

NYISO 2013 Interim Review 4.2

**NYISO 2013 Interim Review  
of  
Resource Adequacy**

**Covering the New York Balancing Authority**

**For the period 2014 to 2017**

**Report 4.2**

**Approved by the RCC December 3, 2013**

**This page left blank**

## NYISO 2013 Interim Review 4.2

### **EXECUTIVE SUMMARY**

This report provides the results of NYISO's 2013 Interim Review covering the period from 2014 to 2017. It is the New York Independent System Operator's (NYISO) first Annual Interim Assessment of its 2012 Comprehensive Review of Resource Adequacy, which covered the time period of 2013 through 2017. This assessment is conducted to comply with the Reliability Assessment Program established by the Northeast Power Coordinating Council (NPCC). This assessment follows the resource adequacy guidelines outlined in NPCC's Regional Reliability Reference Directory #1, Appendix D.<sup>1</sup>

The 2013 Interim Review Report demonstrates that New York will meet the NPCC resource adequacy criterion of not more than one unplanned disconnection of firm load in ten years or 0.1 days/year on average for the Base Case.

---

<sup>1</sup> <http://www.npcc.org/documents/regStandards/Directories.aspx>

# NYISO 2013 Interim Review 4.2

## 1. Introduction

The 2013 Interim Review provides the first update of NYISO's 2012 Comprehensive Review of Resource Adequacy which was approved by NPCC in November 2012. Since the approval of the 2012 Comprehensive Review, the NYISO has conducted additional resource adequacy assessments as part of the Comprehensive System Planning Process (CSPP)<sup>2</sup> and additional annual studies to determine the Installed Capacity Requirements for the New York Balancing Area (NYBA). The major assumptions of this interim review are consistent with those studies with revisions to incorporate updated data that have met Base Case inclusion rules as defined by the CSPP.

## 2. Assumption Changes

### 2.1. Load Shape Model

Load shape models in the past NYISO studies assumed a load shape based on a single historical year, 2002. The year 2002 had 13 days where the daily peak load was within 90% of the system peak, more days than in any other year during the 1999-2012 year period. Use of the 2002 model therefore exposes the system to a relatively higher risk of LOLE events, which may result in inappropriately high (Installed Reserve Margin) IRM levels. Accordingly, in 2011 and 2012 the Installed Capacity Subcommittee (ICS) of the New York State Reliability Council (NYSRC) worked with the NYISO to replace the 2002 load shape model with one that better represents year to year historical load response to weather condition variations.

After considering alternate load shape methodologies, ICS concluded that a new feature in GE-MARS be considered for adoption that allows the representation of multiple load shapes in a way that the load shape model can be represented probabilistically. Part of the effort of implementing this model was to establish criteria for selecting appropriate historical load shapes to include in the seven load forecast uncertainty bins in the Multiple Load Shape Model. It was concluded that an acceptable approach was to select a combination of load shape years 2002, 2006, and 2007. The load shape for the year 2007 represents a typical system load shape over the 1999 to 2012 period. The load shape for 2002 represents a flatter load shape, i.e., a shape that represents a load shape with a higher risk of higher daily peaks relative to the summer peak. The load shape for 2006 represents a load shape with a lower number of daily peaks than a typical year. The combination of these load shapes on a weighted basis represents an expected probabilistic LOLE result as compared to use of the deterministic single year 2002 model. After extensive testing, ICS approved the Multiple Load Shape Model for use in the 2014 IRM Study. This Interim Review was conducted using this new model.

---

<sup>2</sup> [http://www.nyiso.com/public/webdocs/documents/tariffs/oatt/oatt\\_attachments/att\\_v.pdf](http://www.nyiso.com/public/webdocs/documents/tariffs/oatt/oatt_attachments/att_v.pdf)

## NYISO 2013 Interim Review 4.2

### 2.2. Load

Table 2-1 compares the peak demand forecasts from the 2012 Comprehensive Review with the 2013 Load and Capacity Data Report<sup>3</sup> (Gold Book) peak demand forecasts for this Interim Review. The baseline forecast includes the impact of energy efficiency programs and represents an annual average growth rate of 0.96% over the Gold Book's ten-year horizon. This compares to a growth rate of 0.85% as reported in the 2012 Comprehensive Review.

Table 2-1 Comparison of Peak Demand Forecasts

Comparison of Peak Demand Forecasts (MW)						
	Baseline			High Load		
Year	2012 Comprehensive Review	2013 Interim Review	Delta	2012 Comprehensive Review	2013 Interim Review	Delta
2013	33,696			34,320		
2014	33,914	33,725	-189	34,846	34,297	-549
2015	34,151	34,138	-13	35,361	34,998	-363
2016	34,345	34,556	211	35,791	35,667	-124
2017	34,550	34,818	268	36,224	36,142	-82

### 2.3. Resources

For this review, resource assumptions are based upon the 2013 summer capability ratings of generation resources in the NYBA as reported in the 2013 Gold Book. Capacity values in Table 2-2 include resources electrically internal to the NYBA, additions, re-ratings, retirements, purchases, sales, UDRs (UCAP Deliverability Rights) with firm capacity, and SCRs (Special Case Resources).

