2018 NPCC General Meeting

The Westin Prince Hotel
Toronto, Ontario
Wednesday, December 5, 2018
Agenda

Northeast Power Coordinating Council, Inc.
2018 General Meeting

“Reliability through Security and Fuel Assurance”

The Westin Prince Hotel
900 York Mills Rd.
Toronto, ON, M3B 3H2

1:00 PM to 5:00 PM – Wednesday, December 5, 2018

Welcome & Opening Remarks
Harvey Reed
NPCC Chairman

Edward A. Schwerdt
NPCC President & CEO

Electricity Information Sharing and Analysis Center (E-ISAC)
Bill Lawrence
Director - E-ISAC
Vice President, Chief Security Officer
North American Electric Corporation

BREAK

NPCC Fuel Assurance
Stephen Leahy, Vice President - Policy
Northeast Gas Association

Richard Levitan, President & Principal
Levitan & Associates, Inc.

John Norden, Director – System Operations
ISO New England, Inc.

Wes Yeomans, Vice President – Operations
New York ISO

Patrick Doyle, Manager, Operations Support
Hydro-Québec TransÉnergie

Closing Remarks
Philip A. Fedora, Assistant Vice President - Reliability Services
NPCC
Northeast Power Coordinating Council, Inc. (NPCC)

Antitrust Compliance Guidelines

It is NPCC’s policy and practice to obey the antitrust laws and to avoid all conduct that unreasonably restrains competition. The antitrust laws make it important that meeting participants avoid discussion of topics that could result in charges of anti-competitive behavior, including: restraint of trade and conspiracies to monopolize, unfair or deceptive business acts or practices, price discrimination, division of markets, allocation of production, imposition of boycotts, exclusive dealing arrangements, and any other activity that unreasonably restrains competition.

It is the responsibility of every NPCC participant and employee who may in any way affect NPCC’s compliance with the antitrust laws to carry out this commitment.

Participants in NPCC activities (including those participating in its committees, task forces and subgroups) should refrain from discussing the following throughout any meeting or during any breaks (including NPCC meetings, conference calls and informal discussions):

- Industry-related topics considered sensitive or market intelligence in nature that are outside of their committee’s scope or assignment, or the published agenda for the meeting;
- Their company’s prices for products or services, or prices charged by their competitors;
- Costs, discounts, terms of sale, profit margins or anything else that might affect prices;
- The resale prices their customers should charge for products they sell them;
- Allocating markets, customers, territories or products with their competitors;
- Limiting production;
- Whether or not to deal with any company; and
- Any competitively sensitive information concerning their company or a competitor.

Any decisions or actions by NPCC as a result of such meetings will only be taken in the interest of promoting and maintaining the reliability and adequacy of the bulk power system.

Any NPCC meeting participant or employee who is uncertain about the legal ramifications of a particular course of conduct or who has doubts or concerns about whether NPCC’s antitrust compliance policy is implicated in any situation should call NPCC’s Secretary, Ruta Skucas at 202-530-6428.
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NPCC
Electricity Information Sharing and Analysis Center

Bill Lawrence, VP/CSO, NERC, and Director, E-ISAC
NPCC General Meeting
December 5, 2018
Mission
The E-ISAC reduces cyber and physical security risk to the electricity industry across North America by providing unique insights, leadership, and collaboration

Vision
To be a world class, trusted source for quality analysis and rapid sharing of electricity industry security information
Organization

NERC CSO
Director, E-ISAC

Programs and Engagement Group
Operations Group
Threat Intelligence

Watch Operations Team
Cyber Analysis and Context Team
Physical Security Analysis Team
CRISP
Electricity Threat Landscape

E-ISAC Focus Area
1965 – Largest blackout impacting 45 million in northeastern U.S. and southeastern Ontario, Canada

1968 – National Electric Reliability Council (NERC) voluntary organization formed

1998 – Presidential Decision Directive-63 identified ISAC concept

1999 – Electricity ISAC established as a division of NERC

2003 – National policy to prioritize and protect critical infrastructure; Blackout #2 – 55 million

2006 – FERC certifies NERC as the “electric reliability organization” for the United States

2015 – ESCC initiated a strategic review of the E-ISAC to enhance capabilities for members

2018 – Launched the E-ISAC Long-Term Strategic Plan
Long-Term Strategic Plan

**Vision:** To be a world class, trusted source of quality analysis and rapid sharing of electricity industry security information

