

## Meeting Agenda

<b>Meeting Title:</b>	Evolution of Pilbara Network Rules Working Group
<b>Workstream</b>	Workstream 2 (HTR Workstream)
<b>Date:</b>	10 October 2024
<b>Time:</b>	9:30am – 11:30am
<b>Location:</b>	Online, via TEAMS

Item	Item	Responsibility	Type	Duration
1	Welcome and Agenda <ul style="list-style-type: none"> <li>Conflicts of interest</li> <li>Competition Law</li> </ul>	Chair	Noting	4 min
2	Meeting Apologies and Attendance	Chair	Noting	1 min
3	Minutes of Meeting 2024_08_28 <a href="#">Published 07 October 2024</a>	Chair	Noting	1 min
4	Action Items	Chair	Noting	4 min
5	HTR Issue List: <ul style="list-style-type: none"> <li>a) Present Issues Papers, discuss options and recommendations for each issue.</li> </ul>	Issue Leads	Discussion	1h 40 min
6	Next steps	Chair	Noting	10 min
	Next meeting: 9:30 AM, 14 November 2024 (HTR workstream)			

## Competition and Consumer Law Obligations

Members of the PAC's Evolution of the Pilbara Network Rules Working Group (**Members**) note their obligations under the *Competition and Consumer Act 2010 (CCA)*.

If a Member has a concern regarding the competition law implications of any issue being discussed at any meeting, please bring the matter to the immediate attention of the Chairperson.

Part IV of the CCA (titled "Restrictive Trade Practices") contains several prohibitions (rules) targeting anti-competitive conduct. These include:

- (a) **cartel conduct**: cartel conduct is an arrangement or understanding between competitors to fix prices; restrict the supply or acquisition of goods or services by parties to the arrangement; allocate customers or territories; and or rig bids.
- (b) **concerted practices**: a concerted practice can be conceived of as involving cooperation between competitors which has the purpose, effect or likely effect of substantially lessening competition, in particular, sharing Competitively Sensitive Information with competitors such as future pricing intentions and this end:
  - a concerted practice, according to the ACCC, involves a lower threshold between parties than a contract arrangement or understanding; and accordingly; and
  - a forum like the EPNRWG is capable being a place where such cooperation could occur.
- (c) **anti-competitive contracts, arrangements understandings**: any contract, arrangement or understanding which has the purpose, effect or likely effect of substantially lessening competition.
- (d) **anti-competitive conduct (market power)**: any conduct by a company with market power which has the purpose, effect or likely effect of substantially lessening competition.
- (e) **collective boycotts**: where a group of competitors agree not to acquire goods or services from, or not to supply goods or services to, a business with whom the group is negotiating, unless the business accepts the terms and conditions offered by the group.

A contravention of the CCA could result in a significant fine (up to \$500,000 for individuals and more than \$10 million for companies). Cartel conduct may also result in criminal sanctions, including gaol terms for individuals.

**Sensitive Information** means and includes:

- (a) commercially sensitive information belonging to a Member's organisation or business (in this document such bodies are referred to as an Industry Stakeholder); and
- (b) information which, if disclosed, would breach an Industry Stakeholder's obligations of confidence to third parties, be against laws or regulations (including competition laws), would waive legal professional privilege, or cause unreasonable prejudice to the Coordinator of Energy or the State of Western Australia).

### Guiding Principle – what not to discuss

In any circumstance in which Industry Stakeholders are or are likely to be in competition with one another a Member must not discuss or exchange with any of the other Members information that is not otherwise in the public domain about commercially sensitive matters, including without limitation the following:

- (a) the rates or prices (including any discounts or rebates) for the goods produced or the services produced by the Industry Stakeholders that are paid by or offered to third parties;
- (b) the confidential details regarding a customer or supplier of an Industry Stakeholder;
- (c) any strategies employed by an Industry Stakeholder to further any business that is or is likely to be in competition with a business of another Industry Stakeholder, (including, without limitation, any strategy related to an Industry Stakeholder's approach to bilateral contracting or bidding in the energy or ancillary/essential system services markets);
- (d) the prices paid or offered to be paid (including any aspects of a transaction) by an Industry Stakeholder to acquire goods or services from third parties; and
- (e) the confidential particulars of a third party supplier of goods or services to an Industry Stakeholder, including any circumstances in which an Industry Stakeholder has refused to or would refuse to acquire goods or services from a third party supplier or class of third party supplier.

