Reliability Panel
AEMC

REVIEW

Reliability Panel AEMC

FINAL REPORT

Template for Generator Compliance Programs

27 June 2012

Reference: REL0047
Final Report

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About the AEMC

The Council of Australian Governments, through its Ministerial Council on Energy (MCE), established the Australian Energy Market Commission (AEMC) in July 2005. The AEMC has two principal functions. We make and amend the national electricity and gas rules, and we conduct independent reviews of the energy markets for the MCE.

About the AEMC Reliability Panel

The Panel is a specialist body within the AEMC and comprises industry and consumer representatives. It is responsible for monitoring, reviewing and reporting on reliability, security and safety of the national electricity system and advising the AEMC in respect of such matters. The Panel's responsibilities are specified in section 38 of the National Electricity Law.

Foreword

I am pleased to present the Reliability Panel's final report on the Review of the Template for Generator Compliance Programs.

In preparing this report, the Panel has considered how well the template is currently working and has sought comments from stakeholders on areas for improvement.

The Panel notes that the template was initially developed after extensive consultation with stakeholders and considers that it has worked well to date. The Panel has determined that the template should remain largely unchanged, with the exception of some minor amendments to improve its clarity and application.

I would like to thank the stakeholders that have made submissions to this review process and those that participated in the public meeting on 16 May 2012. Stakeholders' views and comments have assisted us with our consideration and assessments.

Neville Henderson
Chairman, AEMC Reliability Panel
Commissioner, AEMC

Reliability Panel members

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1 Introduction

In accordance with the requirements under the National Electricity Rules (the rules) the Reliability Panel (the Panel) has undertaken this review to assess, and update if necessary, the template for generator compliance programs (the template).

1.1 Background

In 2006, the Australian Energy Market Commission (AEMC or Commission) undertook a review at the request of the Ministerial Council on Energy into the enforcement of, and compliance with, technical standards.[1]

Following from the review and the subsequent rule change request raised by the National Generators Forum (NGF), the AEMC made a rule to require the Panel to develop a 'compliance template'. Rule 4.15(c) requires generators to develop compliance programs that are consistent with the template.

The purpose of the compliance template is to assist generators with developing compliance programs and to facilitate the enforcement and monitoring of compliance with technical standards. The Panel undertook a review to establish the template that involved extensive consultation with stakeholders and was completed in July 2009. The template was implemented at that time.

1.2 Requirement for this review

The rules require the Panel to undertake a review of the template at least once every three years from the date the template is determined.[2] As the template was established in July 2009, the Panel must complete this first review by July 2012.

The template refers to specific provisions under the rules to which generators must comply with, as well as suitable testing and monitoring methodologies. Hence the review requirement recognises that ongoing review would ensure consistency of the template with the rules and other market developments. In addition, a periodic review

1 As noted in the review, the term technical standards is not defined in the rules but for the purposes of the development of the template, it was characterised as:

- the performance standards for Generators, Market Customers and market network service providers (MNSPs) specified under clauses 4.13, 4.14 and 5.3.4A(g) that are prepared to be registered with AEMO (NEMMCO at the time);
- the automatic access standards, minimum access standards and performance criteria required for the connection of network service providers (NSPs), Generators, Market Customers and MNSPs set out in schedules of 5.1, 5.2, 5.3, and 5.3a under the rules respectively. For Generators, Market Customers and MNSPs, these form the basis for specific performance standards to be registered with AEMO; and
- the obligations of NSPs, Generators and Market Customers under clauses 5.2.3, 5.2.4 and 5.2.5 of the rules.

2 Clause 8.8.3(ba) of the rules.

would allow any experiences gained from the practical implementation of the template to be recognised and used to improve the template.

In November 2011, the AEMC provided the Panel with terms of reference for this review.[3]

1.3 The Reliability Panel's powers in relation to the template

The rules provide that following the Panel's review of the template, the Panel may amend the template in accordance with its final report to the AEMC.[4] This report and the amended template (published with this report) set out the Panel's changes to the template as a result of the review. The new template is available for participants' use on the AEMC Reliability Panel website.[5]

1.4 Impact of the review on market participants

Participants are required to modify their compliance programs in accordance with the amended template by no later than six months after the amendments are published.[6] The nature of the amendments is minor and the Panel considers the amendments will not have significant operational impacts on participants. The amendments are outlined below and discussed in detail in Chapter 3.

1.5 Amendments to the template

The Panel has made a number of amendments to the template that are mostly for clarification purposes and of a minor nature. A change-marked version of the template is provided with this report, which shows where the 2009 version of the template has been amended. Details of the Panel's considerations are set out in Chapter 3. The amendments are summarised as follows:

- further clarification of the template's purpose in Chapter 2 of the template;
- an additional compliance principle in Chapter 1 of the template to highlight the option for real-time monitoring in demonstrating compliance;
- amended provisions in Table 2.9 of the template to clarify the intent of methods for testing and assessing compliance;
- clarification that generators have some discretion to determine the frequency with which compliance tests are to be carried out;

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3 The terms of reference are published on the AEMC Reliability Panel website.

4 Clause 8.8.3(ba) of the rules.

5 The new version of the template is available at: http://www.aemc.gov.au/panels-and-committees/reliability-panel/standards.html.

6 Clause 4.15(c)(3) of the rules provides a default timeframe of 6 months, but also enables the Panel to establish an alternative timeframe for participants to implement changes to the template. The Panel did not propose alternative timing for implementation due to the minor nature of the amendments.

- some minor clarifications on whether tests apply to synchronous or asynchronous generation; and
- other minor formatting and 'typographical' clarifications to improve ease of use of the template.

1.6 The review process and consultation

The Panel undertook consultation as a part of this review in accordance with clause 8.8.3 of the rules and the terms of reference. The Panel has engaged stakeholders during the review process by providing the opportunity to make submissions on the issues paper and the draft report. Five submissions were received on the issues paper from: the Australian Energy Market Operator (AEMO), AGL Energy, International Power GDF Suez Australia, Sinclair Knight Merz (SKM) and TRUenergy. One submission was received on the draft report from Delta Electricity.[7]

The Panel also held a public meeting by teleconference on 16 May 2012. Attendees were from: AEMO, the Australian Energy Regulator (AER), AGL Energy, Delta Electricity, Eraring, SKM, Snowy Hydro, Macquarie Generation and the National Generators Forum (NGF).[8]

Stakeholder views were considered by the Panel, which is discussed in Chapter 3 of this report. The Panel considered the views outlined in written submissions as well as those raised at the public meeting. The Panel also consulted directly with the AER and AEMO on technical and operational issues associated with the use of the template.

