AEMC

INFORMATION

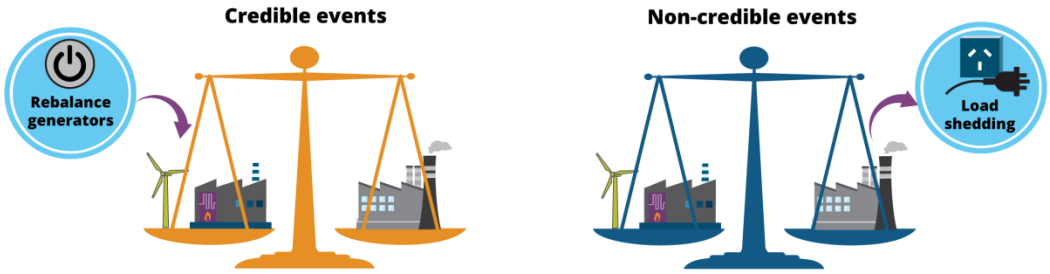
Fact sheet: What is a protected event?

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.

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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 though 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 of 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.

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30 March 2017