### Compliance Procedures for Meetings

If any of the matters listed above is raised for discussion, or information is sought to be exchanged in relation to the matter, the relevant Member must object to the matter being discussed. If, despite the objection, discussion of the relevant matter continues, then the relevant Member should advise the Chairperson and cease participation in the meeting/discussion and the relevant events must be recorded in the minutes for the meeting, including the time at which the relevant Member ceased to participate.



## Agenda Item 4: Action Items

### Evolution of the Pilbara Networks Rules Working Group (EPNRWG) Workstream 2 – Meeting - 2024\_10\_10

Shaded	Shaded action items are actions that have been completed since the last EPNRWG (WS2) meeting. Updates from last EPNRWG (WS2) meeting provided for information in <b>RED</b> .
Unshaded	Unshaded action items are still being progressed.

Item	Action	Responsibility	Meeting Arising	Status
7/2024	Provide insights on system strength requirements from the Power System Security and Reliability Standards Review to the HTR Workstream to assist in advancing the progress on Issue 7.	EPWA	2024_08_28	<b>Completed</b> EPWA will provide presentation slides from PSSRSWG meeting 25 July 2024, as available on EPWA website.
8/2024	Complete an interjurisdictional review summarising how other markets allocate responsibility for managing fault levels and protocols for managing interconnected networks.	RBP	2024_08_28	<b>Completed</b> RBP provided its interjurisdictional review to Issue Lead and Support Group on 26 September 2024.
9/2024	Provide EPWA with a brief paper, one-page paper explaining the circular legal issue identified with the CPC Facility construct to support the transfer of this issue to the PNR Workstream.	Woodside	2024_08_28	<b>Completed</b> Woodside provided paper on 12 September 2024.

Item	Action	Responsibility	Meeting Arising	Status
10/2024	Finalise Issue Papers outlining options and any recommendations for working group consideration, and a provide a copy to EPWA by close of business 30 September 2024.	Issue Leads	2024_08_28	<b>Completed</b> EPWA has compiled and attached all papers from Issue Leads to the meeting papers for discussion in Item 5

**Note.** Action items are removed from this register after they have marked and presented as 'completed'.



## Agenda Item 5

### HTR Issues: Current status and meeting material

This table provides the status of HTR Issues (as of 3 October 2024) provided by Issue Leads. Where materials have been provided by Issue Leads to support discussion at the working group meeting on 10 October 2024, a page number reference is provided.

**Note.** Where no status update has been received from Issue Leads, this is denoted by a dash (-), while ‘no update’ is used to reflect Issue Leads report.

Issue ID		Priority	Simple or Substantive	Lead	Support	Status	Page #
13	I3	High	Substantive	Noel (Rio)	David (HP); Lekshmi (BP), James (ISO); Njabulo and Bec (BHP)	• -	-
	I36	Moderate	Substantive				
14		High	Simple	David (HP)	Nik (APA); Njabulo and Bec (BHP); Noel (Rio), James (ISO)	• -	-
15	I5	High	Substantive	David (HP)	Nik (APA); Shervin and Scott (Woodside); Lekshmi (BP); James (ISO); Njabulo and Bec (BHP); Noel (Rio)	• -	-
	I6	High	Substantive				
	I15	High	Substantive				
	I16	High	Substantive				
	I17	High	Substantive				
	I19	High	Substantive				



