Summer 2005 Reliability Assessments

Comprehensive reliability assessments have been completed by NPCC that indicate the region's electric system reliability criteria will be met, assuming that existing and planned resources will be available as expected and typical weather is experienced during the upcoming summer season. On a regional basis, the assessments project that all NPCC Areas (New England, New York, and the Canadian Provinces of Ontario, Quebec and the Maritimes) will have sufficient supplies of electricity under normal summer weather conditions.

Under extreme weather conditions, such as a wide spread and prolonged heat wave with high humidity and near record temperatures, the implementation of operating procedures and programs are expected to keep electricity supplies and demand in balance. Although supply-side and demand-side resources have increased in recent years, portions of New York and New England could still experience a very limited number of time periods when procedures and programs designed to mitigate demand (such as interruptible power contracts, voltage reductions and/or reductions in reserve requirements) would be required. The potential use of these operating procedures is more likely to be required in southwestern Connecticut, New York City and Long Island, New York if reductions in anticipated resources and/or additional transmission limitations materialize coincident with higher than expected loads. If extreme weather, or unforeseen outages, or localized transmission constraints (or their combination) occur this summer in Greater Boston, established operating procedures may also be used to help maintain reliability.

Projected NPCC Load Growth

The non-coincident (sum of the individual Areas) forecast peak demand for NPCC during the summer of 2005 is 108,297 MW (May – September period). The forecast coincident peak demand for NPCC during the summer of 2005 of 106,618 MW is expected to occur during July. This forecast is 9,322 MW (9.6%) higher than last year’s actual coincident NPCC peak demand of 97,296 MW, which occurred on July 22, 2004.

Ambient weather conditions are the single most important variable impacting the demand forecasts during the summer months. Historically the peak loads and temperatures between New England and New York have a high correlation due to the relative locations of their respective load centers. Depending upon the extent and duration of a summer weather system, there is some potential for the Ontario summer peak demand to be coincident with New England and New York.

New England

The Independent System Operator of New England’s (ISO-NE’s) forecast summer 2005 peak demand is 26,355 MW based on expected summer peak weather conditions. This demand is 2,239 MW (9.28%) higher than last year's actual peak electrical load of 24,116 MW that occurred on August 30, 2004. It is 596 MW higher than the 2004 weather normal summer peak of 25,760 MW.
New York
The forecast 2005 peak load for this summer by the New York Independent System Operator (NYISO) is 31,962 MW, which is 3,529 MW (12.4%) higher than last year’s actual summer peak load of 28,433 MW that occurred on June 9, 2004, and 562 MW (1.78%) higher than the 2004 weather-normalized peak of 31,400 MW.

Ontario
The 2005 summer peak Ontario demand forecast by the Ontario Independent Electricity System Operator (the IESO) for normal weather conditions is 23,897 MW. This normal weather forecast is 79 MW (0.3%) less than last summer’s peak of 23,976 MW that occurred on July 22, 2004, but represents an increase of 229 MW (1.0%) over the 2004 normal weather forecasted peak demand of 23,668 MW. The load model and resultant demands reflect the latest economic growth forecasts for Ontario for 2005. The assessments also consider the impacts of expected and extreme weather conditions.

Québec
The forecast 2005 summer peak load for Québec is 22,083 MW. This is 134 MW (0.6%) higher than the peak load of 21,949 MW experienced on May 4, 2004, an unseasonably cold day for the season.

Maritimes Area
A 2005 summer peak load of 4,000 MW is forecast for the Maritimes Area for the week beginning May 1. This is a 356 MW increase (10%) over the peak load of 3,635 MW experienced on May 25, 2004.

Resource Adequacy Summary

NPCC 2005 Summary
During the NPCC forecast peak load period (week beginning July 10, 2005), the overall spare operable capacity (capacity over and above reserve requirements) for NPCC is estimated to be approximately 13,000 MW. Over half of this spare operable capacity is in the Québec and Maritimes Areas. The transfer capability between the Québec and Maritimes Areas to the remainder of NPCC will not permit the usage of all this forecasted spare operable capacity. As a result of this limitation and additional northern New England transmission constraints (during periods of high transfers from New Brunswick to New England), the operable capacity margin for NPCC in the July peak period is approximately 9,630 MW (see Figure 1).

