



North American Energy Standards Board (NAESB)

**Electric and Gas Industry Coordination in
New England: Cold Weather Conditions**

Houston, Texas
February 9, 2005

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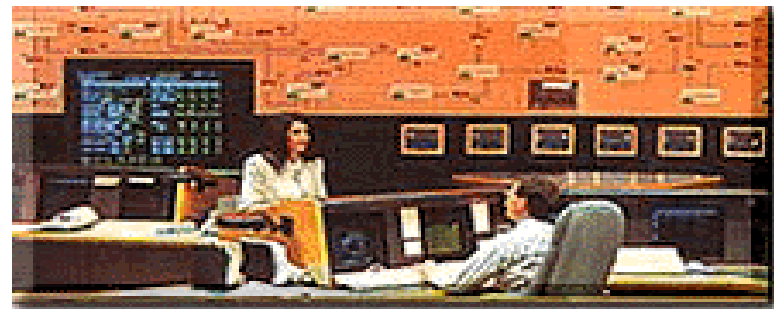


ISO New England Overview

- Private, not-for-profit corporation created in 1997, regulated by Federal Energy Regulatory Commission
- Independent System Operator
 - Independent of companies doing business in the market
 - Independent Board of Directors
- Established as Regional Transmission Organization for New England – Feb. 1, 2005
- Responsible for:
 - System reliability
 - Administration and oversight of wholesale electricity markets
 - Regional transmission tariff
 - Regional system planning



ISO New England in Holyoke, Massachusetts.

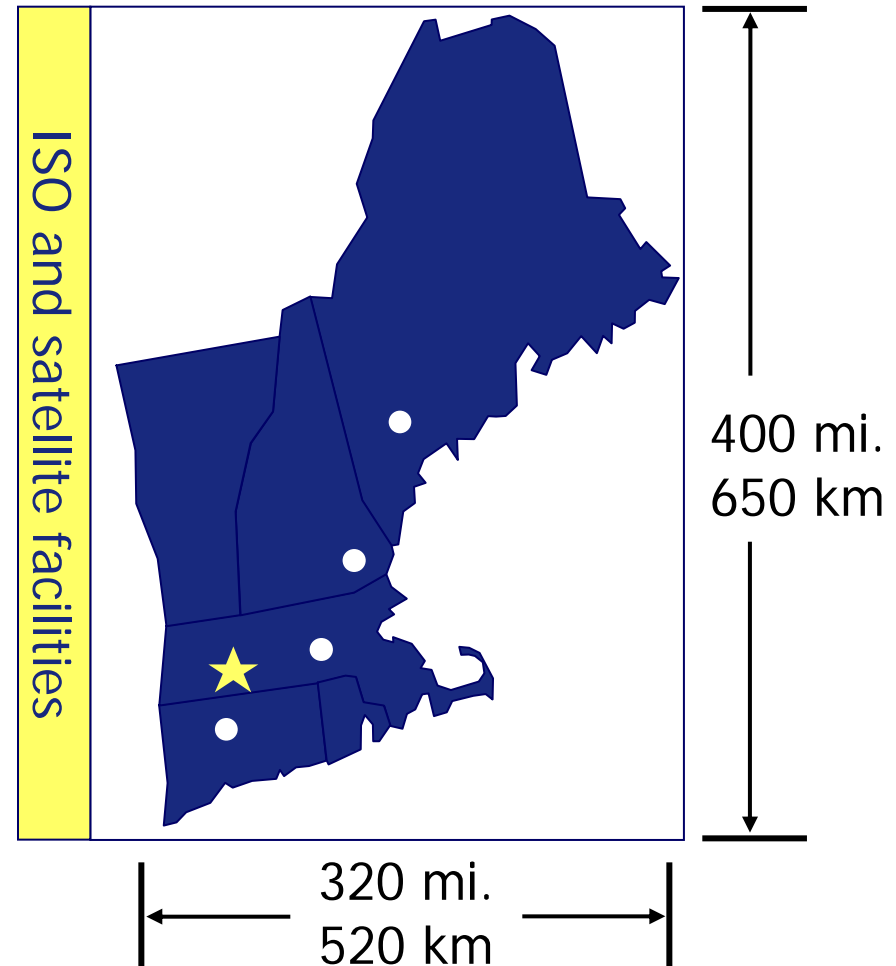


A partial view of the display board in ISO's main control room.