	I34	Moderate	Substantive				
	17	High	Substantive	Nik (APA)	Njabulo and Bec (BHP); James (ISO); Noel (Rio); Lekshmi (BP)	<ul style="list-style-type: none"> <li>PSSRSWG presentation slides provided to relevant workstream separate to Agenda papers.</li> </ul>	-
	18	High	Substantive	James (ISO)	David (HP); Noel (Rio); Njabulo and Bec (BHP), Nik (APA)	<ul style="list-style-type: none"> <li>Verbal update to be provided in the meeting</li> </ul>	-
	19	High	Substantive				-
	112	High	Substantive				-
	I10	High	Substantive	Njabulo (BHP)	Nik (APA); David (HP)	<ul style="list-style-type: none"> <li>-</li> </ul>	-
	I11	High	Substantive	Njabulo (BHP)	Nik (APA); David (HP)	<ul style="list-style-type: none"> <li>-</li> </ul>	-
	113	High	Substantive	James (ISO)	David (HP); Njabulo and Bec (BHP), Nik (APA)	<ul style="list-style-type: none"> <li>Verbal update to be provided in the meeting</li> </ul>	-
	137	Moderate	Substantive				-
	I14	High	Substantive	Lekshmi (BP)	James (ISO); Njabulo and Bec (BHP); Nik (APA)	<ul style="list-style-type: none"> <li>-</li> </ul>	-
	I18	High	Simple	Lekshmi (BP)	Njabulo and Bec (BHP)	<ul style="list-style-type: none"> <li>-</li> </ul>	-
	I22	Moderate	Simple	David (HP)	Njabulo and Bec (BHP); Noel (Rio); Nik (APA)	<ul style="list-style-type: none"> <li>-</li> </ul>	-
	I23	Moderate	Simple	David (HP)	Nik (APA); Njabulo and Bec (BHP)	<ul style="list-style-type: none"> <li>Updated provided (see attached)</li> </ul>	P.5
	124	Moderate	Simple	David (HP)	Lekshmi (BP); Njabulo and Bec (BHP); Noel (Rio); Nik (APA); James (ISO)	<ul style="list-style-type: none"> <li>-</li> </ul>	-
	125	Moderate	Simple				-
	I26	Moderate	Simple	David (HP)	Njabulo and Bec (BHP); Nik (APA)	<ul style="list-style-type: none"> <li>-</li> </ul>	-



127	Moderate	Simple	Nik (APA)	David (HP); James (ISO); Njabulo and Bec (BHP); Noel (Rio)	• -	-
128	High	Substantive	David (HP)	Noel (Rio); James (ISO); Njabulo and Bec (BHP), Nik (APA)	• Updated provided (see attached)	P.6
129	High	Substantive (study likely)	James (ISO)	David (HP); Njabulo and Bec (BHP)	• -	-
130	High	Substantive	Shervin and Scott (Woodside)	David (HP); Noel (Rio); Njabulo and Bec (BHP), Nik (APA), James (ISO)	• Updated provided (see attached)	P.15
131	Moderate	Simple	David (HP)	Njabulo and Bec (BHP)	• -	-
132	132	Moderate	James (ISO)	Noel (Rio); David (HP); Njabulo and Bec (BHP), Nik (APA)	• Verbal update to be provided in the meeting	-
	133	Moderate	James (ISO)		• Verbal update to be provided in the meeting	-
135	Moderate	Substantive	Njabulo (BHP)	Nik (APA)	• Updated provided (see attached)	P.17
138	Moderate	Substantive	Njabulo (BHP)	Shervin and Scott (Woodside)	• -	-
140	Low	Simple	David (HP)	Njabulo and Bec (BHP)	• -	-
141	141	Low	James (ISO)	Noel (Rio); Njabulo and Bec (BHP), Nik (APA)	• Verbal update to be provided in the meeting	-
	142	Low			• -	-
143	Low	Simple	James (ISO)	Njabulo and Bec (BHP)	• Verbal update to be provided in the meeting	-



Department of Energy, Mines,  
Industry Regulation and Safety  
Energy Policy WA

144	Low	Simple	Noel (Rio)	James (ISO); David (HP); Nik (APA); Njabulo and Bec (BHP)	• -	-
145	Low	Simple	Noel (Rio)	James (ISO); Njabulo and Bec (BHP); Nik (APA)	• -	-



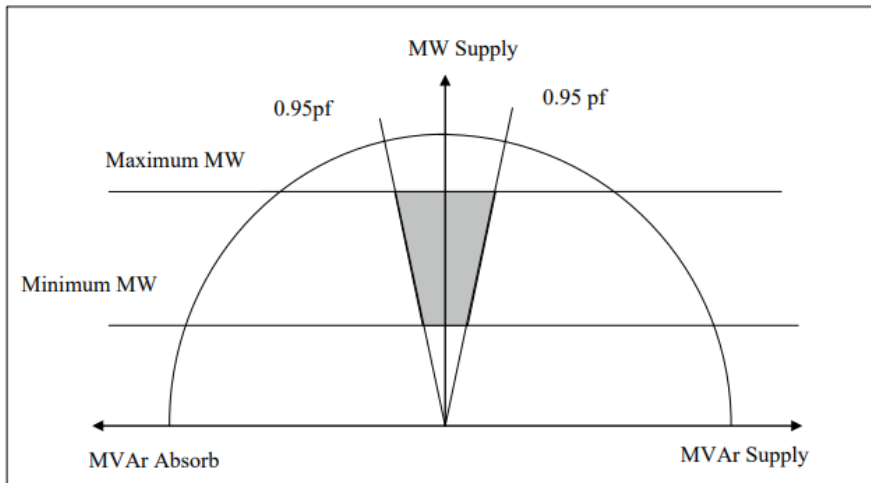
## PHTR Issue 23 – Reactive Power Capability Figure 3.3