Figure 1 shows the NPCC “Forecast Load plus Operating Reserve Requirement” on a weekly basis. “Net Capacity Resources” represents a summation of each NPCC Area’s weekly forecast of installed capacity, plus an estimate of the available interruptible demands, less operating reserve requirements, allowances for transmission constraints, known and unknown outages, and the net impact of firm imports/exports to NPCC.
The week with lowest forecast operable capacity margin begins June 26, 2005; approximately 9,100 MW is estimated to be available, after accounting for transmission constraints. By comparison, in last year’s assessment, this amount for the week with the lowest forecast operable capacity margin was approximately 8,800 MW.

**New England**

ISO-NE forecasts installed capacity of 30,889 MW for the peak week. Operable capacity within New England is forecast to be sufficient to meet load plus operating reserve requirements during all weeks of the summer peak load period under the reference load forecast (50% chance of being exceeded). The lowest projected operable capacity margin is expected to occur during the week beginning June 19, while the highest projected operable capacity margin is expected to occur during the week beginning May 22, if all of the assumed system conditions materialize.

Under the high load forecast (10% chance of being exceeded), the lowest projected operable capacity margin is expected to occur during the week beginning June 19. If this load or higher than expected resource unavailability occurs, ISO-NE will have to implement ISO-NE Operating procedure No. 4 – Action During a Capacity Deficiency (OP-4). OP-4 is designed to provide additional generation and load relief needed to balance electric demand and supply while striving to maintain appropriate operating reserves.
As it has been in past years, portions of Connecticut may face reliability problems due to transmission constraints into and within that region. Pursuant to planning studies conducted for the 2003 and 2004 Regional Transmission Expansion Plans, ISO-NE has identified concerns regarding electric transmission reliability in the southwestern Connecticut sub-area. Under certain conditions, the electric load in these areas could exceed the combined ability of the electric generating resources in the area and the available transmission capacity to import electric energy into the region to meet the demand. Under these conditions, the generation and transmission systems within the region may not be able to supply the electric load without extremely low transmission system voltages and/or overloading lines. In order to address these reliability concerns, a combination of quick-start generation resources, demand response resources, and peak-load reducing Conservation and Load Management (CL&M) projects representing approximately 218 MW of emergency supplemental capacity will be available for use this summer for southwestern Connecticut.

ISO-NE is closely monitoring the reliability of the Boston area -- a major demand center in New England -- during the 2005 Summer Operating Period. If extreme weather, significant unforeseen outages, localized transmission constraints, or some combination of these occur, ISO-NE is prepared to utilize established operating procedures to help balance supply and demand and maintain system reliability.

**New York**

The NYISO forecasts installed capacity of 39,237 MW for the peak week. Approximately 810 MW of resource additions are anticipated to be available for service prior to the summer peak. Of this, 288 MW will be located in New York City (consisting of two 144 MW gas turbines) and the remaining 128 MW from two combustion turbines on Long Island. All are expected to be in-service prior to July 1. The new Bethlehem Energy Center is a 750 MW natural gas-fired combined-cycle plant. This project includes the retirement of the existing Albany Steam station at the same site, which removes 356 MW of capacity for a net increase of 394 MW installed capacity in the NYCA. The total New York additions include (nominal ratings shown):

<table>
<thead>
<tr>
<th>MW</th>
<th>Project</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>750 (394 net)</td>
<td>Bethlehem</td>
<td>Central New York State</td>
</tr>
<tr>
<td>288</td>
<td>East River Repowering</td>
<td>New York City</td>
</tr>
<tr>
<td>79.9</td>
<td>Bethpage</td>
<td>Long Island, NY</td>
</tr>
<tr>
<td>48</td>
<td>Pinelawn</td>
<td>Long Island, NY</td>
</tr>
</tbody>
</table>

New York State, as a whole, should have an adequate supply of electricity, although the state could require electricity to be imported during peak demand periods. However, extreme weather conditions over a long period of time, coupled with any delays in the operation of these units, may result in a tight supply situation for New York City and Long Island.
Ontario
The IESO forecasts installed capacity of 30,041 MW for the peak week. Adequate resources are expected to be available to meet forecast summer demand and energy requirements (based on the expected weather normal demand forecast) even with the anticipated shutdown of four coal-fired units at Lakeview (represents a net loss of 1,148 MW) before April 30, 2005.