1.7 Structure of the paper

The remainder of this report is structured as follows:

Chapter 2 - Factors taken into consideration - sets out the factors that the Panel considered in preparing this final report and the revised template;

Chapter 3 - Amendments to the template - sets out the Panel's considerations of changes to the template, including those raised in submissions;

Appendix A - summarises issues raised in submissions on the draft report;

Appendix B - lists each amendment to Table 2.9 of the template proposed in Delta Electricity's submission to the draft report and provides the Panel's rationale for adopting changes or leaving existing provisions unaltered;

Appendix C - summarises issues raised in submissions on the issues paper; and

Appendix D - sets out some of the specific provisions under the rules that relate to the template.

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7 All submissions are publicly available on the AEMC's website: www.aemc.gov.au.

8 Notes on the issues discussed at the public meeting have been published on the AEMC Reliability Panel website.

2 Factors taken into consideration

This chapter sets out the factors that the Panel considered in preparing this final report and the revised template.

2.1 Role and purpose of the template

The template provides clarity to generators by defining an appropriate compliance framework to assist them with developing and designing their compliance programs to meet relevant technical standards. The template is also intended to assist the AER with the enforcement and monitoring of the generators' compliance with the technical requirements under the rules.

The design of the template supports a flexible application with appropriate controls. It is not an exhaustive document. It was designed on the basis that it forms part of a generator's overall compliance management framework. During the development of the template in 2009, the Panel recognised that it would not be representative of good electricity industry practice to have a prescriptive list of compliance choices. This is because there are different generation technologies, and each plant may have unique attributes, such that some flexibility in the compliance process would be needed to accommodate these varying requirements.

The Panel has taken the overall role and purpose of the template into consideration in undertaking this review and considers the amendments to the template will help clarify how the provisions in the template should be applied. The Panel notes that the template is applied to a broad range of generation plant and consequently it provides a basis for generators to develop compliance programs that are suited to their facilities. The application of the template will also depend on external audits that generators independently conduct.

2.2 Compliance principles

As outlined in the draft report, the Panel considered nine compliance principles in developing the initial template in 2009. The principles are listed in Chapter 1 of the template. The Panel has taken these principles into consideration in determining whether amendments to the template are required. In particular, the Panel considered Principle 5 in assessing whether proposed amendments to Table 2.9 of the template should be adopted. Principle 5 states:

> "The template must therefore support the development of compliance programs which represent 'good electricity industry practice'. The template should specify the objectives and outcomes to be achieved by the testing or monitoring, and an appropriate test interval. The Generator should exercise diligence and good electrical industry practice to determine the detailed methods and procedures to be employed for its plant."

This compliance principle, along with the other eight principles, provides a reasonable guide as to the type of information that should be contained in Table 2.9 and other parts of the template.

The Panel notes that, previously where there was discussion of the compliance principles in the template, the discussion only referred to the compliance principles as providing guidance to the Panel for future template reviews. As part of this review, the Panel considered whether the compliance principles could be of use to generators in developing their compliance programs and, hence, whether they should be described as guiding principles for generators as well as the Panel.

Given that the template was developed using the compliance principles – which primarily relate to how a generator should develop its compliance regime – the Panel considers that generators should also consider the principles in applying the template to their plant. As such, the Panel has made explicit in Chapters 1 and 2 of the template that the principles should be considered by generators to develop their compliance programs and carry out compliance obligations. This provides clarity to the broader context of the template and its application.

The Panel has also added an additional principle in response to stakeholder suggestions concerning the use of real-time performance to demonstrate compliance. The additional principle is discussed in section 3.2 of this report.

The amendments adopted in the template are to clarify the existing provisions and the Panel considers the changes to be consistent with the compliance principles.

2.3 Balancing prescription and flexibility

The work of the Panel in developing the template highlighted the difficulty of establishing a single template that defined good electricity industry practice for the diverse range of plant in the national electricity market (NEM). Participants in the 16 May 2012 public meeting also recognised this challenge to make the template detailed, yet also simple enough to provide the necessary flexibility.

The Panel has considered amendments to the template from the perspective of promoting the right balance of flexibility and prescription. This is consistent with the purpose of the template described in section 2.1 and the nature of the NEM technical standards compliance regime, where generators are required to exercise judgement in how they can best meet their compliance obligations.

Giving consideration to response from stakeholders, the Panel is comfortable that the degree of flexibility in the existing template is appropriate and the template should remain largely unmodified, with the exception of minor amendments that improve clarity or provide additional guidance to generators.

2.4 Provisions in the rules that relate to the template

There are several clauses in the rules that relate to the technical standards and this is reflected in the template. Under the rules, the template is to cover all performance standards and to define suitable testing and monitoring regimes.[9] The Panel notes that when the original template was established, each of these rule provisions were considered in detail. The Panel considers the amendments in the template do not impact how these provisions are captured.

2.5 The National Electricity Objective

The Panel has considered how the amendments to the template will contribute to the national electricity objective (NEO), which is:

"to promote efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers of electricity with respect to -

- price, quality, safety, reliability and security of supply of electricity; and
- the reliability, safety and security of the national electricity system."

The Panel considers that the amendments to the template will, or are likely to contribute to the NEO. This is because the amendments provide clarity to how specific aspects of the template should be applied, which would contribute to improving the efficiency with which compliance requirements are carried out by the AER and generators. This would promote the efficient operation of electricity services.

9 These specific provisions under the rules are outlined in Appendix D.

3 Amendments to the template

This chapter sets out the Panel's consideration of specific issues including those raised in stakeholder submissions and at the public meeting held on 16 May 2012.

3.1 Further clarification of the template's purpose

Generators are required to develop compliance programs that are 'consistent with' the template for generator compliance programs,[10] but they need not be an exact duplicate of the template. The template was developed to assist generators to design their own suitable compliance programs.

Stakeholder submissions

A number of stakeholder comments during this review have highlighted, either directly or indirectly, different perceptions on the purpose of the template.

Delta Electricity offered the view in its submission to the draft report that:[11]

> "although the template should support flexibility, ultimately the template becomes an indication of what a participant can interpret to mean 'good electricity industry practice' for the [compliance] program."

During the public meeting, stakeholders discussed the role of the template – some considered the template outlined 'the bare minimum' for designing a compliance program while others considered it a resource to draw on as appropriate. During this meeting, some stakeholders suggested that future reviews of the template consider creating separate templates that provide guidance according to the type of plant, the systems, the plant size, and the location.

Panel's considerations

The Panel considers these suggestions all relate to the higher-level issue of how the template should be used and how prescriptive it should be.

