Scope of the System Reliability Impact Study for the Island Park Energy Center – Simple Cycle Power Plant and Combined Cycle Power Plant Nassau County, NY

Interconnection Queue #428

1. Purpose

The purpose of this full[1] System Reliability Impact Study ("SRIS") is to evaluate the impact of the proposed Island Park Energy Center, LLC (the "Developer"), Island Park Energy Center – Simple Cycle Power Plant and Combined Cycle Power Plant Project (the "Project") to the New York State Transmission System. The Developer proposes six (6) simple cycle gas turbine generators to replace twelve (12) existing internal combustion units, and a 2x1 combined cycle power plant to replace two (2) existing operating Steam Units. Both existing internal combustion units and steam units are owned by National Grid Generation LLC, and located at E.F. Barrett generating station, at McCarthy Road, Island Park, New York. The new repowering facility (Island Park Energy Center) will interconnect to the existing LIPA owned E.F. Barrett substation located on the same property. The simple cycle power plant is expected to have a maximum potential generating capacity of 271 MW summer net output (at 85^{o}F) and 291 MW winter net output (at 35^{o}F). The combined cycle power plant is expected to have a maximum potential generating capacity of 659 MW summer net output (at 85^{o}F) and 684 MW winter net output (at 35^{o}F). The total maximum proposed generating capacity is of 930MW for summer net output, and of 975MW for winter net output. The proposed in-service date is October 1, 2016 for the simple cycle and October 1, 2017 for the combined cycle. The proposed commercial operation date is May 1, 2017 for the simple cycle and May 1, 2019 for the combined cycle. This Project is a potential alternative to, and will not proceed in combination with the proposed NYISO Q#427 Island Park Energy Center – Combined Cycle Power Plant Project.

The study will assess the impact of the Project on the base case power system, including potentially Affected Systems, and will provide a list of the facilities (PSEG-LI/LIPA Attachment Facilities and System Upgrade Facilities) required to facilitate the interconnection, and non-binding good faith estimates of cost and time to construct those facilities. The study will be conducted in accordance with the applicable NERC, NPCC, NYSRC, PSEG-LI/LIPA and Affected System(s) reliability and design standards; and in accordance with applicable New York Independent System Operator ("NYISO"), Connecting Transmission Owner ("CTO") (i.e.: PSEG-LI/LIPA), and Affected System(s) study guidelines, procedures and practices.

2. Interconnection Plan

The study will include a description of the proposed facilities and the conceptual design of the Interconnection to the transmission system. The description will include a one-line diagram depicting the proposed facilities and their integration with the existing facilities.

3. Study Period

[1] Projects with proposed capability greater than or equal to 80 MW undergo a full SRIS as defined in the NYISO Transmission Expansion and Interconnection Manual ("TEI Manual").

The study will be based on the system represented in 2018 power flow base cases from the NYISO Class Year 2012 ATBA. The study will be conducted using applicable Power Flow, Short Circuit and Stability base cases provided by the NYISO, and will include the representation of other proposed projects that have been cost allocated up to and including Class Year 2011 as listed in Appendix A.

4. Study Area

The study will evaluate the impact of the Project on the bulk power system in the Millwood (Zone H), Dunwoodie (Zone I), New York City (Zone J), and Long Island (Zone K) regions which are most likely to be affected by the Project; for the lower voltage local systems, the study will focus on underlying 69 kV and 34.5 kV network elements in proximity of the POI (the "Study Area").

5. Base Case Conditions

The impact of the proposed Project will be evaluated for summer peak load, winter peak load, and light load for the following base case conditions, and as specified under the subsequent sections of this Scope:

Case 1 – Base case without the Project. The base case will include the baseline system and other proposed projects listed in Appendix A. The Short Circuit base case will model all the projects as in-service. The Power Flow base case will normally model all projects in-service at full output, but may model some projects as out-of-service or less than full output as necessary to establish a feasible base dispatch. Generation will be dispatched in accordance with the NYISO Minimum Interconnection Standard Technical Assumptions[2].

Case 2 – Case 1 with the Project modeled. The Project will be modeled as in-service at full output. Unit and facility reactive resources for the Project will be represented. Generation will be re-dispatched in the Power Flow case in accordance with the NYISO Minimum Interconnection Standard Technical Assumptions.

6. Analysis

Thermal, Voltage, Stability and Short Circuit analyses will be conducted to assess the performance of the base system conditions within the Study Area, with and without the Project, in accordance with Applicable Reliability Standards, Guidelines and study practices, and as described in Section 2.4.1 of the NYISO Transmission Planning Guideline #1-1 (Attachment F of the NYISO TEI Manual).

The analyses will also determine the incremental impact of the Project on the normal and emergency transfer limits of the ConEd-LIPA, LIPA-Import and ISO-NE-LIPA interfaces (open and closed definitions as applicable) and any internal LIPA defined interfaces, as applicable, in accordance with applicable reliability standards, guidelines and study practices, and as described in Section 2.4.2-Impact on System Performance and Transfer limits of the "NYISO Transmission Planning Guideline #1-1" (Attachment F of the NYISO TEI Manual). NYISO transfer limits

[2] As defined in the NYISO Transmission Expansion and Interconnection Manual ("TEI Manual").

will be evaluated in the predominant west-to-east/north-to-south direction. Sufficient analyses will be conducted to determine the most limiting of the thermal, voltage, or stability limits under summer peak load conditions.