**Issue #4 – Classification:**

Moderate Priority, Simple, Technical

**Issue #4 – Description:**

Figure 3.3 in the PHTR shows reactive capability for inverter coupled generating units, but only shows positive active power as shown in the following diagram:



**Figure 3.3 – Inverter coupled generating unit or converter coupled generating unit.  
Minimum reactive capability requirements at connection point shown shaded**

The diagram neglects to cater fully for battery connected units which are capable of absorbing reactive power.

**Issue #4 – Solution Options:**

1. Update plot to show -ve MW, and add commentary to show that -ve MW is applicable for battery connected units. *(Recommended TBC)*
2. Provide a separate plot and description for battery connected units. *(Not recommended TBC)*
3. Leave as is *(Not recommended)*

**Issue #4 – Recommended Actions (TBC):**

- Update PHTR Section 3.3.3.1(c)(4) and figure 3.3 to cater for battery energy storage units.



Government of Western Australia  
Energy Policy WA

# Evolution of the Pilbara Network Rules – HTR Working Group Meeting 2024\_10\_10

10 October 2024

Working together for a  
**brighter** energy future.

# Fault level management in other power systems

There is concern that with increased generation being connected to the system under the new rules that fault levels will increase, causing issues for the operation of the interconnected networks. Clearer rules or processes within the evolved Pilbara Network Rules will be important to manage fault levels on the grid and ensure that fault level issues are mitigated in advance.

We looked for publicly available material on fault level management in Ireland, California, Texas, PJM, SPP, Ontario, and the NEM.

Of these, we found useful material for Ontario and the NEM.

# Rules and procedures

## **NEM:**

Fault levels are managed through the National Electricity Rules (NER) and AEMO's System Strength Procedures & System Strength Impact Assessment Guidelines.

## **Ontario:**

Fault levels are primarily managed in the technical rules (Transmission System Code), but also mentioned in the market rules.

# Maximum fault levels

## **NEM:**

The NER specify maximum fault levels for Victoria only, to inform AEMO's Victorian transmission planning role. AEMO must use best endeavours to ensure that fault levels at a connection point do not exceed these values after a short circuit at that connection point.

## **Ontario:**

The Ontario rules specify maximum fault levels. If fault levels exceed these values, the NSP is responsible for mitigating the financial impacts to others.

# Minimum fault levels

## **NEM:**

The NEM has minimum fault levels across all NEM zones. AEMO uses system strength services to avoid falling below the defined minimum level. NSP's are required to tell AEMO the minimum connection point fault level for proposed new connection

## **Ontario:**

No defined minimum fault levels.

# Pre-connection study requirements

## **NEM:**

Proponents of new connections (or connection augmentations) must organize the relevant NSP to carry out system strength impact assessments, using the method specified in AEMO's System Strength Impact Assessment Guidelines.

## **Ontario:**

Proponents are required to conduct and submit fault studies to the IESO, showing that their proposed connection meets the standards in the Transmission System Code.

# Rectifying fault level issues

## **NEM:**

NSPs (including AEMO in Victoria) are required to design and operate their networks so that fault levels do not breach limits specified in connection agreements.

NSPs are required to provide system strength services that AEMO can use to avoid shortfalls in minimum fault levels.

No mention of who is responsible if maximum fault levels are exceeded.

## **Ontario:**

There is a mechanism for new connections causing fault levels to exceed specified maximums to result in compensation for affected parties.

No mention of who is responsible if maximum fault levels are exceeded when not planned.



# Engagement and consultation

## **NEM:**

NSPs must consult with each other if a new connection or modification will have an impact on system strength, and the process is set out in the NER.

## **Ontario:**

NSPs must provide each other with all necessary information to enable compliance with their obligations.

When performing tests to verify system strength, IESO must communicate with all NSPs.

