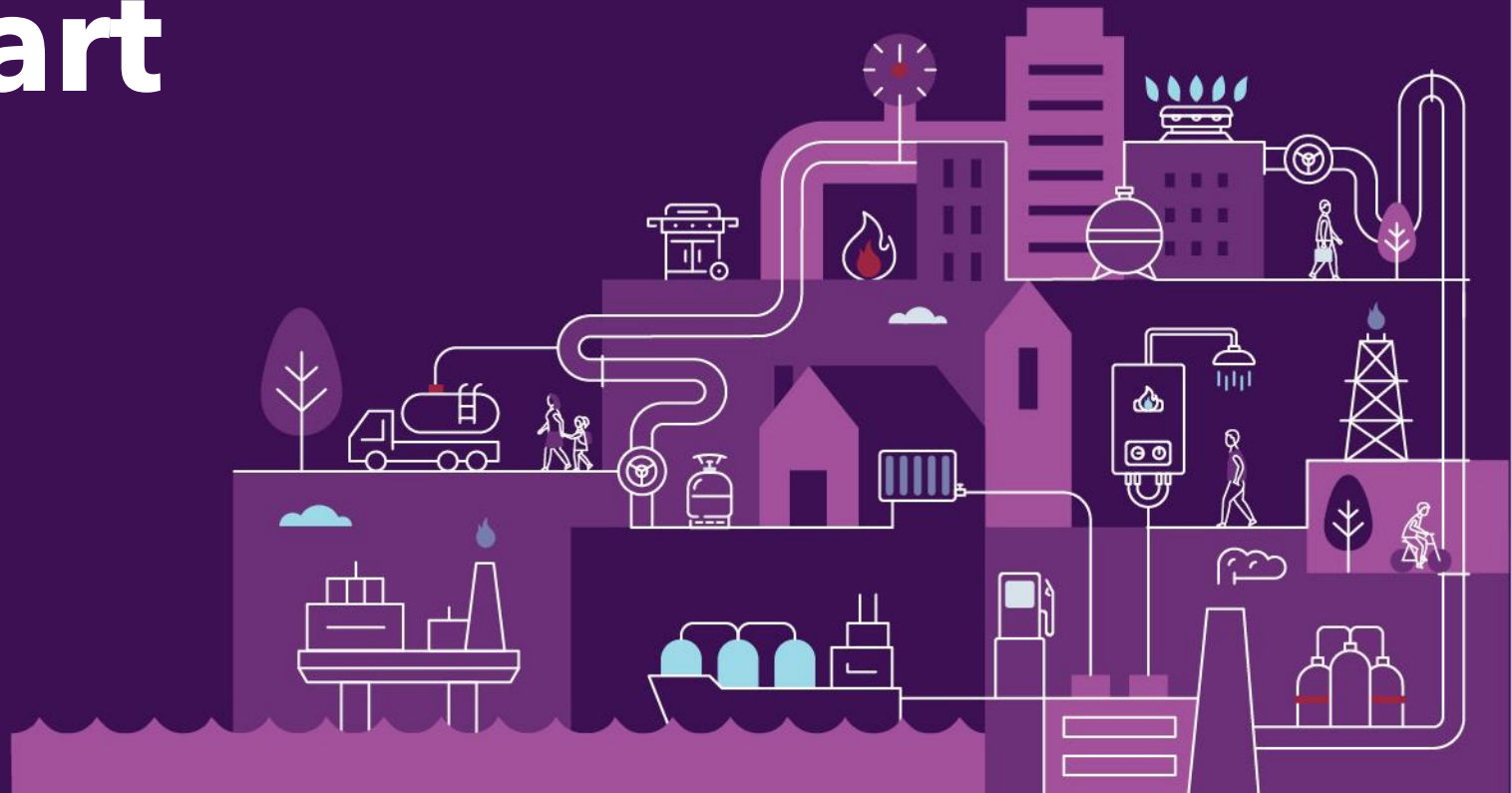
System Restart

WEM Procedure and Standard



Background

- Wholesale Electricity Amendment (Miscellaneous Amendments No.2) Rules 2021, gazetted in September 2021

- Schedule E will commence on 1 June 2022

Transitional Provisions

- AEMO must
  - develop and consult with stakeholders on a standard form contract for System Restart Service prior to the new WEM Commencement Day
  - publish standard form contract on the WEM Website
- Any existing System Restart Service Contracts continue to apply, and are deemed to comply with section 3.7, for the remainder of their contract term

