



Australian Energy Market Commission

DRAFT RULE DETERMINATION

NATIONAL ELECTRICITY AMENDMENT (IMPLEMENTING A GENERAL POWER SYSTEM RISK REVIEW (GPSRR)) RULE 2021

PROPONENT

COAG Energy Council

04 FEBRUARY 2021

RULE

INQUIRIES

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CITATION

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ABOUT THE AEMC

The AEMC reports to the Council of Australian Governments (COAG) through the COAG Energy Council. We have two functions. We make and amend the national electricity, gas and energy retail rules and conduct independent reviews for the COAG Energy Council.

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SUMMARY

- 1 On 4 February 2020, the Australian Energy Market Commission (AEMC or Commission) made a draft determination and draft rule to amend the national electricity rules (NER or Rules) to implement a holistic General Power System Risk Review (GPSRR) that would replace the existing Power System Frequency Risk Review (PSFRR).
- 2 The draft rule seeks to implement a GPSRR. This would be an annual review that would involve the Australian Energy Market Operator (AEMO), in collaboration with Network Service Providers (NSPs), identifying and assessing risks to power system security (that are likely to result in cascading outages or major supply disruptions) associated with five key risk areas, in addition to frequency risks. This would increase the transparency of emerging system security risks that may need to be managed, helping AEMO, NSPs and market participants better understand the nature of new risks as they emerge. AEMO must complete the first GPSRR within 18 months of the rule commencing.
- 3 This rule change is part of a wider Commission work program on system security, which includes this and two other rule changes seeking to action the recommendations made by the Commission in its *Review of the South Australian Black System Event* report (BSE review).¹

The rule change request

- 4 In its BSE review the Commission recommended expanding existing frameworks to enhance prompt identification by AEMO of risks to system security from all sources through the implementation of a GPSRR. The GPSRR would be a front-end risk identification process to inform risk management actions undertaken through other processes.
- 5 Following the BSE review, the Council of Australian Governments (COAG) Energy Council² submitted a rule change request on 26 May 2020 to implement this recommendation. The COAG Energy Council considers there are a range of shortcomings with the existing PSFRR given the changing power system risk and resilience profile.³ The COAG Energy Council is of the view that there is a need to broaden the scope of the existing PSFRR beyond frequency, to become a more frequent and holistic GPSRR process for effectively identifying a range of emerging risks to the power system. In particular, the COAG Energy Council seeks to amend the rules in order:⁴
 - for the GPSRR to consider all events and conditions (including contingency events as defined in the NER) the occurrence of which AEMO expects, alone or in combination, would be likely to lead to cascading outages, or major supply disruptions

1 For more information, see: <https://www.aemc.gov.au/markets-reviews-advice/review-of-the-system-black-event-in-south-australia>. For more information, see section 1.6 and appendix B.

2 On 29 May 2020, the Prime Minister announced the establishment of the National Federation Reform Council and the disbanding of the COAG. New arrangements for the former COAG Energy Council will be finalised following the National Cabinet Review of COAG Councils and Ministerial Forums. The Prime Minister has advised that, while this change is being implemented, former Councils may continue meeting as a Ministerial Forum to progress critical and/or well-developed work.

3 COAG Energy Council, rule change request, p. 3.

4 Ibid, p.1.

- to enhance the breadth of the sources of risk considered in the GPSRR to include a wider range of sources of risk beyond frequency
- to deepen the review to formally include DNSPs
- to increase the speed and frequency of the review process, and
- to integrate the review with other AEMO and NSP planning processes.

The draft rule

6 The Commission has determined to make a more preferable draft rule that largely reflects the rule proposed by the COAG Energy Council. The draft rule seeks to implement a broader review – called the ‘general power system risk review’ - to replace the current PSFRR.

7 In relation to the scope of the GPSRR, the draft rule would require AEMO to consider on a prioritised basis:

- non-credible contingency events, the occurrence of which AEMO expects would be likely to involve uncontrolled increases or decreases in frequency, alone or in combination, leading to cascading outages, or major supply disruptions, and
- other events and conditions (including contingency events) the occurrence of which AEMO expects, alone or in combination, would be likely to lead to cascading outages, or major supply disruptions.⁵

8 In relation to the risks identified, the draft rule would require AEMO to review current arrangements and identify options for future management of these events and conditions.

9 In relation to the process for the GPSRR, the draft rule requires AEMO to:

- undertake the GPSRR no less than annually
- consult with, and take into account the views of, relevant NSPs (both transmission and distribution) in the conduct of the GPSRR, and
- publish and consult on an approach paper at the commencement of the review specifying priorities in the events and conditions to be assessed, the approach and methodologies in assessing each risk, information inputs and assumptions used, and approach to interacting with NSPs.

10 The draft rule also requires NSPs to co-operate with AEMO in the conduct of the GPSRR and provide to AEMO all information and assistance reasonably requested by AEMO.

11 In relation to the coordination and integration of planning processes, the draft rule would require:

- NSPs to:
 - take into account the outcomes from the recent GPSRR in their annual planning reviews

5 As part of this requirement, AEMO must consider risks associated with any or a combination of: increases or decreases in voltage, levels of inertia, the availability of system strength services, the operation and interaction of emergency frequency control schemes and emergency controls, and any other events and conditions AEMO deems necessary, including risks arising on distribution network.

- assess the interactions between emergency frequency control schemes or emergency controls; and settings of protection systems or control systems of plant connected to their respective networks and consider whether they are fit for purpose for the future operation of the network
- AEMO to consider and have regard to the outcomes of the GPSRR in conducting the Integrated System Plan.

12 The Commission has determined to make a more preferable draft rule that varies from the proposed rule. In its rule change request, the COAG Energy Council proposes to require AEMO to review significant risks associated with all system conditions and events (including contingency events). The Commission has determined to retain the current framework in the NER whereby AEMO must consider non-credible contingency events the occurrence of which AEMO expects, alone or in combination, would be likely to involve uncontrolled increases or decreases in frequency leading to cascading outages, or major supply disruptions; and introduce a new requirement for AEMO to consider all events and conditions (including contingency events) for all other risks that AEMO considers could lead to cascading outages and major supply disruptions. The Commission considers that with this change the draft rule would better:

- maintain the delineation between the existing protected event framework that is designed for management of frequency risks arising from non-credible contingency events, and the assessment of risks associated with all other events and conditions (including contingency events)
- recognise the existing arrangements that allow AEMO to manage frequency risks associated with credible contingency events through the frequency control ancillary services (FCAS) markets.

13 The change to the proposed rule does not materially alter the intent of the Commission's recommendation from the BSE report nor the policy position reflected in the rule change request. The more preferable draft rule is broadly consistent with the proposed rule in respect of the GPSRR scope, frequency and coordination and integration of planning arrangements.

14 The Commission considers that the draft rule would contribute to the achievement of the National Electricity Objective (NEO) with respect to the efficient operation and use of electricity services in the long-term interests of consumers of electricity with respect to the safety and security of the national electricity system. The Commission is of the view that the need for a comprehensive risk review is now greater than ever, given the changing generation mix that impacts the power system risk and resilience profile. It is in the long-term interests of consumers that emerging risks from all possible sources are identified promptly and are effectively assessed.

The rule change process

15 The COAG Energy Council has submitted this rule change request in response to the recommendation made by the Commission in its BSE review. While the COAG Energy Council did not request the rule change request be fast tracked, the rule change request is consistent

with the recommendation made in the BSE review, and that recommendation was made following significant consultation as part of the Commission's BSE review. Therefore, the rule change request submitted by the COAG Energy Council meets the criteria to be fast tracked.

- 16 Given the consultation already undertaken, the Commission determined that a fast track process was appropriate and initiated the rule change process with the publication of a notice on 14 January 2021.
- 17 Fast-tracking means that the rule change process moves straight to the draft determination stage i.e. this draft determination and rule. Submissions on the draft determination and draft rule are invited by **18 March 2021** via the AEMC website.

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1 COAG ENERGY COUNCIL'S RULE CHANGE REQUEST

On 26 May 2020, the Australian Energy Market Commission (AEMC or Commission) received a rule change request from the Council of Australian Governments (COAG) Energy Council⁶ seeking to implement a General Power System Risk Review (GPSRR) into the National Electricity Rules (NER).

The rule change request seeks to enhance the breadth of the sources of risk considered in the existing Power System Frequency Risk Review (PSFRR), increase the speed and frequency of the review and integrate the review with other Australian Energy Market Operator (AEMO) and Network Service Providers (NSPs) planning processes.⁷

The COAG Energy Council's rule change request reflects the recommendation made by the Commission in its *Review of the South Australian Black System Event* report (BSE report).⁸

This chapter outlines:

- context and background
- a summary of the AEMC's recommendation on reviewing power system risks made in the BSE report
- the rationale for the rule change request and the solutions proposed
- an overview of the rule making process, including the consultation process for this draft determination, and
- related Commission work.

1.1 Context and background

The PSFRR was introduced in 2017 as a part of the Emergency Frequency Control Schemes (EFCS) rule.⁹ The PSFRR is an integrated, transparent framework for the consideration and management of frequency risks that AEMO expects would be likely to involve uncontrolled increases or decreases in frequency leading to cascading outages or major supply disruptions associated with non-credible contingencies. It requires AEMO to consider non-credible contingency events¹⁰ that could involve uncontrolled increases or decreases in frequency. The current PSFRR does not oblige AEMO to consider any other non-credible contingency risks to power system security.

The 2017 EFCS rule required AEMO to undertake a PSFRR at least every two years.¹¹ This was considered appropriate because it mirrored AEMO's current practice of reviewing the existing under frequency load shedding settings every two years.

