10 February 2021

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Ms Anna Collyer
Chair
Australian Energy Market Commission
Sydney South NSW 1235

By online submission,
AEMC Code: **ERC0304**

Dear Ms. Collyer

Enhancing operational resilience in relation to indistinct events

AEMO welcomes the opportunity to provide feedback on the AEMC's Consultation Paper on Enhancing Operational Resilience in relation to Indistinct Events published on 17 December 2020.

While AEMO agrees with the need to manage indistinct events to enhance operational resilience, a framework that minimises operational complexity and administrative burden is to be preferred.

AEMO remains consistent with its views highlighted in submissions made to the AEMC's South Australian Black System Event Review (BSE Review)[1]. Namely, a completely new framework for the management of indistinct risks, outlined as Option A in the AEMC's Consultation Paper, may introduce impractical and inefficient requirements, inconsistent with prudent and safe power system operation.

Specifically, Option A proposes:

- The need to undertake a cost-benefit assessment to justify power system security actions in response to risks whose potential impact, by nature, cannot be pre-determined.
- Undergoing a rules consultation procedure to publish protected operation criteria that includes the extent of the actions AEMO would take to manage such risks.

Firstly, there is no guarantee that a cascading failure would be avoided by applying or investing in an option that might have been deemed economic for a given set of risk conditions by a theoretical ex ante analysis. This proposed framework obfuscates the power system security principles, implying that AEMO would be limited to the pre-defined responses when those conditions arise, even if considered insufficient in the power system context at the time. The introduction of such considerations into real-time operational decisions appears inconsistent with prudent power system security management.

[1] AEMO submissions available at: https://www.aemc.gov.au/markets-reviews-advice/review-of-the-system-black-event-in-south-australi

Secondly, opening the (existing and new) criteria to a rules consultation procedure is at odds with the NEM's underlying allocation of risks, roles and responsibilities for power system security, and does not align with the urgency of management of the issues that may need to be captured and implemented.

Progressing with Option A would result in up to four frameworks for AEMO to manage risks to the power system that can arise in real-time, each with different levels of complexity and subject to the application of different assessment principles, including the cost-minimisation principle. This adds unnecessary operational complexity to an existing contingency framework that, with some improvements, could accommodate the changes required to manage indistinct events more effectively.

Due to the concerns raised above, AEMO is more aligned with the AEMC's Option B, but with modifications to address administrative processes, as well as the desired outcome that power system management actions for indistinct events should have the objective of minimising the risk of cascading failure.

As highlighted in our submissions to the BSE Review, the following suggestions, complemented by AEMO's proposed legal drafting in Attachment B, would enhance the existing contingency framework, thereby allowing a more streamlined and less complex introduction for the management of indistinct events, thus eliminating the need for a separate protected operation framework:

- The current concept of a contingency event is redefined from an event that causes the failure or removal from service of generation or transmission equipment, to a definition that AEMO expects would result in a sudden and unplanned change in the availability or operability of plant forming part of the power system.
- The purpose of this change is not specifically to accommodate indistinct events (since they are already captured by the existing definition), but to recognise that control systems and schemes may act not only to trip or disconnect plant, but also to substantially reduce or run back output;
- There is a clear statement that, in the absence of abnormal conditions, certain events are not to be considered credible. These are three phase faults, busbar faults (currently implied in clause S5.1.8) and multiple simultaneous disruptive events.
- In abnormal conditions, indistinct events may be considered credible contingencies, and declared as such.
- AEMO's management of a credible contingency will depend on whether the contingency is identifiable (distinct), or indistinct. For distinct credible contingencies AEMO seeks to ensure the power system will remain in a satisfactory operating state if the identified equipment is impacted. For indistinct credible contingencies AEMO would seek to manage the potential consequences by taking steps to make the power system more resilient to a range of possible events, for example by reducing power flows on critical lines.

AEMO's suggested modifications to the administrative process of Option B leverage the framework for the current reclassification process contained in the Power System Security Guidelines (PSSG) and referenced in NER clauses 4.2.3A and 4.2.3B. The PSSG could outline the criteria for the abnormal conditions in which indistinct events are likely to be considered credible, and guidelines for AEMO's management of those credible indistinct events. This approach would:

- build on the established reclassification criteria as a basis for identifying abnormal conditions that make indistinct events credible, to be published in guidelines which undergo a targeted consultation process consistent with power system security principles[2];
- transparently incorporate the principles for operational responses to manage distributed risk, a proposal for which was endorsed by the Power System Security Working Group in 2019[3]; and
- apply the requirements of clause 4.2.3A, incorporating obligations to report any reclassified event, by issuing market notices as well as six-monthly reclassification reporting that would incorporate both distinct and indistinct events.