WEM Procedure – Part i

AEMO must document the processes to:

i. determine the System Restart Standard and System Restart Plan
ii. review the System Restart Standard and System Restart Plan
iii. procure System Restart Services
iv. analyse and select System Restart Service submissions to meet the System Restart Standard
v. award the System Restart Service contract

WEM Procedure – Part ii

In relation to the standard form contract, AEMO must document:

i. required contract fields
ii. factors to consider when determining whether changes are reasonably required (variations)

New System Restart Standard

- Planned for 1st June 2022 publication
- As part of WEM rules amendments [WEM 3.7.2]
- AEMO differentiates Restart and Restoration phases following a system black event
- Key elements of System Restart Standard:
  - Electrical Sub-Networks
  - Diversity
  - Technical Requirements
  - Reliability
  - Timing

- At this stage will only include synchronous generation

WEM Rules Amendment

- Required elements of System Restart according to 3.7.2:
  a) Minimum time for System Restart Service to operate continuously
  b) Technical requirements to be eligible
  c) Diversity guidelines, including diversity of locations within the SWIS
  d) Requirements for mitigating against the risk of unavailability of any System Restart Service
  e) Any other matter that AEMO determines are necessary for a successful SWIS restart

(a) Minimum run time

- AEMO must procure services to operate the island/s under Isochronous control for the duration of the system restart.
  - System Restart Services capable of minimum of 12 hours continuously in Isochronous mode

(b) Technical requirements – Any Service

- Black start unit (BSU) or Trip to House Load Unit (TTHLU)
- Capable of:
  - Maintaining stability upon block loading network feeder up to 10 MW and motor load up to 5 MW
  - frequency regulation with Isochronous mode
  - holding output at fixed MW value
  - regulating voltage
  - operating in voltage range between 95% and 105% of rated terminal voltage
  - energising 330kV line section and 330/132kV 490 MVA transformer (may be via soft start energisation) where generating unit connected to 330kV
  - Absorbing reactive power from SWIS while operating within stable under-excitation area of capability curve
  - Remote control if not manned 24/7

(b) Technical requirements - Black start unit

- Each unit have a nominal power not less than 50 MW*
- 12 hour fuel supply at nominal power output
- Can provide 3 sequential black starts
- Mitigation plan for common mode failure in critical starting equipment
- Permission from environmental authority to waive air pollution restrictions for extended operation at reduced load levels during event or test
- Stable operation at full voltage and no-load (0 MW) and at low loads (<10 MW)

* Except where AEMO studies indicate a smaller unit may be accommodated

(b) Technical requirements - Trip to House Load Units

- Permission from environmental authority to waive air pollution restrictions for extended operation at reduced loads levels for event or test
- Stable operation at 0 MW export (net of house load)
- Export limit not less than 50 MW*

* Except where AEMO studies indicate a smaller unit may be accommodated

(c) Diversity guidelines - Electrical Sub-Networks

- AEMO to restart at least one electrical sub-network to restore supply in a timely manner
- Determination of sub-networks includes factors:
  - Transmission corridors connecting area to entire system
  - Electrical distance between generation centres
  - Quantity of generation in area
  - Quantity of load in area across various scenarios
  - Location of synchronising facilities
- Current sub-network boundaries:
  - North Metro
  - South Metro
  - South Country

(c) Diversity guidelines - System Restart Service Diversity and Strategic Location

- Considered to ensure generating unit and network element failures do not prevent SWIS restart
- To consider:
  - Electrical diversity
  - Technological diversity
  - Geographic diversity
- Considerations for strategic location of Services:
  - Proximity to restart-critical transmission network
  - Complexity of relevant parts of the network
  - Flexibility in re-configuring relevant parts of the network
  - Simplicity in establishing a path between the SRS and large generating units
  - Proximity to stable load

(d) Reliability

- AEMO must plan for more than one Restart Service to be available at all times
- Expected availability target of 95% for Restart Services*
- Service start reliability determined by regular testing
  - Twice a year or subject to AEMO requirements
- NSP must ensure reliability of network elements along agreed** restart pathways

*Exclusions include Planned or Consequential outages. Other considerations may be made

** Currently under discussion with Western Power

(e) Other requirements - Obligations for the NSP

- Network Service Provider must ensure adequate communications and remote switching capability
  - At least 8 hours on agreed* components in the Restart pathways
  - Beyond 8 hours, the NSP must ensure alternate means to manage remote switching and visibility of the system

* Currently under discussion with Western Power

Next Steps

September 2021

Wholesale Electricity Market Amendment (Miscellaneous Amendments No. 2) Rules 2021

March 2022

WRIG Presentation

April 2022

Commence WRIG Consultation

June 2022

WEM Procedure and Standard commences

July 2022

Develop standard form contract