The Panel agrees that, where possible, the template should provide clarity to all parties as to what constitutes good electricity industry practice with respect to technical standards. The Panel notes that the template was not designed to fully define good electricity industry practice, recognising it is the responsibility of each generator to develop its own suitable compliance program tailored to its business and plant to meet its specific compliance requirements.[12]

The Panel notes considerable work and stakeholder engagement led to the development of the template. Part of this work involved developing a clear

10 Rule 4.15(b) and (c).

11 Delta Electricity, submission on the draft report, 28 March 2012, p. 2.

12 Reliability Panel, 2009, final report, template for generator compliance programs, pp. vi, 3.

understanding of the purpose and application of the template, which is described in Chapters 1 and 2 of the template. Section 1.3 of Chapter 1 notes that:

> "...the Panel recognised that the template cannot be a prescriptive list of compliance choices. Such an approach would not be efficient nor representative of good electricity practice. The approach taken is to support a flexible application of the template with appropriate controls. The Panel therefore designed the template on the basis that it forms part of a Generator's overall compliance management process."

The Panel considers there have not been any material changes to the compliance regime for NEM participants in the three years since the template was established and, as such, it does not consider the purpose of the template has or should change.

The Panel recognises that participants may focus only on Table 2.9 of the template in developing and updating their compliance programs without taking into account the other sections of the template that provide further guidance. To help clarify the purpose of the template, the Panel has added a foreword to Table 2.9 in Chapter 2 of the template to draw attention to other sections of the template that need to be considered concurrently with the table. These sections are in earlier chapters of the template document and should be read in conjunction with the table to provide context and guidance.

The Panel agrees with stakeholders that, at this point in the review, it would not be practical to create multiple separate templates for different plant types. Creating multiple separate templates could be a departure from the principles under which the template was first conceived. The Panel considers such a change would potentially require a re-evaluation of the purpose of the template and require a more thorough technical review of its content. The Panel does not consider that sufficient evidence has been provided to require such a review at this time.

3.2 Real-time monitoring

Table 2.9 in the template includes a series of testing methodologies that mostly involve monitoring the actual performance of a plant or its sub-systems and/or modelling likely performance outcomes.

Stakeholder submissions

During the public meeting, participants queried whether there was a need for greater emphasis in the template on the use of real-time monitoring during incidents as a means to demonstrate compliance. For example, where a black start has recently occurred, the generator could use real time performance data during and after the disturbance to demonstrate compliance as opposed to using the tests within the template that are based on modelling hypothetical performance.

Panel's considerations

The Panel supports a pragmatic approach to compliance regimes and considers that real time monitoring should form part of a generator's compliance program where possible.

The template provides for monitoring methodologies to be suggested for each provision in the 'suitable testing and monitoring methodology' column of Table 2.9. Suggestions for real-time monitoring could be added in this column throughout the table, however the Panel considers this suggestion relates to all technical standards as an overarching principle for designing and implementing compliance programs. As such, the Panel has introduced an additional compliance principle in Chapter 1 of the template.

As was noted in section 2.2 of this paper, the compliance principles have been recast in template as guidance not only for the Panel in performing reviews of the template, but also for generators in designing or modifying their compliance programs.

The new compliance principle states:

> "Where appropriate, analysis of performance during an event or disturbance could be used to demonstrate compliance in lieu of a performance test."

This compliance approach was somewhat implicit in the template where Principle 7 notes that a compliance program should include a range of testing methods if compliance to a performance standard cannot be directly tested. However, the Panel considers that adding the additional principle may assist generators in making explicit that data demonstrating performance during and after an event could negate the need for additional performance tests, where appropriate.

3.3 Changes to provisions in Table 2.9 of the template

A key part of the template is Table 2.9, which details all of the technical provisions under the rules relevant to generator compliance programs and suggests appropriate methods for generators and the AER to use to test and assess compliance with technical standards.

Stakeholder submissions

Delta Electricity suggested a series of changes to provisions in Table 2.9 of the template, which were provided in a change-marked table in an attachment to its submission. This included adjusting the provisions for a total of nine technical standards. Delta Electricity's submission was also discussed in detail at the public meeting.

Panel's considerations

Delta Electricity's suggestions

The Panel has assessed each of Delta Electricity's suggested changes to Table 2.9 through discussions with AEMO and the AER, and through its own internal analysis.

The Panel considered the majority of Delta Electricity's suggested amendments to Table 2.9 to be consistent with existing provisions in the table and to help clarify the intent of testing methods and compliance assessments.

The Panel has summarised its views on each of Delta Electricity's proposed amendments in Attachment B of this paper. For details on the Panel's consideration and rationale for adopting particular amendments, please refer to this attachment.

Response to Frequency Disturbances

The Panel has also considered a separate issue concerning the testing and compliance methods for the Response to Frequency Disturbances provision in Table 2.9.

The Panel found there was ambiguity in method 3 for testing the Response to Frequency Disturbances with the first two parts of the test requiring small asynchronous generators to:

> "(a) Verify the modelled performance of a sample of turbines;
>
> (b) Verify the performance at the connection point by testing [the] response to an introduced disturbance;
>
> ...."

Part (b) is a type test where generators may test a sample of generating units to demonstrate performance consistent with the performance standard registered at the connection point.

The ambiguity arises as the test could imply that, in order to 'verify the performance at the connection point', a large disturbance would be required at the connection point to test the generator to the extremities of the performance standard. However, this is not the intention of the test as it is unlikely that a disturbance of the required magnitude could be introduced at the connection point to carry out a compliance test.

The Panel has consulted with AEMO and the AER and determined that the wording for this test should be modified.

The Panel modified the provisions in Table 2.9 of the template as follows (relevant changes are underlined):

Suitable testing and monitoring methodology	**Suggested frequency of testing**	**Notes**	**Basis for compliance assessment**
Method 3 (of 4): (a) Verify the modelled performance of a sample of turbines;	Following plant change, which may include control system setting or protection system setting change	Only applicable to small asynchronous generators with digital controls that are aggregated and that do not materially differ in terms of their design and settings.	Operation over the frequency range specified and agreed in the Generator Performance Standard
(b) Verify the performance ~~at the connection point~~ by testing response to an introduced disturbance;	Type testing and verification every 10 years	Each unit is not material and performance slippage is unlikely.	Consistent with the performance standard registered at the connection point

The Panel's reasoning for making these changes is to:

- provide additional guidance for part (a) of the test, by indicating that part (a) of the test could be conducted following a change of control or protection system settings (in addition to other relevant types of plant changes);
- make explicit that, in order perform part (a) of this test for small aggregated asynchronous generators, the sample of units tested should not materially differ from the other aggregated units in terms of their design or settings; and
- clarify that the basis of compliance assessment for part (b) of the test would involve demonstrating performance consistent with the performance standard. This may be demonstrated through type testing the response of asynchronous generating units to introduced disturbances. The disturbances may be introduced wherever it is feasible and appropriate for the plant (for example, at the turbine terminal).