The Study shall also evaluate the incremental impact of the Project on the normal and emergency transfer limits of the LIPA transmission system using LIPA's Deliverability Guideline. This procedure does not supersede study requirements of the NYISO Large Facility Interconnection Process but rather serves as an additional study requirement for any interconnection within the LIPA system. In addition, internal LIPA interface transfer capability in both directions with respect to the Barrett and Pilgrim phase angle regulator (PAR) settings shall be documented. Guidelines for modification of LIPA system generation dispatch necessary for the Newbridge and Holbrook Transfer limit analysis shall be supplied by the Connecting Transmission Owner (LIPA). System Upgrade Facilities relative to LIPA's Deliverability Guideline will be considered, evaluated and identified only to the extent consistent with the NYISO Minimum Interconnection Standard.

Modifications to Base Cases, if determined necessary during analyses, will be documented in the Study Report.

6.1. Power Flow Analyses

Thermal and voltage analyses, using the PSS/E power flow or comparable program, will be performed for summer peak and winter peak load conditions in the Study Area. In addition to the summer and winter load peak conditions, the impact of the project under light load system conditions needs to be evaluated under selected generation dispatch scenarios as identified by the Connecting Transmission Owner (LIPA).

The Project impact on (901L/M / 903 / Y49) PAR schedule (the LIPA "Wheel"), and control ranges will be assessed and reported.

6.2. Stability Analysis

Stability analysis, using the PSS/E, will be performed for summer peak and light load conditions to determine the impact of the Project on system performance within the Study Area. This analysis will evaluate the performance of the system for design criteria contingencies, and will address issues including, but not limited to, transient stability, dynamic stability (i.e. damping), critical clearing time, coordination of protection and control systems, and performance of any Special Protection Systems that may be affected.

6.3. Short Circuit Analysis

Short Circuit analysis will be performed to evaluate the impact of the Project on system protection and adequacy of existing circuit breakers, other fault current interrupting devices, and related equipment within the Study Area to identify impacts of 100A or more. This analysis will be performed in accordance with the NYISO Guideline for Fault Current Assessment (Attachment I of the NYISO TEI Manual), and Connecting Transmission Owner and Affected System(s) criteria.

6.4. Extreme Contingency Assessment

The study will evaluate representative extreme contingencies under summer peak conditions within the Study Area, discuss significant load flow and stability analyses, showing the post-fault conditions in the Study Area, and report on pre- and post-Project system response for the most severe contingencies, as specified in Section 5.6 and 5.7 of the NPCC Directory # 1, entitled "Extreme Contingency Assessment".

6.5 NPCC A-10 Testing

The study will review the NPCC Bulk Power System (BPS) classification of existing and proposed stations within the proximity of the Project to identify any existing or new stations that could be classified as BPS due to the addition of the Project. This testing will be done in accordance with the approved NPCC A-10 criteria for summer peak cases.

6.6. N-1-1 Contingency Assessment

The study will evaluate the selected N-1-1 contingencies within the Study Area. Power flow analyses will be performed based on the N-1-1 contingency descriptions provided by the Connecting Transmission Owner (LIPA) for summer peak cases.

7. Modeling Assumptions

7.1 Phase angle regulators ("PARs"), switched shunts, and LTC transformers will be modeled as regulating pre-contingency and non-regulating post-contingency. The study will use PAR schedules established by the NYISO in coordination with the neighboring ISOs through the NERC and NPCC base case development processes. PARs may be adjusted as necessary to relieve pre-contingency overloads.

7.2 SVC and FACTS devices will be set to zero pre-contingency and allowed to operate to full range post-contingency. The dynamic devices within Long Island area will be offline in both pre- and post-contingency condition in power flow analysis while set to zero for dynamic initialization.

7.3 In order to determine transfer limits, the analysis will simulate generation re-dispatches according to the standard proportions used in NYISO transmission planning and operating studies, for NYISO interfaces. Where applicable, for local (Transmission Owner) interfaces, generation re-dispatching will be done in accordance with Transmission Owner standards and practices.

8. System Upgrade Facilities

If study results indicate that the Project, as proposed, would result in violations of reliability standards, analyses will be performed to identify any System Upgrade Facilities (SUFs) that would be required to meet the NYISO's Minimum Interconnection Standard.

9. Cost Estimates of Facilities/Time to Construct

A description of facilities (CTO Attachment Facilities and CTO and Affected Systems' System Upgrade Facilities, if any) required to interconnect the Project to the New York State

Transmission System, and non-binding good faith estimates of cost and time to construct those facilities, will be provided.

10. Report

A report will be prepared, following the report outline (as applicable) specified in the NYISO Transmission Planning Guideline #1-1 (Attachment F of the NYISO TEI Manual). Any additional analysis that is outside the scope of the NYISO Interconnection studies (e.g., SSTI, Voltage Regulation, Harmonics, EMTP, etc.) that the CTO recommends to be performed at a later date may be listed and described in the report as deemed necessary.

Appendix A

List of Other Proposed Projects to be modeled in the Base Case
Queue #428: Island Park Energy Center Simple Cycle Power Plant and Combined Cycle Power Plant Project

Queue Pos.	Owner / Project Name	MW (S|W)
197	PPM Roaring Brook, LLC / PPM / Tug Hill	78 | 78
201	NRG Energy, Inc. / Berrians GT	200 | 200
224	NRG Energy, LLC. / Berrians GT II	50 | 90
237	Allegany Wind, LLC / Allegany Wind	72.5 | 72.5
251	CPV Valley, Inc. / CPV Valley Energy Center	678 | 691
349	Taylor Biomass Energy, LLC / Taylor Biomass	19 | 22.5