Strategic Planning – Risk Summary

21 April 2011

Strategic Pla

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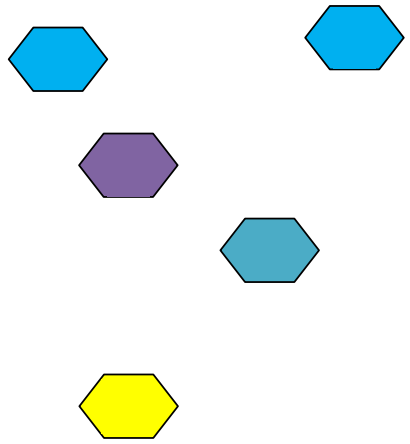

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Strategic Planning Risk Summary

Issue	*Risk Profile*
Resource Performance and Flexibility	***See 1***
Increased Reliance on Natural Gas-Fired Capacity	***See 2***
Retirement of Fossil-Fired Generators	***See 3***
Integration of a Greater Level of Variable Resources	***See 4***
Non-Transmission Alternatives	***See 5***

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Risk Profile

Issue: Resource Performance and Flexibility

System operational events over the past year have further highlighted risks that could reduce system reliability and commitment/dispatch efficiency. The risks include 1) differences between the availability, output and load-following performance of capacity resources and the dispatch signals issued by the ISO, and 2) heavy reliance on a limited set of resources for ten-minute claimed capability and contingency response. These are immediate risks, particularly under stressed system conditions, and failure to address these risks will exacerbate the reliability and efficiency impacts of unit retirements (see Risk Profile 3).

Probability and Timing of Occurrence:

Older (particularly oil-fired) units that are relied on for peaking service, ramping, and reserves are not performing within their offered parameters, likely due to age and extremely low utilization. Many of these units were built as baseload or intermediate generation and were never intended to be flexible, or to be used to quickly respond to contingencies on the system. In addition, although a large segment of the New England fleet consists of relatively flexible gas combined cycle units, these units are providing limited dispatch ranges. The performance of active demand response resources is uncertain due to limited historic performance data, the relative lack of resource maturity, and limited opportunities for dispatch by system operations. In addition, demand resource market obligations are not comparable to supply resources, measurement and verification procedures are complicated, and some resources have demonstrated inconsistent availability and/or performance during the limited occasions these resources have been activated. Finally, efficient and reliable commitment and dispatch is made difficult by a lack of granularity in resource specifications and the fact that, while resources are required to follow the dispatch signal, there is a relatively wide operating range before there is a financial penalty for deviation from the dispatch signal. These conditions can lead to a lack of necessary performance.

Timing: This risk is already in evidence, with events on June 24, 2010, September 2, 2010 and January 24, 2011 (including a NERC violation on September 2).

Consequences described below are highly probable in the near-term, and are likely to get worse over time, absent proactively addressing the issues.

Consequence:

Submitted resource parameters do not capture all of the uncertainty associated with operating a physical resource. In addition, the requirement to follow the ISO system dispatch signals in practice allows for a relatively wide bandwidth around the desired operating point before financial penalties apply. These features threaten system reliability and create the possibility of NERC violations, particularly under stressed system conditions. This leads to a higher probability of reliability violations and/or unintended power outages, and forces operators to commit and dispatch resources in a manner that departs from efficient system commitment and dispatch, thereby increasing the cost of operations.

Mitigation:

ISO has initiated and is aggressively promoting a regional dialogue focused on solutions that can avert undesirable outcomes, and has initiated a number of studies to better quantify the implications of this issue.

Data/Analysis underway: (1) review of fleet performance; (2) review of potential improvements to audit procedures; (3) study of the requirements for Operating Reserves and the appropriate level of Ten-Minute Non-Spinning Reserves and Thirty-Minute Operating Reserves to procure in the Locational Forward Reserve Market (LFRM); (4) review of potential enhancements to LFRM to better meet operational needs; and (5) review of causes for and implications of recent events.

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Risk Profile

Issue: Increased Reliance on Natural Gas-Fired Capacity

Current – and increasing – reliance on natural gas-fired capacity may complicate reliability of operations, particularly under cold winter conditions and other times of system stress because gas-fired Electric Generating Units (EGUs) generally do not have firm contracts for either the commodity or transportation. The lack of dual-fuel capability at most EGUs that is either economic or effective (in terms of time to switch, ramping rates, or the availability of secondary fuel inventory) exacerbates this problem.

Probability and Timing of Occurrence:

The region is already very dependent on natural gas-fired generation, and this dependence is very likely to increase with the retirement of aging oil and coal resources, and the potential retirement of certain nuclear resources. Significant additional in-region hydro, coal, or nuclear capacity is extremely unlikely, and, given output variability, wind resources may provide only limited contributions to reliable daily operations, particularly if located within constrained areas. Finally, as a relatively new resource category, the ability of active DR to contribute under these conditions is uncertain. The dependence on natural gas is particularly acute during cold winter conditions, when residential, governmental, and certain commercial interests have priority for natural gas commodity and transportation capacity. Further, for economic reasons, most natural gas-fired capacity lacks firm commodity or transportation, or economic or effective dual-fuel capability, and EGU owners can release fuel and transportation assets on an intraday basis.