6 On 29 May 2020, the Prime Minister announced the establishment of the National Federation Reform Council and the disbanding of the COAG. New arrangements for the former COAG Energy Council will be finalised following the National Cabinet Review of COAG Councils and Ministerial Forums. The Prime Minister has advised that, while this change is being implemented, former Councils may continue meeting as a Ministerial Forum to progress critical and/or well-developed work.

7 COAG Energy Council, rule change request, p. 1.

8 For more information, see: <https://www.aemc.gov.au/markets-reviews-advice/review-of-the-system-black-event-in-south-australi>

9 National Electricity Amendment (Emergency frequency control schemes) Rule 2017 No. 2.

10 For the definition of a non-credible contingency event, see box 1.

11 National Electricity Amendment (Emergency frequency control schemes) Rule 2017 No. 2.

BOX 1: SECURE OPERATING ENVIRONMENT

When the system is operating within the range of acceptable limits it is considered to be secure. For frequency, the optimal operation of the system is 50 cycles per second, or 50 Hertz. A secure power system is designed to withstand a single credible contingency event.

Contingency events

A contingency event is defined in clause 4.2.3(a) of the NER as an event that affects the power system in a way which would likely involve the failure or sudden and unexpected removal from operational service of one or more generating units or transmission elements. There are two categories of contingency events: credible contingency events and non-credible contingency events.

Credible contingency events

Credible contingency events are events the occurrence of which that AEMO considers to be reasonably possible in the surrounding circumstances. Examples of credible contingencies are: the unexpected disconnection or unplanned reduction in capacity of an operating generating unit, or the unexpected disconnection of one major item of transmission plant.

Non-credible contingency events

Non-credible contingency events are contingency events other than credible contingency events. These are generally considered to be events that are rare in occurrence, such as the combination of a number of credible contingency events occurring at the same time. AEMO can re-classify non-credible events as credible when the risk of rare events becomes more likely, including during extreme weather such as bushfires or storms.

Protected events

A protected event is a non-credible contingency event the Reliability Panel has declared to be a protected event. The category of protected event was introduced to give AEMO additional tools to manage certain high consequence non-credible contingency events. AEMO may use a mixture of ex-ante actions to manage a protected event declared by the Reliability Panel. These actions include the purchase of Frequency Control Ancillary Services, constraining generation dispatch, and the use of an Emergency Frequency Control Scheme in order to maintain the frequency operating standards applicable to protected events.

AEMO must have in place arrangements it considers appropriate to consult with, and take into account the views of, Transmission Network Service Providers (TNSPs) in the conduct of the PSFRR.¹² AEMO is currently required to collaborate with Distribution Network Service Providers (DNSPs) only in limited circumstances. When considering the development of a new, or modification of an existing emergency frequency control scheme, AEMO must also consult with DNSPs whose networks are likely to be affected by the scheme.¹³

¹² Clause 5.20A.2(b) of the NER.

¹³ Clause 5.20A.2(c) of the NER.

The PSFRR is not formally integrated into broader planning arrangements undertaken by AEMO and NSPs, such as AEMO's Integrated System Plan (ISP) or NSPs' annual planning reviews.

For more information on the existing arrangements for reviewing and managing frequency risks arising from non-credible contingency events, see Appendix A.

1.2 South Australian black system event review

On 12 December 2019, the AEMC published a final BSE review report.¹⁴ The report included several recommendations that were designed to enhance the resilience of the power system.

Through its consultation with stakeholders in the review, the Commission identified a number of issues in relation to the current PSFRR.¹⁵ The issues identified relate to:

- **Scope of the PSFRR:** The range of risks currently considered is limited to frequency.
- **Process for conducting the PSFRR:** The requirement to conduct the review every two years takes too long to translate findings into outcomes, for example, an application to the Reliability Panel for declaring a protected event, if needed.
- **Integration of the PSFRR into other planning processes:** The PSFRR is not sufficiently integrated into the broader planning arrangements undertaken by AEMO and NSPs. Further, current arrangements require AEMO to collaborate only with TNSPs but not DNSPs. Therefore, the PSFRR considers the impacts of distributed energy resources (DER) in a limited manner.

The Commission's final BSE review report therefore identified the opportunity to expand the scope of the PSFRR to become a GPSRR. The GPSRR was proposed with the following elements:¹⁶

- The GPSRR was recommended to consider, and identify options for the future management of, all events and conditions (including contingency events and indistinct events) the occurrence of which AEMO expects, alone or in combination, would be likely to lead to cascading outages, or major supply disruptions.
- The GPSRR should be conducted annually with AEMO required to consult with, and take into account, the views of TNSPs and DNSPs in conducting the review.
- The GPSRR should be integrated into relevant AEMO and NSPs planning processes.

Stakeholder views on the discussion paper proposal for the BSE review to expand the PSFRR into GPSRR were generally supportive, with the main concerns centred around:¹⁷

- complexity and cumbersome unmanageable processes
- costs, and

¹⁴ For more information, see: https://www.aemc.gov.au/sites/default/files/documents/aemc_-_sa_black_system_review_-_final_report.pdf

¹⁵ See section 1.3 and chapter 3 for the detailed description of issues identified in the BSE report.

¹⁶ AEMC, Mechanisms to Enhance Resilience in the Power System – Review of the South Australian Black System Event, final report, December 2019, p. 77.

¹⁷ Ibid, p. 84.

- resources involved.

Stakeholders supported inclusion of DNSPs and capturing risks associated with DER in the GPSRR. They also highlighted the importance of integrating the review into existing and future planning processes and including clear linkages.¹⁸

AEMO supported the recommendation but noted that it is important for there to be flexibility to prioritise different sources of risk in each review, promoting efficiency and value in reporting, and to balance the impacts of operational and institutional changes (such as rule changes) that may alter reporting processes.¹⁹

1.3 Rationale for the rule change request

In its rule change request, the COAG Energy Council agreed with the AEMC that there were a range of shortcomings with the existing PSFRR in light of the changing power system risk and resilience profile. In particular, the PSFRR was identified as being:²⁰

1. too narrow - the range of risks it considers are limited to only frequency risks for a range of non-credible contingency events
2. too shallow - it only requires AEMO to collaborate with TNSPs but not DNSPs. This does not provide for detailed consideration of system security risks arising from increased DER penetration
3. too slow - the existing PSFRR process occurs too infrequently and it takes too long to effectively identify emerging risks in a rapidly changing power system, and
4. not integrated - the existing PSFRR is not sufficiently integrated into the broader planning arrangements undertaken by AEMO and NSPs.

Given the changing power system risk and resilience profile, the rule change request proposes changes to the NER to broaden the existing PSFRR beyond frequency to become a more frequent and holistic GPSRR process for effectively identifying emerging risks to the power system from all sources.

1.4 Solution proposed in the rule change request

In relation to the **scope of the review**, the proposed rule would:²¹

- amend existing arrangements for the PSFRR to consider, and identify options for the future management of, all events and conditions (including contingency events) the occurrence of which AEMO expects, alone or in combination, would be likely to lead to cascading outages, or major supply disruptions
- specify six key risk areas which AEMO is required to consider when specifying the scope of the GPSRR in each jurisdiction in which it is conducted:
 - increases or decreases in frequency;

18 Ibid.

19 Ibid.

20 COAG Energy Council, rule change request, p. 3-4.

21 Ibid, p. 2.

- increases or decreases in voltage;
 - levels of inertia;
 - the availability of system strength services
 - the operation and interaction of special protection schemes; and
 - any other factors AEMO deems appropriate, including those arising on distribution network.
- upon consultation with NSPs, allow AEMO to prioritise certain risks over others, or elect not to consider some of the six key risks.

In relation to the **review process**, the proposed rule would:²²

- require the GPSRR review to be conducted no less than annually
- require AEMO to publish an approach paper before the review commences (removing the requirement for AEMO to publish a draft report during the course of the review) which, among other things, would prioritise the risks AEMO proposes to assess in each region, methods for assessing risks, and their approach to collaboration
- require AEMO to consult on the approach paper for a period of at least 10 working days
- require AEMO to publish a final report setting out its findings and recommendations, and time and cost of the option's implementation.

In relation to the **links to the other existing planning processes**, the proposed rule would:²³

- require NSPs to take into account the outcomes from the recent GPSRR in their annual planning reviews
- require NSPs in their annual planning reviews to:
 - consider whether any special protection schemes and settings of protection systems or control systems of plant connected to its network are fit for purpose for the future operation of its network
 - assess the interactions between special protection schemes and settings of protection systems or control systems of plant connected to their respective networks, with a view to identifying the potential for adverse interactions
- require AEMO to consider and have regard to the outcomes of the GPSRR in conducting the ISP.

In the COAG Energy Council's view, the recommended GPSRR would promote the efficient operation and use of electricity services in the long-term interests of consumers of electricity with respect to the safety and security of the national electricity system.²⁴

The COAG Energy Council considers that customers would benefit from an improvement in the security of supply from the early identification of emerging risks and uncertainties to the power system thereby enabling their effective and efficient management. It was noted that

²² Ibid.

²³ Ibid, p. 2-3.