The IESO is anticipating an additional 25 MW of new generating capacity to become available during the 2005 summer operating period. This increase is due to the upgrading of an existing unit and is expected to be complete by early June.

During extreme weather conditions or at a time when generator outages are greater than anticipated, Ontario may require imports from its neighbors. The IESO will monitor the capacity balance and take appropriate actions where necessary.

Québec and the Maritime Areas
The Québec and the Maritimes Areas are winter peaking. Québec’s installed capacity forecast for the peak week is 37,244 MW. The Maritimes Area forecasts installed capacity of 6,420 MW for the peak week. Adequate resources are forecast to be available to serve summer peak demand and meet operating reserve requirements.

The Maritimes Area has no new generation resources scheduled for commercial operation during the summer period May through September 2005.

In Québec, a new hydroelectric power plant located east of the Manicouagan power complex will be put in service in 2005. The Toulnoistouc plant will have a total output of 526 MW. The first of its generators (263 MW) is planned to be commissioned at the beginning of May and the second one at the beginning of July.

Also, about 100 MW (nameplate capacity) of wind power generators is expected to be placed in service this summer. These are the first of at least 1,300 MW of wind power generators planned until 2012 in Québec.

Load Response Programs
Each Area utilizes various methods of demand management. In those Areas where market based structures have been implemented or are evolving, there has been a shift in contractual obligations of the interruptible loads. The move is an attempt to manage load interruption, as a result of demand exceeding resources, by giving industrial and commercial customers the ability to respond to price signals in the wholesale electricity marketplace. Many of these programs are in varying degrees of development. The following is a summary of each Control Area’s current interruptible load programs available, or in development to be available, for the summer period.

New England
Interrupting real-time demand response providers is accomplished through the New England Load Response Program (LRP). Through the LRP, Market Participants or
Demand Response Providers enrolled directly with ISO-NE can enter into agreements with retail customers to encourage them to reduce their electricity consumption during periods of high prices or peak demand. Within the LRP, an asset can reside in one of four distinct programs:

- Day-Ahead Demand Response Program
- Real-Time Demand Response Program
- Real-Time Price Response Program
- Real-Time Profiled Response Program

Participants in the Day-Ahead Demand Response Program will offer an amount of energy into the Day-Ahead market and, if cleared, will be required to interrupt as offered. Those participants that do not clear in the Day-Ahead Demand Response Program have the option to participate in the Real-Time Price Response Program. Within this program, participants will have the option to voluntarily reduce energy consumption in real time when the zonal price is or is forecasted to be greater than or equal to $100/MWh. Participants within the Real-Time Demand Response Program will be involved in one of two sub-programs based on their response time.

ISO-NE has assumed a total of approximately 317 MW of load reduction available under the ISO-NE Load Response Program. The amount of MW available from the LRP represents an estimate of what will be available for the summer period and does not equal the amount currently enrolled. As NEPOOL Participants continue to sign up additional resources under the LRP, it is recognized that the actual amount of LRP resources may be different than the amount assumed in this study.

**New York**

The NYISO introduced two load response programs for the New York Market in May 2001; the Emergency Demand Response Program (EDRP), and Special Case Resources (SCR).

EDRP is a program in which Customers would be paid to reduce their consumption by either interrupting load or switching to emergency standby generation when requested by the NYISO. During the Summer 2004 period the NYISO did not experience peak conditions that required activation of the EDRP.

The Emergency Demand Response Program is continuing for this summer. This load relief will be available to support the New York State power system during capacity emergency periods. Based on the operational experience of the NYISO with the EDRP programs, the amount modeled in this analysis (269 MW of load relief during peak conditions) represents a discounted amount from the forecast registered amount of approximately 600 MW.

Additionally, Special Case Resources (SCR) are expected to provide 897 MW of load relief under peak conditions. Special Case Resources (SCRs) are loads capable of being interrupted on demand, and distributed generators, rated 100 kW or higher, that are not
directly telemetered. SCRs are ICAP resources that only provide energy/load curtailment when activated in accordance with the NYISO Emergency Operating Manual.

