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Winter 2017-2018 Operations and Market Performance



Federal Energy Regulatory Commission

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Background

- ISO-NE is a non-for-profit RTO
 - Oversees operation of New England's BPS
 - Administers wholesale electricity markets
 - Plans the system to ensure reliability
- The New England system consists of approximately 9,000 miles of high-voltage transmission lines

Background (cont'd)

- Approximately 350 generators (total generating capacity of approximately 31,000 MW)
- New England produced 49% of electricity using gas in 2016, up from 15% in 2000
 - Gas prices set price for electricity approximately 70% of the time
 - Availability of gas impacts grid reliability/production costs

Background (cont'd)

- New England has limited gas pipeline infrastructure serving the region
- Pipelines have reached their maximum capacity, especially in winter months when demand for gas to heat homes is at its highest

January 2004 “Cold Snap”

- ISO-NE’s concerns predate the 2014 Polar Vortex
- Extremely low temperatures during 2004 “Cold Snap”
 - High demand for electricity raised concerns about market and system performance
 - Revealed vulnerabilities of the New England BPS
 - Capacity limitations on the gas pipeline system
 - Availability of gas transportation for non-firm customers

January 2004 “Cold Snap” (cont’d)

- New England developed new operating procedures
 - Improve information on generator availability during cold weather conditions
 - Require generators to report availability
 - Details on ability to procure fuel
 - Any physical limitations of the generating unit

January 2004 “Cold Snap” (cont’d)

- ISO-NE also enhanced communications with the regional gas industry
 - Goal was to improve ISO-NE’s ability to anticipate conditions on the gas system
 - Procedures are still in effect today

Winter Reliability Programs

- Winter operation concerns returned during the 2012/2013 winter
 - Extreme cold weather led to constraints on the gas pipeline system
 - Gas-fired generators' unable to procure fuel
 - Increased reliance on oil-fired generation with low fuel inventories

Winter Reliability Programs (cont'd)

- Temporary winter reliability program developed
- Incentivized oil-fired generators to firm-up fuel
- Included a demand response (DR) component
- Incentives for investment in dual-fuel capability
- Procured roughly 4 million barrels of oil
 - Equals approximately 2 million MWh of energy
 - Almost all of the oil was needed that winter

Winter Reliability Programs (cont'd)

- Winter program expanded in 2014/2015 to include a liquefied natural gas (LNG) component
- Modified compensation: no upfront payment
 - Payments offset some of the costs of unused oil inventories and unused LNG contract volumes
- In September 2015, FERC approved winter reliability programs for 2015/2016, 2016/2017, and 2017/2018

2017/2018 Winter Reliability Program

- Intended to mitigate reliability risks associated with inadequate fuel supplies during severe weather conditions
 - Will run from 12/1/17 to 2/28/18
 - Requests to participate due to ISO-NE by 10/1/17
 - ISO-NE can reject any notice of proposed participation on any grounds

2017/2018 Winter Reliability Program (cont'd)

- Generators may not sell the fuel or fuel rights
- Generators participating in oil component must notify ISO-NE of their expected level of oil inventory by 12/1/17
- Generators participating in the LNG component must present executed LNG contracts to ISO-NE by 12/1/17

2017/2018 Winter Reliability Program (cont'd)

- Assets participating in the DR component must have additional capacity beyond their obligations in the Forward Capacity Market (FCM), be registered with ISO-NE, have meters installed and operational, and otherwise be fully ready to respond by 12/1/17

“Pay for Performance” (PFP) Market Enhancement

- 2017/2018 winter reliability program is the last one
- Winter reliability programs were a stop-gap measure until “PFP” in the FCM goes into effect
- On 6/1/18 the Tariff provisions for “PFP” become effective to be implemented
- “PFP” has stronger FCM incentives to invest in operational improvements/secure fuel arrangements

Winter Coordination/Communications

- Increased information sharing and operational interfaces with the gas pipelines
 - Gas Usage Tool allows ISO-NE to estimate the demand for gas by industrial and local gas distribution companies' customers, as well as gas-fired generators, compared to the capability of the gas pipeline system

Winter Coordination/Communications (cont'd)

- Conference calls with the Reliability Coordinators within NPCC (NYISO, IESO, New Brunswick Power Corporation, and Hydro Quebec)
- ISO-NE is in regular communication with the gas pipeline companies
 - Daily if not hourly exchange of information

Winter Coordination/Communications (cont'd)

- ISO-NE is in regular contact with coal, oil, and gas-fired generators
 - Monitor fuel arrangements throughout the winter
 - Monthly fuel surveys (can be sent weekly or daily)
 - For gas-fired generators, ISO-NE confirms each day that they have nominated sufficient volumes of gas to meet their day-ahead obligations

Operating Procedures to Maintain Reliability

- In planning for the winter season, ISO-NE takes into account a number of outage scenarios
- Includes the potential for some gas-fired generators to be temporarily unavailable during extreme cold weather conditions

Operating Procedures to Maintain Reliability (cont'd)

- If unexpected generator or transmission line outages occur, ISO-NE has Operating Procedure No. 4
 - Action During a Capacity Deficiency
 - Calling on DR resources to reduce their energy use
 - Importing emergency power from neighboring regions
 - Asking businesses and residents to conserve electricity
 - Up to 3,000 MW of relief through 11 action steps

Practical Implications/Challenges

- With the winter reliability program, ISO-NE expects to have adequate electricity supplies this winter
- Gas pipeline constraints continue to be a concern
 - Relief provided last winter by Spectra Energy's Algonquin Incremental Market project was short-lived due to the retirement in 2017 of more than 1,500 MW of non-gas units (Brayton Point Power Station)

Practical Implications/Challenges (cont'd)

- LNG shipments are unknown and will be closely monitored
- Non-gas resources will continue to play a vital role in maintaining reliability

Practical Implications/Challenges (cont'd)

- Biggest challenges this winter:
 - Extended cold weather when fuel inventories are depleted
 - A day when gas supplies are constrained and the region is using primarily nuclear, coal, and oil resources and suddenly a large non-gas resource is lost

Practical Implications/Challenges (cont'd)

- Region has adequate generating capacity to serve load under those conditions but the ability to meet energy needs is at risk if gas cannot be supplied to gas-fired generators
- System operators may have to rely on emergency actions to maintain operating reserves and meet energy needs reliably