Supported by:
- NERC Board of Trustees
- Electricity Subsector Coordinating Council (ESCC)
- ESCC Members Executive Committee (MEC)

**E-ISAC Strategic Plan**

- **Information Sharing**
  - Accelerate sharing and high priority notifications
  - Enhance portal
  - Improve information flow and security
  - CRISP
  - CYOTE
  - CAISS
  - Strategic Vendor Partnerships

- **Analysis**
  - Hire and develop exceptional employees
  - Leverage information sharing technologies and resources to enhance analytical capability

- **Engagement**
  - Build trust and show value
  - Prioritize products and services
  - Metrics benchmarking
  - Evaluate 24x7 Operations (future)

**World Class ISAC**
• Accelerate sharing and high-priority notifications
  ▪ Deploy HF capability
  ▪ Gather requirements, develop plan, issue RFP for Event Management tool
  ▪ Develop strategic vendor partnerships

• Enhance Portal
  ▪ Develop detailed roadmap and begin implementations of portal enhancements including potential data visualization, enhanced authentication, user management and registration
  ▪ Implement User Communities

• Improve information access
  ▪ Build work plan with ESCC and CIPC to accomplish GridEx recommendations and lessons learned
• Acquire and develop high quality resources
  ▪ Hire additional cyber analysts and watch officers
  ▪ Enhance Industry Engagement Program (Canadian participation)

• Leverage technology
  ▪ Enhance CRISP data analysis
  ▪ Evaluate deployment of DOE malware forensics tools and dropbox
  ▪ Gather requirements and issue RFP for data warehouse and analyst workbench

• Metrics benchmarking
  ▪ Benchmark security metric data
Key Activities
Engagement

• Expand industry relationships and collaboration
  ▪ Enhance Energy (DNG, ONG) and cross-sector ISAC relationships (Water, Auto, REN, Nuclear, Comms, FS)
  ▪ GridSecCon 2018

• Build trust and value via user communities
  ▪ Develop User management registration requirements
  ▪ Build relationship with Cyber Mutual Assistance program

• Strengthen governmental, institutional, and private sector relationships
  ▪ Operationalize MOU with Canadian Cyber Incident Response Centre
  ▪ Signed trilateral MOU with Japan E-ISAC and European Energy ISAC
• **Voluntary Information Sharing**
  - IT Cyber Security
    - Indicators of Compromise
    - Phishing Emails
    - Software Vulnerabilities
  - Operational Technology
    - Industrial Control Systems
  - Physical Security
    - Intrusions
    - Theft
    - Gunfire

• **Watch Operations 24/7**
  - Contact us: [operations@eisac.com](mailto:operations@eisac.com)  202-790-6000
• Products
  ▪ Issue-specific reports
  ▪ Incident (cyber and physical) bulletins
  ▪ Weekly and monthly summary reports
  ▪ NERC Alerts
• Programs and Services
  ▪ Critical Broadcast Program (CBP)
  ▪ Monthly briefing series, first Tuesday of the month
  ▪ Grid Security Conference (GridSecCon)
  ▪ Grid Security Exercise (GridEx)
  ▪ Cyber Risk Information Sharing Program (CRISP)
  ▪ Industry Engagement Program (IEP)
• Tools
  ▪ E-ISAC portal (www.eisac.com)
  ▪ Cyber Automated Information Sharing System (CAISS)
• GridEx V
  ▪ November 2019
  ▪ Exercise response and recovery from simulated coordinated cyber and physical security threats and incidents
  ▪ Two days of distributed exercise play with Executive Tabletop
  ▪ Builds on GridEx IV lessons learned
• GridSecCon 2018
  ▪ Nearly 600 participants from across North America
  ▪ Opportunity to train, hear from industry leaders, network
• Securing the Grid series – classified one-day sessions
• Unclassified threat workshops (happening today)
The Industry Engagement Program is a multi-day immersive learning experience for electricity industry analysts:

- Increase familiarity with E-ISAC people, processes and programs
- Enhance comfort with information sharing
- Gain understanding about how the E-ISAC protects, analyzes and shares information
- Build and enhance industry relationships

Who Can Participate

- Electricity industry asset owner and operator organizations
- Cyber and physical security analysts

2018 IEP by the Numbers:

- 7 sessions, with 21 participants from 16 organizations
• 2019 Industry Engagement Program Dates
  ▪ January 29-31
  ▪ March 26-28
  ▪ May 29-31
  ▪ July 30-Aug 1
  ▪ September 24-26
  ▪ December 3-5

• Questions? Contact Memberservices@eisac.com
GridEx IV: Who Participated?

