



Generator Deactivation Assessment Indian Point Energy Center

**A Report by the
New York Independent System Operator**

December 13, 2017

Purpose

On November 13, 2017 the New York Independent System Operator, Inc. (“NYISO”) determined that Entergy Nuclear Power Marketing, LLC (“Entergy”) had submitted a complete Generator Deactivation Notice for the proposed retirement of the Indian Point Energy Center Units 2 & 3 (individually, “IP2” and “IP3,” respectively, and collectively, “IPEC” or “IPEC Facility” or “Generators”). Entergy reported that it intends to deactivate the 1,299 MW (nameplate) IP2 unit on April 30, 2020 and the 1,012 MW (nameplate) IP3 unit on April 30, 2021.

Pursuant to Section 38.3.4.3 of the NYISO Open Access Transmission Tariff (“OATT”), the NYISO performed resource adequacy and, in coordination with New York Transmission Owners (“NYTOs”)¹, transmission security analyses of the New York Control Area (“NYCA”) system to determine whether a Generator Deactivation Reliability Need (a “Need”) would result from the deactivation of the IPEC Facility. The NYISO and NYTOs timely completed this analysis within the 90-day period starting from November 13, 2017, the Generator Deactivation Assessment Start Date (by February 11, 2018). The Generator Deactivation Process ends if the assessment does not identify a Need or if the reliability need can be timely addressed during the next Reliability Needs Assessment in the NYISO’s biennial reliability planning process. If the NYISO finds a Need, then the NYISO follows the process for soliciting and selecting a solution stated in Sections 38.3.5 – 38.10.5 of the OATT.

Assumptions

The NYISO evaluated the period five years from the conclusion of the 365-day notice period (November 13, 2018 – November 13, 2023) (the “Study Period”) using the most recent reliability planning process base case including removal of Greenport GT1, Selkirk I, Selkirk II, Binghamton Power Plant and Ravenswood GT9 in accordance with NYISO procedures, with the load forecast consistent with the 2017 Load and Capacity Data Report (“Gold Book”)². In accordance with the Reliability Planning Process base case inclusion rules³, generation and transmission projects are added to the base case if they have met significant milestones such that there is a reasonable expectation in completion of the project. There are three major generation facilities currently under construction that were included in the base case for this assessment that impact the findings: Bayonne Energy Center II Uprate (Zone J, 120 MW), CPV Valley Energy Center (Zone G, 678 MW),

¹ The NYTOs included in this assessment are: National Grid, New York State Electric and Gas, Rochester Gas and Electric, New York Power Authority, Central Hudson, Orange and Rockland, Consolidated Edison, Long Island Power Authority/PSEG Long Island, and New York Transco.

² This IPEC Generator Deactivation Assessment utilizes the 2017 Gold Book baseline summer peak load forecast.

³ NYISO Reliability Planning Process Manual, April 1, 2016

and Cricket Valley Energy Center (Zone G, 1,020 MW).

Consistent with the NYISO's obligations under its tariffs, the NYISO provided stakeholders within its shared governance process information on the modeling assumptions employed in conducting this assessment. Details on the study assumptions were originally reviewed with stakeholders at the August 28, 2017 joint Electric System Planning Working Group/Transmission Planning Advisory Subcommittee (ESPWG/TPAS) as part of an *ad hoc* reliability assessment and were later updated at the November 17, 2017 ESPWG/TPAS meeting. The meeting materials are posted on the NYISO's public website⁴.

Base Case Findings

This assessment finds that reliability criteria would be met without Indian Point Energy Center throughout the Study Period under the assumed and forecasted base case system conditions. The NYISO assessed the resource adequacy of the overall NYCA system, per the one-day-in-ten-years (0.1 per year) Loss of Load Expectation ("LOLE") criterion, which measures the probability of disconnecting firm load due to a resource deficiency. This assessment finds that without IPEC the resource adequacy criterion is met throughout the Study Period for the base case assumptions.

Additionally, the NYISO performed a transmission security assessment for the Bulk Power Transmission Facilities ("BPTF") and the NYTOs performed a transmission security assessment of their non- BPTFs. The NYISO reviewed and verified the analysis performed by NYTOs. Without IPEC, no transmission security-related Need was identified in the Study Period for the base case assumptions⁵.

Scenario Findings

For information purposes, the NYISO performed a scenario assessment to evaluate the reliability of the system without three major generation facilities currently under construction (Bayonne Energy Center II Uprate, CPV Valley Energy Center, and Cricket Valley Energy Center). This scenario identified both resource adequacy and transmission security reliability criteria violations without IPEC.