The Panel considers these changes help clarify the original intent of the test. The Panel notes that, where generators operate technology that does not permit the introduction of a disturbance or where other aspects of method 3 are unfeasible or inappropriate, the template offers three additional testing methods that may be suitable.

3.4 Template formatting

The template consists of two chapters and a table (Table 2.9) that sets out methods to test, monitor and assess compliance with technical standards.

Stakeholder submissions

Delta Electricity has suggested a series of minor formatting changes for the template. These are:[13]

- clearly demarcating each part of the testing methodologies within Table 2.9;
- providing the template in formats other than PDF and to separate the guidance for standards across pages for better clarity; and
- reformatting Table 2.9 into a series of separate forms to be completed by each generator.

TRUenergy submitted to the issues paper some minor suggested amendments to improve the clarity of the template:[14]

- where testing methods contain parts (a) and (b), "; and" should be inserted to ensure that both parts are used; and
- where rule provisions and their precedents are quoted, they should be listed in reverse chronological order to improve clarity.

Panel's considerations

The Panel agrees there are some minor changes that can be made to the 2009 version of the template to improve its readability and ease of use.

The Panel adopted the minor amendments suggested by TRUenergy in the draft and final version of the template to help improve its clarity.

The Panel has also adopted some of Delta Electricity's suggestions to improve the format of the template. This includes demarcating the multiple parts of testing methodologies and adding the terms 'as above' where this was previously implied in the table. The Panel considers these minor formatting changes will help to improve the table's readability.

The Panel has decided to provide the template in Word format to make it easier to copy relevant excerpts into a generator's compliance documents. The Panel notes, however, that the PDF version of the template remains the controlled document.

13 Delta Electricity, submission on the draft report, 28 March 2012, Attachment 2, p. 1.

14 TRUenergy, submission on the issues paper, p. 1.

The Panel decided not to adopt Delta Electricity's suggestion of more extensive reformatting of the table into a series of separate pages. The Panel's decision was based on stakeholders' comments, including the AER, that generators take varied approaches to compiling their compliance programs. On balance, the Panel considers significant reformatting of the table would not provide material benefits to stakeholders. In addition, by providing the template in Word format, generators are able to easily manipulate the format and extract relevant information to suit their own requirements.

3.5 Changes to the rules or performance standards

One of the specific objectives of this review process is to consider whether any changes to the rules, or changes to the performance standards, impact the content or operation of the template.

Stakeholder submissions

Delta Electricity noted there may be issues with the operation of clause 5.3.9 in its submission on the draft report and suggested:[15]

> "...AEMO also review Clause 5.3.9 alteration process and ensure a participant's proposed alteration to plant is appropriately considered by all the relevant participants. "

Related to the first point, Delta noted that the operation of clause 5.3.9 is relevant to the template in terms of revising compliance programs following plant alterations:[16]

> "Some guidance is required in the Template as to the need for parties to renegotiate relevant standards affected by any alteration, with consideration of the latest version of the Rules, and the subsequent need for the generator to reconsider the program activities for the altered technology and standards."

Submissions on the issues paper did not raise any specific issues on rule changes that have been implemented or any changes to performance standards.

Panel's considerations

From the time of the template's implementation in July 2009 to June 2012, the AEMC completed 37 electricity rule changes. Although some of the rule changes resulted in changes to Chapters 4 and 5 of the rules (where the provisions relating to generator compliance requirements are set out) the changes related to other aspects of the rules – for example, changes associated with network support and control ancillary services. There were no other changes that impacted the technical provisions considered under the template. For these reasons, the Panel considers that no rule changes have affected the content or operation of the template.

15 Delta Electricity, submission on the draft report, 28 March 2012, p. 1.

16 ibid

The Panel also notes that there have not been any changes to the performance standards that affect the template.

The Panel considers that the issue regarding clause 5.3.9 is not within the scope of this review. The Panel will note the issue with AEMO, however Delta Electricity is encouraged to raise this issue directly with AEMO if it has material concerns with the alteration process. The requirement to consider the latest version of the rules when renegotiating standards is also a matter for AEMO and extends beyond the scope of the template's guidance.

The Panel evaluated Delta Electricity's suggestion on including guidance in the template on the need to reconsider the compliance program activities for any altered technology and standards. The Panel considers that this requirement is already generally captured by Principle 1 regarding variability of plant system performance over time, by Principle 4 regarding assurance of compliance with registered performance standards and by Principle 9, which states that 'compliance programs should be reviewed and updated periodically'. The Panel considers that updating compliance programs following the alteration of technology and standards is good industry practice and does not require further specification above the existing principles.

3.6 Frequency of tests

As noted earlier, a key part of the template is Table 2.9 that sets out the details of specific compliance methods for applicable performance standards. When the template was established, this table included a column entitled 'Frequency' outlining the frequency with which each suggested compliance test could be completed.

The Panel proposed in its draft report to amend the template to make clear these were only 'suggested frequencies'. This was to address issues raised in submissions on the issues paper from AEMO, SKM and AGL (Attachment C refers).

Stakeholder submissions

Delta Electricity noted in its submission that it accepted the findings of the Panel's draft report concerning the frequency of testing and offered a suggestion for a future review. Delta Electricity suggested that a future review consider whether the template should include a maximum period for the testing interval of each method in the table to provide an indication of what a participant can interpret to mean 'good electricity industry practice'.[17]

Delta Electricity also offered suggested testing frequencies in Table 2.9, either where a provision did not contain a suggested testing interval or where Delta considered an alternative interval was more appropriate.[18]

17 Delta Electricity, submission on the draft report, 28 March 2012, pp. 1-2.

18 Delta Electricity, submission on the draft report, 28 March 2012, Attachment 1, pp. 11-46.

Panel's considerations

The Panel noted in its draft report that it agrees with stakeholders' views that there should be flexibility in the frequency with which compliance testing is conducted. The Panel notes that the frequency values set out in Table 2.9 in the template are the 'suggested' frequency values. The template was designed to support a flexible application and, as such, there is a degree of discretion on the frequency of testing. Section 2.7 of the template discusses that, in determining the appropriate frequency, the generator should consider the broader compliance framework and take into account all relevant factors including:[19]

- the technology of the plant specific to that performance standard;
- experience with the particular generation technology;
- manufacturer's advice with respect to the particular model; and
- an assessment of the frequency required to provide reasonable assurance of compliance.