Attachment B sets out AEMO's proposed drafting for the option described above, as previously submitted to the BSE review. During the review AEMO also identified a number of drafting consequences and existing issues relating to the use of the credible contingency event term throughout the NER.[4]

AEMO strongly believes the above modifications to Option B would still meet the objectives of the original rule change proposal – it would be a relatively simple, incremental regulatory solution to enhance the operational resilience of the power system that aligns with the NEO, avoids inconsistent frameworks and potentially conflicting obligations around real time power system security responsibilities, provides reasonable certainty to the market in a range of risk scenarios, and provides the same degree of transparency and accountability that has always applied to contingency risk management in the NEM.

In addition to the above views, AEMO has responded to the AEMC's Consultation Paper questions, where relevant, in Attachment A. We welcome the opportunity to provide further input as this rule change process progresses.

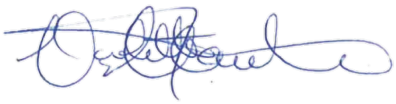
Should you wish to discuss any of the matters raised in this submission, please contact Kevin Ly, Group Manager Regulation on kevin.ly@aemo.com.au.

[2] The power system security principles will confirm that an indistinct credible contingency will be managed by taking measures to increase resilience such that AEMO expects the power system can be restored to a satisfactory operating state, even though it may not immediately return to that state.

[3] Summarised in section 3.3.1 of AEMO's submission dated 13 September 2019 to the BSE Review discussion paper, available at: https://www.aemc.gov.au/sites/default/files/2019-09/AEMO%20-%20Submission%20to%20the%20Discussion%20Paper%20-%20EPR0057.pdf

[4] See section 3 of AEMO's supplementary submission dated 23 October 2019 to the BSE Review discussion paper, available at https://www.aemc.gov.au/markets-reviews-advice/review-of-the-system-black-event-in-south-australi

Yours sincerely



Violette Mouchaileh
Chief Member Services Officer

Attachment A: AEMO response to Consultation Paper questions

Attachment B: AEMO's proposed drafting amendments to incorporate credible indistinct events in the contingency framework

ATTACHMENT A: AEMO RESPONSE TO CONSULTATION PAPER QUESTIONS

QUESTION 1 – ASSESSMENT PRINCIPLES

AEMO agrees with the assessment principles outlined in the Consultation Paper.

Additionally, AEMO is of the view that any new or amended Rule should impose minimal costs, be simple and integrated into existing frameworks where possible thereby avoiding duplication, inconsistency, and unnecessary administrative burden on the industry.

QUESTION 2 – DEFINING INDISTINCT EVENTS

Under AEMO's proposal of a modified Option B, a specific definition for indistinct events would not be required.

QUESTION 3 – PROPOSED FRAMEWORK FOR MANAGING INDISTINCT EVENTS

AEMO's comments on the proposed framework to manage indistinct events are provided in our letter above.

QUESTION 4 – PROPOSED FRAMEWORK FOR OPTION A

AEMO supports the concept for managing condition-dependent indistinct events, but at this stage cannot identify any application for the proposed 'standing indistinct event' category.

AEMO does not support a separate protected operation framework (parallel to the existing contingency management framework) for the reasons outlined in our letter above.

The application of the existing contingency framework to indistinct contingency events would allow AEMO, as the independent market and system operator for the NEM, to continue to take the action it considers necessary to maintain power system security using the information and tools available to it for that purpose. This does not currently, and should not in future, require time-consuming and unnecessary administrative measures. Existing obligations provide the necessary transparency through reclassification reporting and targeted consultation.

QUESTION 5 – GENERAL QUESTIONS ON PROPOSED MANAGEMENT OF INDISTINCT EVENTS

AEMO is of the view that the current protected event framework is too restrictive in the required approach to managing non-credible contingency events that are declared to be protected events. The NER require that a protected event is managed to the same power system security standard as a credible contingency event, including for:

- Voltage control and voltage unbalance requirements (NER 4.5.1, S5.1a.7, S5.1.4)[5]
- System stability assessment (transient stability and voltage stability) (NER S5.1.8, S5.1a.3)

[5] NER S5.1a.4 is one location where credible continency events are mentioned with regards to voltage management, but not protected events. The reason for this is not readily apparent, especially since it is referred to in S5.1.4 in a way which does reference both credible continency events and protected events.

