedy to resolve that breach should be determined. NEMMCO as the market and system operator has the ability to assess whether an incident is a credible or non-credible contingency and to determine a remedy to the incident. NEMMCO does not have the ability or desire to determine whether the breach of a performance standard or a compliance monitoring program has occurred. Further NEMMCO is not in a position to resolve appeals or dispute with its determination of a timeframe for rectification or to enforce this rectification period. The Commission should consider clarifying the enforcement and dispute processes for rectification of a breach of compliance.

Incentives Arrangements

Question 6, 8 and 12 of the Commission's Issues paper seeks comment on the effectiveness and adequacy of incentives in providing effective compliance programs, reporting of breaches and enforcement of breaches. The data available to NEMMCO is not sufficient to establish the adequacy of incentive arrangements to report breaches since we do not know the potential number of non-compliance events which occur. However NEMMCO does have information to display the success of incentives on plant operators to establish performance standards and compliance monitoring programs as presented in Table 1.

3.4 Enforcement

Governance Arrangements

Questions 12 to 13 of the Commission's Issues paper, seeks comment on the regime of enforcement for the technical standards process. Under section 59 of the NEL, the AER has the sole responsibility for initiating enforcement proceedings relating to the breach of the

National Electricity Law, Regulations and Rules. In order to satisfy this role the AER must establish when non-compliance has occurred. One method of discovering non-compliance is through notification by NEMMCO. Although NEMMCO does not have an obligation to enforce non-compliance, there is potential for NEMMCO to notify the AER when NEMMCO learns of possible non-compliance. This notification and provision of information to the AER is advantageous as it avoids duplication of investigation, however the disadvantage is that it may act as a disincentive for plant operators to report non-compliance to NEMMCO. This disincentive may be offset by considering the cooperation of participants in supplying information to NEMMCO and the AER to determine the level of penalty following a breach.

Currently there seems to be an inconsistency in the Rules regarding NEMMCO's obligation to supply information regarding a breach to the AER. Following a breach the Rules require plant operators to advise NEMMCO whenever they are aware of a breach of the performance standard however NEMMCO is not required to advise the AER unless the plant operator fails to meet the deadline to remedy the breach. This would suggest that a breach of the performance standard is not in itself a breach of the Rules unless the plant operator fails to remedy the breach within a timeframe set by NEMMCO. Conversely another section of the Rules (clause 4.15 (a)) indicate that any breach of the performance standards is immediately a breach of the Rules.

Incentives Arrangements

Question 10 and 17 of the Commission's Issues paper seeks comment on whether the AER should publicly report non-compliance and whether the penalties for breaches of performance standards are adequate. NEMMCO believes that the incentives for plant operators are necessary to maintain compliance both in the form of penalties and public reporting. The adequacy of these incentives can only be determined with knowledge of the desired level of compliance and how the current system achieves this level of compliance. Although Table 1 gives some measure of the success of the current compliance regime for technical standard a more comprehensive investigation may be necessary.

Question 14 of the Commission's Issues paper, seeks comment on the other matters that may be taken into account in proceedings to resolve a breach of performance standards. Clause 4.15 (l) requires a Court to consider the effectiveness of a clause 4.15(b) compliance regime in proceedings taken against a Registered Participant by the AER. Other relevant considerations should include:

- whether the plant operator itself notified NEMMCO of the breach;
- whether the plant operator attempted to conceal or deny any evidence;
- the level of co-operation by the plant operator after having been notified of the breach;
- the social and economic impact of the breach;
- whether the plant operator has reasonably complied with the compliance program including appropriate testing, reviews and measurements;
- whether reasonable maintenance of the facilities was carried out to ensure that the facility was performing to the registered standard;
- whether the plant operator had followed the Rules procedures in registering and updating control settings;
- whether the plant operator had been prompt in attempting rectification; and
- whether the plant operator showed no inclination to rectify.

Question 16 of the Commission's Issues paper seeks comment on whether the AER's enforcement functions and powers place a disincentive for plant operators to provide information to NEMMCO, if that information could incriminate the plant operator. The disincentive on the plant operator to provide information if information is to be shared between NEMMCO and the AER needs to be balanced against the practicality to the AER

running enforcement and investigation without the assistance of NEMMCO. It is likely that if NEMMCO is required to share information it will form a disincentive on participants to report breaches to NEMMCO however if by not cooperating the plant operator faces potentially larger penalties following a breach. The management of the plant would have to balance whether the risk of not reporting a breach is worth the penalty if the breach is discovered.