Given the existing provisions of the template, the Panel does not consider extensive amendments to the template are necessary to address the frequency of testing requirement. As discussed in the draft report, the Panel has amended the column entitled 'Frequency' in Table 2.9 to read 'Suggested frequency'. This is to emphasise that these are not fixed values. The Panel has also amended the explanation in section 2.7 of the template to capture the issues raised by stakeholders on the issues paper.

The Panel supports Delta Electricity's suggestions to include testing intervals in the 'suggested frequency' column of Table 2.9 wherever a testing frequency has not been suggested. This is consistent with compliance Principle 5, which states the template should specify appropriate testing intervals. The suggested intervals adopted in the table are discussed in Appendix B.

The Panel notes Delta Electricity's suggestion that a future review consider the merits of including minimum testing intervals in Table 2.9. If the Panel were to include this as part of a future review, it would likely require significant technical advice. The Panel would therefore need to do a preliminary assessment of the potential costs and benefits of incorporating this issue into a future review. This would include considering whether it is efficient and feasible to determine a set of minimum testing intervals that would apply to a range of plant types in the NEM.

3.7 Different generation technologies

As noted earlier, the template is a single document that needs to apply to various types of generation technology. The Panel considered a range of fossil fuel and renewable energy technologies when developing the template in 2009. This included advice from

19 AEMC Reliability Panel, Template for Generator Compliance Programs, 31 July 2009, p. 8.

a working group that was established to inform the review, with representation from the National Generators Forum and the Clean Energy Council (among others). The Panel also considered advice provided in submissions from a broad range of stakeholders in its 2009 review and this 2011-12 review.

The Panel proposed minor amendments in the draft report to address issues raised by stakeholders in their submissions to the issues paper.

Stakeholder submissions

AGL submitted to the issues paper that the majority of provisions in the template apply to synchronous generators rather than asynchronous generators. AGL suggested minor amendments to clarify the applicability of the tests.[20]

TRUenergy submitted to the issues paper that "some consideration to the emergence of large scale solar may be warranted in due course".[21]

AEMO also submitted to the issues paper that the template should be updated to reflect new technologies.[22]

International Power submitted to the issues paper that, as wind generation was operational at the time the template was first established, it would assume that any technological requirements for wind generation would already be considered.[23] Further, International Power noted that it is "not aware of any substantial new technology that has become established in the national electricity market since 2009" and that should large scale solar generation become a reality then this should be examined.[24]

Delta Electricity accepted the findings put forward by the Panel in the draft report.[25]

Panel's considerations

The amendments proposed in the draft report have been adopted in the final template. These relate to clarifying provisions for synchronous and asynchronous generation. The Panel considers the amendments do not change the intention of the requirements and allow clearer understanding of the tests.

The Panel agrees that, should the requirement arise in the future, additional consideration of provisions for large scale solar installations would be needed. The Panel does not consider it efficient or appropriate to make any specific amendments to the template at this time for large scale solar installations as there are no committed projects on which to test and measure the potential requirements.

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20 AGL, submission on the issues paper, 8 February 2012, p. 1.

21 TRUenergy, submission on the issues paper, 6 January 2012, p. 1.

22 AEMO, submission on the issues paper, 29 February 2012, p. 2.

23 International Power, submission on the issues paper, 8 February 2012, p. 1.

24 ibid

25 Delta Electricity, submission on the draft report, 28 March 2012, p. 1.

The Panel notes that the current template includes specific provisions and references to wind generation and, as noted by International Power, some consideration was given to the requirements for different technologies at the time the template was first established.

3.8 Timing to implement compliance programs

The rules require that a participant must institute a compliance program as soon as reasonably practicable but no later than:[26]

(1) 6 months after the day that AEMO gives notice to the Registered Participant of registration of the performance standard; or

(2) 6 months after the day on which the plant commences operation.

The draft report discussed the differences between the two processes of instituting a compliance program to meet ongoing compliance requirements and demonstrating compliance with technical standards at the commissioning stage.

Stakeholder submissions

Delta Electricity suggested in its submission to the draft report that the Panel consider a future review of the process of commissioning power stations. This would include the impact and expectations of participants for registered performance standards. Delta Electricity has noted that its experience with this process suggests some modifications of the template may be required.[27]

AEMO submitted to the issues paper that:[28]

> "Clause 5.7.3 of the Rules requires generators to demonstrate that they comply with the performance standards in the time specified in clause 4.15. This is generally 6 months after commissioning. However it is believed that the intention of this clause is that compliance be demonstrated at the time of commissioning, as may be required under clause 5.8.1(b)."

AEMO considered the timing of the compliance requirements should be clarified.

Panel's considerations

The Panel noted in its draft report that section 5.7 of the rules is on the 'Inspection and Testing' requirements, whereas section 5.8 of the rules is on 'Commissioning'. The timing provisions under clause 4.15(b) of the rules relate to the establishment of a 'compliance program' for demonstrating on-going compliance and compliance monitoring, in which case the existing timeframes under 4.15(b) seem appropriate.

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26 Clause 4.15(b) of the rules.

27 Delta Electricity, submission on the draft report, 28 March 2012, p. 1.

28 AEMO, submission on the issues paper, 29 February 2012, p. 1.

The Panel recognises the commissioning process can inform the development of ongoing compliance regimes for generators. However, it is important to note that the two processes are discrete in terms of the obligations under the rules and their practical operation. Under the rules, the template is to be used for the latter purpose – the development of compliance programs that enable a generator to meet technical standards on an ongoing basis. As such, the Panel considers the commissioning process a separate issue and is not within the scope of reviews of the compliance template.

If there is a demonstrated problem with the commissioning process, the Panel encourages AEMO or other stakeholders to propose a rule change to the AEMC. Future reviews of the template would then consider whether the rule change impacts the operation of the template.

Abbreviations

AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
Commission	See AEMC
MCE	Ministerial Council on Energy
MNSP	market network service provider
NEM	national electricity market
NEO	national electricity objective
NGF	National Generators Forum
NSP	network service provider
Panel	Reliability Panel
rules	National Electricity Rules
SKM	Sinclair Knight Merz

A Summary of submissions on the draft report

The Panel received one submission on the draft report from Delta Electricity. The issued raised are summarised below. Details of Delta Electricity's suggested changes to Table 2.9 of the template are discussed in Attachment B. The submission is available on the AEMC Reliability Panel website.