- System strength assessment (NER 4.6.1, 5.20.6, and definitions of "adverse system strength impact", and "system strength impact assessment"). This is also reflected in AEMO's systems strength requirements methodology.

The system security expectation in the NER for credible contingencies is more restrictive than for non-credible contingencies – for which emergency controls are expected to be in place under the NER to minimise the risk of cascading failure. The current power system frequency risk review identifies non-credible contingencies where the cascading failure risk may not be adequately addressed by those controls, and in appropriate circumstances they can be declared protected events.

Given the focus on cascading failure risk, there may be instances where it is not appropriate to manage all (non-frequency) aspects of a satisfactory operating state for protected events as if they were credible contingencies. AEMO therefore considers that the current protected event framework needs to be amended to allow the flexibility to make bespoke proposals for appropriate management and targeted outcomes of a particular protected event.

The proposed management of these issues must satisfy the requisite cost-benefit assessment before a protected event can be approved by the Reliability Panel. While there are reasons for voltage and stability to be considered in the declaration of a protected event, this additional analysis may delay or even prohibit the implementation of prudent management actions required to address the frequency issues that result from the same event.

An example of this includes South Australian separation from the rest of the NEM as the under-frequency load shedding (UFLS) in South Australia (SA) is no longer adequate to arrest frequency decline for non-credible contingency events. AEMO analysis may show that this separation, along with loss of load in SA, can lead to voltage and stability issues, and therefore potentially unserved energy in Victoria. While the risks of managing voltage and stability considerations in the Victorian network are unrelated to the UFLS risks in SA, a potential outcome of the current NER requirements may be that the costs of managing the Victorian power system security issues are too great to justify the declaration of a SA separation as a protected event. This could prevent AEMO from taking actions to protect South Australian consumers, where those actions have a net benefit.

AEMO also refers to section 3.2 of its submission to the BSE Review Discussion Paper in relation to concerns with managing indistinct events under the AEMC's proposed framework. In particular Table 3 highlighted the difficulties involved with defining an indistinct event as a protected event and applying operational measures within pre-defined limits that were illustrated on the first occasion that AEMO invoked the first protected event declared for South Australia on 8 August 2019.

QUESTIONS 9-10 – RELIABILITY PANEL RESPONSIBILITIES

Under AEMO's modified Option B, the Reliability Panel's involvement is not required if credible indistinct contingencies are managed under the contingency framework.

QUESTION 11 – ROLE OF NSPs AND GPSRR IN MANAGING INDISTINCT EVENTS

AEMO is of the view the GPSRR is not an appropriate tool for defining condition-dependent credible indistinct contingency events or their management, for the reasons explained in AEMO's letter. The GPSRR should continue to consider only non-credible contingencies under the protected events framework.

QUESTION 12 – PROPOSED COST MINIMISATION APPROACH

AEMO has outlined several concerns with the cost minimisation approach in previous communication to the AEMC including:

- it is neither logical nor consistent with the NEO to require the independent system operator to make ex-ante decisions, based on a cost-benefit assessment, that limit the tools available to manage the system for credible risk in real-time. AEMO considers that this reflects an overreach of the policy objective of cost minimisation, in conflict with NEM system security principles and AEMO's duty of care as a power system operator.
- the cost-minimisation proposal may infer that AEMO has no obligation to maintain a secure operating state in the face of a credible risk to the power system if the costs of doing so are assessed (in advance) not to be justified; and
- AEMO would have to perform a cost-benefit assessment for what can only be a hypothetical 'indistinct risk' scenario. There is no guarantee that, acting upon the 'cost-minimised' option to minimise the impact of risk conditions, cascading failure would be avoided.

ATTACHMENT B: AEMO PROPOSED DRAFTING AMENDMENTS TO INCORPORATE CREDIBLE INDISTINCT EVENTS IN THE CONTINGENCY FRAMEWORK

Attachment B: AEMO's proposed drafting amendments to incorporate credible indistinct events in the contingency framework

4. Power System Security

…

4.2 Definitions and Principles

…

4.2.2 Satisfactory Operating State

The *power system* is defined as being in a *satisfactory operating state* when:

(a) the *frequency* at all energised *busbars* of the *power system* is within the *normal operating frequency band*, except for brief excursions outside the *normal operating frequency band* but within the *normal operating frequency excursion band*;