3.5 Investigative Powers

Governance

Questions 15 to 16 of the Commission's Issues paper, seeks comment on the investigative provisions into power system incidents. The Issues paper refers to the dual process of the AER and NEMMCO in investigating power system incidents with the role of NEMMCO to maintain and improve power system security and the AER in the role of enforcing compliance.

As part of this review NEMMCO noticed similarities between this dual process for investigation of power system security and a tripartite arrangement for safety in the aviation industry. Although NEMMCO believes that similarities exist between these frameworks there are a number of differences that make adopting such a framework unattainable. These differences include that:

- the aviation industry has a purely independent body dedicated to investigate transport safety incidents which does not have other obligations in the operation of the industry;
- incidents in the aviation industry are often due to human error whereas the technical security of the power system is a complex interdependency between many plant's control systems;
- incidents in the aviation industry often result in loss of life or serious injury whereas incidents in the power system are more likely to result in economic loss.

3.6 Perverse Incentives

Overlap with NEMMCO's Rule request

Question 21 of the Commission's Issues paper seeks comment regarding whether clause 5.7.3(e) is sufficiently clear to allow NEMMCO to use this clause to manage a power system incident. In NEMMCO's Rule request alternative words have been proposed for clause 5.7.3(e) that make clear that assessment of compliance is with the performance standards and the relevant connection agreement. The main issues with clause 5.7.3(e) are that it:

- requires NEMMCO to determine (in an operational timeframe) whether or not a plant is conforming to a performance standard and effectively whether or not it is complying with the Rules, this is an inappropriate role for NEMMCO as the market and system operator. In order to perform its power system security function, NEMMCO needs to determine only whether or not the behaviour of the plant is in accordance with what was assumed in establishing the current technical envelope which the power system is being operated. This would be regardless of whether or not the plant operator is conforming to its performance standard; and
- is based upon compliance with the technical requirements of Chapter 5. In the case of existing plant the plant may be not be complying with the technical requirements of Chapter 5 but may still be complying with its performance standards. This could create a significant anomaly.

Incentive Arrangements

Question 20 of the Commission's Issues paper seeks comments regarding whether NEMMCO should consider commercial incentives or opportunities when managing the impact of a breach on power system security. NEMMCO suggests it is impracticable to determine the commercial position of a plant operator in the dispatch process as the

commercial position of a plant operator relies on extrinsic information to the physical wholesale market. Further NEMMCO's role is to economically and securely dispatch of the market, not determine and enforce non-compliance.

4. Technical standards principles

4.1 Governing principles of technical standards

NEMMCO considers that there is a need to document and review technical standards governance arrangements from a strategic level. To facilitate this, NEMMCO has prepared the following tables, which set down the underlying governance principles as NEMMCO currently understands them for technical standards as an overall concept and for the performance standards regime introduced in 2003. To facilitate discussion of these strategic issues, NEMMCO has also made some comments and asked some questions relevant to each principle.

Principle	Comment
<p>In order to efficiently meet the needs of consumers for a supply of electricity that is reliable and of adequate quality, networks and plant connected to networks need to behave in certain ways, including in response to plant failures and adverse conditions.</p>	<p>Power system security is a concept that is applied to manage reliability of supply by operating the power system to withstand the most likely events to occur without causing consequential damage, indirect loss of supply or unacceptable loss of quality. A key issue is how to ensure that minor events do not degrade power system performance in a way that leads to consequential failures and major disruption.</p> <p>What is the relationship between the unserved energy reliability standard set by the Reliability Panel and the objective of technical standards?</p> <p>Many technical standards specify unacceptable behaviour rather than acceptable behaviour, and many are based on undocumented assumptions. A key issue is how to clearly identify the boundary between what is acceptable and what is not.</p> <p>Reliability and quality of supply are also affected by network performance, and, where there is less redundancy in the network, commonly more so than connected plant.</p>
<p>A regulatory process is necessary to ensure that the characteristics of the network and its connected plant that influence the reliability and quality of supply satisfy certain levels of performance, called “technical standards”.</p>	<p>The underlying assumption is that if all networks and connected plant satisfy their technical standards then the standards of supply reliability and quality will be satisfied.</p> <p>In many cases, behaviour that is unacceptable will also cause loss of income for the participant or risk a claim for compensation from another party. However, if the probability is low, some participants may be prepared to take the risk of not being discovered.</p> <p>The relationship between technical standards and the potential adverse impact on consumers or other participants is fundamental to the concept of technical standards but not always well understood or documented.</p>