²⁴ Ibid, p. 4.

while the additional costs incurred by NSPs and AEMO in conducting the review would ultimately be borne by consumers, these additional resources are likely to be efficient given the improvement in system security from early identification and prompt management of such risks.²⁵

The COAG Energy Council also notes that the proposed review is an incremental expansion that builds on existing arrangements and not a process that needs to be established from scratch. The costs involved are not entirely additional to those that would be incurred in the absence of the rule as all parties can adapt and expand existing processes.²⁶

The rule change request (which can be found on the AEMC website) included a proposed rule.²⁷

1.5 The rule making process

On 14 January 2021, the Commission published a notice advising of its intention to commence the rule making process in respect of the rule change request.²⁸ The Commission decided to fast-track this rule change request. This is because it concluded that the rule change request reflects the relevant recommendation of the BSE review and adequate consultation with the public was undertaken during that review.²⁹ Accordingly, the AEMC did not publish a consultation paper upon initiation of the rule change process and there has been no formal consultation carried out in this rule change process to date.

1.6 Consultation on draft rule determination

The Commission invites submissions on this draft rule determination, including a more preferable draft rule, by 18 March 2021.

Any person or body may request that the Commission hold a hearing in relation to the draft rule determination. Any request for a hearing must be made in writing and must be received by the Commission no later than 11 February 2021.

Submissions and requests for a hearing should quote project number ERC0303 and may be lodged online at www.aemc.gov.au.

1.7 Related Commission work

This rule change is part of a wider Commission work program on system security, which includes those rule changes seeking to action the recommendations made by the Commission in its BSE review report. Three rule change requests were submitted by the COAG Energy Council:

²⁵ Ibid, p. 5.

²⁶ Ibid.

²⁷ <https://www.aemc.gov.au/rule-changes/implementing-general-power-system-risk-review>

²⁸ This notice was published under s 95 of the National Electricity Law (NEL).

²⁹ The decision to fast-track the rule change request was made under s. 96A(1)(b) of the NEL.

- Implementing a general power system risk review rule change request (the subject of this draft determination)
- Enhancing operational resilience in relation to indistinct events
- Prioritising arrangements for system security during market suspension.

The other two rule change projects related to this draft determination are discussed at a high level in Appendix B.

2 DRAFT RULE DETERMINATION

This chapter sets out the Commission's draft determination with a summary of reasons.

This chapter includes the following:

- the Commission's draft rule determination
- key features of the more preferable draft rule
- the rule making test
- the assessment framework used
- a summary of the Commission's reasons, and
- transitional arrangements.

The Commission considerations of the key aspects of the proposed rule are described in Chapter 3 and provide additional details supporting the Commission's decision.

2.1 The Commission's draft rule determination

The Commission's draft rule determination is to make a more preferable draft rule. The draft rule made by the Commission is published with this draft rule determination. The key features of the draft rule are:

- It would implement a holistic GPSRR process, to effectively identify emerging material risks to power system security from all sources. The draft rule would require AEMO to review all events and conditions (including contingency events) the occurrence of which AEMO expects, alone or in combination, would be likely to lead to cascading outages, or major supply disruptions as part of the GPSRR.
- The GPSRR would be an annual review, integrated with existing planning frameworks that would involve AEMO, TNSPs, and DNSPs transparently assessing risks to power system security associated with five key risk areas in addition to frequency risks.³⁰ These would increase the transparency of emerging system security risks that may need to be managed, helping AEMO, NSPs and market participants better understand the nature of new risks as they emerge. AEMO must complete the first GPSRR within 18 months of the rule commencing.

The key features of the more preferable draft rule are set out in the table below.

³⁰ As part of this requirement, AEMO must consider risks associated with any or a combination of: increases or decreases in voltage, levels of inertia, the availability of system strength services, the operation and interaction of emergency frequency control schemes and emergency controls, and any other events and conditions AEMO deems necessary, including risks arising on distribution network.

Table 2.1: Summary of Commission’s more preferable draft rule

| RULE ELE- MENTS | DRAFT RULE REQUIREMENTS | COMPARISON WITH THE PROPOSED RULE |
|--------------------------------------|--|---|
| <p>Scope of the GPSRR</p> | <p>1. AEMO must through the GPSRR consider:</p> <ul style="list-style-type: none"> • non-credible contingency events the occurrence of which AEMO expects would be likely to involve uncontrolled changes in frequency leading to cascading outages, or major supply disruptions • other events and conditions (including contingency events) the occurrence of which AEMO expects, alone or in combination, would be likely to lead to cascading outages, or major supply disruptions • current and future arrangements for management of the events and conditions mentioned above. | <p>In relation to this requirement, the Commission has made a change to the proposed rule by requiring AEMO to consider only non-credible contingency events in relation to frequency risks. The change aims to maintain the current frameworks for the consideration of frequency risks (the protected events and EFCS frameworks) which give AEMO the tools to manage those risks. The Commission considers the more preferable draft rule better delineates between the existing arrangements to manage frequency and the review of all other risks.</p> |
| | <p>2. When conducting a GPSRR, AEMO must consider whether the risk of cascading outages or major supply disruptions is associated with any or a combination of:</p> <ul style="list-style-type: none"> • increases or decreases in voltage; • levels of inertia; • the availability of system strength services; • the operation or interaction of emergency frequency control schemes, emergency controls and special protection schemes. <p>AEMO may consider whether the risk of cascading outages or major supply disruptions is associated with any other factors, including events or conditions that may arise on distribution networks</p> | <p>This requirement largely reflects the rule proposed by the COAG Energy Council but removes frequency risks from the proposed list of risks to be considered under this clause. This is because frequency risks are covered by a different clause in the more preferable draft rule to maintain the current frameworks for addressing those risks.</p> |

| RULE ELEMENTS | DRAFT RULE REQUIREMENTS | COMPARISON WITH THE PROPOSED RULE |
|--|---|---|
| | <p>3. AEMO may prioritise certain risks over others or elect not to consider some risks in the GPSRR. AEMO is required to consult with relevant TNSPs and DNSPs in relation to these priorities. AEMO is required to consult on its choice of risks and provide an explanation should certain risks not be considered.</p> | <p>This requirement reflects the proposed rule but requires AEMO to consult with relevant NSPs, as opposed to all NSPs. This change was made to allow for better allocation of resources, and for administrative efficiency.</p> <p>The requirement also allows AEMO to prioritise its consideration of certain risks over others. AEMO is not required to assess all risks with the same degree of rigour.</p> |
| <p>Process for the GPSRR</p> | <p>AEMO must:</p> <ol style="list-style-type: none"> 1. undertake a GPSRR no less than annually 2. consult with, and take into account, the views of relevant TNSPs and DNSPs in the conduct of a GPSRR 3. publish an approach paper at the commencement of the review specifying: <ul style="list-style-type: none"> • priorities in the risks to be assessed • the approach and methodologies used in assessing each risk • information inputs and assumptions used, and • AEMO’s approach to interacting with TNSPs and DNSPs in conducting the review 4. invite submissions to be made for a period of at least 10 days following publication of the GPSRR approach paper. | <p>This obligation reflects the proposed rule but removes the requirement for submissions to be written. This change was made to provide AEMO and stakeholders with some flexibility in relation to the consultation process.</p> |
| <p>Coordination and integration</p> | <p>1. NSPs, in their annual planning reviews, must</p> | <p>These requirements largely reflect the proposed rule but</p> |

| RULE ELEMENTS | DRAFT RULE REQUIREMENTS | COMPARISON WITH THE PROPOSED RULE |
|---|--|---|
| | <ul style="list-style-type: none"> take into account the outcomes from the recent GPSRR conduct a review of, and interactions between, emergency frequency control schemes or emergency controls on their network, and the settings of protection systems or control systems of plant connected to their networks (including consideration of whether such settings are fit for purpose for the future operation of their network). <p>2. AEMO must consider and have regard to the outcomes of the GPSRR in conducting the ISP.</p> | <p>clarify certain terms. References to "Special protection schemes" in the proposed rule have been substituted in the more preferable draft rule with "emergency frequency control schemes" and "emergency controls". This is because these terms are used elsewhere in the NER, and special protection schemes are a subset of these schemes.</p> |
| <p>New Chapter 10 terms</p> | <p>The General Power System Risk Review is defined in Chapter 10 of the NER as follows:</p> <p>"A review described in clause 5.20A.1(c)"</p> <p>The Power System Frequency Risk Review definition in Chapter 10 is omitted.</p> | <p>The proposed rule did not include a new Chapter 10 definition.</p> |
| <p>Transitional arrangements</p> | <p>AEMO must complete the first GPSRR within 18 months of the rule commencement date.</p> | <p>The proposed rule did not include transitional rules.</p> |

2.2

2.2.1

Rule making test

Achieving the NEO

Under the NEL the Commission may only make a rule if it is satisfied that the rule will, or is likely to, contribute to the achievement of the national electricity objective (NEO).³¹ This is the decision making framework that the Commission must apply.

The NEO is:³²

³¹ Section 88 of the NEL.

³² Section 7 of the NEL.

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:

- (a) price, quality, safety, reliability and security of supply of electricity; and
- (b) the reliability, safety and security of the national electricity system.

The Commission considers that the relevant aspects of the NEO are the efficient operation and use of electricity services in the long-term interests of consumers of electricity with respect to the safety and security of the national electricity system because:

- the objective of the proposed GPSRR is to promptly identify and assess emerging risks to power system security from all possible sources, and
- the direct and indirect costs of a reduction in the security of supply due to a failure to promptly and effectively identify emerging risks can be significant and are ultimately paid for by consumers through higher prices for electricity.

2.2.2 Making a more preferable rule

Under s. 91A of the NEL, the Commission may make a rule that is different (including materially different) to a proposed rule (a more preferable rule) if it is satisfied that, having regard to the issue or issues raised in the rule change request, the more preferable rule will or is likely to better contribute to the achievement of the NEO.