Timing: The region's dependence on natural gas is already in evidence (e.g., 2004 Cold Snap, 2009 Sable Island Outage, January 2011 cold weather, and April/May 2011 Canaport LNG outage), and will potentially increase significantly over the next 3-7 years if additional gas-fired generation were to be developed in response to oil, coal or nuclear unit attrition.

Consequences described below are highly probable in the near-term, and are likely to increase over time absent proactively addressing the issues. For example, Salem Harbor Station, over 700 MW of coal- and oil-fired capacity, has already made application to retire, and Vermont Yankee and Pilgrim Station are both facing challenges to their relicensing efforts.

Consequence:

The dependence on natural gas fired capacity introduces two issues. First, under extreme cold weather conditions, delivery restrictions to power plants and economic incentives to sell natural gas commodity and transportation diminish the available level of gas-fired capacity at a time when loads are near the winter peak. Second, a natural gas infrastructure problem (e.g., loss of a major interstate pipeline) could severely limit available gas-fired capacity in New England at any point in the year, including at the time of summer peak; such natural gas system contingencies are not currently addressed in ISO analyses.

Mitigation:

ISO has initiated and is aggressively promoting a regional dialogue focused on finding solutions that can avert reliability challenges associated with gas dependency, particularly in severe winter or other stressed system conditions. The ISO has initiated a study to better quantify the implications of this issue.

Data/Analysis underway: study of the natural gas system to determine quantities of gas-fired MW available after all firm/priority deliveries are taken into account and review of natural gas infrastructure as a contingency for electric operations. The study will also look at a future case when oil/coal resources may be retired and replaced with new, natural gas resources. This analysis will complement the 2010 economic planning studies.

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Risk Profile

Issue: Retirement of Fossil-Fired Generators

Economic and policy factors are likely to result in substantial changes to the New England power system over the next several years. Such changes could include the exit of a substantial portion of existing, older fossil-fuel capacity, potentially including resources that are important for system-wide or local security needs.

Probability and Timing of Occurrence:

Emerging environmental regulations will very likely require large capital investments that are uneconomic for many older fossil-fueled resources. While the exact form and timing of the requirements remain uncertain, the stated intent of and requirements on the Environmental Protection Agency (in certain instances through court order) means that there is a very high likelihood that substantial compliance investments will be required by owners of existing New England resources to continue operations. This could lead to a significant quantity of older generation choosing to retire rather than comply.

Timing: Compliance with a wide range of environmental requirements is expected to trigger capital investments beginning as soon as within the next two years and extending out for several years. Consequently, decisions on resource retirement and capacity pricing in light of these emerging requirements may affect current capacity auctions.

Consequences described below are highly probable in the mid-term absent proactively addressing the issues. For example, Salem Harbor Station, over 700 MW of coal- and oil-fired capacity, has already made application to retire. In addition, although they are nuclear units, Vermont Yankee and Pilgrim Station are both facing challenges to their relicensing efforts, and, if they were to retire, would raise very similar issues to the retirement of the oil units.

Consequence:

Currently, procedures are in place that would maintain system reliability. These include reliability agreements and out-of-merit unit commitment. However, appropriate enhancements to wholesale market design and system planning procedures could reduce the need for reliability agreements and out-of-merit unit commitment and dispatch, which would degrade the efficiency of market operations and/or prompt regulatory action. In addition, losing a significant quantity of coal, oil and nuclear capacity could further increase the region's dependence on natural gas-fired resources (see Risk Profile 2). The retirement of a significant quantity of capacity will almost certainly trigger a vigorous debate on whether to solve the resulting reliability problems with market resources or transmission (see Risk Profile 5). If all of the region's older oil units were to seek retirement, the region would require new capacity resources to satisfy the Installed Capacity Requirement.

Mitigation:

The ISO has initiated and is aggressively promoting a regional dialogue focused on solutions that can avert undesirable outcomes. The ISO has initiated a study to better quantify the implications of this issue.

Data/Analysis underway: study of units expected to face significant capital investments due to regulatory requirements, and potential impact on transmission system operations. This analysis will complement the 2010 economic planning studies.

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Risk Profile

Issue: Integration of a Greater Level of Variable Resources

Prevailing federal and state policies are leading to the development of increasing amounts of variable (wind, solar) resources on the system, thereby increasing the need to manage system commitment and dispatch to be prepared for potentially rapid and significant swings in resource output.

Probability and Timing of Occurrence:

State and federal policies are driving investments in renewable resources, and there is substantial stakeholder interest in the development of renewables and associated transmission in the New England region. While state Renewable Portfolio Standards have recently faced resistance from legislators in some states, they remain significant contributors to new renewable energy development. They are supplemented by Governor-level efforts to sign long-term contracts for large renewable development projects. FERC has arguably reserved a place in the design of the FCM for renewables, and may open the door to, and encourage, tariff recovery for public policy transmission projects.