*We're working for  
Western Australia.*

# MEETING AGENDA AND MINUTES

Name of Meeting	Location	Date / Time	Written by
CPC – Mtg 1	11 Mount Street / MSTeams	31-5-2024 1-2:45pm	Scott Hiscock / Shervin Fani
Attendees		Distribution	
Shervin Fani - Woodside	Gemma Hamilton - ISOCO		
Scott Hiscock - Woodside	Noel Michelson – Rio Tinto		
David Stephens – Horizon Power	Njabulo (Jay) Milo - BHP		
Apologies			
N/A			
Agenda			
<ul style="list-style-type: none"> <li>• I30 Connection Point Compliance – minutes taken by Woodside representatives.</li> <li>• I4 (voltage &amp; frequency standards) – minutes taken by Isoco representatives.</li> <li>• I32 (CFCT) –minutes taken by Isoco representatives.</li> <li>• I44 (Back up protection) – minutes taken by Isoco representatives.</li> </ul>			
Meeting Minutes			
<p><b>I30 Connection Point Compliance</b> <i>Connection Point Compliance parameters and definition (including negotiated vs ideal rules - with particular consideration for brownfield plant vs greenfield). Consider if any updates required to facilitate or improved the treatment of Connection Point Compliance measures.</i></p> <p>General discussion around options for path forward, consolidated to the following options:</p> <ol style="list-style-type: none"> <li>1. Review relevant sections of the HTR (Chapter 3) to check potential CPC measures, as this will give clarity and confidence that proposed changes will not negatively impact the intent of the rules. It may include recommending a CPC section or applicable notes in the HTR (if appropriate) so that future connection applicants can have a more efficient and streamlined process.</li> <li>2. Do nothing.</li> <li>3. Procedural approach.</li> <li>4. Permanent derogation approach (derogation style process, but permanent / can't be withdrawn).</li> <li>5. Risk based approached. Contingency case modelling, end to end modelling, to meet system reliability requirements.</li> </ol> <p>Group identified a list of studies required to demonstrate CPC compliance could also be developed, and included as a guideline in the HTR's. This would be potentially helpful to design requirements to new parties.</p> <p>Group identified a non-CPC related change, but worth consideration for wider HTR update:</p> <ul style="list-style-type: none"> <li>• Negotiated standard (this would be addition to CPC compliance), rather than a prescriptive standard requirement. (/Negotiated outcome, similar to derogation.). This could apply across the whole HTR's. WEM have minimum / ideal / negotiated in the middle. Could be resource heavy, with studies, etc... when compared to a derogation. May require a new process to be developed.</li> </ul> <p><b>*Note:</b> For reference completeness - post meeting N.M. (Rio) highlighted the following which will need to be addressed as a priority:</p> <p><i>I refreshed my understanding of the CPC in the PNR and there are linkages between the PNR and HTR that we need to be aware of.</i></p> <p><i>One of these is that a CPC can't progress unless there is a non-compliance with the HTR (PNR Rule 274B(2)(a)(i)). Meaning, based on our discussion today, if we create a CPC set of rules in the HTR then that would potentially mean compliance can be made with the HTR, meaning CPC can't be applied for. A circular argument may form between the PNR and the HTR.</i></p> <p><i>This same clause also requires each component of equipment to be assessed against the HTR with equipment identified with one or more non-compliances.</i></p> <p><i>So there is potentially PNR changes required to allow compliance with the HTR and still follow the CPC process in the PNR. Also the requirement for each component to be assessed may need to be lifted if the preference is to not assess behind the connection point, or assess at a facility level.</i></p>			

*Just thought it would be helpful to raise this, that we probably need to be reading the PNR in conjunction with the HTR for this specific task. It is likely both PNR and HTR requirements are required. Our recommendation to simplify this process may cause problems with the PNR. This interrelationship with the HTR exists for other clauses throughout the PNR as well.*

Group discussed the merits of each option and originally concluded that option 1 would be preferred – and to progress with initial screening work, but only after it was discussed internally with each participants company. Subsequently Rio raised the circular PNR-CPC issue (which is highlighted in the **note** above). This is was presented in the Workstream 2 workshop on the 28<sup>th</sup> of August 2024 – Recommendation to come post 2<sup>nd</sup> group meeting.

