

Power System Update

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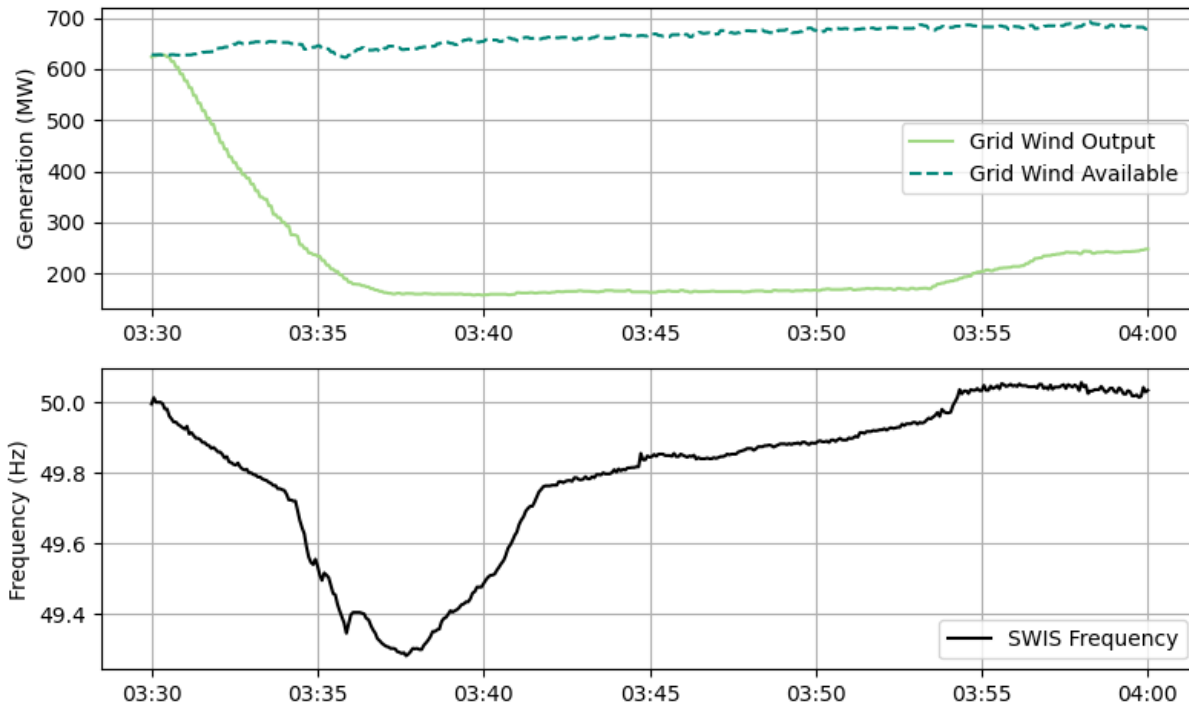
Keeping system frequency under control

- Stable power system frequency is a key to maintain system security and reliability.
- Inertia and Frequency Control (aka Primary Frequency Response) is the first stage of frequency management in a power system.
- Frequency control is the automatic response of Generating Systems to arrest and correct locally detected changes in frequency by changing their Active Power output.
- However, not every Generating System has frequency control implemented with the same consideration of network security and reliability.
- The ongoing energy transformation and greater reliance on intermittent generation causes additional challenges on maintaining system frequency.

Asynchronous Generating System Response to Low Frequency events

- Synchronous Generating Systems are currently expected to provide a droop response to both over- and under-frequencies outside of the 50 +/- 0.025 Hz dead band, at 4% droop.
- Most of existing Asynchronous Generating Systems (e.g. wind and solar farms) provide various responses to over-frequency events, but not to under-frequency events, an outcome not necessarily driven by technical limitations, but rather historical technical requirements.
- Where Asynchronous Generating Systems are operating at 100% of available primary energy, this limitation is clear.
- With more frequent dispatch of Asynchronous Generating Systems at targets below their maximum available generation, a response to a reduction in frequency would assist in ensuring system security.
- All new Transmission Connected Generating Systems, connected under the WEM Rules, will comply with these requirements.
- However, existing Asynchronous Generating Systems don't currently have this obligation and they don't respond in this way to frequency events.

Example Event



- An error in load forecast, as a result of a number of coincident IT system issues, resulted in dispatching down of several wind farms from 3:30am on 26th May 2022.
- Frequency declined to approximately 49.3 Hz due to the speed of wind generation ramping down.
- Droop response from wind farms would have limited the frequency decline as there was approximately 500 MW of wind generation available.

For example, a 100 MW NSG could provide an additional 35 MW of system droop response for a 0.7 Hz deviation (as in the event) if dispatched at 65 MW or lower. This would be larger for a larger unit, or with more partially-dispatched NSGs.

What comes next?

- In order to manage power system security, AEMO will be looking into how existing intermittent generators can provide a suitable response to frequency excursions when they are able to do so.
- More communication will be provided in due course.

Questions and Feedback

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