- 6500 Participants
- 450 Organizations
- 206 Electric Utilities
- 23 Cross-Sector Partners
- 20 States (2 full-scale)
• Enhance engagement and coordination with partners (e.g. cross-sector, law enforcement, emergency managers, etc.)
• Clarify government’s role during a grid emergency
• Implement E-ISAC Portal improvements
• Employ clear and consistent messaging during a crisis
• Ensure communications resiliency
• Support Cyber Mutual Assistance
• Offer on-keyboard cyber training
• Encourage lead planners to be active and engaged
Value Proposition

• Unique Insights
  ▪ North American view of grid security
  ▪ Credible, reliable, actionable analysis

• Leadership
  ▪ Relationships with industry, U.S. and Canadian governments, international partners
  ▪ Ability to rapidly convene industry leaders

• Collaboration
  ▪ E-ISAC portal, to include user communities and forums
  ▪ GridSecCon, GridEx, Industry Engagement Program (IEP)
Questions and Answers
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NPCC
Fuel Security & Natural Gas

The Northeast Power Coordinating Council General Meeting

Stephen Leahy
Northeast Gas Association
About NGA

- Non-profit trade association
- Local gas utilities (LDCs) serving New England, New York, New Jersey, Pennsylvania
- Several interstate pipeline companies
- LNG importers, suppliers and trucking companies
- Over 400 “associate member” companies, from industry suppliers and contractors to electric grid operators
- www.northeastgas.org
NGA’S ANTITRUST COMPLIANCE PROCEDURES

Adopted by the NGA Board of Directors on June 20, 2018

Objective

The Northeast Gas Association (NGA) and its member companies are committed to full compliance with all laws and regulations, and to maintaining the highest ethical standards in the way we conduct our operations and activities. Our commitment includes strict compliance with federal and state antitrust laws, which are designed to protect this country’s free competitive economy.

Responsibility for Antitrust Compliance

Compliance with the antitrust laws is a serious business. Antitrust violations may result in heavy fines for corporations, and in fines and even imprisonment for individuals. While NGA’s attorneys provide guidance on antitrust matters, you bear the ultimate responsibility for assuring that your actions and the actions of any of those under your direction comply with the antitrust laws.

Antitrust Guidelines

In all NGA operations and activities, you must avoid any discussions or conduct that might violate the antitrust laws or even raise an appearance of impropriety. The following guidelines will help you do that:

- **Do** consult counsel about any documents that touch on sensitive antitrust subjects such as pricing, market allocations, anti-employee poaching practices, refusals to deal with any company, and the like.

https://www.northeastgas.org/compliance_docs.php
Topics

- Winter Outlook
- Natural Gas Market Update
- Infrastructure Developments in Last Year
- Regulatory & Environmental Issues
Winter Outlook

- Storage levels lower than average
- U.S. gas production higher this year – new annual output record likely
- LNG imports to region remain lower but still significant for winter peak market
- Commodity price higher than last year but generally in $3/Mcf range – although spot price volatility increasing in recent month
- FERC Winter Assessment, 10-18-18:
  - “Regional pipeline constraints in New York City, Boston and Los Angeles increase the risk of price volatility.”
Recent Metrics

Storage Levels

Working gas in underground storage compared with the 5-year maximum and minimum billion cubic feet.

- U.S. stocks currently 19% below 5-year average;
- East Region stocks 13% below average.

Spot Price, Jan. 2017 - Nov. 2018

Natural gas spot prices (Henry Hub)

- Source: U.S. Energy Information Administration
- Source: Natural Gas Intelligence

Chart: US. EIA, 11-29-18
Natural Gas Market Update
Interstate Pipelines Serving NGA Region

Northeast Gas Association
Interstate Pipelines
2012

Legend:
- Algonquin Gas Transmission
- Columbia Gas Transmission
- Dominion Gas Transmission
- Empire Pipeline
- Iroquois Gas Transmission
- Granite State Gas Transmission
- Maritimes & Northeast Pipeline
- Millennium Pipeline
- National Fuel Gas Supply
- PNGTS / M&N Joint
- PNGTS
- Tennessee Gas Pipeline
- Texas Eastern Pipeline
- TransCanada
- Transco (Williams)

Copyright: Northeast Gas Association
Prepared by: Coler & Colantonio, Inc.
February 2012
Natural Gas Service Areas
Northeast Production

Northeast region producing ~29 Bcf/d. Further growth expected.