Below points were also discussed but minutes to be issued separately:

- I4 (voltage & frequency standards)
- I32 (CFCT)
- I44 (Back up protection)

#### **Actions**

<b>Item</b>	<b>Discussion and Decisions</b>	<b>Action By</b>	<b>Due Date</b>
1	Review HTR's and identify which clauses be waived as part of CPC measures and which ones need to be addressed. Applies to both generation and loads.	All	
2	Summary of action plan back to Dora (/EPWA) / these minutes	WEL	
3	Parties to discuss internally and revert back on recommended option.	All	
4			
5			
6			
7			

#### **Next Steps**

--

## MEETING AGENDA AND MINUTES

Name of Meeting	Location	Date / Time	Written by
Issue 35	Online	10-09-2024 2:00-2:45 pm	Njabulo Miilo
Attendees		Distribution	
Njabulo Miilo - BHP			
Nik Walker - APA			
David Stephens – Horizon Power			
Apologies			
N/A			
Agenda			
<ul style="list-style-type: none"> <li>• I35 – Special Protection schemes</li> </ul>			
Meeting Minutes			
<p><b>Background/context</b></p> <ul style="list-style-type: none"> <li>i. Not clear if there are requirements on NSPs to enact special protection schemes to manage network congestion/instability and non-credible contingency events as required to enhance system security. However, this shouldn't be the sole option to manage security issues – network augmentation and re-dispatch are other methods by which this can be achieved.</li> <li>ii. HTR silent of acceptability of special protection schemes (SPS) and management of non-credible events</li> <li>iii. UFLS is used to manage non-credible events at present, however, the scheme may have limitations that may result in cascading power system elements failures leading to a system blackout e.g. high ROCOF events, post fault TOVs</li> </ul> <p><b>Objectives</b></p> <ul style="list-style-type: none"> <li>(a) Minimize likelihood of widespread network disruption when certain non-credible events occur</li> <li>(b) Minimize likelihood of widespread network damage when certain non-credible events occur</li> </ul> <p><b>Options</b></p> <ol style="list-style-type: none"> <li><b>1. Do nothing</b> <ul style="list-style-type: none"> <li>(a) Likely to be less rigor (on non-credible contingency that may be in blind spot) when power system studies or operational considerations are undertaken to consider and prepare mitigation measure to limit impact of non-credible contingency events.</li> <li>(b) In the past Inter-tripping schemes were referenced in TR to manage significant contingencies e.g. islanding parts of the network</li> <li>(c) There is a question whether current arrangements are sufficient to minimize network disruption (i.e. avoid system collapse) under extreme circumstances when intermittent renewable generation penetration increases.</li> </ul> </li> <li><b>2. Include new requirements in HTR – defined standards.</b> <ul style="list-style-type: none"> <li>(a) Defining events and operating standards around select non-credible events (similar to 'protected events' in NEM)</li> <li>(b) Bring NWIS operation and design standards in respect to high consequence non credible events in line with other NSP practices in the country</li> </ul> </li> <li><b>3. Include new requirements in HTR – reasonable endeavors</b> <ul style="list-style-type: none"> <li>(a) Reasonable endeavors approach</li> <li>(b) Leave to individual NSPs to include risk assessments during studies and include mitigation as required</li> </ul> </li> </ol> <p><b>Recommended option</b></p> <p>Option 2 recommended, requires input and review from ISO to validate recommendation/limitations of option. Studies on select non-credible events is advisable to understand network impact/risk, and possible mitigating protection schemes/other solutions.</p>			
Actions			
Item	Discussion and Decisions	Action By	Due Date

1	Send minutes to all	NM	10/09/2024
2			
3			
4			
5			
6			
7			

**Next Steps**

--

**Current WEM approach**

- Requires reasonable endeavours to be taken to manage a non-credible events.

3B.3.11. For a Non-Credible Contingency Event or Multiple Contingency Event, reasonable endeavours must be taken to maintain the SWIS Frequency in accordance with the Extreme Frequency Tolerance Band, and to Stabilise and Recover the SWIS Frequency in accordance with the relevant requirements set out in Table 1, Appendix 13 for the SWIS and Table 2, Appendix 13 for an Island. For the avoidance of doubt, the use of load shedding is acceptable in order to meet the requirements of this clause 3B.3.11.

2.27A.10. AEMO must document in a WEM Procedure:

- (cC) the processes and timeframes to be followed by AEMO for creating new Constraint Equations and Constraint Sets in response to a **Non-Credible Contingency Event**;

**Current NEM approach**

- Have a concept of a ‘protected event’ which is essentially a recognised non-credible contingency event that needs to be managed by NSP.