New England's Electric Power Grid

- 6.5 million customer meters
- 350+ generators
- 8,000+ miles of high voltage transmission lines
- 4 satellite control centers
- 12 interconnections to neighboring systems
- 32,000 MW of installed generating capacity
- Peak load:
 - Summer: 25,348 MW
 - Winter: 22,818 MW





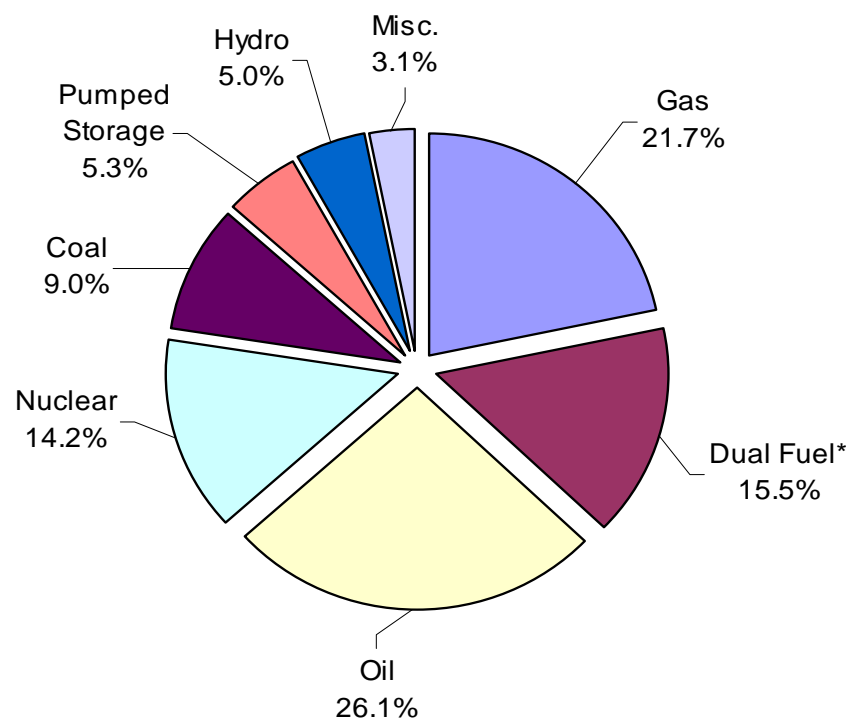
January 14-16, 2004 – “Cold Snap”

- Coldest winter period in New England in 20 years
 - Sixth coldest temperatures since 1960
 - Coldest month for Boston in 100 years
- Record-setting winter demand for electricity and natural gas
- First extreme cold weather for new combined cycle gas units
- Regional gas pipelines had operational restrictions in effect
- Nearly 30 percent of the region’s generation capacity was unavailable
- Shortage of operating reserves led to emergency procedures
- The lights stayed on



New England Installed Capacity

- New England relies heavily on natural gas for power generation
- Total installed capacity
 - 32,000 MW
- Approx. 40 percent is gas fired
 - Gas only: 21.7%
 - Dual-fuel (primary gas): 15.5%
 - Subject to permit limitations
- Virtually all of the 10,000 MW of new generation capacity installed since 1999 is gas fired





Cold Snap Report

- ISO issued Interim Cold Snap Report in May
 - Received stakeholder comments from state regulators and market participants
- ISO issued Final Cold Snap Report and Management Response in October
 - 23 recommendations formed basis for remedial actions in four areas:
 - System Operations and Reliability;
 - Market Timelines and Flexibility;
 - ISO Operations and Implementation; and
 - Market Monitoring and Analysis