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Principle	Comment
<p>All networks and connected plant do not need to achieve the same technical standards in order to efficiently provide adequate reliability and quality of supply to consumers. Technical standards can be varied subject to the reliability and quality requirements.</p>	<p>If the same technical standards were to be applied to networks and connected plant across the national grid, it would increase costs. It would also be unnecessary to achieve the same reliability and quality standards across the national grid.</p> <p>In general, the technical standards of today are more stringent and more detailed than the technical standards of previous years, for example before interconnection. For example, the power systems of 50 years ago did not suffer from the stability and quality of supply issues of today or were oblivious to them. The design standards of generating plant were different.</p> <p>Existing plant cannot be expected to be upgraded to satisfy new technical standards, because it would make the industry uneconomic. Therefore a mechanism is required by which existing plant can be accepted while new plant needs to meet higher standards. This can be seen to be a barrier to entry into the market unless the new standards are commensurate with current international design standards.</p> <p>A key issue is how the technical standards can be varied. Who should have the power to do so? On what basis? Within what limits? Under what circumstances?</p>
<p>Compliance with the applicable technical standards is a condition of network augmentation and plant connection, and a condition of registration in respect of network elements and plant under the National Electricity Law and clause 2 of the National Electricity Rules.</p>	<p>If compliance with applicable technical standards is necessary, then compliance is reasonably a condition of connection and a condition of registration. However, often connection is required before compliance can be demonstrated, so connection and registration must be based on assurances, evidence of plant capability and enforcement of disconnection if compliance is not demonstrated. However, compliance is not always capable of being tested. Sometimes it has to be demonstrated through in-service performance. Sometimes it can only be assessed by mathematical simulation.</p> <p>Key issues are how to coordinate the processes for connection and registration and how to regulate augmentation and connection of networks.</p>

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Principle	Comment
<p>On-going compliance sufficient to provide acceptable supply reliability and quality is a condition of continued connection and registration. Failure to comply may be subject to civil penalty under the National Electricity Law.</p>	<p>A participant may modify its facilities provided it continues to satisfy its technical standards. A key issue is how to regulate modifications that change technical performance, and particularly whether the applicable standard for modified plant with improved performance should be amended to require that improved performance to be maintained.</p> <p>Key issues are whether disconnection and de-registration should occur, and if so, who has the necessary powers, what procedure is to be followed, and how can this apply to networks?</p>
<p>Technical standards need to be reviewed from time to time to ensure they are necessary and sufficient. Any change to technical standards requires transitional arrangements for existing facilities so that changes to obligations on a Registered Participant do not cause it to become in breach through no action of itself.</p>	<p>The greatest threats to technical standards are technological developments and changing consumer expectations. Can technical standards be structured in a way that makes them more adaptable to changing technology? Who has the responsibility for identifying the need for a review?</p> <p>There is a need for a mechanism to keep track of the technical standards that apply to particular networks and plant. This was addressed by the NECA review that lead to Code changes in 2003 (see below).</p> <p>If a technical standard for new plant changes, some existing plant may have the capability to meet the new standard. An important issue is whether, and to what extent, technical standards applying to a particular existing plant can be reviewed when the technical standards applying to new plant are changed.</p>