(b) the *voltage* magnitudes at all energised *busbars* at any *switchyard* or *substation* of the *power system* are within the relevant limits set by the relevant *Network Service Providers* in accordance with clause S5.1.4 of schedule 5.1;

(c) the current flows on all *transmission lines* of the *power system* are within the ratings (accounting for time dependency in the case of emergency ratings) as defined by the relevant *Network Service Providers* in accordance with schedule 5.1;

(d) all other *plant* forming part of or impacting on the *power system* is being operated within the relevant operating ratings (accounting for time dependency in the case of emergency ratings) as defined by the relevant *Network Service Providers* in accordance with schedule 5.1;

(e) the configuration of the *power system* is such that the severity of any potential fault is within the capability of circuit breakers to *disconnect* the faulted circuit or equipment; and

(f) the conditions of the *power system* are stable in accordance with requirements designated in or under clause S5.1.8 of schedule 5.1.

4.2.3 Credible and non-credible contingency events and protected events

(a) A *contingency event* means an event ~~affecting the power system which AEMO expects would be likely to involve the failure or removal from operational service of one or more generating units and/or transmission elements.~~ that *AEMO* expects would result in a sudden and unplanned change in the availability or operability of *plant* forming part of the *power system* or *scheduled load*.

(b) A *credible contingency event* means a *contingency event* the occurrence of which *AEMO* considers to be reasonably possible in the surrounding circumstances including the *technical envelope*.

(b1) In the absence of *abnormal conditions*, the following *contingency events* (without limitation) are not to be considered reasonably possible:

(1) three phase electrical faults on the *power system*;

(2) *busbar* faults; or

(3) simultaneous disruptive events such as:

(i) multiple *generating unit* failures, unless reasonably expected to follow from a single initiating event or set of circumstances; or

(ii) double circuit *transmission line* failure (such as may be caused by tower collapse).

~~Without limitation, examples of *credible contingency events* are likely to include:~~

~~(1) the unexpected automatic or manual *disconnection* of, or the unplanned reduction in capacity of, one operating *generating unit*; or~~

~~(2) the unexpected *disconnection* of one major item of *transmission plant* (e.g. *transmission line*, *transformer* or *reactive plant*) other than as a result of a three phase electrical fault anywhere on the *power system*.~~

(c) ~~**[Deleted]**~~ A *credible contingency event* may be further classified as:

(1) a [*distinct*] *credible contingency event* if the *power system plant* or *scheduled load* at risk is reasonably identifiable; or

(2) an [*indistinct*] *credible contingency event* if, in *abnormal conditions*, the *power system plant* or *scheduled load* at risk is not reasonably identifiable.

(d) **[Deleted]**

(e) A *non-credible contingency event* is a *contingency event* other than a *credible contingency event*. ~~Without limitation, examples of *non-credible contingency events* are likely to include:~~

~~(1) three phase electrical faults on the *power system*; or~~

~~(2) simultaneous disruptive events such as:~~

~~(i) multiple *generating unit* failures; or~~

~~(ii) double circuit *transmission line* failure (such as may be caused by tower collapse).~~

(f) A *protected event* means a *non-credible contingency event* that the *Reliability Panel* has declared to be a *protected event* under clause 8.8.4, where that declaration has come into effect and has not been revoked. *Protected events* are a category of *non-credible contingency event*.

4.2.3A ~~Re-classifying~~ Reclassifying contingency events

(a) *Abnormal conditions* are conditions posing added risks to the *power system* including, without limitation, severe weather conditions, lightning, storms and bush fires.

(b) *AEMO* must take all reasonable steps to ensure that it is promptly informed of *abnormal conditions*, and when *abnormal conditions* are known to exist *AEMO* must:

(1) on a regular basis, make reasonable attempts to obtain all information relating to how the *abnormal conditions* may affect the *power system* ~~a *contingency event*~~; and

(2) identify whether ~~any~~ *non-credible contingency event* ~~which~~ is more likely to occur because of the existence of the *abnormal conditions*.

(c) As soon as practicable after *AEMO* identifies that a *non-credible contingency event* ~~which~~ is more likely to occur because of the existence of *abnormal conditions*, *AEMO* must provide *Market Participants* with a notification specifying:

(1) the *abnormal conditions*;

(2) the ~~relevant~~ *non-credible contingency event*;

(3) whether *AEMO* has reclassified ~~this~~ the *non-credible contingency event* as a *credible contingency event* under clause 4.2.3A(g) and, if so, any additional measures implemented to maintain *power system security*;

(4) information (other than *confidential information*) in its possession that is relevant to its consideration under clause 4.2.3A(e), the source of that information and the time that information was received or confirmed by *AEMO*;

(5) the time at which the notification has been issued; and

(6) the time at which an updated notification is expected to be issued, where this might be necessary.