In this instance, the Commission has made a more preferable rule. The Commission considers that the changes made to the rule as proposed will better contribute to the achievement of the NEO. The reasons are summarised in section 2.4 and detailed further in chapter 3.

Further information on the legal requirements for making this final rule determination is set out in Appendix C.

2.2.3 Making a differential rule

Under the Northern Territory legislation adopting the NEL, the Commission may make a differential rule if, having regard to any relevant MCE statement of policy principles, a different rule will, or is likely to, better contribute to the achievement of the NEO than a uniform rule. A differential rule is a rule that:

- varies in its term as between:
 - the national electricity system, and
 - one or more, or all, of the local electricity systems, or
- does not have effect with respect to one or more of those systems

but is not a jurisdictional derogation, participant derogation or rule that has effect with respect to an adoptive jurisdiction for the purpose of s. 91(8) of the NEL.

As the proposed rule related to parts of the NER that apply in the Northern Territory, the Commission has assessed the draft rule against additional elements required by the Northern Territory legislation.³³

The Commission has determined not to make a differential rule. However, as some parts of Chapter 5 of the NER apply in the Northern Territory, some of the amendments made by this rule change will have application in the Northern Territory. The rules relating to the general power system review will not apply in the Northern Territory and therefore the changes to Chapter 10 made by this rule will also not apply. However, some of the changes to the NSP planning arrangements will apply, as modified. The Northern Territory modification regulations modify the application of certain provisions of the NER as it applies in the Northern Territory, and therefore, further changes may be required to those regulations as a result of this rule change. The Commission will liaise with the Northern Territory in this regard.

2.3 Assessment framework

In assessing the rule change request against the NEO the Commission has considered the following principles:

- **Effective risk identification and assessment:** The power system's transition to supply provided predominately by intermittent renewable generation and the closure of existing synchronous generation is changing the power system's risk and resilience profile. New risks are emerging as this process occurs. A risk assessment framework should aim to account for the full range of possible risks to power system security and safety. It should also constitute an integrated, transparent framework that allows recommendations to be developed for addressing all risks in a systematic manner.
- **Transparency and clear accountabilities:** A risk assessment framework should promote clear accountabilities and effective coordination among all parties responsible for managing the changing power system risk and resilience profile. Any new components of the risk assessment framework should be accounted for in the planning processes carried out by AEMO and NSPs. This may assist in the implementation of the lowest cost management processes overall.
- **Flexibility and efficiency:** There should be flexibility to prioritise certain risks over others when undertaking a risk assessment. Some risks may not be relevant in the region being considered or cease to be relevant, while others as yet unidentified will assume greater importance. This flexibility would allow AEMO and NSPs to make the most efficient use of resources in responding to the most pressing risks present in a particular region of the NEM. Further, given the pace of regulatory reform, it is important to ensure that the processes adopted for the risk review, including consultation process, are flexible

³³ From 1 July 2016, the NER, as amended from time to time, apply in the NT, subject to derogations set out in regulations made under the NT legislation adopting the NEL. Under those regulations, only certain parts of the NER have been adopted in the NT. (See the AEMC website for the NER that applies in the NT.) National Electricity(Northern Territory) (National Uniform Legislation) Act 2015.

enough and do not impose unnecessary or extended procedural steps. Allowing a certain level of flexibility would promote efficiency and value in reporting.

2.4 Summary of reasons

The Commission has determined to make a more preferable draft rule on the basis that the more preferable rule is likely to better contribute to the achievement of the NEO than the proposed rule. In making its draft rule determination and more preferable draft rule, the Commission made some changes to the proposed rule submitted by the proponent.

These changes do not materially alter the intent of the Commission's recommendation from the BSE review report or to the policy position reflected in the rule change request. The more preferable draft rule is broadly consistent with the proposed rule in respect of the GPSRR scope, frequency and coordination and integration of planning arrangements.

This section summarises the Commission's reasons for making the more preferable draft rule including consideration of how it better contributes to the achievement of the NEO than the proposed rule.³⁴

Effective risk identification and assessment

The Commission has determined that the more preferable draft rule is likely to promote better identification and assessment of emerging system risks through expanding the scope of the PSFRR into a GPSRR, streamlining the process for the GPSRR and making the review more frequent. This is because:

1. Individual system services are frequently capable of addressing more than one system need. A coordinated assessment of all system security risks, through the GPSRR, could assist in a more efficient deployment of system services to address system needs.
2. Including the ability to consider events and conditions on distribution networks in the GPSRR would provide better visibility of the performance of DER and inform AEMO's understanding of the effectiveness of emergency response mechanisms.
3. A streamlined, a more frequent review process would allow AEMO to sufficiently quickly identify emerging risks in order to effectively manage them.

The Commission considers that the more preferable draft rule is likely to achieve the NEO through promoting effective system security risk identification and assessment.

These risks would be identified in a more timely manner, although the Commission acknowledges that some additional costs may be incurred through the requirement for annual reviews.

Transparency and clear accountabilities

The Commission has determined that the more explicit links between NSP annual planning reviews, the ISP and GPSRR would promote transparency of planning processes and clear accountabilities of parties involved in the system security risk management. In the Commission's view, the more preferable draft rule is likely to:

³⁴ Further detail on the Commission's reasons for making the draft rule in each of these areas are presented in Chapter 3.

- assist in the implementation of the lowest cost management processes overall
- allow AEMO to more fully consider risks arising from increasing DER
- provide for capturing the learnings from a GPSRR in broader NEM planning and reporting processes, and
- assist in the identification of regulatory changes required to manage risks that are not recognised under the existing risk management frameworks.

The Commission considers that the more preferable draft rule would contribute to the achievement of the NEO as it promotes coordination among parties responsible for system security and resilience and coordinated management of the identified risks.

Flexibility and efficiency

The more preferable draft rule would allow flexibility for AEMO to prioritise certain risks over others when undertaking the GPSRR. AEMO would not be required to identify or undertake a detailed assessment of all conceivable risks. Some risks may not be relevant in the region being considered or cease to be relevant, while others as yet unidentified will assume greater importance.

The Commission considers that such flexibility would:

- allow AEMO and NSPs to make the most efficient use of resources in responding to the most pressing risks present in a particular region of the NEM, and
- promote efficiency and value in reporting.

The Commission has determined that the more preferable rule would promote the NEO as it would allow for efficient allocation of resources. This would provide for the greatest possible value to come from the review and the investment of resources in conducting the review.

More preferable draft rule

The Commission has made a change to the COAG Energy Council's proposed rule by retaining the requirement for AEMO to consider non-credible contingency events for the risks associated with frequency variations (as is currently the case), and all events and conditions (including contingency events) for all other types of risks, that AEMO considers are likely to lead to cascading outages or major supply disruptions. The Commission considers that this change better:

- maintains the delineation between the existing protected event framework that is designed for management of frequency risks arising from non-credible contingency events, and the assessment of risks associated with all other events and conditions (including contingency events), and
- recognises the existing arrangements that allow AEMO to manage frequency risks associated with credible contingency events through the frequency control ancillary services (FCAS) markets.

The Commission has determined that the more preferable draft rule promotes the NEO as it aligns with other parts of the regulatory framework without making any unintended changes to them.

2.5 Transitional arrangements

The proposed rule submitted by the COAG Energy Council does not include any proposed transitional arrangements for the first GPSRR.

The more preferable draft rule made by the Commission replaces the existing requirement to undertake the PSFRR with the requirement to do the GPSRR. The more preferable draft rule also sets out transitional arrangements for the first GPSRR requiring AEMO to complete the first GPSRR within 18 months of the date the rule is made. With the recent publication of a PSFRR final report,³⁵ this means that AEMO would not be required to undertake another PSFRR.

Given that the rule change significantly broadens the scope of the existing review, the Commission considers it appropriate to allow AEMO an 18 month period to develop methodologies and assumptions, consult with stakeholders and assess identified risks and options to manage them.

³⁵ AEMO, *Power System Frequency Risk Review, Stage 2 Final Report*, December 2020.

3 COMMISSION CONSIDERATIONS

This chapter sets out the Commission's considerations and analysis in forming its draft determination. The Commission's considerations are divided into the following sections:

- scope of and requirements for the GPSRR
- the GPSRR process, and
- links to the existing planning processes.

3.1 Scope of and requirements for the GPSRR

BOX 2: DRAFT DETERMINATION ON THE INTRODUCTION OF THE GPSRR AND ITS SCOPE

The Commission's draft determination is to implement the General Power System Risk Review and require AEMO to consider and identify options for the future management of:

- non-credible contingency events the occurrence of which AEMO expects would be likely to involve uncontrolled increases or decreases in frequency, alone or combination, leading to cascading outages, or major supply disruptions;
- other events and conditions (including contingency events) the occurrence of which AEMO expects, alone or in combination, would be likely to lead to cascading outages, or major supply disruptions.

In addition to frequency-related risks, the GPSRR would specify five key risk areas which AEMO is required to consider when specifying the scope of the GPSRR in each jurisdiction in which it is conducted. These five additional key risk areas are:

- increases or decreases in voltage
- levels of inertia
- the availability of system strength services
- the operation or interaction of emergency frequency control schemes and emergency controls, and
- any other risks AEMO deems necessary, including risks arising on distribution network.

In conducting the GPSRR, AEMO may prioritise certain risks over others, or elect not to consider some of the risks. AEMO would be required to consult on its choice of risks and provide an explanation should certain risks not be considered. This consultation should occur following publication of an approach paper.

3.1.1 Issue raised

AEMO is currently required to publish a PSFRR focused on frequency risks only. In collaboration with TNSPs, AEMO must consider non-credible contingency events that involve

uncontrolled increases or decreases in frequency, leading to cascading outages or major supply disruptions.³⁶ The current PSFRR does not consider any other non-credible contingency risks to power system security.