The generation resource totals for this review account for retirements of 567 MW. Three units, totaling 105 MW, returned to service from a previous mothball state. Special Case Resources (SCR) total 1195 MW as compared to 1767 MW in the 2012 Comprehensive Review. The NYISO does not project a growth factor for SCR resources in the Load and Capacity Data Report or in this analysis.

In the 2013 Interim Review, wind resources totaled 1634 MW at nameplate rating with 1367 MW participating in New York's Installed Capacity Market compared with 1584 MW at nameplate rating in the 2012 Comprehensive Review.

3

[http://www.nyiso.com/public/webdocs/markets\\_operations/services/planning/Documents\\_and\\_Resources/Planning\\_Data\\_and\\_Reference\\_Docs/Data\\_and\\_Reference\\_Docs/2013\\_GoldBook.pdf](http://www.nyiso.com/public/webdocs/markets_operations/services/planning/Documents_and_Resources/Planning_Data_and_Reference_Docs/Data_and_Reference_Docs/2013_GoldBook.pdf)

## NYISO 2013 Interim Review 4.2

Table 2-2 Comparison of Resource Assumptions (summer MW ratings)

Year	2012 Comprehensive Review	2013 Interim Review <sup>4</sup>	Delta
2013	42,405		
2014	42,361	40,923	-1438
2015	42,361	40,923	-1438
2016	42,361	40,923	-1438
2017	42,361	40,923	-1438

### 2.4. Transmission

No new transmission projects are anticipated to come on-line over the period covered by this review. The Hudson Transmission Project (HTP) came on-line in May 2013 as projected in the 2012 Comprehensive Review. HTP is a market-based tie-line between PJM and NYISO from PSE&G's Bergen 230 kV substation to Con Edison's W.49<sup>th</sup> Street 345 kV station. The project consists of a back-to-back HVDC converter in New Jersey with a submarine 345 kV AC cable from the converter station to New York City. The project is capable of transferring 660 MW, but has firm capacity withdrawal rights from PJM of 320 MW.

There were only three updates to the NYBA's transmission system representation. The summer transfer limit on Dysinger East was reduced to 2650 MW and the West Central summer transfer limit was reduced to 1300. These reductions were influenced by the unit retirements in Zone A. The PJM grouping of 2000 MW import into New York was increased to 2320 MW to account for transmission updates for the HTP transmission project.

### 2.5. Unit Availability

Table 2-3 compares the 5-year weighted EFORD (Equivalent Demand Forced Outage Rate) values for generation units in the New York Balancing Authority included in this Interim Review to the EFORD values used in the 2012 Comprehensive Review. The EFORD for thermal units and large hydro units is calculated from NERC GADS data submitted by the generator owners. Run of river hydro units and wind units are given a 45% and 90% summer capacity derate factor, respectively, for modeling purposes. A performance factor for SCRs is determined based upon their actual load reduction in either required system tests or their capability to reduce load or actual demand response activation calls.

---

<sup>4</sup> Note: Existing wind units are listed at their nameplate capability rating.

## NYISO 2013 Interim Review 4.2

Table 2-3 5-Year Weighted EFORd values (%)

Unit Type	2012 Comprehensive Review	2013 Interim Review
Coal	4.8	3.8
Oil	10.0	Not Applicable
Gas	16.3	20.7
Nuclear	2.2	2.5
Combustion Turbines	19.5	20.6
Jet Engine	14.6	16.3
Combined Cycle	3.5 Block/3.9 Individual	4.7
All Thermal Fossil Units (5-Year EFORd)	8.0	10.2
All units including Hydro, Wind	Not Reported	11.6

### 2.6. Fuel Diversity

The NYISO benefits from a diverse fuel supply. New resources in the review period are projected to be fueled primarily by renewable resources (e.g. wind and solar) and natural gas. Natural gas-fired generators in NYBA are supplied by various networks of major gas pipelines (e.g., Dominion, Columbia Gas Transmission, CNG Transmission, National Fuel Gas, Tennessee Gas Pipeline, and Iroquois Gas Transmission). In addition, NYBA generation capacity has a balance of fuel mix which provides operational flexibility and reliability. In the 2012 Comprehensive Review, the single fuel natural gas-fired generators was reported as comprising 17% of the NYBA capability and the dual fuel value was reported as 38% of the NYBA capability. Since then, NYISO has performed a comprehensive review of the NYBA generation fleet. As a result, the values have been updated to more accurately represent the current fuel capability of these units. The updated value for the single fuel natural gas-fired generator is 8% of the NYBA capability and the dual fuel generation is 47% of the NYBA capability.

