Annual Planning Outlook

Ancillary Services

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Ancillary Services

Ancillary Services are services used to help ensure the reliable operation of the power system. Ancillary Services make up a relatively small component of all power system costs but are a critical part of the overall power system.

The IESO contracts for four ancillary services: certified black start facilities, regulation service, reactive support and voltage control service, and reliability must-run. More information about ancillary services can be found on the IESO's website.

1. Regulation Service Needs

Regulation service is one of the four ancillary services the IESO contracts to help ensure the reliable operation of the power system. The main purpose of regulation service is to provide minute-to-minute balancing to ensure electricity supply matches demand. The IESO currently schedules a minimum of ±100 MW of regulation service at all times. Regulation service is currently provided by certain generation facilities with automatic generation control (AGC) capability, which permits them to vary their output in response to signals sent by the IESO. The IESO currently has +235MW of capacity which was procured through negotiated contracts to support the 100MW real time scheduling of regulation while allowing for outages to the remaining facilities when necessary.

The IESO conducted a regulation needs assessment in 2021 to determine if an incremental regulation need exists beyond today's minimum 100 MW requirement for a period up to 2026. The objective of the assessment was to maintain the IESO's compliance with the NERC's BAL-001-2 reliability standard over the assessed period. The assessment found that the IESO can remain in compliance using the existing regulation schedule of +/-100 MW. As such, there is no incremental need for scheduled regulation greater than +/-100 MW in Ontario up to 2026.

Compliance with the NERC's BAL-001-2 reliability standard is measured by the CPS1[1] and BAAL[2] metrics. Both metrics were calculated using Area Control Error (ACE)[3] and frequency deviation values as per the defined relationship in the standard[4]. Compliance with the NERC's BAL-001-2 reliability standard was projected to 2026 with a regression model using estimated ACE and frequency deviation values which were calculated considering impact from demand forecast error, resources off dispatch[5], and variable generation forecast error. Demand forecast error was scaled to maintain the same error profile with future demand growth. Variable generation forecast error was scaled to account for newly installed variable generation capacity. Resources operating off dispatch was

[1] CPS1 assigns each Control Area a share of the responsibility for control of interconnection frequency. Minimum required monthly performance is 100%.

[2] Balancing Authority ACE Limit or BAAL manages each Balancing Authority's (BA) risk on the interconnection and requires that no BA operate beyond this limit for more than 30 minutes.

[3] ACE measures the load/generation mismatch. Imbalances of supply and demand result in a non-zero ACE affecting frequency. NERC's standard (BAAL-001-2) determines compliance based on how far and for how long ACE can be outside of an applicable range.

[4] NERC BAL-001-2, https://www.nerc.com/pa/Stand/Reliability%20Standards/BAL-001-2.pdf

[5] Difference between resources' actual output and their constrained dispatch schedule.

updated for 2024-26 to account for the expected utilization of other resources when the Pickering generation facility is anticipated to retire.

The 2021 regulation needs assessment is an update to the one conducted in 2019 which indicated an additional regulation need of 15 MW identified in the 2019 Reliability Outlook. The latest assessment was based on a more comprehensive methodology which looked at multiple contributing factors described above as well as the effectiveness of the regulation fleet. The IESO plans to regularly conduct a regulation needs assessment in order to ensure our needs continue to be met into the future.

2. Black Start Needs

Black start service is one of the ancillary services the IESO procures to help ensure the reliable operation of the power system. The main purpose of the black start service is to restore the power system in a timely manner after a grid blackout. This service is provided through certified black start facilities that have black start capability – ability to start without power from grid-supplied station service or other generation unit support to energize transmission elements, other generation and load in a defined portion of the IESO controlled grid (ICG).

The IESO has the authority to determine the need for black start facilities as per Ontario Power System Restoration Plan (OPSRP). The IESO has developed a principle based methodology to assess black start needs in Ontario in consideration of i) the need to meet system requirements as Ontario's supply mix evolves; and ii) potential extreme weather events. The methodology assessed reliability and resiliency of the black start portfolio in Ontario based on the following principles:

- Black start portfolio must have **capability to energize nuclear units** among other OPSRP priorities to assist in starting up other key generation to restore the grid;
- **Geographic Diversity**: Black start portfolio must have at least one black start service facility in each island;
- **Resiliency**: Black start portfolio must have a) black start unit redundancy in each island, b) black start unit redundancy to energize nuclear units, and c) fuel diversity to energize nuclear units and in each island if there are concerns with fuel availability;
- **Dependability**: Black start facilities must be available throughout the year, perform successfully at tests and have capability to provide black start service for up to eight hours.

A reliable and resilient black start portfolio defined by the principles above will reduce the impact of blackout events in Ontario. The present portfolio satisfies the current black start needs as defined in the OPSRP, and the IESO will consider how the black start portfolio will evolve to account for resiliency based on future need.

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