The COAG Energy Council considers that the set of system security risks is changing and are significantly different to those managed in the past. According to the Council, the changing generation mix is changing the power system risk and resilience profile which includes increasing levels of:³⁷

- generation and load risk and uncertainty - The changing generation mix is changing both the events and types of uncertainty regarding generation output. Unlike the failure of thermal generators, unexpected variation from variable generation is often not related to internal failure of the unit, but rather involves weather conditions, such as changes in sunlight intensity or wind speeds. These changes are generally distributed and can affect a significant number of units and systems in a surrounding area. This means that system security risks may arise from an external event, such as a storm front passing across a region, and require the aggregate impact across all the generating units in the affected area to be considered, rather than the loss of a specific unit.
- system response risk and uncertainty - In addition to new types of generation and load uncertainty, the response of the power system itself to disturbances is also becoming more uncertain. This increase in uncertainty is due to factors including reduction in the level of inertia and fault level as synchronous units have retired, as well as a more complex demand side, due to an increased prevalence of DER. Other factors, such as increasing prevalence of network protection schemes, also increase the complexity and therefore the uncertainty, of power system response to a disturbance.

Given these changes, the COAG Energy Council is of the view that a risk assessment framework should account for the full range of risks to power system security. To achieve this, the COAG Energy Council proposes to require AEMO to consider six key risk areas and identify options for the future management of all events and conditions (including contingency events) which would likely lead to cascading outages, or major supply disruptions.³⁸ These key six areas are:³⁹

1. power system frequency risks (as currently considered in the PSFRR)
2. power system voltage risks
3. risks arising from system strength
4. risks arising from levels of synchronous inertia
5. risks arising from the effect of DER penetration and the potential for DER to increase the probability of cascading outages or major supply disruptions, and
6. risks arising from interactions between settings on Emergency Frequency Control schemes and connected plant control and protection schemes.

³⁶ Clause 5.20A.1(a)(1) of the NER.

³⁷ COAG Energy Council, rule change request, p. 3.

³⁸ Ibid, p.1.

³⁹ Ibid, p. 1-2.

The COAG Energy Council proposes to provide AEMO with flexibility to prioritise certain risks over others or elect not to consider some of the six key risks. In establishing priorities, AEMO would be required to consult with both TNSPs and DNSPs.⁴⁰

3.1.2

Stakeholder views

Generally, through the AEMC's BSE review, stakeholders supported expanding the scope of the risk review process beyond frequency to include voltage, inertia, fault level and other factors that create risks to power system security and resilience.⁴¹

In particular, the Australian Energy Council supported the expansion, considering the PSFRR already a "beneficial process";⁴² Stanwell Corporation considered the PSFRR should be broadened and "embedded within AEMO's operational processes";⁴³ and Ergon Energy and Energex suggested "the risk review should include all relevant elements".⁴⁴

While supporting the proposal, AEMO considered it important for there to be flexibility to prioritise different sources of risk between reviews, promoting efficiency and value in reporting, and to balance the impacts of operational and institutional changes (such as rule changes) that may alter reporting processes.⁴⁵

Stakeholders strongly supported including DNSPs and risks associated with DER in the GPSRR.⁴⁶ SA Power Networks noted concerns over the management of reverse energy flows from high DER penetration and the implications for under frequency load shedding schemes.⁴⁷ Ergon Energy and Energex particularly noted the importance of risks to be considered by DNSPs, including "generation at risk, load shedding required to facilitate frequency or other contingency management activities, and voltage constraints in a particular area."⁴⁸

3.1.3

Commission's analysis and determination

The Commission considers that the introduction of a GPSRR will allow for the effective recognition of emerging risks, and faster development of solutions to address these risks.

In coming to this conclusion, the Commission has taken stakeholder views into account including their general support for the concept of a GPSRR. In particular, stakeholders supported the proposals to:

- expand the range of system security risks considered by the review, and
- include DNSP and DER related issues within the review.

⁴⁰ Ibid, p. 2.

⁴¹ Submissions to the AEMC's Mechanisms to enhance resilience in the power system (Review of the black system event in South Australia) discussion paper: AEMO, p. 15; PIAC, p. 6; AEC, p. 3; Ergon and Energex, p. 7.

⁴² AEC, submission to the AEMC's BSE review discussion paper, p. 3.

⁴³ Stanwell, submission to the AEMC's BSE review discussion paper, p. 2.

⁴⁴ Ergon and Energex, submission to the AEMC's BSE review discussion paper, p. 7.

⁴⁵ AEMO, submission to the AEMC's BSE review discussion paper, p. 15.

⁴⁶ Submissions to the AEMC's BSE review discussion paper: TasNetworks, p. 6; SAPN, p. 2; Ergon and Energex, p. 7; PIAC, p. 6.

⁴⁷ SAPN, submission to the AEMC's BSE review discussion paper, p. 2.

⁴⁸ Ergon and Energex, submission to the AEMC's BSE review discussion paper, p. 7.

The stakeholder concerns expressed in submissions to the BSE discussion paper were also addressed in the final BSE report and the rule change request submitted by the COAG Energy Council by expanding the range of system security risks to be considered but with flexibility for AEMO to prioritise and consider new risks.

Better coordination of system risks and services

The Commission considers any framework that seeks to describe system security arrangements should aim to account for as many risks to power system security as possible. The PSFRR specifically considers non-credible contingency events associated with frequency risks. However, this may not capture all possible risks in the NEM.

The NER outlines, and AEMO operationalises, system security services and mechanisms that respond to meet the system needs of the NEM to survive and recover from different types of disturbances. These may be grouped into three broad categories of frequency management, voltage management and system restoration. AEMO is also required to consider the minimum inertia⁴⁹ and minimum fault level⁵⁰ requirements of the power system and declare shortfalls where these are identified.

While the system needs outlined above are detailed separately, individual system services are frequently capable of addressing more than one system need. There are overlaps and interplays between the benefits system services may provide for system security, while a deficiency in one system service may lead to issues in several system need categories. A coordinated assessment of all system security risks, through the GPSRR, could therefore assist in a more efficient deployment of system services to address system needs.

The Commission considers that the risk assessment framework would benefit from the Rules being amended to expand the scope of the current PSFRR to require AEMO to undertake the GPSRR that considers a broader range of risks, in addition to frequency risks. Therefore, the Commission has determined to implement the GPSRR into the regulatory framework.

Further, the Commission agrees with the COAG Energy Council that there would be a benefit from evaluating risks arising from contingency events in addition to non-credible contingency events.⁵¹ The Commission is of the view that emerging risks that are not identified cannot be effectively managed. The GPSRR should focus on creating a comprehensive stock-take of all security related risks existing in the NEM. This would provide AEMO with some flexibility to explore all kinds of risks in the NEM and flag to stakeholders what the options would be to address them.

The Commission recognises that currently the risk management framework may not cover all risks that potentially could be identified by AEMO through the GPSRR. For example, in the BSE review, the AEMC found that the existing system security framework may be ill-suited to

⁴⁹ Clause 5.20B.2 of the NER.

⁵⁰ Clause 5.20C.1 of the NER.

⁵¹ With the exception of frequency risks, where there are already robust mechanisms in place to identify and manage risks associated with credible contingency events. This is discussed in detail on p. 29.

manage indistinct events.⁵² To address this identified issue, the Commission is currently progressing the *Enhancing operational resilience in relation to indistinct events* rule change.⁵³ Among other things, the rule change considers providing AEMO with more tools to prepare for and manage indistinct events.

Further, the Commission considers that the GPSRR could be a suitable tool for AEMO to identify and flag to stakeholders what kind of risks (if there are any) could not be addressed through the existing risk management frameworks and what regulatory changes are required to manage those risks.

Consideration of risks associated with DER

AEMO has identified that high DER penetration, in particular small rooftop PV, may have increasing implications for the secure operation of the system.⁵⁴ The Commission considers that the existing PSFRR may not fully consider the impact of DER on system security outcomes.

Existing arrangements for the PSFRR require AEMO to put in place arrangements to consult with and take into account the views of TNSPs in conducting the PSFRR.⁵⁵ While consultation with DNSPs is not precluded by existing rule arrangements, the omission of a requirement to explicitly consult with DNSPs may mean that risks associated with increasing levels of DER penetration are not fully considered.

The draft rule requires AEMO to collaborate with both TNSPs and DNSPs in developing the GPSRR. This includes a requirement for consideration of risks related to increased DER, both in terms of how DER might exacerbate events that have occurred on the transmission system, and whether increased DER could itself potentially trigger events on the transmission system. This would provide better visibility of the performance of DER during contingency events.

Further, given that as part of the PSFRR AEMO is already required to consider the effective functioning of under-frequency load shedding schemes and over frequency generator shedding schemes, including consideration of DER in the GPSRR would better inform AEMO's understanding of emergency response mechanisms' effectiveness. The Commission is interested in the views of DNSPs regarding the draft rule and how it seeks to incorporate their input into the GPSRR process in a collaborative manner.

Differences between the proposed rule and more preferable draft rule

The Commission has made a change to the proposed rule to clarify the scope of the GPSRR and ensure that the draft rule is consistent with the existing frameworks.