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Principle	Comment
Network Service Providers must allow access to their networks on reasonable terms and conditions. Prospective Network Users arrange for access to networks through a contract with the relevant Network Service Provider. Such agreements are called “connection agreements”. Connection agreements are confidential but certain technical information must be revealed to NEMMCO.	<p>The existing connection agreements vary considerably in their obligations, structure and technical content. The more recent ones closely match the current Rules including the current technical standards. At the other extreme, some old plant has no connection agreement as such, and application of clause 5.2.2(a) is unlikely to yield any technical arrangements corresponding to the technical standards.</p> <p>Connection agreements are confidential and some participants have been reluctant to provide NEMMCO with adequate information. It is often difficult to separate technical information when its interpretation depends on defined terms, rules of interpretation and the obligations incorporating tables.</p> <p>A key issue is whether connection agreements should be required to meet set standards of drafting, and how connection agreements for existing plant can be brought to an acceptable standard.</p>
NEMMCO must be kept informed of any incapability of networks and connected plant to satisfy its performance requirements, so that it can take the expected performance into account in power system and market operation.	<p>NEMMCO’s key responsibility is to dispatch the market in a way that maintains power system security as a method of achieving reliable supply in the face of likely failures. To do so, NEMMCO must assess how likely failures within the network and connected plant would affect supply to consumers. Knowledge of the capability of the networks and connected plant is essential to such assessments.</p> <p>Key issues are how information is communicated to NEMMCO and how NEMMCO can use it.</p>
Significant operating incidents that adversely affect the reliability and quality of supply to consumers, or have the potential to do so, are investigated in order to determine what action, if any, is needed to prevent similar events occurring.	<p>This is an essential feedback mechanism to assess whether technical standards are sufficient in scope and in level.</p> <p>The key issues are who should have powers to investigate, what powers they need and how they should relate to enforcement powers. Another issue is how to ensure that sufficient data is available to investigate dynamic performance.</p>
The Rules are enforced by the AER. Consumers and Registered Participants can also seek compensation through the courts if the behaviour of others causes loss or damage.	<p>A key issue for NEMMCO is whether and to what extent NEMMCO should assist the AER with an investigation of alleged breach of Rules when it will undermine NEMMCO’s ability to obtain information to meet its own obligations.</p>

The key principles of the performance standards regime are:

Principle	Comment
The intended supply reliability and quality requirements are established as “system standards” and apply to the whole national grid.	Key issues are how these relate to the objectives of technical standards and whether they are necessary and sufficient to meet that objective.
The technical requirements for connected plant are each established as a “minimum access standard” (below which network access is not permitted) and an “automatic access standard” (at or above which access cannot be denied).	A number of technical matters were not converted to minimum access standards and automatic access standards in 2003, and remain as absolute obligations on all participants despite there being included in performance standards. NEMMCO has proposed changes to establish minimum access standards and automatic access standards for these.
A “negotiated access standard” may be agreed between these levels, assessed against the system standards. Negotiated access standards that affect power system security require NEMMCO’s agreement.	A key issue is the extent to which NEMMCO can consider reliability of supply when considering proposed performance standards. NEMMCO has proposed changes to ensure that reliability can be considered.
The collection of negotiated access standards for a particular connected plant is called its “performance standards”. NEMMCO maintains a register of all performance standards.	The roles of a Customer as a purchaser of electricity directly or indirectly through the market and as an owner and operator of a facility that consumes electricity are not distinct. The status of performance standards relative to connection agreement provisions, direct Rules obligations and surviving derogations needs to be resolved. NEMMCO has proposed changes to make the performance standards take precedence over other documents.
Plant already connected before the commencement of the performance standards regime has its performance standards established by reference to its pre-existing obligations according to rules of precedence. Technical derogations can be deleted once they are converted into performance standards.	After a time limit, performance standards are deemed under a different set of rules that are problematic. NECA intended the technical derogations to be replaced with performance standards, but some derogations had no sunset clauses and some had sunset clauses that were not accepted in the change from Code to Rules and so survived. This creates conflict between minimum access standards, automatic access standards and derogations.

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<p>A Network User must ensure that its connected plant complies with its performance standards and must institute a procedure to demonstrate ongoing compliance called its “compliance program”.</p>	<p>Only Generators are required to obtain the agreement of their Network Service Provider and NEMMCO. Customers and Market Network Service Providers are not obliged to show NEMMCO their compliance programs.</p> <p>A key issue is the need for consistent treatment of different classes of participants.</p>
<p>The technical requirements for networks are determined by the Network Service Provider with reference to the system standards. They are not performance standards. Some technical requirements are subject to verification according to a “compliance program” established by the Network Service Provider.</p>	<p>The principal focus of the review by NECA under clause 5.2.6 of the Code, was on the connection of generation.</p> <p>A key issue is how the compliance program concept should apply to Network Service Providers.</p>
