1st Draft

Comprehensive Reliability Planning Process (CRPP)

Reliability Needs Assessment 2006

December 21, 2005

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Introduction

The introduction of competition in the electric industry in New York State, and in many parts of the Northeast separated the costs of utilities' services into distinct producers and marketers, and led to the unbundling of power generation and transmission development. As a result, the State's electric utilities no longer conduct vertically-integrated planning through which generation and transmission plans were tightly coordinated.

In today's world, the future reliability of the bulk power system depends on a combination of additional resources, provided in response to market forces and by electric utility companies, which continue to deliver electricity to customers and have the obligation to provide safe and reliable services. To maintain the system's long-term reliability, those resources must be readily available or in development to meet future needs.

With these goals in mind, the NYISO, in conjunction with stakeholders, developed and implemented in 2005 its Comprehensive Reliability Planning Process (CRPP), which is contained in Attachment Y of the NYISO's Open Access Transmission Tariff (OATT). The NYISO's Comprehensive Reliability Planning Process (CRPP) is an annual, ongoing process – developed with NYISO stakeholders – to assess and establish the grid's reliability needs and solutions to maintain bulk power system reliability. The first step in the CRPP is the Reliability Needs Assessment (RNA) with the second step in the process being the identification of solutions to the identified needs and the development of the Comprehensive Reliability Plan (CRP).

If the Reliability Needs Assessment (RNA) determines the reliability of the system is inadequate, the RNA will identify reliability needs and the TOs responsible for identifying regulated backstop solutions. The solutions will consist of both market-based and Transmission Owner (TO) or alternative regulated solutions. Solutions will need to satisfy reliability criteria and not necessarily the specified level of Megawatts (MW) or Megavars (MVAR) need identified in the RNA. There are various combinations of resources and transmission upgrades that could meet the needs identified in the RNA. In addition, reconfiguration of transmission facilities and/or modifications to operating protocols identified in the solution phase could result in changes in or modification of the needs identified in the RNA.

This report is the second draft RNA prepared by the New York Independent System Operator. This document represents the second in a series of annual CRPP plans designed to address the long-term reliability of the New York State bulk power system. The RNA consists of this document and the supporting documents and appendices. Just as important as the electric system plan is the process of planning itself. Electric system planning is an ongoing process of evaluating, monitoring and updating as conditions warrant. In addition to addressing reliability, the CRPP is also designed to provide information that is both informative and of value to the New York wholesale electricity marketplace.

Summary of the 2005 Comprehensive Reliability Plan

The 2005 CRP was the first Comprehensive Reliability Plan prepared by the NYISO. The 2005 CRP was approved by the NYISO Management Committee and subsequently the NYISO Board of Directors in August of 2006. The 2005 CRP determined that the transmission owner plans and proposed solution to the identified needs would maintain the reliability of the New York State Bulk Power System (BPS) and presented the CRP findings, conclusions and recommendations:

Actions that will maintain reliability of the BPS:

1. Defer retirement of the New York Power Authority's Charles A. Poletti generating unit in Astoria, Queens for one year, from 2008 until 2009.

2. Deploy transmission projects, including upgrades, reactive resource additions and capacity additions (466 MW); import 990 MW of generation from neighboring control areas committed to the NYCA; and implement voluntary demand reduction programs (449 MW). This results in total resource additions of 1,905 MW through 2010.

3. The development of 1,200 MW of merchant generation, in particular, the 950 MW in New York City – the 400 MW Astoria repowering project (NRG Power Marketing Inc.); and the 550 MW Oak Point Energy Center (Key-Span Ravenswood, LLC). It is important that generation equivalent to this 950 MW be in service in New York City no later than 2011. Key-Span Ravenswood, LLC also proposed for development the 250 MW Spagnoli Energy Center on Long Island.

4. The planned resource additions noted above total 3,105 MW by 2015.

CRP Findings, Conclusions and Recommendations:

1. The New York State Legislature should reinstate the Article X power plant siting law, which expired at the end of 2002. The lack of a project siting process could delay the construction and operation of new generation plants necessary for future system reliability needs.

2. The construction of planned resources and transmission upgrades must stay on schedule. It is important for the NYISO, along with its stakeholders, to approve and deploy a process to monitor the viability of solutions and assess when regulatory solutions should be triggered.

3. The Independent Market Advisor should review if market rule changes are necessary to address and identify failure, if any, of the NYISO competitive markets. (NYISO OATT, Attachment Y, Section 5.2).

4. The impact of fuel diversity on the power supply system should be continually monitored.

5. New York must monitor its capacity markets to determine if they are competitive and can attract enough investment to maintain system reliability.

6. The comprehensive reliability planning process must stay on schedule. Environmental factors that could lead to the retirement of generating units must be identified and addressed in the RNA and CRP.

7. Conforming New York's reactive power planning and voltage control practices to the best practices identified in the North American Electric Reliability Council's (NERC) Blackout Recommendation 7a.