The draft rule requires AEMO to review:

52 For more information see: https://www.aemc.gov.au/sites/default/files/documents/aemc_-_sa_black_system_review_-_final_report.pdf

53 For more information, see: <https://www.aemc.gov.au/sites/default/files/2020-12/Information%20sheet%20-%20Enhancing%20operational%20resilience%20in%20relation%20to%20indistinct%20events%20-%20ERC0304%20-%20Consultation%20Paper.pdf>

54 AEMO's Technical Integration of Distributed Energy Resources 2019, p. 4.

55 Clause 5.20A.2(b) of the NER.

- non-credible contingency events for the risks associated with frequency increases or decreases (as currently is the case), and
- events and conditions (including contingency events) for all other risks.⁵⁶

The more preferable draft rule better promotes the NEO because:

1. The existing PSFRR is an important component of the protected event framework that is designed for management of frequency risks arising from non-credible contingency events. Through the PSFRR, AEMO identifies non-credible contingency events which it considers it may be economically efficient to manage using certain ex-ante measures.⁵⁷ AEMO then submits a request to the Reliability Panel to have the event declared to be a “protected event”.⁵⁸

The Commission considers it is important to ensure that no changes are made to the protected event framework through this rule change process. The clarity should be maintained in the Rules that the GPSRR would become an important component of the protected event framework, substituting for the PSFRR.

The Commission considers there should be a clear delineation in the Rules between two roles of the GPSRR: as a component of the protected event framework and as a comprehensive stock-take review of all security related risks existing in the NEM.

2. Under the current rules, AEMO is required to maintain the power system frequency within the operational frequency tolerance band when reasonably possible disturbances occur and must return the frequency to the normal operating frequency band within a specified time period. These reasonable disturbances are credible contingency events which AEMO manages through the procurement of contingency raise and lower FCAS. These services increase or decrease the frequency in response to these frequency variations.

Given this existing mechanism, the Commission does not see a rationale in requiring AEMO to review risks associated with credible contingency events for frequency variations and identifying options to address those risks.

56 Other risks include increases or decreases in voltage, levels of inertia, the availability of system strength services, and the operation and interaction of emergency frequency control schemes and emergency controls.

57 The measures may include a new or modified Emergency Frequency Control Scheme.

58 For more information, see section 1.2.

3.2 The GPSRR process

BOX 3: DRAFT DETERMINATION ON THE PROCESS FOR THE GPSRR

The Commission draft determination is for the GPSRR to be conducted annually with AEMO required to consult with, and take into account, the views of relevant TNSPs and DNSPs in conducting the review.

A single final report would be published at the conclusion of the GPSRR and an approach paper published at the commencement of the review. AEMO is to publicly consult for a period of at least 10 days following publication of the GPSRR approach paper.

3.2.1 Issue raised

AEMO is currently required to publish the PSFRR at least every two years. The NER also specify that a PSFRR is conducted according to a two stage draft and final report process.⁵⁹ Over this two stage process, AEMO must hold full consultations with TNSPs to assess system risks. Following the publication of a draft report, AEMO must invite written submissions from stakeholders on its report, only after which it can submit recommendations to the Reliability Panel for new or modified Emergency Frequency Control Schemes, or the declaration of a protected event.

In its rule change request, the COAG Energy Council considers that the existing PSFRR process occurs too infrequently and it takes too long to effectively identify emerging risks in a rapidly changing power system. Therefore, the COAG Energy Council proposes:

- that AEMO should conduct the GPSRR on an annual basis, and
- for the process to be streamlined via introduction of a single stage expedited process to support faster identification of risks, and development of solutions to identify those risks.

3.2.2 Stakeholder views

Through the AEMC's BSE review, there were a range of views regarding the frequency of the proposed review. Stanwell considered annual publication to be insufficient, instead favouring publication "at least quarterly to account for seasonal weather forecasts".⁶⁰ AEMO, Ergon Energy and Energex, and TasNetworks were concerned about the burden of time and effort required in identifying a broad scope of risks, and the feasibility of doing this in a 12-month time frame.⁶¹ Ergon Energy and Energex considered an annual publication would require "new processes for extensive forecasts and analysis in addition to existing DNSP functions."⁶² AEMO suggested that the division of responsibilities between TNSPs, DNSPs and AEMO be clearly set out to facilitate an annual review cycle.⁶³

59 Clause 5.20A.3 of the NER.

60 Stanwell, submission to the AEMC's BSE review discussion paper, p. 2.

61 Submissions to the AEMC's BSE review discussion paper: TasNetworks, p. 6; AEMO, p. 15; Ergon Energy and Energex, p. 7.

62 Ergon Energy and Energex, submission to the AEMC's BSE review discussion paper, p. 7.

63 AEMO, submission to the AEMC's BSE review discussion paper, p. 15.

PIAC was concerned that the number of DNSPs may make the process complex and potentially unmanageable. PIAC recommended exploring alternative mechanisms that would not make the process cumbersome or unmanageable, while still gathering “insight and data on DER from DNSPs without requiring all DNSPs in the NEM to be involved”.⁶⁴

3.2.3

Commission’s analysis and determination

Through the PSFRR, AEMO can recommend the declaration of a protected event, if AEMO considers it economic to operate the power system in a way that limits the consequences of certain high impact non-credible contingency events. The Commission considers that the current process for identification, declaration and management of a protected event is transparent and systematic, but also prone to potentially unnecessary delays that may detract from AEMO’s ability to respond flexibly to power system security risks in a way that may be more optimal.

The Commission has identified potentially unnecessary delays existing in the current process. In particular, the Commission considers that processes could be sped up for AEMO to undertake the PSFRR process to identify a system need.

Frequency of the review

The requirement to conduct the PSFRR at least every two years was imposed as part of the 2017 EFCS rule change and, at that time, was considered appropriate because it mirrored AEMO’s practice of reviewing the existing under frequency load shedding schemes settings every two years.

Over a two-stage draft-final process, AEMO must hold full consultations with TNSPs to assess system risks and, in the event of recommending new or modifications to existing emergency frequency control schemes, full consultations with affected DNSPs also. Following the publication of a draft report, AEMO must invite written submissions from stakeholders on its report, only after which it can submit recommendations to the Reliability Panel for new or modified emergency frequency control schemes, or the declaration of a protected event.

This ex-ante process provides a transparent and systematic framework to identify anticipated power system security risks well in advance of their occurrence. However, the process also makes delivery of the solutions to address these identified risks contingent on completion of a lengthy review process. The Commission considers changes included in a GPSRR could help alleviate these concerns.

After completion of its review process, AEMO can submit a request to the Reliability Panel for an event to be declared a protected event, if it considers it economically efficient to manage one or more non-credible contingency events using existing ex-ante measures.⁶⁵

Although comprehensive, stakeholders have argued that the existing process is overly lengthy. Given the pace of change in the power system, and the speed at which new risks

64 PIAC, submission to the AEMC’s BSE review discussion paper, p. 6.

65 AEMC 2017, Emergency frequency control schemes, Rule Determination, 30 March 2017, p. ii

can emerge, this may result in inefficient outcomes and create risks to the secure operation of the power system.

The Commission has therefore determined that an annual review cycle is required to identify emerging risks sufficiently quickly to allow for their effective management. While the Commission notes stakeholder concerns regarding the resource requirements involved in an annual GPSRR, the speed and scope of current, and expected, changes in the power system makes a biennial review not frequent enough. Further, as discussed above, AEMO will also have scope to prioritise and focus its resources on the consideration of those specific risks it considers material in the jurisdiction being considered.

Process for the review

To address stakeholder concerns regarding resource implications, the Commission has also introduced other measures in the draft rule to streamline the review process. The existing NER arrangements for the PSFRR require a two-stage process. This involves publication and consultation on a draft report prior to publication of a final report. To streamline the review, the Commission recommends removing the requirement to publish and consult on a draft report. Removing the draft report requirement should streamline and reduce the administrative complexity of the review process. The proposed streamlined review process would instead require publication of:

- an approach paper at the commencement of the review process, and
- a single final report at the review's conclusion.

An approach paper would enhance transparency for all stakeholders and improve the process of interacting with TNSPs and DNSPs in conducting the review. The approach paper would assist the efficiency of the review process by promoting a common understanding of the process amongst stakeholders. The approach paper would require AEMO to set out:

- the system security risks it proposes to prioritise in each region of the NEM
- the proposed methods for assessing the prioritised risks, and
- its approach to collaborating with TNSPs and DNSPs during the review process.

Following publication of the approach paper, stakeholders would have a minimum 10-day period to comment on AEMO's priorities and methods. A 10-day consultation period is consistent with current arrangements for consultation on the draft PSFRR report. AEMO may extend the consultation period if it chooses.

Differences between the proposed rule and more preferable draft rule

The Commission is of the view that the consultation process should:

- allow stakeholders an adequate opportunity to have their views heard and considered, and
- not require market bodies or participants to waste time and resources on unnecessary or extended procedural steps.

The Commission has determined to make a number of changes to the proposed rule in relation to the consultation process AEMO must adhere to. The changes are to:

- require AEMO to consult with relevant NSPs in relation to a risk identified, not all NSPs – this change was made with a view to ensuring that the consultation process would not become cumbersome or unmanageable given the number of NSPs in the NEM
- remove the requirement to comment on AEMO’s priorities and methods only in a written form – the Commission considers that there should be flexibility for stakeholders to share their comments with AEMO via different methods, including meetings and others

3.3 Links to the existing planning process

BOX 4: DRAFT DETERMINATION ON THE LINKS TO THE EXISTING PLANNING PROCESSES

The Commission draft determination is for the draft rule to require:

- NSPs to take into account the outcomes from the recent GPSRR in their Annual Planning Reviews
- NSPs to consider, in their annual planning reviews, whether any emergency frequency control schemes or emergency controls and settings of protection systems or control systems of plant connected to its network are fit for purpose for the future operation of their network; and whether there is a risk of any adverse interactions of those schemes, controls and settings
- AEMO to consider and have regard to the outcomes of the GPSRR in conducting the ISP.