Timing: While new renewable resources are being added to the system, the amount and pace of such additions remains modest relative to the overall regional power system resource base. Substantial increases in variable renewable resources are not expected for several years at least.

Consequences described below are likely in the mid- to long-term, although the pace of new renewable growth may be mitigated by sustained low natural gas prices, delay in action in Washington on clean energy and carbon policies, and resistance in some parts of the region on Renewable Portfolio Standards and long-term contract policies.

Consequence:

Currently, procedures are in place to maintain system reliability in a world with greater penetration of variable resources. Growth in renewable resources provides environmental benefits and potentially improves energy economics and fuel diversity. Significant increases in variable resources are likely over time, and such resources will increase the complexity of commitment, dispatch and control room operations. This will lead to the ISO making additional investments in people and infrastructure, and will increase needed reserves and ramping capability.

Mitigation:

ISO-NE has initiated a regional dialogue focused on solutions that can avert undesirable outcomes associated with such integration. The ISO has recently completed a number of studies on this issue. In particular, the ISO will implement the appropriate operational recommendations in the New England Wind Integration Study (NEWIS) over the next 2 – 5 years as penetration levels increase and warrant. In addition, the New England State Committee on Electricity (NESCOE) recently issued a Request for Information to ascertain the potential market response to a solicitation by the New England states for a bulk purchase of renewable energy for the region. The results of that Request for Information directionally reinforce the findings in the technical study performed by the ISO (in 2009) for the New England Governors: the most prevalent wind resources tend to be in Northern New England (Maine and New Hampshire) and off the New England Coast. A significant investment in transmission will be required to reliably enable the development of the wind potential in New England; in the short term, only limited amounts of wind resources will be able to interconnect to the existing transmission system.

Data/Analysis underway: ISO-NE continues to analyze wind resource development in the context of state requests for economic analyses and wind and transmission developer requests for interconnection and transmission planning studies.

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Risk Profile

Issue: Non-Transmission Alternatives

Many stakeholders have requested that the ISO provide additional analysis on the potential of market resources – or non-transmission alternatives (NTAs) – to address identified local and regional system reliability needs. Some stakeholders advocate for a regional mechanism that will allow market resources (NTAs) to become economically viable alternatives to transmission, to the extent that they provide the lowest cost reliability solution.

Probability and Timing of Occurrence:

Stakeholders and some states are pushing to have the ISO conduct additional analyses that show where market resources (or NTAs) can solve identified local system needs (e.g., Vermont Yankee retirement). ISO has been conducting a "pilot" NTA analysis in the Vermont/New Hampshire system assessment, and high-level estimates of demand-side and supply side MWs needed in six of the nine NH/VT study areas to meet identified needs have been provided to stakeholders. While the ISO has stressed that this NTA analysis is an initial effort focused on exploring how to conduct such work, there appears to be a significant degree of support among stakeholders for rapidly expanding the application of the NTA analyses, and there has been at least one specific request for additional NTA analysis (the Office of the Massachusetts Attorney General has requested NTA analysis for Salem Harbor retirement solutions).

Timing: The ISO is already conducting one NTA analysis, has at least one other requested, and states and stakeholders are likely to continue to request additional NTA analyses.

Continuation of additional NTA analyses, and needing to address the consequences described below, are highly probable in the short term, and will likely increase over time. It is desirable to have at least a partial solution to this issue in time to address the emergence of Issue 3 (Retirement of Oil-Fired Generators).

Consequence:

The scope of market resource/NTA analysis and what it means for the region in terms of identified solutions to reliability issues remains unclear. Many stakeholders have proposed some form of regional cost sharing for NTAs that are lower cost than transmission solutions, an issue that is not being considered or addressed by the ISO in its pilot NTA analysis for the Vermont/New Hampshire system assessment. The ISO must also consider how to feed information from its market resource/NTA analysis into planning studies and market design. Further, NTA analysis is specifically being considered in state siting proceedings, and it is not clear what the role of ISO is in such reviews. The NTA discussion thus far raises issues of ISO resource constraints to conduct NTA analysis, the appropriateness of current analytic methods, and how reliability solution development and cost allocation will be addressed by the region. This is an extremely complex issue that has far-reaching implications for both wholesale market design and system planning procedures.

Mitigation:

ISO-NE has initiated a regional dialogue focused in part on the proper role for market resource/NTA analysis.

Data/Analysis underway: ISO-NE is conducting a pilot NTA analysis for the Vermont/New Hampshire system assessment. As an initial matter, the ISO is considering how best to incorporate the reliability needs that are found in the long-term Regional System Plan into wholesale market design. To the ISO's knowledge, this problem has not been addressed or solved in any other wholesale electricity market design. The complexity of the issue is such that it will likely take several years of ISO effort and regional stakeholder review to arrive at a fully integrated solution. This raises the question of whether there are partial solutions that may be helpful in the mid-term.