Issues Defined

- **Coordination and Timing:**
 - Electric and gas system coordination and communication is critical during coincidental peak demand conditions
 - Timing of gas and electric trading deadlines are not well aligned
 - High gas price volatility leads to significant financial risk for gas units
- **Infrastructure:**
 - Natural gas remains “fuel of choice” for new generators
 - Natural gas pipeline owners are not expected to build infrastructure without commitments for long-term firm contracts
 - Over the next 10 years, new gas supply into New England may be LNG



Stakeholder Process

- ISO led stakeholder process to put changes in place for winter 2004/05
 - Included representation from electric and natural gas industries, state policymakers and state regulators
 - ISO leveraged existing stakeholder process
 - Fuel Diversity Working Group charged with Electric and Gas Wholesale Initiative to identify major issues and possible solutions
 - Stakeholder meetings in March, May and November
 - ISO and NEPOOL established Cold Snap Task Force
 - Reviewed market rules and operating procedures
 - Developed straw proposals
 - Stakeholder meetings in March and April
- Changes effected through new cold weather operating procedure
 - No changes to market rules



Stakeholder Process

- Meetings with Public Officials
 - Governors and State Regulators
 - Jan. 2004: Real-time and follow-up briefings
 - February – October: Briefings on new operating procedure
 - State Air Regulators
 - May – December: Engaged New England Air Regulators as a region and as individual states
 - Briefings on new operating procedure and impact on dual-fuel units
 - Modification of certain permits to incorporate new operating procedure
 - Federal Energy Regulatory Commission
 - FERC staff participated in stakeholder meetings
 - November: Informational briefing for FERC staff



Actions for this Winter

- **Communications and Information**
 - Established regular contact between electric and gas system operators
 - ISO has new tools to check a generating unit's availability to operate during extreme winter weather:
 - Access to gas pipelines' Electronic Bulletin Boards
 - Information on gas pipeline contracts for gas-fired generation (firm vs. interruptible)



Cold Weather Operating Procedure

- Established a new operating procedure for Cold Weather Event Operations (OP20)
- Final action
 - August – September: Discussion at NEPOOL committees
 - October: Reliability Committee approval
 - November: Participants Committee approval
- ISO conducted drill
 - December: Successfully tested communications protocols with market participants and state regulators
- New operating procedure in effect for two years



Cold Weather Operating Procedure

- Assessment of weather and capacity situation
 - If the effective temperature is less than or equal to 0° F, then ISO declares:
 - Cold Weather **Watch** if capacity margin is at least 1000 MW
 - Cold Weather **Warning** if capacity margin is below 1000 MW
 - Cold Weather **Event** if capacity margin is below 0 MW requiring emergency actions to deal with a capacity deficiency (OP4)



Industry Coordination

- ISO confers with natural gas pipeline companies at least weekly during the winter
 - Normally occurs on Thursday
 - Communication is with individual pipeline companies to avoid antitrust conflicts
- Review conditions for upcoming week:
 - Weather and temperature forecasts
 - Posted notices by pipeline operators
 - Equipment-related restrictions on gas supply
 - Overall capacity requirements to serve electric load in New England



Evaluating Conditions

- ISO develops a Seven-day Capacity Margin Forecast each Friday by 11 a.m.
 - Includes assessment of notices issued by gas pipelines and the potential impact on gas unit availability
 - Includes assessment of weather forecast and the potential impact of Cold Weather Conditions (temperatures below zero) on gas unit availability
- ISO develops Cold Weather Conditions analysis by 12 noon on Friday
 - ISO will classify each day in coming week as: Cold Weather Watch, Warning, Event, or No Cold Weather Conditions
 - ISO updates analysis daily by 11 a.m.