PA is now 2nd largest gas producing state in U.S., behind Texas.
Last Winter, Multiple Gas Utility Sendout Records Set


- New England natural gas utilities collectively set 3 new sendout records that week – with new all-time peak set on 1-6-18, at close to 4.4 Bcf.

- Good gas-electric communication during winter and cold snap.
Gas Utility Growth Has Continued

Since 2010, natural gas has added over 1 million new household customers in the Northeast states.
Recently-Added Gas Generation Capacity

Footprint Power
Salem Harbor
Salem, MA
674 MWs
Online June 2018

CPV Towantic Energy Center
Oxford, CT
805 MWs
Online June 2018

CPV Valley Energy Center
Wawayanda, NY
680 MWs
Full commercial operation, October 2018
Infrastructure Developments
Projects Recently Completed / Entered Service in 2018

- Enbridge & DTE Energy: “NEXUS Project”
- Energy Transfer: “Rover Pipeline”
- Millennium: “Valley Lateral Project”
- PNGTS: “Portland XPress” [phase 1]
- Transco: “Atlantic Sunrise”
- Transco: “Garden State Expansion Project” [phase 2].
Most New Capacity Directed Outside the NY/NE Area

Map: U.S. EIA, 5-18
Con Ed’s “Smart Solutions” – Planned Mix of Efficiency, Electric, CNG, LNG & RNG

Smart Solutions for Natural Gas Customers

• Solution 1: Enhanced Gas Energy Efficiency Program
  – Implementation Plan – filed March 2018
• Solution 2: Gas Demand Response Program
  – Implementation Plan (Pilot) – filed April 2018
• Solution 3: Gas Innovation Program
  – RFP - second quarter 2018
• Solution 4: Market Solicitation for Non-Pipeline Solutions
  – RFP – released December 15, 2017; responses received March 1, 2018
• Solution 5: Parallel Planning for Traditional Pipeline Solution

Read Con Edison’s Smart Solutions for Natural Gas Customers filings:
Proposed In-State Pipeline & LNG for System Reliability

Granite Bridge Pipeline

- New 16” pipeline linking existing infrastructure
- Located in NHDOT right-of-way along Route 101
- Utilize an Energy Infrastructure Corridor
- 27 mile route between Manchester and Stratham
- No eminent domain or FERC preemption
- Lowest cost option to meet customers’ needs
Regulatory & Safety Issues
Federal Review of Pipeline Permitting

In April, FERC issued Notice of Inquiry seeking public comment on its approach to the certification of new interstate natural gas pipelines (Docket No. PL18-1-000)

- Should the current process be updated/revised?
- What should be the criteria?
- What about environmental concerns/GHG?
- Balancing federal and state oversight.
- Comments submitted in July.

In February, the Government of Canada introduced proposals to replace the National Energy Board (NEB) with a new agency, the Canadian Energy Regulator, and to enact an Impact Assessment system “to better incorporate environmental review into major infrastructure projects.”

- A single Agency, the Impact Assessment Agency of Canada, would lead all impact assessments for major projects.
- The proposals need to be approved by Parliament.

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Merrimack Valley Incident

- Overpressurization incident on Sept. 13 on Columbia Gas of MA system in Lawrence, MA.
- One fatality, 20 injuries, 131 homes damaged (with 5 destroyed). About 8,500 meters in 3 towns had gas service interrupted. Services lines and in-home appliances (boilers, dryers, water heaters) needed to be replaced.
- System restoration progressing. Pipeline replacement of ~45 miles completed. As of Dec. 1, gas heat & hot water had been restored to over 90% of impacted residences.
- NTSB released preliminary report on Oct. 11. MA DPU has hired consultant to conduct safety & operational assessment of entire state gas distribution system. NGA seeking consultant to develop “Pipeline Safety Management System” for MA (and other states’) utilities.
- NGA remains grateful to all the utilities from multiple states for providing workers in response to mutual aid request. Thanks also to the American Gas Association and Canadian Gas Association.