New York City and Long Island are required by the NYSRC Local Reliability Rules I-R3 and I-R5 to be operated so that the loss of a single gas facility does not result in the loss of electric load on their respective systems. Since the NYBA is a summer peaking area with adequate gas supply during the summer months, the NYISO does not anticipate that fuel shortages or potential interruptions will be problematic over this study period. For the winter capability periods, the NYISO has a gas-electric coordination protocol that streamlines communications to avoid loss of

## NYISO 2013 Interim Review 4.2

electric system capacity due to a wintertime loss of gas event.<sup>5</sup> Recent loss of gas/minimum oil burn (LOG-MOB) studies indicates compliance with the current rules. A review of the nature of the network of gas supplies and fuel diversity in the rest of New York State indicated no significant changes from the previous Comprehensive Review.

### 2.7. Environmental Initiatives

There are numerous environmental initiatives that may impact the manner in which the existing generating fleet operates, or that may require retrofitting environmental control technologies in order to comply with the new requirements. Several final rules will require fuel-switching or significant capital investments from numbers of New York generators in order to achieve the new standards.

Five environmental initiatives are sufficiently broad in application and have requirements that potentially may require retrofitting environmental control technologies and, therefore, generator owners will likely need to address the retirement vs. retrofit question. These environmental initiatives are:

- NYSDEC’s Reasonably Available Control Technology for Oxides of Nitrogen (NOx RACT),
- Best Available Retrofit Technology (BART),
- Best Technology Available (BTA),
- USEPA’s Mercury and Air Toxics Standards (MATS), and
- Cross State Air Pollution Rule (CSAPR) formerly the Clean Air Interstate Rule (CAIR). CSAPR is United States Environmental Protection Agency’s (USEPA) revision of the Clean Air Interstate Rule (CAIR) which was vacated by the US Supreme Court.

The following table summarizes the current status of New York’s generation fleet with respect to environmental initiatives listed above.

Table 2-4 Summary of Environmental Initiatives

Program	Status	Compliance Deadline	Approximate Capacity Affected	Potential Retrofits
NOx RACT	In effect	July 2014	27,700 MW (242 Units)	5,700 MW (20 Units)
BART	In effect	January 2014	8,500 MW (18 Units)	1,500 MW (4 Units)
MATS	In effect	March 2015	10,000 MW (25 Units)	200 MW (1 Unit)
BTA	In effect	Upon Permit Renewal	16,500 MW (35 Units)	4,400 to 7,300 MW
CSAPR	Implementation stayed while rule is in litigation	January 2014	26,000 MW (155 Units)	2,000 MW (9 Units)

<sup>5</sup> See New York State Gas-Electric Coordination Protocol, NYISO Open Access Transmission Tariff, Attachment BB; [http://www.nyiso.com/public/webdocs/documents/tariffs/oatt/oatt\\_attachments/att\\_bb.pdf](http://www.nyiso.com/public/webdocs/documents/tariffs/oatt/oatt_attachments/att_bb.pdf).



## NYISO 2013 Interim Review 4.2

The power system implications of the final environmental initiatives listed above have not been included in this evaluation as generators are still preparing their compliance plans.

### 3. Results

The power system implications of the final environmental initiatives listed above have not been included in this evaluation as generators are still preparing their compliance plans.

Table 3-1 summarizes the Loss of Load Expectation (LOLE) results comparing the 2012 Comprehensive Review results with the 2013 Interim Review for the Base Case and the high load forecast case results.

Table 3-1 LOLE Results

Year	Base Case Forecast		High Load	
	2012 Comprehensive Review	2013 Interim Review	2012 Comprehensive Review	2013 Interim Review
2013	.01		.02	
2014	.01	.03	.04	.06
2015	.02	.05	.06	.08
2016	.02	.08	.09	.16
2017	.03	.09	.16	>.16

### 4. Conclusion

This Interim Review finds that the NYBA will comply with the NPCC resource adequacy criterion under the Base Case peak demand forecast. The NYISO will continue to monitor and evaluate progress on pending environmental initiatives and the implications of generator compliance with final initiatives to understand their impact, if any, on capacity availability and retirements. Should the NYISO determine that conditions have significantly changed during or outside of the normal planning cycle, it will determine whether market-based solutions that are currently progressing are sufficient to meet the resource adequacy and system security needs of the New York power grid. If not, the NYISO will address any newly identified Reliability Need in the subsequent RNA or, if necessary, issue a request for an interim, or “Gap” solution to maintain bulk power system reliability.