3.3.1 Issue raised

In its rule change request, the COAG Energy Council considers that the existing PSFRR is not sufficiently integrated into the broader planning arrangements undertaken by AEMO and NSPs.⁶⁶ Therefore, the Council proposes to:⁶⁷

- require NSPs to take into account the outcomes from the recent GPSRR in their annual planning reviews
- require AEMO to consider and have regard to the outcomes of the GPSRR in conducting the ISP
- require NSPs to consider, in their annual planning reviews, whether any special protection schemes and settings of protection systems or control systems of plant connected to its network are fit for purpose for the future operation of its network; and whether there is a risk of any adverse interactions of those settings.

⁶⁶ COAG Energy Council, rule change request, p. 4.

⁶⁷ Ibid, p. 2.

The COAG Energy Council is of the view that these requirements would assist the co-ordination of all parties responsible for managing the changing power system risk and resilience profile through its inclusion of AEMO, TNSPs, and DNSPs.⁶⁸

3.3.2

Stakeholder views

Through the BSE review, stakeholders noted the importance of integrating the review into existing planning processes. AEMO considered that clear linkages should be drawn in the rules between the GPSRR and planning processes, including the ISP where appropriate. AEMO considered such linkages would enable AEMO to assess the impact of the occurrence of the risk under different development paths and facilitate stakeholder consultations to discern optimal options.⁶⁹ Ergon Energy and Energex also suggested drawing an explicit link between the GPSRR and ISP.⁷⁰

In addition to the ISP and NSP planning processes, the AER also flagged a need for the GPSRR to consider the potential risks arising from protection scheme interactions. The AER specifically identified the importance of considering risks arising from the settings of the protection and control systems owned by NSPs including special protection schemes, along with any potential interactions with neighbouring NSPs. The AER suggest this could be undertaken annually through the NSP annual planning reports (APRs).⁷¹

3.3.3

Commission's analysis and determination

Links to other planning processes

Stakeholders supported the discussion paper's proposal to effectively integrate the GPSRR with AEMO and NSP planning processes. The Commission agrees with the COAG Energy Council and stakeholders that explicit links between NSP annual planning reviews, the ISP and GPSRR, would support the integration of system security risks into planning more generally. Therefore, the Commission determines to require:

- NSPs, in their annual planning reviews, to consider findings from the most recent GPSRR, and
- AEMO to consider findings from the most recent GPSRR in its ISP.

Including risks from protection scheme interactions

The Commission agrees with the COAG Energy Council and AER that unexpected outcomes from, and adverse interactions between, emergency frequency control schemes and emergency controls, plant control and protection settings represent a material risk that

⁶⁸ Ibid, p. 4.

⁶⁹ AEMO, submission to the AEMC's BSE review discussion paper, p. 16.

⁷⁰ Ergon Energy and Energex, submission to the AEMC's BSE review discussion paper, p. 7.

⁷¹ AER, submission to the AEMC's BSE review discussion paper, p. 2.

should be systematically assessed as part of a GPSRR. The events of 25 August 2018 are an example of the risks inherent in the use of special protection schemes.⁷²

The Commission therefore has determined to impose a requirement on:

- AEMO to holistically consider the risks associated with adverse operation or interaction of emergency frequency control schemes and emergency controls, including as identified by NSPs in their APRs
- both TNSPs⁷³ and DNSPs⁷⁴ to conduct a review of, and interactions between: emergency frequency control schemes and emergency controls on their network; and the settings of protection systems or control systems of plant connected to their network (including consideration of whether such settings are fit for purpose for the future operation of their network), and
- both TNSPs and DNSPs⁷⁵ to conduct joint planning in assessing the interactions between emergency frequency control schemes or emergency controls, and the settings of protection systems or control systems of plant connected to their respective networks.

Differences between the proposed rule and more preferable draft rule

The Commission has determined to clarify the wording in the proposed rule by substituting “special protection schemes” in the proposed rule drafting by “emergency frequency control schemes” and “emergency controls” in the more preferable draft rule. The Commission has done this change with the view to maintain the NER consistency and clarity as “emergency frequency control schemes” and “emergency controls” are the terms used elsewhere in the NER.

72 On Saturday 25 August 2018, a single lightning strike caused the simultaneous “double back” flashover across two insulators of the QLD – NSW interconnector (QNI). After two seconds QNI tripped, separating the Queensland region from the rest of the NEM. This led to the loss of the interconnector between South Australia and Victoria (Heywood) and the separation of the South Australia region from the rest of the NEM. This in turn resulted in under-frequency load shedding in the New South Wales, Victoria, and Tasmania regions. The event demonstrated the present challenges of controlling frequency in the NEM and keeping the power system in a secure state, particularly following non-credible contingency events.

73 As part of their transmission annual planning review obligations under clause 5.12.1 of the NER.

74 As part of their distribution annual planning review obligations under clause 5.13.1 of the NER.

75 As part of their joint planning obligations under clause 5.14.1(d).

ABBREVIATIONS

| | |
|------------|---|
| AEMC | Australian Energy Market Commission |
| AEMO | Australian Energy Market Operator |
| AER | Australian Energy Regulator |
| Commission | See AEMC |
| DER | Distributed Energy Resources |
| DNISP | Distribution Network Service Provider |
| EFCS | Emergency Frequency Control Schemes |
| FCAS | Frequency Control Ancillary Services |
| ISP | Integrated System Plan |
| NEL | National Electricity Law |
| NEO | National electricity objective |
| NER | National Electricity Rules |
| NFRC | National Federation Reform Council |
| NSP | Network Service Provider |
| PSFRR | Power System Frequency Risk Review |
| RIT-D | Regulatory Investment Test for Distribution |
| RIT-T | Regulatory Investment Test for Transmission |
| TNSP | Transmission Network Service Provider |
| Rules | See NER |

A EXISTING ARRANGEMENTS FOR REVIEWING AND MANAGING FREQUENCY RISKS ARISING FROM NON-CREDIBLE CONTINGENCY EVENTS

The PSFRR is an integrated, transparent framework for the consideration and management of frequency risks that AEMO expects would be likely to involve uncontrolled increases or decreases in frequency leading to cascading outages or major supply disruptions associated with non-credible contingencies. The purpose of the existing PSFRR is to determine whether:

- in order to limit the consequences of some non-credible contingency events, there is a need to introduce, modify or adapt automatic schemes to shed load or generation, or
- it would be economic for AEMO to operate the power system in a way that limits the consequences of certain high consequence non-credible contingency events, should they occur. This process can lead to the declaration of a protected event by the Reliability Panel.⁷⁶

The PSFRR outlines a different process for AEMO to follow for each of the purposes mentioned above. For the former, once a need to introduce, modify or adapt such an Emergency Frequency Control Scheme is identified:

- the assessment, design, implementation and monitoring of the scheme will largely proceed through the existing framework for NSP planning and investment decision-making in the NER, and
- the Regulatory Investment Test for Transmission (RIT-T) or Distribution (RIT-D) will be used to assess the economic case for the change.

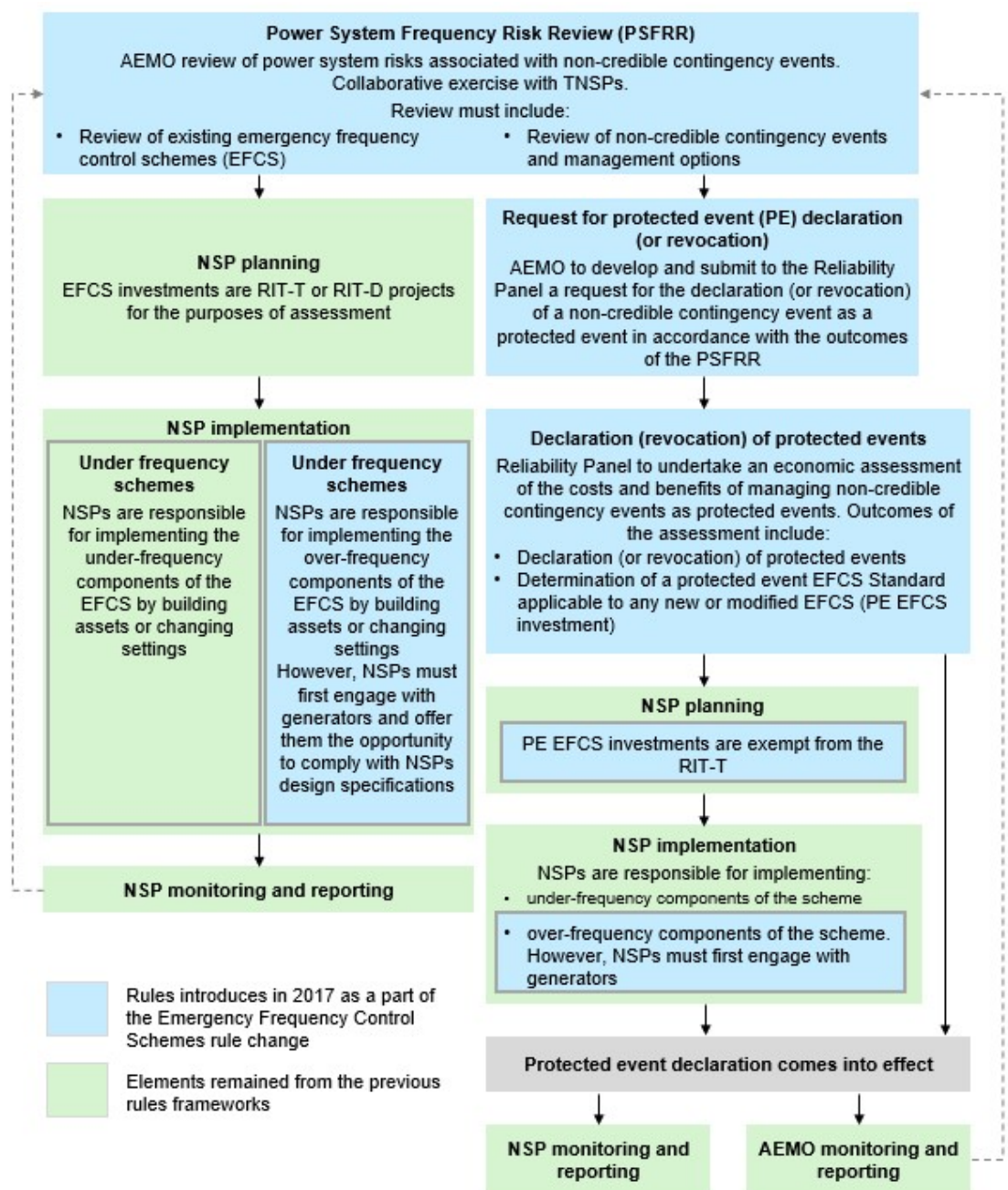
For the latter purpose, if AEMO identifies through the PSFRR one or more non-credible contingency events which it considers it may be economically efficient to manage:

