
Ministerial Council on Energy

Statement on Review of Under Frequency Load Shedding Arrangements December 2004

On Friday 13 August 2004, an equipment failure in New South Wales led to the loss of six major electricity generating units in that State, resulting in some customers in Queensland, New South Wales, Victoria and South Australia losing supply. For this particular event, approximately 1500 MW of customer load was automatically shed from the system. Power was restored progressively, with all affected customers fully restored within 2.5 hours of the incident occurring.

In extreme events such as 13 August when significant generation is lost, load is shed automatically from the system to rapidly balance supply and demand and stabilise system frequency within the relevant standards established by the Reliability Panel so as to maintain power system security. This is known as Under Frequency Load Shedding (UFLS). Under these arrangements, all National Electricity Market (NEM) States share the load shedding requirements. As far as reasonably practicable, allocations of load shedding between states should be equitable and apportioned approximately relative to demand in each state.

While the UFLS arrangements proved effective in restoring power system security following the system disturbance of 13 August 2004, the incident highlighted some areas where these arrangements could be improved. Load shedding has been reviewed in the NEM on a state by state basis. However, UFLS has never been reviewed across the entire NEM.

In response to issues arising from the load shedding incident of 13 August 2004, the National Electricity Market Management Company (NEMMCO) has commenced a NEM-wide review of the UFLS arrangements.

To guide this review, and to ensure outcomes are achieved that are consistent with that agreed by the Ministerial Council on Energy on 27 August 2004, NEMMCO has developed a set of 'Guiding Principles' in consultation with the Jurisdictional Coordinators in each state.

While the Guiding Principles are technical in nature, they capture the two main priorities for Governments. That is, the UFLS arrangements must above all else maintain power system security during and following the unplanned loss of capacity, and secondly must as far as reasonably practicable achieve an equitable allocation of load shedding between regions.

The MCE supports NEMMCO's conduct of the UFLS review on the basis of the agreed set of guiding principles.

Review of Under Frequency Load Shedding Settings

Guiding Principles

The following principles shall be adhered to in carrying out the review into under frequency load shed settings:

1. The prime consideration is to achieve protection against total or partial power system collapse following multiple contingency events. This principle takes precedence over all others.
2. The determination of under frequency load shedding settings will consider a range of scenarios, including multiple contingency events, against which the power system should be protected (*protected events*). These *protected events* would include, but not be limited to:
 - i. Loss of multiple generation in a region (each region to be considered in turn),
 - ii. Loss of interconnection between regions (each interconnector to be considered in turn).
3. The under frequency load shedding settings shall be established so that the power system frequency remains within the relevant standards as set out in the Reliability Panel frequency standards following any *protected event*.
4. Under frequency load shedding will be grouped into two categories:
 - i. *stabilisation* (to arrest the decline in frequency) and
 - ii. *recovery* (to recover the frequency back to 50Hz).

Time delays should not be used for under frequency load shedding required for the *stabilisation* of frequency. Under frequency load shedding for the recovery of *frequency* will include time delays.
5. As far as reasonably practicable, under frequency load shedding in each of the *stabilisation* and *recovery* categories should be shared among the NEM regions in proportion to the average region demands (in the absence of separation of regions). This should be based on the market data in the 12 months preceding the review.
6. At least 60% of the load in each region should be under the control of under-frequency load shedding.
7. To the extent practicable, load block sizes should be within the range of:
 - i. 100 to 300 MW for VIC, NSW and QLD
 - ii. 50 to 150 MW for Tas and SA
8. In analysis of under frequency load shedding, frequency control ancillary service should be assumed to be dispatched in accordance with NEMMCO's procedures.
9. Hydro pumps, and other loads that have a low likelihood of being available for tripping, should be treated as available for frequency control ancillary services only, and excluded from analysis of under-frequency load shedding.
10. Identification of the customers associated with any load block will be treated as confidential information unless the Jurisdictional Coordinator agrees otherwise.