Issue	Detail	Panel Response
Changes to the rules or the performance standards	Delta Electricity suggested that AEMO review clause 5.3.9 alteration process, while noting it accepted that the time to comment on this issue may have passed. Delta noted some guidance is required in the template as to the need for parties to renegotiate relevant standards affected by any alteration, with consideration of the latest version of the rules, and the subsequent need for the generator to reconsider the program activities for the altered technology and standards.	This issue is considered and discussed in section 3.5.
Frequency of tests	Delta Electricity accepted the findings in the draft report on this issue. It offered a suggestion that future reviews may consider including advice in the template on a maximum period between tests. This is to avoid issues where, for example, one participant chooses a philosophy of testing every 15 years whilst another, with similar equipment, adopts an approach of 4 yearly testing.	This issue is considered and discussed in section 3.6.
Different generator technologies	Delta Electricity accepted the findings in the draft report on this issue.	This issue is considered and discussed in section 3.7.

Issue	Detail	Panel Response
Timing to implement compliance programs	Delta Electricity suggested that the Panel considers performing a future and separate review of the process of commissioning power stations and the impact and expectations of participants for registered performance standards. Delta submitted that the template may need to be modified as a result.	This issue is considered and discussed in section 3.8.
Other minor amendments	Delta Electricity suggested some amendments to Table 2.9. Delta also suggested changes to the format of the template to improve the ease of reading and use.	This is considered and discussed in section 3.3 and attachment B. This is considered and discussed in section 3.4.

B Delta Electricity's suggested changes to Table 2.9 of the template

Section 3.3 of this report notes that Delta Electricity's submission to the draft report included a series of suggested changes to the provisions in Table 2.9 of the template. The Panel has considered each suggested change, having regard to the factors discussed in Chapter 2 of this report. The table below lists each suggestion and the final wording adopted in the template, along with the Panel's rationale for adopting the new wording or maintaining the existing wording.

Provision	Delta pg.	Revised template pg.	Previous wording	Suggested wording	Adopted wording	Panel's rationale
Reactive Power Capability	11	11	Basis for compliance: Achieve reactive power requirements of the performance standard	Basis for compliance: Be capable of achieving reactive power requirements of the performance standard	Basis for compliance: Be capable of achieving reactive power requirements of the performance standard	The Panel has adopted Delta's suggested amendment. This was adopted to reflect instances where generators would be unable to achieve reactive power requirements, were it not for circumstances outside of their control (e.g. network issues).The Panel considers the adopted wording is consistent with the provisions under the rules.
Reactive Power Capability	11	11	Nil	Testing and monitoring methodology, Methods 1-4 (of 5): (b) Investigate and report any known plant condition that arises that is known to restrict the capability	Nil	The Panel considered this amendment against other provisions in the template and against requirements under the rules. There is already an obligation in the rules under 4.15(f) that requires a generator to investigate and report if it is not capable of meeting any of its registered performance standards. As this rules requirement applies across all the provisions covered by the template, the Panel did not consider this level of detail was necessary.

Provision	Delta pg.	Revised template pg.	Previous wording	Suggested wording	Adopted wording	Panel's rationale
Power Factor Requirements	13	13	Provision title: Power Factor Requirements	Provision title: Reactive Power Capability – Power Factor Requirements	Provision title: Power Factor Requirements	The Panel notes this provision applies when generator auxiliaries are running when the generator is not connected. The Panel has maintained the current wording, which is consistent in the template's approach for listing provisions in the table according to their titles in the rules (or abbreviations of these titles). Participants in the 16 May 2012 teleconference supported this approach.
Power Factor Requirements	13	13	Basis for compliance assessment: Actual capability directly demonstrated	Basis for compliance assessment: Power factor within allowable range / specification	Basis for compliance assessment: Power factor within allowable range / specification	The Panel has adopted Delta's suggested amendment. This provision applies where generators are acting as load. The basis for compliance is set out in the rules as being within a specified range (the permissible range for the automatic access standard), or meeting a negotiated alternative power factor. As such, the Panel considers Delta's suggested wording to be appropriate. Participants in the 16 May 2012 teleconference supported this approach.
Quality of Electricity Generated	13	13	Testing and monitoring methodology, Method 1 (of 2), (a): Direct measurements using power quality meters to derive: iii. harmonics, flicker and negative phase sequence voltage prior to	Testing and monitoring methodology, Method 1 (of 2), (a): Direct measurements using power quality meters to derive: iii. harmonics, flicker and negative phase sequence	Testing and monitoring methodology, Method 1 (of 2), (a): Direct measurements using power quality meters to derive: iii. harmonics, flicker and negative phase sequence	The Panel has adopted Delta's suggested amendment as the change is considered to be consistent with the practical application of this test where it could be applied before or after synchronisation. This change was canvassed with participants in the 16 May 2012 teleconference and no issues were raised with adopting the amendment.

Provision	Delta pg.	Revised template pg.	Previous wording	Suggested wording	Adopted wording	Panel's rationale
			synchronisation;	voltage;	voltage;	
Quality of Electricity Generated	14	14	Testing and monitoring methodology, Method 2 (of 2), (b): Testing of any relevant sub-systems.	Testing and monitoring methodology, Method 2 (of 2), (b): Testing and/or calibration of any relevant sub-systems.	Testing and monitoring methodology, Method 2 (of 2), (b): Testing and/or calibration of any relevant sub-systems.	The Panel notes that the template currently uses both the terms 'testing' and 'calibration'. The Panel has adopted Delta's suggested change as it is consistent with the descriptions of testing methodologies used in the template. A general clarification has also been made in the template to note that "routine testing may require testing and calibration of equipment".
Response to frequency disturbances	16	15	Testing and monitoring methodology, Method 1(b), 2(b); 3(d) and 4(b): Routine testing of relevant sub-systems…	Testing and monitoring methodology, Method 2(b); 3(d) and 4(b): Routine testing and/or calibration of relevant sub-systems…	Testing and monitoring methodology, Method 2(b); 3(d) and 4(b): Routine testing and/or calibration of relevant sub-systems…	Refer to the Panel's comments above.
Response to Voltage Disturbances	19	19	Testing and monitoring methodology, Method 1(b) and 2(b): Routine testing of relevant sub-systems…	Testing and monitoring methodology, Method 1(b) and 2(b): Routine testing and/or calibration of relevant sub-systems…	Testing and monitoring methodology, Method 1(b) and 2(b): Routine testing and/or calibration of relevant sub-systems…	As above