**S5.1.8 Stability**

In planning a network a Network Service Provider must consider **non-credible contingency events** such as busbar faults which result in tripping of several circuits, uncleared faults, double circuit faults and multiple contingencies which could potentially endanger the stability of the power system. In those cases where the consequences to any network or to any Registered Participant of such events are likely to be severe disruption a Network Service Provider and/or a Registered Participant must in consultation with AEMO, install, maintain and upgrade **emergency controls** within the Network Service Provider's or Registered Participant's system or in both, as necessary, to minimise disruption to any transmission network or distribution network and to significantly reduce the probability of cascading failure.

A Registered Participant must co-operate with a Network Service Provider to achieve stable operation of the national grid and must use all reasonable endeavours to negotiate with the Network Service Provider regarding the **installation of emergency controls** as described in the previous paragraph. The cost of installation, maintenance and operation of the emergency controls must be borne by the Network Service Provider who is entitled to include this cost when calculating the Transmission Customer use of system price.

**S5.1.8 Stability**

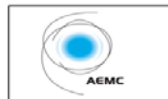
In conforming with the requirements of the system standards, the following criteria must be used by Network Service Providers for both planning and operation:

For stable operation of the national grid, both in a satisfactory operating state and following any credible contingency events or any protected event described in clause S5.1.2.1:

- (a) the power system will remain in synchronism;
- (b) damping of power system oscillations will be adequate; and
- (c) voltage stability criteria will be satisfied.

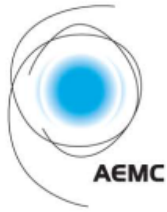
Damping of power system oscillations must be assessed for planning purposes according to the design criteria which states that power system damping is considered adequate if after the most critical credible contingency event or any

**protected event**, simulations calibrated against past performance indicate that the halving time of the least damped electromechanical mode of oscillation is not more than five seconds.



**What is a protected event?**

A protected event is a low likelihood, high consequence non-credible contingency event for which AEMO must maintain the power system security standards, including the frequency operating standards, following the occurrence of the event.



# INFORMATION

## Fact sheet: What is a protected event?

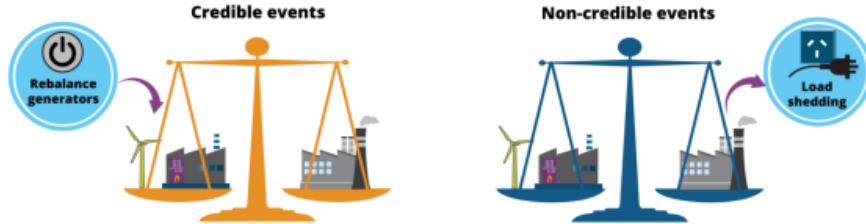
The AEMC's new rule introduces a mechanism to help prevent system-wide black outs. It is called a protected event.

When generation and load are not matched at all times, the power system will not be stable.



Power system imbalance

Depending on the likelihood and severity of the event causing the imbalance, AEMO has existing tools available to limit the impact of the event by bringing the system back into balance.



The new category of event - the protected event - allows AEMO to use power system operational tools (such as rebalancing generators) in addition to some limited load shedding, to bring the system back into balance.



### What is a protected event?

A protected event is a low likelihood, high consequence non-credible contingency event for which AEMO must maintain the power system security standards, including the frequency operating standards, following the occurrence of the event.

To do so, AEMO may utilise ex-ante measures such as the purchase of frequency control ancillary services (FCAS) or constraining generator dispatch, in addition to some limited load or generation shedding, to maintain the frequency operating standards applicable to protected events.



**The introduction of a contingency event classification for protected events will allow for more efficient operation of the power system, providing security benefits for consumers.**

### Contingency events in the NEM

#### What is a credible contingency event?

From time to time, the power system may experience significant disturbances where there is a temporary and unexpected imbalance of supply and demand. These disturbances, which AEMO considers to be reasonably possible in the surrounding circumstances, are known as credible contingency events. They may be caused by events such as the loss of a single generator, a single load or a single line in the network.

Under the current rules, AEMO is required to maintain the power system frequency within the operational frequency tolerance band when these kinds of events occur, and must return the frequency to the normal operating frequency band within a specified time period. To do so, it procures contingency raise and lower FCAS, which increase or decrease the frequency in response to these more significant frequency variations.

#### What is a non-credible contingency event?

More rarely, the power system can experience very significant disturbances to the supply/demand balance. These events, which AEMO considers are not reasonably possible in the surrounding circumstances, are known as non-credible contingencies. They may include events such as the simultaneous loss of multiple generators, or the loss of interconnection with a neighbouring region as a result of the loss of multiple transmission circuits.