(d) *AEMO* must update a notification issued in accordance with clause 4.2.3A(c) as it becomes aware of new information that is material to its consideration under clause 4.2.3A(e), and in any event no later than the time indicated in the original notification under clause 4.2.3A(c)(6), until such time as it issues a notification specifying that the *abnormal conditions* have ceased to increase the likelihood of a ~~have a material effect on the likely occurrence of the~~ *non-credible contingency event* occurring.

(e) If *AEMO* identifies under paragraph (b) that a *non-credible contingency event* ~~which~~ is more likely to occur ~~because of the existence of *abnormal conditions*~~ it must, on a regular basis while the *abnormal conditions* exist, consider whether they make the occurrence of a ~~that~~ *non-credible contingency event* ~~is~~ reasonably possible, having regard to all the facts and circumstances identified in accordance with clause 4.2.3A(b).

(f) In undertaking its consideration in accordance with clause 4.2.3A(e), *AEMO* must have regard to the criteria referred to in clause 4.2.3B.

~~**Note:**~~

~~Clause 4.2.3A(f) will not come into effect until *NEMMCO* has established the criteria referred to in clause 4.2.3B.~~

(g) If, after undertaking a consideration in accordance with clause 4.2.3A(e), *AEMO* decides that the existence of the *abnormal conditions* make the occurrence of a *non-credible contingency event* reasonably possible, it must:

(1) reclassify that event to be a *credible contingency event*;

(2) determine, having regard to the criteria referred to in clause 4.2.3B, any additional measures it will implement to maintain *power system security*; and ~~must~~

(3) provide *Market Participants* with a notification consistent with the

requirements in paragraph (c)~~notify *Market Participants* as soon as practicable~~.

(h) If, after reclassifying a *non-credible contingency event* to be a *credible contingency event* in accordance with clause 4.2.3A(g), *AEMO* considers that the relevant facts and circumstances have changed so that the occurrence of that *credible contingency event* is no longer reasonably possible, *AEMO* must ~~may~~ reclassify that *credible contingency event* to be a *non-credible contingency event* and ~~. If *AEMO* does so, it must~~ notify *Market Participants* as soon as practicable.

(i) Every six months, *AEMO* must issue a report setting out its reasons for all decisions to ~~re-classify~~ reclassify *non-credible contingency events* to be *credible contingency events* under clause 4.2.3A(g) during the relevant period. The report must include:

(1) ~~must include~~ an explanation of how *AEMO* applied the criteria established in accordance with clause 4.2.3B for each reclassification decision ~~of those decisions~~;

(2) *AEMO's* appraisal of the appropriateness and effectiveness of the reclassification criteria and the measures applied to maintain *power system security* as a result of reclassification decisions; and

(~~2~~3) ~~may also include~~ if sufficient data is available to discern trends, *AEMO's* analysis of ~~re-classification~~ reclassification trends during the relevant period ~~and its appraisal of the appropriateness and effectiveness of the relevant criteria that were applied in the case of each reclassification decision~~.

4.2.3B Criteria for ~~re-classifying~~ reclassifying contingency events

(a) *AEMO* must develop and *publish*, and may amend, the ~~Within six months of the commencement of this clause, *NEMMCO* must establish~~ criteria **(reclassification criteria)** that it must use when considering whether the existence of *abnormal conditions* make the occurrence of a *non-credible contingency event* reasonably possible under clause 4.2.3A(e).

(b) *AEMO* must review the reclassification criteria ~~established under clause 4.2.3B(a)~~ not less frequently than once every two years ~~after the date of establishment~~.

~~(c) *AEMO* may amend the criteria established under clause 4.2.3B(a).~~

(c~~d~~) In ~~establishing~~ developing, reviewing or amending the reclassification criteria ~~under this clause~~, *AEMO* must: ~~(1)~~ first consult with relevant stakeholders including *Market Participants*, *Transmission Network Service Providers*, *Jurisdictional System Security Coordinators* and relevant emergency services agencies.