8. A review of NERC blackout recommendations related to voltage is also advisable

Base Case Assumptions, Drivers and Determination of Needs

The NYISO established procedures and a schedule for the collection and submission of data and the preparation of the models used in the underlying studies that were performed during the Comprehensive Reliability Planning Process (CRPP) as defined in Attachment Y of the NYISO OATT.

The NYISO's procedures were designed to allow the NYISO's planning activities associated with the CRPP to be aligned with and coordinated with the related activities of NERC, NPCC, and other regional reliability organizations. The assumptions underlying the RNA were reviewed both at TPAS and ESPWG. The Five Year Base Case was developed based on the 2005 Annual Transmission Reliability Assessment (ATRA) base case, input from Market Participants, and a project screening procedure.

The NYISO developed the system representation for the second five years of the Study Period using (1) the most recent Load and Capacity Data Report published by the NYISO on its web site; (2) the most recent versions of NYISO reliability analyses and assessments provided for or published by NERC, NPCC, NYSRC, and Neighboring Control Areas; (3) information reported by neighboring control areas such as power flow data, forecasted load, significant new or modified generation and transmission facilities, and anticipated system conditions that the NYISO determines may impact the bulk-power transmission facilities; and (4) Market Participant input. Based on this process, the network model for the second five-year period was identical to the network model for the year 2010 in the Five Year Base Case except for the MW and MVAR load model. The load model reflected the load forecast from the Gold Book.

The Base Case model of the New York system for the 2006 RNA includes the following new and proposed facilities:

a. TO projects on non-bulk power facilities
b. Facilities that have accepted their Attachment S cost allocations and are in service or under construction as of June, 2006.
c. Transmission upgrades related to any projects and facilities that are included in the Base Case, as defined above

The base-case does not include all projects currently listed on the NYISO's interconnection queue.

The NYISO's scenario analyses will address, among other things, all other TO plans and projects on the bulk power system and merchant projects that have accepted their cost allocation but had not yet commenced construction

Table 1 below presents the unit retirements, which were represented in the base case:

Table 1

This table of retirements is set forth in the RNA because it is indicative of potential adverse impacts to the reliability of the NY BPTFs.

Table 2 below presents the unit additions, which were represented in the base case:

Table 2

The General Electric Multi-Area Reliability Simulation model was used to determine the year in which loss-of-load criterion was violated and by what degree. Compensatory MWs were added to the system to resolve criteria violations, i.e., the LOLE of 0.1 days per year. As violations are found, compensatory MW needs for the NYCA were developed by adding generic 250 MW generating units to the zones with the highest LOLE in an interative process to determine when reliability criteria were satisfied. These 250 MW additions were used to quantify the reliability needs and as indicator of the amount of load at risk of being disconnected. The additions are not intended to represent proposed solutions. However, resource needs could potentially be met by many different combinations of supply and demand-side resources in other areas in conjunction with transmission upgrades. Due to the differing natures of supply and demand-side resources, the amounts and locations of resources needed to match the level of compensatory MW needs identified will vary. In addition, resource needs could be met in part by transmission system reconfigurations that increase transfer limits, or by changes in operating protocols. Operating protocols could include such actions as using dynamic ratings for certain facilities, operating exceptions or special protection systems.

Reliability Criteria

The standard industry definition of bulk power system reliability is the degree to which the performance of the elements of that system (i.e., generation and transmission) results in power being delivered to consumers within accepted standards and in the amount desired. It may be measured by the frequency, duration, and magnitude of adverse effects on consumer service.

Reliability consists of adequacy and security. Adequacy, which encompasses both generation and transmission adequacy, refers to the ability of the bulk power system to supply the aggregate requirements of consumers at all times, accounting for scheduled and unscheduled outages of system components. Security is the ability of the bulk power system to withstand disturbances such as electric short circuits or unanticipated loss of system components.

There are two different approaches to analyzing a bulk power system's security and adequacy. Adequacy is a planning and probability concept. The New York State Power

System is planned to meet an LOLE that is less than or equal to a involuntary load disconnection that is not more than once in every 10 years or 0.1 days per year. A system is adequate if the probability of having sufficient transmission and generation to meet expected demand is equal to or less than the system's standard which is expressed as a loss of load expectation (LOLE). This requirement forms the basis of New York's installed capacity or resource adequacy requirement.

Security is an operating and deterministic concept. This means that possible events are identified as having significant adverse reliability consequences and the system is planned and operated so that the system can continue to serve load even if these events occur. Security requirements are sometimes referred to as N-1 or N-2. N is the number of system components; an N-1 requirement means that the system can withstand the loss of any one component without affecting service to consumers.

Reliability Needs

Scenarios

Historic Congestion

The graph below presents cumulative historical congestion dollars as determined by the bid-production-cost-savings methodology for the years 2003, 2004, 2005 and the first quarters of 2006. The results through 2006 Q1 are below those of previous years. The favorable trend in congestion is the result of a reduction in natural gas prices and the addition of new efficient combined cycle capacity in Zone J or New York City. There were no unusual days in Q1 2006 and the binding constraints are similar to previous years. The detailed congestion information can be found on the NYISO web site under Services Planning.