Photo: NTSB
Questions?
Fuel Assurance Analysis in New England

Northeast Power Coordinating Council
General Meeting

Richard L. Levitan, rll@levitan.com
December 5, 2018
Fuel Assurance Analysis Activities

- Supply adequacy
  - Is there enough natural gas to meet customer needs?
- Infrastructure adequacy
  - Can supply reach customer locations?
- System resilience
  - Is there ample system flexibility when gas side contingencies arise?
- Mitigation
  - Are current mitigation measures sustainable?
  - Are alternative LNG solution sets realistic?
Supply Adequacy Analysis

- Comparison of supply and demand
  - Mathematical/spreadsheet model
- Flow into New England is the limiting factor for supply
  - Consideration of infrastructure expansions
- LNG represents additional supply when contracted or market conditions support sendout
  - Upstream supply chain limits just-in-time usability to storage inventory
- Multiple demand scenarios possible based on forecast variables for both the utility and generation sectors
Supply Balance w/o LNG to Pipelines (Winter 2021-22)

-6,000 -4,000 -2,000 0 2,000 4,000 6,000

12/1 1/1 2/1

Gas Volume (MDth/d)

Distrigas
Mystic
Iroquois from Upstate NY
PNGTS Pittsburg
Tennessee West to East
Algonquin Southeast
Atlantic Canada
Iroquois to Downstate NY
Utility Sector
Generation Sector
Supply Surplus (Deficit)
Infrastructure Adequacy Analysis

- Consideration of infrastructure limitations
  - Hydraulic models – steady-state (flat demands) and transient (varying intraday demands)
- Flow of gas is limited by throughput capacity
  - Varies between pipelines and within pipelines
- Pipelines sized to meet firm customer demands
  - Strategic considerations related to location of non-firm generator demands – move demand from constrained locations to unconstrained locations
New England Infrastructure Model

Note: Granite State not included
System Resilience Analysis

- System recovery from adverse events
  - Hydraulic models – transient
- Disruption impacts determined by location and severity
  - Supply loss, pressure diminution, throughput interruption
  - Relative to alternate supply locations, distance from demand
- Hydraulic analysis is scenario specific
  - Time of year, time of day, type of event, location of event
  - Can also evaluate impacts of electric-side contingencies as the demand changes affect pipeline utilization
Post-Contingency Generator Delivery Pressure Profile

- **Delivery Pressure (psig):**
  - 500
  - 600
  - 700
  - 800

- **Generation (MWh):**
  - 0
  - 100
  - 200
  - 300
  - 400
  - 500
  - 600
  - 700
  - 800

- **Key Events:**
  - Rupture Occurs
  - Plant Offline

- **Timeline:**
  - 8/6/18 0:00 to 8/7/18 24:00

- **Graph Details:**
  - Blue line: Delivery Pressure
  - Red line: Generation
  - Dashed red line: Post-Trip Scheduled Generation

**Note:** The graph illustrates the delivery pressure and generation over time, showing the impact of a rupture and plant shutdown.
Mitigation Analysis

- How to protect the system from supply shortfalls or during post-contingency period

- Mitigation measures for inadequate supply under baseline or contingency conditions
  - Alternate supply – full use of interconnections and cooperation with other pipelines, increased LNG imports
  - Underutilized infrastructure – ramp up compression horsepower
  - Demand reduction or relocation
LNG Supply Availability

- Sendout requires inventory to be available in on-site storage tanks
- Northeast Gateway confers no capacity benefits, i.e., arbitrage Atlantic basin trade
- Complicated logistics for scheduling cargoes
  - Canaport located relatively from far market
  - Tight tankage limitations at Everett
  - Back-end vapor into TN / AGT dependent on continued Mystic operation
  - Truck transported LNG to satellite tanks for LDCs dependent on continued Mystic operation
Historical Distrigas Sendout

- Mystic 8&9 Daily
- Tennessee Daily
- Algonquin Daily
- Total Pipelines Monthly Average
- Total Pipelines and M8&9 Monthly Average

Distrigas Sendout Volume (MMBtu/d) vs Time

Years: Jun-12 to Jun-18
Sendout from Northeast LNG Terminals

LNG Sendout (MDth/d)

Northeast Gateway  Canaport  Distrigas
Key Take-Aways

- Infrastructure adequacy plagued by deliverability constraints during the peak heating season
- System resiliency is good during the 2018 August peak
- System resiliency is poor during the heating season when gas side contingencies are postulated
- Achievable winter season mitigation through increased LNG sendout is an integral part of any solution set
  - May require contract formation to support increased operating regime from Canaport and Distrigas
  - Incremental mitigation from Canaport relatively trivial during cold snaps
- Reliance on oil-fired generation may require contract formation
OP-21 Energy Emergency Forecasting & Reporting

NPCC General Meeting

John Norden
DIRECTOR OPERATIONS
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Highlights

• During the extreme cold weather of Winter 2017-2018, it became clear that the effectiveness of OP-21 would be enhanced by the addition of an Energy Emergency Forecasting and Reporting framework.

