SA synchronous generator requirements

Stakeholder briefing

2 March 2022

Objective

- Status update on the work packages underway investigating SA synchronous generator requirements
- Providing an opportunity to ask and answer questions relating to these ongoing work packages

Current status

- Current requirement for SA: with 4 synchronous condensers installed, SA has now moved to a 2 synchronous generator minimum.
- 2 synchronous generators currently provide the following aspects of system security:
  - Grid formation and grid reference capabilities
  - Ensure adequate operation of protection systems
  - To maintain rate of change of frequency below 3 Hz/s for non-credible loss of Heywood
  - Steady state voltage control
  - Secure operating envelope for voltage and transient stability
  - Ramping management

➔ Many system parameters and many interactions between parameters which make exact requirements difficult to independently specify

- Top tier priority for AEMO

Estimated timelines

- AEMO-driven studies planned for completion by mid 2022. These studies are nearing completion:
  - Grid formation
  - Impacts of non-credible separation of SA (including Protected Event submission for the separation of SA)
  - Small signal stability (power system damping)
  - Ramping management
- Support from NSPs required in defining the operational envelope
  - Transfer limit advice (operating envelope)
  - Protection adequacy (distribution and transmission)
- Following completion of these studies, develop and communicate detailed plan for next steps

Other options under consideration

- AEMO is considering options including contracts and market services to meet some power system requirements
- Further studies to be done to determine if other system requirements can be met through alternative arrangements

Study type	Status	Options under consideration	Next steps	Estimated timeframe
NSCAS gap	If the 2 synchronous generator requirement is removed prior to FYE25, NSCAS gap declaration of 40 MVAr reactive power absorption RSAS will be brought forward	Contracts, market services and network solutions	ElectraNet or AEMO to consider options	On completion of synchronous generator requirement assessments
Ramping management	Initial studies found some level of risk	Contracts, market services	Detailed studies ongoing	Mid 2022

Initial findings

- Initial desktop studies for grid formation and grid reference show SA system could be theoretically capable of ‘holding together’ without synchronous generators. Further desktop studies and real time tests required as this is world-first operation.
- Revisions to transfer limit advice required if the 2 synchronous generator requirement is reduced.
- Changes in the operating envelope for SA, alongside DER growth, is increasing complexity in operating the region.

Next steps

- Further updates to come mid 2022
- Next quarterly update will cover:
  - Findings of desktop analysis
  - Plan for next steps

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