Provision	Delta pg.	Revised template pg.	Previous wording	Suggested wording	Adopted wording	Panel's rationale
Response to Voltage Disturbances	19	19	Basis for compliance assessment, Method 1 (of 3), (a): Consistency with plant characteristics	Basis for compliance assessment, Method 1 (of 3), (a): Achieves performance standard	Basis for compliance assessment, Method 1 (of 3), (a): Achieve performance standard	The Panel has adopted Delta's suggested change. This change concerns the methodology: investigating plant trips that occur during significant voltage disturbances. The Panel considers it appropriate that the basis for compliance reflect the performance standards rather than the plant characteristics.
Response to Disturbances following Contingency Events	22	22	Testing and monitoring methodology, Method 2(b) and 3(b): Routine monitoring and testing of relevant sub-systems…	Testing and monitoring methodology, Method 2(b) and 3(b): Routine monitoring and testing and/or calibration of relevant sub-systems…	Testing and monitoring methodology, Method 2(b) and 3(b): Routine monitoring and testing and/or calibration of relevant sub-systems…	Refer to the Panel's comments for Response to frequency disturbances.
Quality of Electricity Generated and Continuous Uninterrupted Operation	24	23	Testing and monitoring methodology, Method 1(c): Routine monitoring and testing of relevant sub-systems…	Testing and monitoring methodology, Method 1(c): Routine monitoring and testing and/or calibration of relevant sub-systems…	Testing and monitoring methodology, Method 1(c): Routine monitoring and testing and/or calibration of relevant sub-systems…	As above

Provision	Delta pg.	Revised template pg.	Previous wording	Suggested wording	Adopted wording	Panel's rationale
Partial Load Rejection	25	24	Suggested frequency of testing, Method 1 (of 3): on every event	Suggested frequency of testing, Method 1 (of 3): on every event where high frequency moves out of the operational frequency tolerance band	Suggested frequency of testing, Method 1 (of 3): on every event where high frequency moves out of the operational frequency tolerance band or every five years (whichever is more frequent)	The Panel has adopted Delta's suggested amendment, with one additional modification. The Panel's modification recognises that in the past six years there have not been any high frequency excursions outside of the operational frequency tolerance band. As such, this suggested testing frequency may be inadequate. In order to offer additional guidance on testing frequencies, the Panel has suggested this be tested once every five years at a minimum.
Partial Load Rejection	26	25	Testing and monitoring methodology, Method 2 (of 3), (a): [none suggested]	Testing and monitoring methodology, Method 2 (of 3), (a): Routine testing and/or calibration of relevant sub-systems…	Testing and monitoring methodology, Method 2 (of 3), (a): Routine testing and/or calibration of relevant sub-systems…	Refer to Panel's comments for Response to frequency disturbances.
Partial Load Rejection	27	25	Suggested frequency of testing, Method 3 (of 3), (a): every 4 years	Suggested frequency of testing, Method 3 (of 3), (a): on every event	Suggested frequency of testing, Method 3 (of 3), (a): on every event or every 10 years (whichever is more	The Panel has adopted Delta's suggested amendment, with one additional modification. Testing on every 'event' is considered suitable, with the relevant 'event' being defined in the performance standard (for example, 30% load rejection for automatic access standard). An additional suggestion of testing at least every 10 years is provided for generators where load rejection events do not occur

Provision	Delta pg.	Revised template pg.	Previous wording	Suggested wording	Adopted wording	Panel's rationale
					frequent)	for a long period of time.
Protection from Power System Disturbances	28	26	Suggested frequency of testing, Method 1 (of 3): [none suggested]	Suggested frequency of testing, Method 1 (of 3): not relevant assuming alarms are incorporated into the design of the recorder	Nil	The Panel notes that this test has three parts. No suggested frequency is included for the first part as it refers to having 'continuous monitoring' in place. The Panel therefore has not made an amendment to the existing provision. Delta's suggestion has, however, been captured in the notes column for this test.
Protection from Power System Disturbances	29	26	Testing and monitoring methodology, Method 1(b), 2(a) and 3(b): Routine testing of relevant sub-systems…	Testing and monitoring methodology, Method 2(a) and 3(b): Routine testing and/or calibration of relevant sub-systems…	Testing and monitoring methodology, Method 2(a) and 3(b): Routine testing and/or calibration of relevant sub-systems…	Refer to Panel's comments for Response to frequency disturbances.
Protection Systems that Impacts on Power System Security	31	29	Testing and monitoring methodology, Method 1(a), 2(a) and 3(b): Routine testing of relevant sub-systems…	Testing and monitoring methodology, Method 1(a), 2(a) and 3(b): Routine testing and/or calibration of relevant sub-systems…	Testing and monitoring methodology, Method 1(a), 2(a) and 3(b): Routine testing and/or calibration of relevant sub-systems…	Refer to Panel's comments for Response to frequency disturbances.

Provision	Delta pg.	Revised template pg.	Previous wording	Suggested wording	Adopted wording	Panel's rationale
Protection Systems that Impact on Power System Security	33	31	Suggested frequency of testing, Method 3 (of 3), (c): [none suggested]	Suggested frequency of testing, Method 3 (of 3), (c): At least every 5 years	Suggested frequency of testing, Method 3 (of 3), (c): Every 5 years	The Panel has adopted a suggested frequency of 5 years as it is consistent with other similar provisions under this method and other tests.
Asynchronous Operation of Synchronous Generating Units / Protection to Trip Plant for Unstable Operation	34	32	Testing and monitoring methodology, Method 1(a): Routine testing of relevant sub-systems…	Testing and monitoring methodology, Method 1(a): Routine testing and/or calibration of relevant sub-systems…	Testing and monitoring methodology, Method 1(a): Routine testing and/or calibration of relevant sub-systems…	Refer to Panel's comments for Response to frequency disturbances.
Frequency Control / Frequency Responsiveness and / or Governor Stability and Governor System	36	33	Basis for compliance assessment, Method 3 (of 4), (a): [none suggested]	Basis for compliance assessment, Method 3 (of 4), (a): Achieves the performance standard	Basis for compliance assessment, Method 3 (of 4), (a): Achieve performance standard	The Panel has adopted Delta's suggestion, which is consistent with the approach for other provisions in the table where the basis of compliance is considered relatively straightforward.
Frequency Control / Frequency Responsiveness and / or Governor	36	33	Suggested frequency of testing, Method 3 (of 4), (b): ongoing	Suggested frequency of testing, Method 3 (of 4), (b): on every event	Suggested frequency of testing, Method 3 (of 4), (b): on every event where the frequency	The Panel has adopted Delta's suggestion with a modification. This is consistent with the revised suggested testing frequency for the Partial Load Rejection provision in this table.