• OP-21 “Energy Inventory Accounting and Actions During an Energy Emergency” has since been revised and changes are in place for Winter 2018-2019 to reflect a new 21-day Energy Emergency forecasting and reporting process.

• The initial 21-day Energy Emergency forecast and report was published on November 26, 2018 and the latest published this week at:
  – www.iso-ne.com/21-day-report
OP-21 Background

- OP-21 documents the processes ISO utilizes in order to:
  - Collect fuel availability and environmental limitation information from resources in the region
  - Communicate with regional stakeholders regarding matters related to resource fuel availability and environmental limitations
  - Forecast and report on expected energy availability over a 21-day look-ahead period
  - Declare Energy Alerts and Energy Emergencies based on forecasted or real-time system conditions
  - Take appropriate action in anticipation of, or during, an Energy Alert or Energy Emergency
Energy Emergency Forecast

• ISO will perform Energy Emergency forecasting and reporting using an hourly 21-day energy assessment

• Results of the Energy Emergency forecast will be compared against forecast alert thresholds in order to identify and communicate potential reliability issues to regional and national stakeholders via declaration of Energy Alerts and Energy Emergencies

• New forecasting and reporting framework will:
  – Alert stakeholders to the potential for near-term forecasted energy deficiencies
  – Allow resources in short supply of fuel to take action to replenish fuel supplies
  – Allow resources with potential environmental limitations to obtain additional credits or pursue regulatory relief to mitigate the limitation
  – Allow resources to take action to shorten or reschedule maintenance or repair to transmission facilities or resources throughout the region
  – Inform regulatory and government entities of potential energy deficiencies
Energy Emergency Forecast, cont.

• Assumptions used in the forecast include:
  – 21 day weather and hourly load forecasts
  – Expected operating reserve requirements
  – Expected tie line availability and flows
  – Expected fuel availability based on OP-21A survey responses
  – Expected pipeline capability including known outages and reductions
  – Expected transmission and resource outages and reductions
  – Expected LNG tank volumes including known replenishment

• OP-21A generator surveys will be performed weekly during winter months (Dec-Mar), and bi-weekly during non-winter months (Apr-Nov)
  – Will increase to daily if Energy Alert or Energy Emergency is declared
Energy Emergency Forecast, cont.

- **Energy Alert** is declared when the forecast indicates the potential for use of OP-4 Actions 6-11 (10 Min Reserve Deficiency) or OP-7 Actions (Load Shed) in at least 1 hour on 2 consecutive days in **days 6-21** of the forecast.

- **Energy Emergency** is declared when the forecast indicates the potential for use of OP-4 Actions 6-11 (10 Min Reserve Deficiency) or OP-7 Actions (Load Shed) in at least 1 hour on 2 consecutive days in **days 1-5** of the forecast.
Energy Emergency Forecast, cont.

• Energy Alerts and Energy Emergencies will be communicated by ISO staff to:
  – Local Control Centers
  – Neighboring Reliability Coordinators/Balancing Authorities
  – Market Participants
  – New England state regulators
  – Publicly on website

• Energy Emergencies will be reported to all above and in addition to the U.S. Department of Energy (DOE)

• Declaration of an Energy Emergency will result in the use of OP-4 or OP-7 actions in real-time without a corresponding real-time capacity deficiency in order to conserve fuel
Energy Emergency Forecast, cont.

- The Energy Emergency forecast and report will be produced weekly during winter months (Dec-Mar), and bi-weekly during non-winter months (Apr-Nov)
- Forecast results and report will be published externally on the ISO-NE website www.iso-ne.com/21-day-report
- Report will include an analysis of significant factors contributing to the Energy Alert or Energy Emergency
- Indications of declared Energy Alerts and Energy Emergencies will be visible on the ISO-NE website and the ISO-to-GO mobile app
- If an Energy Alert or Energy Emergency has been declared, the forecast will be produced daily until the declaration criterion is no longer met
Energy Surplus does not fall below 5,000 MW in any hour
Energy Surplus does not fall below 5,000 MW in any hour
Oil Depletion Chart 11/26/18
NYISO Fuel & Energy Security Initiative

