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{Lodged on-line at www.aemc.gov.au}

Dear Mr Pierce

Consultation Paper: Declaration of Lack of Reserve conditions

Please accept this submission to the Commission's Consultation Paper on the National Electricity Amendment (Declaration of Lack of Reserve conditions) Rule, proposed by AEMO.

AEMO's project to incorporate a better risk-based system into its PASA tools remains on track for delivery at the start of summer. AEMO appreciates the Commission's prioritisation of this rule change, which should enable it to be implemented in time for the highest risk period beginning mid-January 2018.

The Consultation Paper accurately captures the principal issues related to this rule change.

Please find attached some comments on:

- A proposed variation to address an identified drafting concern in AEMO's proposed rule.
- A suggestion for an effective implementation date.
- Information on project development.
- Other minor matters in the Consultation Paper.

For discussion on this submission, please contact Ben Skinner, Market Development Specialist on (03) 9609 8769.

Yours sincerely

Brett Hausler
Executive General Manager – Regulation and Governance

Attachment: AEMO Submission - National Electricity Amendment (Declaration of Lack of Reserve conditions) Rule Consultation Paper

1. Adjustment to proposed rule

AEMO has identified a concern that the use of the defined term *involuntary load shedding* in its proposed rule is broader than intended, and requests that the AEMC consider the adjustments described below:

- AEMO's initial proposed drafting for clause 4.8.4 (b)

  Lack of reserve condition – when *AEMO* determines, in accordance with the *reserve level declaration guidelines*, that the probability of *involuntary load shedding* is, or is forecast to be, more than remote.

- Suggested replacement for draft clause 4.8.4(b):

  Lack of reserve condition – when *AEMO* determines, in accordance with the *reserve level declaration guidelines*, that the probability of *load shedding* (other than *interruptible load*) is, or is forecast to be, more than remote.

- AEMO's initial proposed drafting for clause 4.8.4A(b)

  The *reserve level declaration guidelines* must:

  (1) describe how *AEMO* continually assesses the probability of *capacity reserves* being insufficient to avoid *involuntary load shedding* given reasonably foreseeable conditions and events;

  (2) describe how that assessment applies in relation to different periods of time;

  (3) specify two or more probability levels, at which *AEMO* will declare a corresponding *lack of reserve* condition in relation to a specified period of time, indicating an increasing probability of *involuntary load shedding*; and

  (4) be reviewed at least once every four years.

- Suggested replacement for draft clause 4.8.4A(b):

  The *reserve level declaration guidelines* must:

  (1) describe how *AEMO* continually assesses the probability of *capacity reserves* being insufficient to avoid *load shedding* (other than *interruptible load*) given reasonably foreseeable conditions and events

  (2) describe how that assessment applies in relation to different periods of time;

  (3) specify two or more probability levels, at which *AEMO* will declare a corresponding *lack of reserve* condition in relation to a specified period of time,

indicating an increasing probability of *load shedding* (other than *interruptible load*); and

be reviewed at least once every four years.

- Please delete from the glossary the following definition.

involuntary load shedding
Load shedding where the *load* shed is not an *interruptible load* except *load* under the control of underfrequency relays as described in clause S5.1.10.1(a), or a *scheduled load.*

The initial proposal had the unintended effect of obliging AEMO to declare LOR in conditions where there is a more than remote possibility of under-frequency relays being activated, because the definition of *involuntary load shedding* includes load shed under this mechanism (note the double negative in the glossary definition). During some network conditions, the prospect of under-frequency load shedding may arise even when there are excess capacity reserves. AEMO has discontinued the historical practice of declaring LOR2 for these conditions, which had caused confusion as the condition is unrelated to a lack of capacity reserve.

In the current version of the Rules, the italicised term "*involuntary load shedding"* appears only in clause 4.8.4. As the definition is not required for any other provision, it is simpler to remove it from the rules altogether than attempt to redefine it. In our new wording, we propose the alternative defined term of "*load shedding"* be used, with a qualifier excluding *interruptible load* (a defined term that incorporates load under the control of under-frequency relays).

We note that in clauses 5.16.1, 5.17.1 and 5.17.4 "involuntary *load shedding"* appears with the prefix "involuntary" unitalicised. It appears from context that these clauses intended to use only the defined term "*load shedding"* with the prefix applied in its plain English meaning. Thus these clauses should be unaffected by AEMO's proposed amendment.

2. Implementation date

AEMO's project to incorporate a better risk-based system into its Short-term and Predispatch PASA tools remains on track for delivery at the start of summer. AEMO recognises that the Consultation Paper's target of 19 December represents the fastest possible time to make the Rule. Assuming the Rule is made on that date, AEMO proposes that it should take effect in the second week of January, specifically Tuesday 9 January 2018 in order to avoid the holiday period (which is also a low demand period). By that time AEMO expects it will have been operating an offline trial for several weeks.

