System Restart Standard Review

SRAS from perspective of Generators & Major Users

27 April 2016

Issues

- **Major black outs can and will occur**
  - Expected once every 20 or 30 years
  - Risk increasing with higher penetration of renewables – particularly in South Australia

- **Restoration of load in system black is challenging and risky**
  - Individual black start sources are are likely to fail
  - Generators restarting are likely to fail
  - Rebuilding the network is risky and time consuming

- **Current arrangements appear unsuitable**
  - Likely to result in significant delays in restoration of load – current standard unlikely to be achieved
  - Risk of major economic cost
  - Risk of social disruption

- **Concerns regarding current standard and its application**
  - Does not take into account risks associated with restoring load
  - Standard focuses on an intermediate outcome – not the final restoration of load
  - Not based on economic trade off – costs versus benefits

Recommendations

- The System Restart Standard (SRS) should define outcomes required for a sub-region:
  - Amount of load to be restored - MW
  - Time for this load to be restored – Minutes
  - Reliability for standard being achieved - %

- The SRS vary from sub-region to sub-region

- Sub-regions be defined primarily on economic characteristics of load in region
  - Should take into account sensitive loads
  - Technical limitations important but secondary
  - Should not be limited by current availability of black start sources within region

- The SRS for a sub-region should be defined based on economic trade-off
  - Costs of achieving restoration times and reliability of these times vs. benefits of achieving them
  - Additional black start sources should be acquired while incremental cost < incremental benefit

- AEMO to provide much more transparency to improve validation

Possible implementation approach - overview

- Define potential sub-regions
  - Seeking to group loads with similar characteristics in geographic regions that could be restored as a region

- Develop "demand curve" for each sub-region
  - Seeking to define value of a range of restoration times, reliability and values to loads within that region
  - Estimates should be conservative – i.e. biased to understate value of restoration times

- Publish for comment draft sub-region definition and "demand curve"

- Develop understanding of possible "supply curve" for each sub-region
  - Seeking to understand range of costs and reliabilities or achieving a range of restoration times
  - This will need to examine all possible black start sources, generation and network issues
  - Estimates should again be conservative – i.e. biased to overstate cost of achieving restoration times

- Compare "demand" and "supply" curves for each sub-region
  - Based on this economic analysis set the SRS for each sub-region
  - SRS set at a level to ensure that value of restoration is expected to exceed costs of acquiring necessary SRAS
  - AEMO then responsible for sourcing SRAS to achieve standard at lowest cost