For this study, the New York ISO recommended that the SCR programs be modeled as a 975 MW operating procedure step, discounted to 897 MW in July and August (and further discounted in other months proportionally to the monthly peak load).

Since customer participation in these programs varies over time, it is recognized that the actual amount of SCR/EDRP resources available for this summer may be different than the amount assumed in this study.

**Ontario**

Throughout 2004, the IESO-Administered Market saw increases in the number of load facilities that are willing to be treated as a resource that would be dispatched off the system by the IESO once the price of energy in the real time market has exceeded the bid (to Buy) price submitted by the load. The subject load must then reduce their demand according to the dispatch instructions. Based on indications of additional facilities desire to become dispatchable, the values have been increased from last years 300 MW to projected values of between 400 and 430 MW for this assessment period.

In 2002, the IESO instituted an Emergency Demand Response Program to provide additional demand relief under emergency conditions. The program involves 16 different customer sites with approximately 400 MW of load contracted in this ancillary service. When requested, the customers would reduce their demand on a voluntary basis. This demand response program would be implemented just prior to the interruption of firm load. The effectiveness of the program has been reviewed and approvals have been received to extend the program to October 31, 2005.

**Québec**

The Québec Area is a winter peaking system and does not usually need to resort to the load response programs during the summer, although, of the 1,593 MW of interruptible power available in winter, 935 MW could be called on if needed during the summer.

**Estimated Need for Operating Procedures**

A wide range of assumptions were analyzed, including extreme weather conditions derived through almost 40 years of experience, unexpected plant outages, transmission constraints between and within regions, implementation of operating procedures and estimated impact of demand response programs.

In the probabilistic assessment, chronological system histories were developed by combining randomly generated operating histories of the generating units with the inter-area transfer limits and the hourly chronological loads. Consequently, the system was modeled in great detail with accurate recognition of random events, such as equipment failures, peak load forecast uncertainty, as well as the deterministic rules and policies that govern system operation. The effects on reliability of uncertainties in the peak load forecast (due to weather and economic conditions) were captured through simulation of
seven forecast load levels. The expected load level results were based on the probability-weighted average of the reliability at each of the seven load levels simulated.

For the May - September 2005 period, Figure 2 shows the estimated potential range of use of the indicated operating procedures under the Base Case assumptions for the expected load level and the extreme load level (represents the second to highest load level, having approximately a 6% chance of being exceeded). For these conditions, use of the indicated operating procedures designed to mitigate resource shortages (specifically, reducing 30-minute reserve, voltage reduction, reducing 10-minute reserve, and public appeals) is not anticipated for the NPCC Areas during the 2005 summer period. Recent capacity added in the NPCC Areas, in addition to the Demand Response Programs planned to be available this year are contributing factors that tend to reduce the need for the use of these operating procedures in 2005.

However, if the assumed Severe Case reductions in anticipated resources and/or additional transmission limitations materialize coincident with higher than expected loads, New England and New York may require the use of their operating procedures designed to mitigate resource shortages during the summer of 2005. The potential use of these operating procedures is more likely to be required in southwestern Connecticut, New York City and Long Island, New York under these conditions.
Operational Readiness

The Resource and Transmission Reliability Adequacy Assessments are key elements in determining NPCC’s ability to meet the forecasted demands of the summer period. To mitigate the uncertainty surrounding load forecasts, forced outages and other conditions that cannot be controlled or predicted, the Control Areas of NPCC are prepared to deal with contingencies in real time.

To be prepared to deal with the constantly changing conditions on the power system, NPCC routinely conducts weekly operational planning calls between Areas to coordinate short-term system operations. NPCC has also refined and expanded its pre-emergency conference call mechanism to enable Areas and neighboring regions to communicate current operating conditions and facilitate the procurement of assistance under emergency conditions.

Who is NPCC?

The Northeast Power Coordinating Council (NPCC) establishes the processes that assure the reliable and efficient operation of the international, interconnected bulk power systems in Northeastern North America through development and enforcement of regionally-specific criteria that are not inconsistent with NERC broad-based continent-wide reliability standards. NPCC coordinates system planning, design and operations, assesses reliability, and monitors and enforces mandatory compliance with regional reliability criteria. NPCC, to the extent possible, facilitates attainment of fair, effective and efficient competitive electric markets.