- AEMO can submit a request to the Reliability Panel to have the event declared to be a protected event
- ex-ante measures may be used to manage an event either alone or in combination with a new or modified Emergency Frequency Control Scheme
- the Reliability Panel undertakes an economic assessment of the request by weighing the costs of the options for managing the event against the benefits of avoiding the consequences of the non-credible contingency event should it occur. Where the benefits of managing the event outweigh the costs of doing so, the Reliability Panel would declare the event a protected event, and
- where the efficient management option includes a new or modified Emergency Frequency Control Scheme, the Reliability Panel would set a “protected event Emergency Frequency Control Scheme standard”, which is a set of target capabilities for the scheme.

⁷⁶ AEMC, Emergency frequency control schemes, rule determination, 30 March 2017 p. ii. For the definition of a protected event, see box 1.

Importantly, NSPs would be exempt from having to undertake a RIT-T or RIT-D for investments made as a part of a declared protected event. This is because the Reliability Panel would have already undertaken a cost benefit analysis of the operation recommended by AEMO in the PSFRR. This process is detailed graphically in Figure A.1.

Figure A.1: Process flow of the PSFRR



Source: AEMC

B RELATED COMMISSION WORK

This rule change is part of a wider Commission work program on system security, which includes those rule changes seeking to action the recommendations made by the Commission in its BSE review report. Three rule change requests were submitted by the COAG Energy Council⁷⁷:

- Implementing a general power system risk review rule change request (subject of this draft determination)
- Enhancing operational resilience in relation to indistinct events
- Prioritising arrangements for system security during market suspension.

The latter two are discussed below.

B.1 Enhancing operational resilience in relation to indistinct events

On 26 May 2020, the AEMC received a rule change request from the COAG Energy Council to amend the NER to introduce a framework to manage indistinct events.⁷⁸

Indistinct events are events that can impact multiple generators or transmission lines in an unpredictable and uncertain manner. Indistinct events may include major storms, widespread fires and cyber attacks, which may trigger unpredictable responses in an increasingly complex power system.

In the BSE review report, the AEMC found that the existing system security framework may be ill-suited to managing indistinct events and recommended introducing a framework for protected operation, as a new operational tool for AEMO to enhance the resilience of the power system to indistinct events.⁷⁹

The proposed rule would:

- introduce the new definition of an 'indistinct event'
- clarify that standing risks from indistinct events can be managed as a type of protected event
- enhance the protected event approval process to manage standing indistinct events
- implement a new operational tool, protected operation, allowing AEMO to more effectively manage condition-dependent indistinct events
- set out two types of protected operation:
 - pre-defined protected operation, and
 - ad-hoc protected operation

⁷⁷ On 29 May 2020, it was announced that the Council of Australian Government (COAG) will cease and a new National Federation Reform Council (NFRC) will be formed, with National Cabinet at the centre of the NFRC.

⁷⁸ For more information, see the project page: <https://www.aemc.gov.au/rule-changes/enhancing-operational-resilience-relation-indistinct-events#:~:text=Rule%20Change%3A%20Open&text=Indistinct%20events%20are%20events%20that,an%20increasin gly%20complex%20power%20system.>

⁷⁹ Mechanisms to Enhance Resilience in the Power System – Review of the South Australian Black System Event, final report, December 2019, p. i.

- specify governance arrangements for protected operation.

On 17 December 2020, the Commission published a consultation paper for this rule change request, with the submissions due on 11 February 2021.

The draft and final rule determinations are due on 22 April 2021 and 15 July 2021, respectively.

B.2 Prioritising arrangements for system security during market suspension

On the 26 May 2020, the AEMC received a rule change request from COAG Energy Council that seeks to clarify the applicability of the NER during periods of market suspension.⁸⁰

Existing arrangements provide for AEMO to suspend the operation of the spot market in a region. However, the rules do not explicitly set out the applicability of other provisions of the NER during a period of market suspension, and the extent to which AEMO must comply with these elements.

Additionally, current rule arrangements do not explicitly provide AEMO with flexibility to prioritise core system security requirements during a period of market suspension. This rule change request seeks to provide AEMO with such flexibility.

This rule change request proposes to amend the NER by:⁸¹

- clarifying the applicability of market rules during a period of market suspension thereby reducing uncertainty for AEMO and market participants
- providing AEMO with flexibility to prioritise system security obligations if compliance with a rule provision (particularly an obligation of a more administrative nature) would place a material risk on their ability to maintain power system security during a period of spot market suspension, and
- specifying transparency arrangements applying to any prioritisation of system security over other NER obligations by AEMO during a period of market suspension.

On 17 December 2020, the AEMC released a consultation paper to seek feedback on the issues and solution identified by the COAG Energy Council in its rule change request, with submissions due on 4 February 2021.

The draft and final rule determinations are due on 15 April 2021 and 8 July 2021, respectively.

⁸⁰ For more information, see the project page: <https://www.aemc.gov.au/rule-changes/prioritising-arrangements-system-security-during-market-suspension>

⁸¹ COAG Energy Council, Rule Change Request – Market Suspension, May 2020.

C LEGAL REQUIREMENTS UNDER THE NEL

This appendix sets out the relevant legal requirements under the NEL for the AEMC to make this draft rule determination.

C.1 Draft rule determination

In accordance with s. 99 of the NEL the Commission has made this draft rule determination in relation to the rule proposed by the COAG Energy Council.

The Commission's reasons for making this draft rule determination are set out in section 2.4.

A copy of the more preferable draft rule is attached to and published with this draft rule determination. Its key features are described in section 2.1.

C.2 Power to make the rule

The Commission is satisfied that the more preferable draft rule falls within the subject matter about which the Commission may make rules. The more preferable draft rule falls within s. 34 of the NEL as it relates to the operation of the national electricity market, the operation of the national electricity system for the purposes of safety, security and reliability of that system, the activities of persons participating in the national electricity market or involved in the operation of the national electricity system.

C.3 Commission's considerations

In assessing the rule change request the Commission considered:

- it's powers under the NEL to make the rule
- the rule change request
- submissions received in response to the August 2019 discussion paper for the Mechanisms to enhance resilience in the power system – review of South Australia black system event⁸²
- the Commission's analysis as to the ways in which the draft rule will or is likely to, contribute to the NEO.

There is no relevant Ministerial Council on Energy (MCE) statement of policy principles for this rule change request.⁸³

The Commission may only make a rule that has effect with respect to an adoptive jurisdiction if satisfied that the proposed rule is compatible with the proper performance of Australian

82 For more information, see: <https://www.aemc.gov.au/markets-reviews-advice/review-of-the-system-black-event-in-south-australi>

83 Under s. 33 of the NEL the AEMC must have regard to any relevant MCE statement of policy principles in making a rule. The MCE is referenced in the AEMC's governing legislation and is a legally enduring body comprising the Federal, State and Territory Ministers responsible for energy. On 1 July 2011, the MCE was amalgamated with the Ministerial Council on Mineral and Petroleum Resources. The amalgamated council is now called the COAG Energy Council.

Energy Market Operator (AEMO)'s declared network functions.⁸⁴ The draft rule is compatible with AEMO's declared network functions because it does not amend or affect those functions.

C.4 Civil penalties

The Commission cannot create new civil penalty provisions. However, it may recommend to the National Federation Reform Council that new or existing provisions of the NER be classified as civil penalty provisions.

The draft rule does not amend any clauses that are currently classified as civil penalty provisions under the NEL or National Electricity (South Australia) Regulations. The Commission does not propose to recommend to the National Federation Reform Council that any of the proposed amendments made by the draft rule be classified as civil penalty provisions.

C.5 Conduct provisions

The Commission cannot create new conduct provisions. However, it may recommend to the National Federation Reform Council that new or existing provisions of the NER be classified as conduct provisions.

The draft rule does not amend any rules that are currently classified as conduct provisions under the NEL or National Electricity (South Australia) Regulations. The Commission does not propose to recommend to the National Federation Reform Council that any of the proposed amendments made by the draft rule be classified as conduct provisions.

⁸⁴ Section 91(8) of the NEL.