Prior to this rule being made, the rules did not allow AEMO to procure FCAS or constrain generation dispatch for contingency events that AEMO considers to be non-credible. Instead, controlled load shedding would be utilised through under-frequency load shedding (UFLS) schemes (and in some instances, special protection schemes) to limit the consequences of a non-credible contingency event.

#### Can AEMO reclassify events from non-credible to credible contingencies?

AEMO currently has the discretion to reclassify contingency events from non-credible to credible. This discretion allows AEMO to reclassify a non-credible contingency event when it considers that the presence of abnormal conditions means that the non-credible contingency is now more likely to occur.

AEMO publishes power system security guidelines, which set out its approach to the reclassification of credible and non-credible events. These guidelines define two scenarios that AEMO has considered for reclassification, being the presence of bushfires and lightning near transmission assets (although AEMO may reclassify in light of other threats). The guidelines then set out detailed decision making processes that AEMO will follow in these scenarios.

#### Why do we need the new category of contingency event?

The new category of protected event is an efficient way of limiting the consequences of certain non-credible contingency events.

Formerly, events like the loss of interconnection between two regions may have resulted in controlled load shedding. However, changing power system conditions resulting from changes in the generation mix means that there may be higher rates of change of frequency (RoCoF) levels following such an event.

The higher RoCoF means that the current equipment which facilitates load shedding may no longer be able to act fast enough to arrest the fall in frequency following this kind of event. This means that there is an increased risk that such an event could more easily trigger a major blackout (a black system event).

For a protected event, AEMO can use a mixture of ex-ante solutions, such as the purchase of FCAS or constraining generation dispatch, to maintain the power system in a configuration such that, if the event were to occur, there is a better chance that its consequences can be limited to an amount of controlled load shedding.

#### How does a non-credible contingency event become a protected event?

The AEMC's new rule sets out a transparent framework for the identification, declaration (or revocation) and management of a protected event.

**The inclusion of an economic assessment allows for the severity of the consequences of certain non-credible contingency events to be balanced against the price outcomes associated with managing the event.**

- **Power system frequency risk review** – AEMO must undertake a review of power system risks associated with non-credible contingency events at least every two years. This is a collaborative exercise with TNSPs. The review must include a review of non-credible contingency events and possible management options.
- **Request for protected event declaration (or revocation)** – AEMO must develop and submit to the Reliability Panel a request for the declaration (or revocation) of a non-credible contingency event as a protected event in accordance with the outcomes of the power system frequency risk review.
- **Declaration (or revocation) of a protected event** – the Reliability Panel must, following a request from AEMO, undertake an economic assessment of the costs and benefits to the community of managing the non-credible contingency event as a protected event. Where the benefits of managing the event outweigh the costs of doing so, the Reliability Panel will declare the non-credible contingency event a protected event. The outcomes of the assessment include the declaration (or revocation) of a protected event and the determination of the target capabilities to apply to any new or modified emergency frequency control scheme where such a scheme is part of the management strategy of the protected event.
- **Management of a protected event** - Once a new or modified emergency frequency control scheme has been implemented in accordance with the target capabilities set by the Reliability Panel, AEMO will be able to manage the power system at all times, through the use of ex-ante measures such as FCAS or constraining generation dispatch, to maintain the frequency operating standards applicable to protected events, should the event occur.

#### **Why does the Reliability Panel have a role in protected events?**

Certain non-credible contingency events, if left unmanaged, could have significant impacts on the community, particularly where the result is a major black-out. The protected event framework allows AEMO to operate the system to limit the consequences of these types of events should they occur. However, this also comes at a cost to consumers, namely through the costs associated with AEMO buying frequency control ancillary services, or through higher electricity prices caused by AEMO constraining output from generators.

The Reliability Panel is the appropriate body to undertake the cost benefit assessment necessary to determine whether it may be economically efficient to maintain the power system within the frequency operating standards applicable to protected events, should the event occur. Where the benefits of managing the event outweigh the costs of doing so, the Reliability Panel would declare the non-credible contingency event a protected event.

This is similar to its existing functions in determining various NEM standards, which require it to exercise its judgement and make economic trade-offs to determine an efficient standard.

For information contact:

Media: Communication Director, Prudence Anderson 0404 821 935 or (02) 8296 7817

**30 March 2017**