For this scenario, resource adequacy was assessed for the entire ten-year planning horizon. The resource adequacy scenario results show that the system exceeds the LOLE criterion starting in

⁴ http://www.nyiso.com/public/markets_operations/committees/meeting_materials/index.jsp?com=bic_espwg#.

⁵ There are generators modeled as deactivated in the base case that have not yet completed their Generator Deactivations Notices. The local reliability impacts of each generator deactivation are addressed by the NYISO and the Responsible Transmission Owner in each generator's Deactivation Assessment when the notice has been deemed complete.

year 2021 upon deactivation of IPEC, with the exceedance growing worse through 2027.

Compensatory megawatt analysis was performed to quantify the shortfall of power by year and by zone.

Compensatory megawatt amounts are determined by adding generic perfect-capacity⁶ resources to zones to address the shortfall. These additions in 100 MW blocks are used to estimate the amount of resources generally needed within a given zone to bring the system back within the reliability criteria. The compensatory megawatt additions are not intended to represent specific solutions, as the impact of specific solutions can depend on the type of the solution and its location on the grid. Resource needs could potentially be met by combinations of solutions including generation, transmission, energy efficiency, and demand response measures.

A generic addition of at least 200 MW by 2023 anywhere within the G, H, I, or J zones (Lower Hudson Valley) would resolve the deficiency through the five-year horizon. To address the deficiency through 2027, the level of required additional resources would range from 400 MW to 600 MW depending on type and location of the resource(s) within the Lower Hudson Valley. Due to transmission constraints into the Lower Hudson Valley from upstate (Zones A-F) and Long Island (Zone K), additional resources in any other zone would not effectively resolve the deficiency. The results of the compensatory megawatt analysis are shown in the following table.

Table 1: Scenario Compensatory Megawatts

Year	LOLE	Compensatory MW
2018	0.031	-
2019	0.028	-
2020	0.043	-
2021	0.108	100 MW within Zones G, H, I, or J
2022	0.116	200 MW within Zones G, H, I, or J
2023	0.123	200 MW within Zones G, H, I, or J
2024	0.143	400 MW in G, or 300 MW within Zones H, I, or J
2025	0.152	500 MW in G, or 400 MW within Zones H, I, or J
2026	0.167	600 MW in G, or 400 MW within Zones H, I, or J
2027	0.168	600 MW in G, or 400 MW within Zones H, I, or J

Transmission security violations were also identified within the Lower Hudson Valley for this scenario, but the resource adequacy deficiency exceeds the transmission security deficiency.

⁶ Perfect capacity is capacity that is not derated (e.g., due to ambient temperature or unit unavailability) and not tested for transmission security or interface impacts. Actual resources may need to be larger in order to achieve the same impact as perfect-capacity resources.

These deficiencies would increase with any additional future deactivations within the Lower Hudson Valley.

These scenario results demonstrate that, without the expected new generation facilities currently under construction, additional replacement sources of power would be necessary to maintain reliability following deactivation of IPEC.

Conclusions

This assessment does not identify a Generator Deactivation Reliability Need following the deactivation of the Indian Point Energy Center for the Study Period under base case assumptions. This assessment also determined that following the deactivation of Indian Point Energy Center, the reliability of the existing system could only be maintained if sufficient replacement sources of power are added within the Lower Hudson Valley (Zones G-J). In the absence of the expected new generation facilities currently under construction, resource needs, as detailed in Table 1 of this report, would need to be met by one or more types of solutions including generation, transmission, energy efficiency, and demand response measures.

Entergy has satisfied the applicable requirements under the NYISO's Generator Deactivation Process to retire the Generators on or after its requested deactivation date.⁷ This concludes the Generator Deactivation Process. The 2018 Reliability Needs Assessment will further evaluate the reliability of the New York Control Area through 2028 using the most up to date information at the time, in accordance with the applicable tariffs and procedures.

⁷ Entergy must complete all required NYISO administrative processes and procedures prior to deactivation. The NYISO's determination in this Generator Deactivation Process does not relieve Entergy of any obligations it has with respect to its participation in the NYISO's markets. If Entergy rescinds its Generator Deactivation Notice or does not deactivate Indian Point Energy Center Unit 2 between April 30, 2020 and April 30, 2021 and Indian Point Energy Center Unit 3 between April 30, 2021 and April 30, 2022, then it will be required to submit a new Generator Deactivation Notice in order to deactivate the Generators, and will also be required to repay study costs in accordance with Section 38.14 of the OATT.