Provision	Delta pg.	Revised template pg.	Previous wording	Suggested wording	Adopted wording	Panel's rationale
Stability and Governor System					moves out of the operational frequency tolerance band or at least every four years.	
Stability / Impact on Network Capability	37	35	Testing and monitoring methodology, Method 1(b): Routine monitoring and testing of relevant sub-systems…	Testing and monitoring methodology, Method 1(b): Routine monitoring and testing and/or calibration of relevant sub-systems…	Testing and monitoring methodology, Method 1(b): Routine monitoring and testing and/or calibration of relevant sub-systems…	Refer to Panel's comments for Response to frequency disturbances.
Excitation Control System/Voltage and Reactive Power Control	38	36	Testing and monitoring methodology, Method 1 (of 3), (c): monitoring in-service performance or undertake transfer function measurements	Testing and monitoring methodology, Method 1 (of 3), (c): monitoring in-service performance or undertaking in-service transfer function measurements	Testing and monitoring methodology, Method 1 (of 3), (c): monitoring in-service performance or undertake transfer function measurements	The Panel has left this provision unchanged in order to maintain the flexibility of this testing methodology. Enabling generators to undertake transfer function measures while the system is out of service provides an alternative method to monitoring in-service performance.

Provision	Delta pg.	Revised template pg.	Previous wording	Suggested wording	Adopted wording	Panel's rationale
Excitation Control System/Voltage and Reactive Power Control	38	36	Suggested testing frequency, Method 1 (of 3), (c): every 4 years	Suggested testing frequency, Method 1 (of 3), (c): report every 4 years	Suggested testing frequency, Method 1 (of 3), (c): On every event or every 4 years	The Panel has changed the suggested frequency to reflect that the provision contains two parts. Monitoring in-service performance is an event-related process, whereas undertaking transfer function measurements is of a routine nature that could be undertaken every four years (consistent with the original suggested timeframe in the template).
Power Station Auxiliary Transformers / Supplies	43	40	Testing and monitoring methodology, Method 1(b): Testing of any relevant sub-systems...	Testing and monitoring methodology, Method 1(b): Testing and/or calibration of any relevant sub-systems...	Testing and monitoring methodology, Method 1(b): Testing and/or calibration of any relevant sub-systems...	Refer to Panel's comments for Response to frequency disturbances.

C Summary of submissions on the issues paper

Issues raised in submissions on the issues paper are summarised below. Submissions are published on the AEMC Reliability Panel website.

Issue	Stakeholder	Detail	Panel Response
Frequency of testing	AEMO, AGL, SKM	AEMO submitted that the application of the compliance template to generators that do not operate often should be reviewed. AGL noted that where testing is required, some consideration should be given to the relevant technologies of the control and protection devices. This should include the ability to test full digital protection relays, AVRs and governors up to a period of every five years. This period should be decreased as best practice for lower technology devices, i.e. three years for electro-mechanical relays and electronic AVRs. SKM suggested that the frequency testing should be extended to "major inspection interval, or every 5 years (whichever occurs sooner)".	This issue is considered and discussed in section 3.6 of this report and section 3.2 of the draft report.
Asynchronous generation	AGL, International Power	International Power noted wind generation had been in operation at the time of development of the template and assumes that all technology requirements were considered at that time. AGL noted that the majority of testing methods outlined in the template apply to synchronous generators only, which is not relevant to asynchronous generators, such as wind. AGL provides a mark-up of one section of the template which would clarify the application of the testing requirements.	This issue is considered and discussed in section 3.7 of this report and section 3.3 of the draft report.

Issue	Stakeholder	Detail	Panel Response
Minor suggestions to improve clarity	TRUenergy	TRUenergy suggested minor amendments to the template to improve clarity, such as the insertion of "; and" between part (a) and part (b) of a testing method to ensure that both parts of the testing method are used. TRUenergy also suggested that references to Rule provisions and their precedents are listed in reverse chronological order to further improve clarity.	This issue is considered and discussed in section 3.4 of this report and section 3.5 of the draft report.
Large scale solar generation	TRUenergy, International Power, AEMO	TRUenergy suggested that some consideration to large scale solar installations may be warranted in due course. AEMO considered that the template should be updated to reflect new technologies such as solar. International Power was of the view that if the large scale solar generation projects proposed by the federal government were implemented, the template should be amended to accommodate this emergence of large scale solar installations.	This issue is considered and discussed in section 3.7 of this report and section 3.3 of the draft report.
Timing to implement compliance programs	AEMO	AEMO noted that compliance needs to be demonstrated by generators at the time of commissioning and hence questioned the timing of the establishment of compliance programs.	This issue is considered and discussed in section 3.8 of this report and section 3.4 of the draft report.

D Provisions under the rules that relate to the technical standards

There are several clauses in the rules that relate to the technical standards generators must adhere to. Clause 4.15(ca) outlines that the template for generator compliance programs must:

(a) cover all performance standards; and

(b) define suitable testing and monitoring regimes for each performance standard so that a Registered Participant can select a regime that complies with the obligations set out in rules 4.15(a), 4.15(b) and 4.15(c) for their particular plant.

Rule 4.15(a) requires that a Registered Participant must:

1. ensure that its plant meets or exceeds the performance standard applicable to its plant; and

2. ensure that its plant is not likely to cause a material adverse effect on power system security through its failure to comply with a performance standard; and

3. immediately ensure that its plant ceases to be likely to cause a material adverse effect on power system security through its failure to comply with a performance standard, if:

    (a) the Registered Participant reasonably believes that by failing to comply with a performance standard, its plant is likely to cause a material adverse effect on power system security; or

    (b) AEMO advises the Registered Participant that by failing to comply with a performance standard, the Registered Participant's plant is likely to cause a material adverse effect on power system security.

Rule 4.15(b) requires that a Registered Participant who engages in the activity of planning, owning, controlling or operating a plant to which a performance standard applies must institute and maintain a compliance program which complies with rule 4.15(c). The compliance program must be instituted, as soon as reasonably practicable, but no later than:

1. 6 months after the day that AEMO gives notice to the Registered Participant of registration of the performance standard under rule 4.14(n); or

2. 6 months after the day on which the plant commences operation.

Rule 4.15(c) requires that a compliance program instituted and maintained under rule 4.15(b) must:

1. be consistent with the template for generator compliance programs;

2. include procedures to monitor the performance of the plant in a manner that is consistent with good electricity industry practice;

3. be modified to be consistent with any amendments made under clause 8.8.3(ba) to the template for generator compliance programs, by no later than 6 months after amendments to the template for generator compliance programs are published or by a date determined by the Reliability Panel; and

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