3. Project progress

AEMO is well progressed in its development of a Baysian Belief Network learning system based upon historical short-term forecasting errors and has specified a design for the necessary modifications to the PASA systems. As originally proposed, AEMO intends to provide a complete draft of the Guidelines to the Commission for publication alongside the draft determination in October 2017.

Whilst the Guidelines will provide a fulsome description, AEMO can now advise the following preliminary developments since the outline presented in section 4.2.3 of our Rule change proposal:

- AEMO intends to declare LORs on the *greater of* the existing contingency-based margin *or* the probabilistic error margin, as described in the diagram below. This is the matter raised by the Consultation Paper's question 4.
- The probabilistic error learning algorithm is being applied to the forecasting error of the result of the following equation in each region:
    - Unconstrained Intermittent Generation Forecast; plus
    - Scheduled Generator Availability; less
    - Operational Demand.
- Errors in network constraint forecasts will not be assessed in the initial version of the system.
- The learning has identified the following input states as relevant to the error distribution at any time, which will be applied to develop distributions in real-time:
    - Forecast time ahead of present.
    - Forecast temperature.
    - Forecast Unconstrained Intermittent Generation Forecast.
    - Current Operational Demand error.
- AEMO is trialling a 96% confidence interval for preparing the "Forecast Uncertainty Measure" (FUM). When short-term reserves fall below FUM, an LOR2 declaration will result according to the diagram below. Early studies suggest this would only marginally increase the number of days with declarations.
- AEMO intends to prepare FUM to a maximum of 48 hours ahead of present, and hold the value fixed from that point to the end of the short-term horizon (7 days).
- The LOR1 and LOR2 margin levels will be continuously published in the same short-term PASA and predispatch PASA output fields as they are presently.

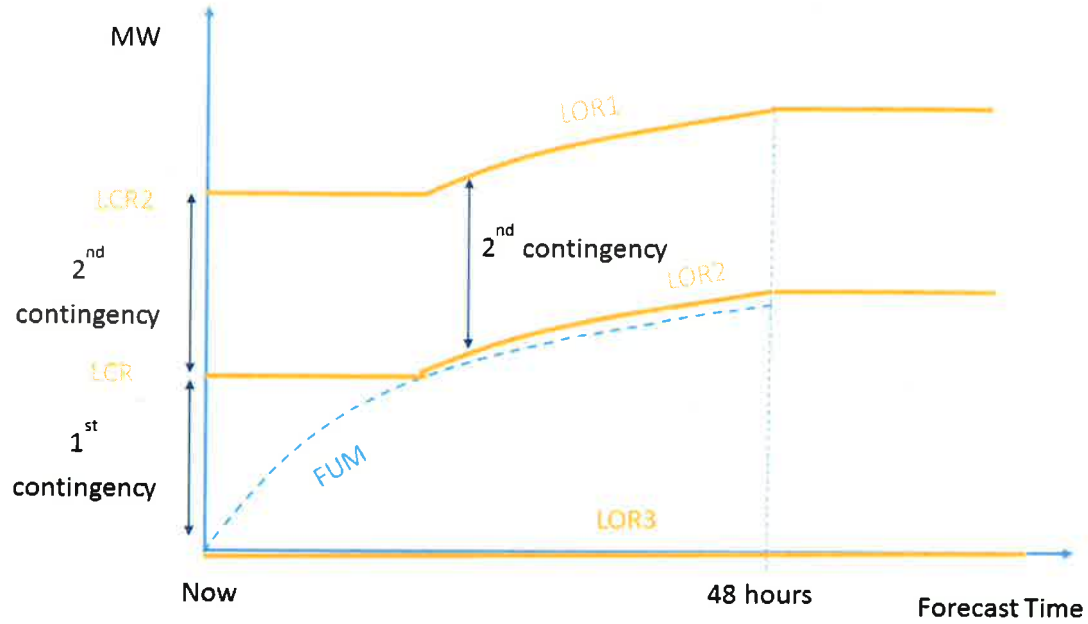

Figure: New LOR trigger regime approach.

4. Consultation Paper clarifications

The Consultation Paper accurately captures the main matters in relation to this Rule change. Please note the following:

- In respect of section 5.1, AEMO intends to retain three levels, LOR1, 2 and 3 in the initial version of the guidelines. LOR3 will be unchanged from its current definition, but as explained in the diagram above, LOR1 and 2 will be significantly altered.
- In respect of section 5.1, AEMO presently provides a value in its short-term and predispatch PASA output fields indicating the current LOR1 and 2 margins for each region. In deleting NER 3.13.4 (f) (6) (i) and (ii), AEMO did not intend to suggest that participants are not using this information, but rather that the precise conveyance of LOR information does not need to be specified in the Rules beyond the broad obligation to publish in NER 4.8.5.
- The discussion in section 5.2.2 accurately describes two possible approaches for incorporating both the existing contingency-based trigger and the probabilistic trigger into the LOR. AEMO has since formed the view that the second approach, being the *larger of* the two triggers, should be used for the initial design. Whilst AEMO welcomes industry and Commission feedback on the approach, it considers this should be a matter for the Guidelines' development rather than the Rules.