Wes Yeomans
VICE PRESIDENT, OPERATIONS

NPCC General Meeting - Fuel Assurance
December 5, 2018
NYISO Overview
Roles of the NYISO

- Reliable operation of the bulk electricity grid
  - Managing the flow of power on 11,000 circuit-miles of transmission lines from hundreds of generating units
- Administration of open and competitive wholesale electricity markets
  - Bringing together buyers and sellers of energy and related products and services
- Planning for New York’s energy future
  - Assessing needs over a 10-year horizon and evaluating projects proposed to meet those needs
- Advancing the technological infrastructure of the electric system
  - Developing and deploying information technology and tools to make the grid smarter
NYISO by the numbers

- New York population: **19.85 million**
- 2017 Energy Demand: **156,370 GWh**
- 2018 Required Installed Capacity: **42,839 MW**
- 2017 Peak: **29,699 MW**
- Record peak: **33,956 MW (July 19, 2013)**
- Transmission: **11,173 circuit miles**
- Power Generation: **700+ units**
- Wholesale Market Participants: **434**
- Average Annual Market Transactions: **$5.3 billion**
2019 Fuel and Energy Security Assessment
Background

- An extremely important element of grid resilience is fuel and energy security.
- Future changes to New York’s fuel supply mix as well as the expected increased demands for natural gas may challenge the ability to meet electric system demands under certain stressed system conditions.
- Retain an external consultant to perform a forward-looking study to examine fuel and energy security for the New York State grid.
- The study will report:
  - Any future reliability issues.
  - Describe fuel security initiatives underway in other regions.
  - Provide recommendations for potential operational and/or market enhancements necessary to improve fuel and energy security.
Study Overview: Study Year

- The proposed study period will be the 2023-2024 winter
  - The selection of this study period was informed by consideration of various factors, including:
    - Planned retirement timeframe for the Indian Point nuclear units
    - State’s stated timeframe for completing the retirement or conversion of the remaining coal generation in New York
    - Expected timeframe for implementing potential new NOx emissions requirements for existing older gas turbines
  - The fuel and energy security assessment will primarily be focused on a long duration of consecutive days of cold weather conditions
Study Overview: Methodology

- The assessment will be a deterministic analysis. The assessment will evaluate the fuel adequacy of the resource mix to serve the projected load requirements based on the specified system conditions.
  - Fuel security risk will be identified as any inability to meet load and/or reserve requirements without emergency actions.
- The assessment will not be:
  - An economic analysis that directly considers fuel costs;
  - A resource adequacy evaluation reflecting probability distributions or loss of load expectation (LOLE) criteria; or
  - A full transmission security assessment.
Study Overview: Assumptions

- The “starting point” assumptions for supply resource mix and energy load forecasts will come from the 2017 CARIS Phase 1 System Resource Shift case with updated information and projections of potential changes for the 2023-2024 winter period
  - Availability of pipeline and LDC system service to gas fired generators
  - Starting oil inventory and replenishment capability for dual fuel and oil-only resources
  - Potential impacts of emissions restrictions or other limitations on resource production capability, including limitations on operation using alternative fuel sources
  - Regional market interchange quantities
- All assumptions to, and reviewed with, stakeholders prior to commencing the assessment will be presented
Study Overview: Scenario Analysis

- Potential scenarios to be considered include:
  - Loss of the most significant interstate pipeline
  - Loss of the most significant, single internal LDC pipeline
  - Loss of the most significant, single gas pipeline “city-gate” connection to the New York Facilities System
  - Scenarios assuming different starting oil inventories and replenishment capability
  - No duel fuel capability or complete inability to operate on alternative fuel sources
  - No gas available to generators (either statewide or on a locational basis)
  - Reduced availability of hydroelectric generation due to river ice jams

- Proposed scenarios will be presented to, and reviewed with, stakeholders prior to commencing the assessment
Study Overview: Study Report

- If fuel security risks are identified, next steps include developing recommendations for potential market and/or operational enhancements necessary to minimize the identified reliability concerns.
The Mission of the New York Independent System Operator, in collaboration with its stakeholders, is to serve the public interest and provide benefits to consumers by:

- Maintaining and enhancing regional reliability
- Operating open, fair and competitive wholesale electricity markets
- Planning the power system for the future
- Providing factual information to policymakers, stakeholders and investors in the bulk power system

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