Cold Weather Watch

- ISO forecasts that sufficient capacity is available
 - A Cold Weather **Watch** triggers:
 - Special Notice posted to ISO website
 - Notification to satellite control centers
 - Cancellation of Economic Outages* if capacity margin drops below 1000 MW
 - Notification to state regulators (utility commissions and air regulators)
- * Market participants may request to remove a generator from service for economic reasons associated with market conditions – subject to recall by ISO.



Cold Weather Warning

- ISO forecasts that sufficient capacity may not be available
- A Cold Weather **Warning** triggers:
 - Request for dual-fuel units to take steps to switch to oil
 - Notification to state regulators (utility commissions and air regulators)
 - Cancellation of Economic Outages
 - Alert demand response resources to prepare for activation if a capacity deficiency is declared



Cold Weather Event

- ISO forecasts that sufficient capacity will not be available – emergency actions are expected
- A Cold Weather **Event** triggers:
 - Shift of the wholesale electric market timeline
 - From 12 noon to 9 a.m. day prior to Operating Day
 - Commitment analysis by ISO Forecast Office
 - 9 a.m. day prior to Operating Day
 - Earlier notice to gas units that will be needed
 - Between 9:30 a.m. and 10 a.m. day prior to Operating Day
 - Daily review of gas nominations to determine if gas units have confirmed gas supplies



Cold Weather Event (cont.)

- A Cold Weather **Event** triggers:
 - Request for gas units that can burn oil to switch to oil
 - Cancellation of Economic Outages
 - Notification to state regulators (including air regulators), Electric & Gas Operations Committee, and market participants
 - Notification to NPCC and PJM of potential capacity shortage



Longer-term Actions

- Proposed market design changes in New England
 - Link capacity payments to generators' availability to deliver during times of peak demand for electricity
 - Allow generators greater flexibility in submitting offers in the electricity markets
 - Encourage alternative resources (e.g. demand response)
- Increase dual-fuel capability and flexibility



Recent Cold Weather Conditions

- Coldest temperature to-date this winter (New England-wide):
 - Jan. 18, 2005: **5.7 degrees F** (22,100 MW peak demand)
- Peak demand to-date this winter:
 - Dec. 20, 2004: 22,635 MW (7.3 degrees F)
- Conditions have not matched the consecutive days of extreme cold weather of the 2004 Cold Snap



First Test of Cold Weather Conditions Operating Procedure: Jan. 21, 2005

- Wednesday, Jan. 19, 2005: ISO declares a Cold Weather **Watch** for Friday
 - Capacity margin expected to be adequate (greater than 1000 MW)
- Thursday, Jan. 20: ISO upgrades forecast to a Cold Weather **Warning** for Friday
 - Capacity margin expected to be tight (less than 1000 MW)
- Friday, Jan. 21: Warning Expires without 'Event'
 - Capacity margin at the time of peak: approx. 950 MW
 - Peak: 21,136 MW
 - No emergency procedures required (OP4)



Effect of New Procedure

- Signals the market that additional resources may be needed
 - Days in advance, not hours
- Improved coordination with generators and gas pipelines helps confirm unit availability in extreme weather conditions
- Fuel-switching keeps generation online and frees up natural gas for other users
 - Jan. 21: 750 MW of combined cycle gas-fired units switched to oil
- Canceling Economic Outages early improves readiness for peak hours
- Cold Weather Watch and Warning designed to avoid an 'Event' situation where emergency procedures are required



Questions?



For More Information

- Cold Weather Event Operations (OP20)
 - www.iso-ne.com > Rules & Procedures > Operating Procedures > ISO New England Operating Procedures > OP20
- Seven-Day Forecast
 - www.iso-ne.com > Data & Reports > Forecasts > 7-Day Forecast
- ISO Cold Snap Report
 - www.iso-ne.com > Data & Reports > Special Reports and Studies > January 14-16, 2004 Cold Snap Reports