

SA minimum synchronous generator requirements

Update

May 2023



Progress update

- AEMO and ElectraNet are assessing technical requirements and update operating procedures.
- Based on the advice currently provided, under some system conditions the minimum generation requirement in South Australia may be reduced to a minimum of one large 275 kV connected synchronous generator in the Adelaide metro region.
- Voltage control around Adelaide metro area is a critical factor in determining minimum number of synchronous generator requirement, especially in low demand periods.

Voltage control

- A minimum number of reactive power control devices are required to be online together with one large synchronous generator in the Adelaide Metropolitan region. Some of these devices are yet to be commissioned.
- A minimum of 2 synchronous units are required online during low demand conditions.
- ElectraNet is progressing a voltage control RIT-T* to ensure sufficient voltage control capability is provided in the Adelaide Metropolitan region.

*<https://www.electranet.com.au/wp-content/uploads/ritt/PSCR-EC.11645-Transmission-Network-Voltage-Control.pdf>

Grid reference

- The SA power system currently requires at least one large synchronous generator for grid formation and grid reference.
- Results of power system analysis suggest a synchronous generator may not be required for grid reference.
 - This means grid-following inverter-based resources can ‘latch-on’ to the voltage waveform supplied by the synchronous condensers.
- To be confident that power system security can be maintained in the absence of synchronous generation, appropriately scaled system tests will be required to demonstrate grid formation and grid reference.

Current status of the work

Tasks / Assessment	ElectraNet	AEMO
Voltage control	Complete	Work ongoing to ensure appropriate outage contingency plans are defined
Protection system changes	Complete	-
Transient stability	Complete	Complete
System strength	Complete	Complete
Power system damping	At final stage. Expected completion by end of May 2023.	-

Next steps

- ElectraNet and AEMO continue to assess technical requirements.
- AEMO will update constraints and operating procedures once all technical assessment is complete.
- AEMO will advise market at least 2 weeks prior to implementation of limits.
- Next regular update will be provided in June 2023.



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