(d) The reclassification criteria must:

(1) describe criteria to be used when assessing different types of *abnormal conditions* and their potential impact on *plant*, having ~~(2) ensure that the criteria include a requirement to have~~ regard to the particulars of any risk(s) to the *power system* associated with the relevant type of ~~various types of~~ *abnormal conditions* ~~that might arise~~;

(2) describe the type of measures that *AEMO* may implement to maintain *power system security* for a *contingency event* reclassified as an [*indistinct*] *credible contingency event*. ~~and~~

~~(3) *publish* the criteria on its website as soon as practicable after the criteria have been established or amended.~~

4.2.4 Secure operating state and power system security

(a) The *power system* is defined to be in a *secure operating state* if, in *AEMO's* reasonable opinion, taking into consideration the appropriate *power system security* principles described in clause 4.2.6:

(1) the *power system* is in a *satisfactory operating state*; ~~and~~

(2) the *power system* will return to a *satisfactory operating state* following the occurrence of the ~~any~~ [*distinct*] *credible contingency event* with the largest expected impact on the *power system* at any given time; and

(3) the *power system* can be restored to a *satisfactory operating state* following the occurrence of a significant [*indistinct*] *credible contingency event* or a *protected event*,

in accordance with the *power system security standards*.

(b) Without limitation, in forming the opinions described in clause 4.2.4(a), *AEMO* must:

(1) consider the impact of each of the potentially *constrained interconnectors*; and

(2) use the *technical envelope* as the basis of determining events considered to be *credible contingency events* at that time.

4.2.5 Technical envelope

(a) The *technical envelope* means the technical boundary limits of the *power system* for achieving and maintaining the *secure operating state* of the *power system* for a given demand and *power system* scenario.

(b) *AEMO* must determine and revise the *technical envelope* (as may be necessary from time to time) by taking into account the prevailing *power system* and *plant* conditions as described in clause 4.2.5(c).

(c) In determining and revising the *technical envelope AEMO* must take into account matters such as:

(1) *AEMO's* forecast of total *power system load*;

(2) the provision of the applicable *contingency capacity reserves*;

(3) operation within all *plant* capabilities of *plant* on the *power system*;

(4) *contingency capacity reserves* available to ~~handle any~~ respond to a *credible contingency event* in accordance with the *power system security principles*;

(5) advised *generation* minimum *load constraints*;

(6) *constraints* on *transmission networks*, including short term limitations;

(7) *ancillary service* requirements and *inertia network service* and *system strength service* availability;

(8) **[Deleted]**

(9) the existence of proposals for any major equipment or *plant* testing, including the checking of, or possible changes in, *transmission plant* availability; and

(10) applicable *performance standards*.

(d) *AEMO* must, when determining the secure operating limits of the *power system*, assume that the applicable *performance standards* are being met, subject to:

(1) a *Registered Participant* notifying *AEMO*, in accordance with rule 4.15(f), that a *performance standard* is not being met; or

(2) *AEMO* otherwise becoming aware that a *performance standard* is not being met.

4.2.6 General principles for maintaining power system security

The *power system security* principles are as follows:

(a) To the extent practicable, the *power system* should be operated such that it is and will remain in a *secure operating state*.

(b) Following a *contingency event* (whether or not a *credible contingency event*) or a significant change in *power system* conditions, *AEMO* should take all reasonable actions:

(1) to adjust, wherever possible, the operating conditions with a view to returning the *power system* to a *secure operating state* as soon as it is practical to do so, and, in any event, within thirty minutes; or

(2) if any principles and guidelines have been *published* under clause 8.8.1(a)(2a), to adjust, wherever possible, the operating conditions, in accordance with such principles and guidelines, with a view to returning the *power system* to a *secure operating state* within at most thirty minutes.

(c) *Emergency frequency control schemes* should be available and in service to:

(1) restore the *power system* to a *satisfactory operating state* following *protected events*; and

(2) significantly reduce the risk of *cascading outages* and *major supply disruptions* following significant multiple *contingency events*.

(d) <u>The measures taken to reduce the potential impact of a significant [*indistinct*] *credible contingency event* should be sufficient to increase the resilience of the *power system* to that event, such that *AEMO* reasonably expects that the *power system* can be restored to a *satisfactory operating state* following the event.</u> ~~**[Deleted]**~~

(e) Sufficient *system restart ancillary services* should be available in accordance with the *system restart standard* to allow the restoration of *power system*

security and any necessary restarting of *generating units* following a *major supply disruption*.

(f) Sufficient *inertia* should be available in each *inertia sub-network* to meet the applicable *inertia requirements*.

(g) Sufficient *three phase fault level* should be maintained at each *fault level node* to meet the applicable *system strength requirements*.