

Consolidated Edison Company of New York

Developer Welcome Kit



Legal Disclaimer

This document is for informational purposes only. Consolidated Edison Company of New York shall not be held liable for indirect, special, incidental, punitive or consequential damages of any kind including loss of profits, arising under or in connection with the use of this Developer Welcome Kit.

Introduction

This Developer Welcome Kit has been compiled by the Consolidated Edison Company of New York, Inc (Con Edison) Interconnection Services Group to provide developers of merchant generator or merchant transmission projects with general guidelines for connecting proposed facilities to Con Edison's electric transmission system. This Welcome Kit contains a general schedule and provides key points of information to assist developers in the development of their interconnection plans.

The information contained in the Welcome Kit is not intended to cover all details and aspects of a proposed interconnection plan, and is subject to change without notice. This document does not address contractual matters such as property ownership, leasing, easements, scheduling, permitting and billing. The project developer assumes all costs for the design, construction, inspection, analysis, maintenance, operations, monitoring, permitting, and all associated facilities required to satisfy the technical and regulatory requirements for connection to the Con Edison transmission system. This document is not intended as a design specification or an instruction manual.

The recipients of the Welcome Kit shall retain the information for their sole use. The information provided in the Welcome Kit shall be handled in accordance with the confidentiality provisions specified in Section 13.1 of Attachment X in the OATT.

The NYISO Interconnection Process

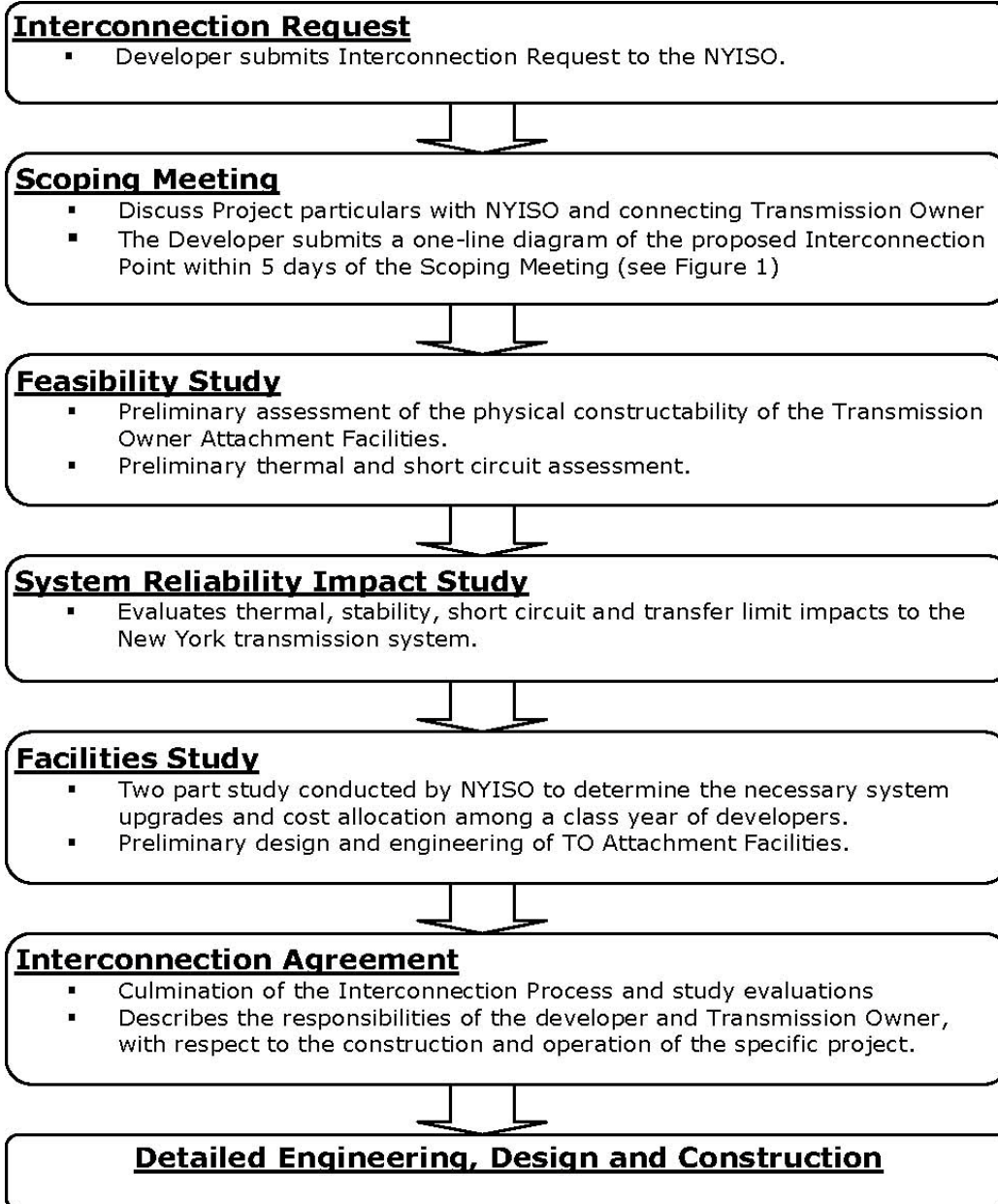
As Con Edison is a member of the New York Independent System Operator (NYISO), all proposed connections to the New York transmission system are governed by the NYISO's Large Facility Interconnection Procedures (Attachment X to the Open Access Transmission Tariff).

Attachment X to the NYISO OATT prescribes a number of technical system studies that are required to evaluate the potential impact of a new facility's interconnection to the New York transmission system. These system studies are performed to ensure that the proposed project does not have an adverse impact on the performance of the New York State Bulk Power System, and to allocate cost responsibility for necessary upgrades to mitigate any potential adverse impacts uncovered.

The performance of these studies is the responsibility of the NYISO, which may subcontract Con Edison to perform certain aspects of a particular study. Studies performed for previous projects can be obtained from the NYISO.

Below is a simplified flow chart of the Interconnection Process. This is intended to serve as a general guide to the Interconnection Process with notes that pertain to Con Edison. For more details, Developers should consult the most updated NYISO Open Access Transmission Tariff.

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Connection of proposed developer projects to the Con Edison electric transmission system must meet established reliability, environmental and safety standards. The interconnection plan must conform to NERC, NPCC and NYSRC standards. These standards are publicly available and can be obtained by contacting the relevant organization. All proposed facilities must comply with the latest city, state and federal environment and safety laws and regulations, as well as all applicable Con Edison standards, procedures and specifications. Two key Con Edison standards are provided as appendices.

- Con Edison System Design Criteria, EP-7100, "Transmission Planning Criteria"
- Con Edison Engineering Specification, CE-ES-2002, Section 1, "Standard Engineering Design Guidelines for Area Substations, Transmission Substations and PURS Facilities: General Requirements"

Please contact the NYISO on matters relating to the Interconnection Process and associated studies. For issues specific to the Con Edison system, please contact the Con Edison representatives below.

Contacts – Con Edison

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Key Points of Information

- It is the developer's responsibility to suggest one or more points of interconnection for evaluation. Con Edison will review the feasibility of designated points of interconnection but will not propose a point of interconnection.
- One line diagram(s) provided by the developer should clearly identify the bus section to which the Developer's Attachment Facilities will be connected, the isolating circuit breakers and disconnect switches. Where an extension of an existing substation is proposed, please show the existing equipment in black and the new equipment in red (see diagram below).

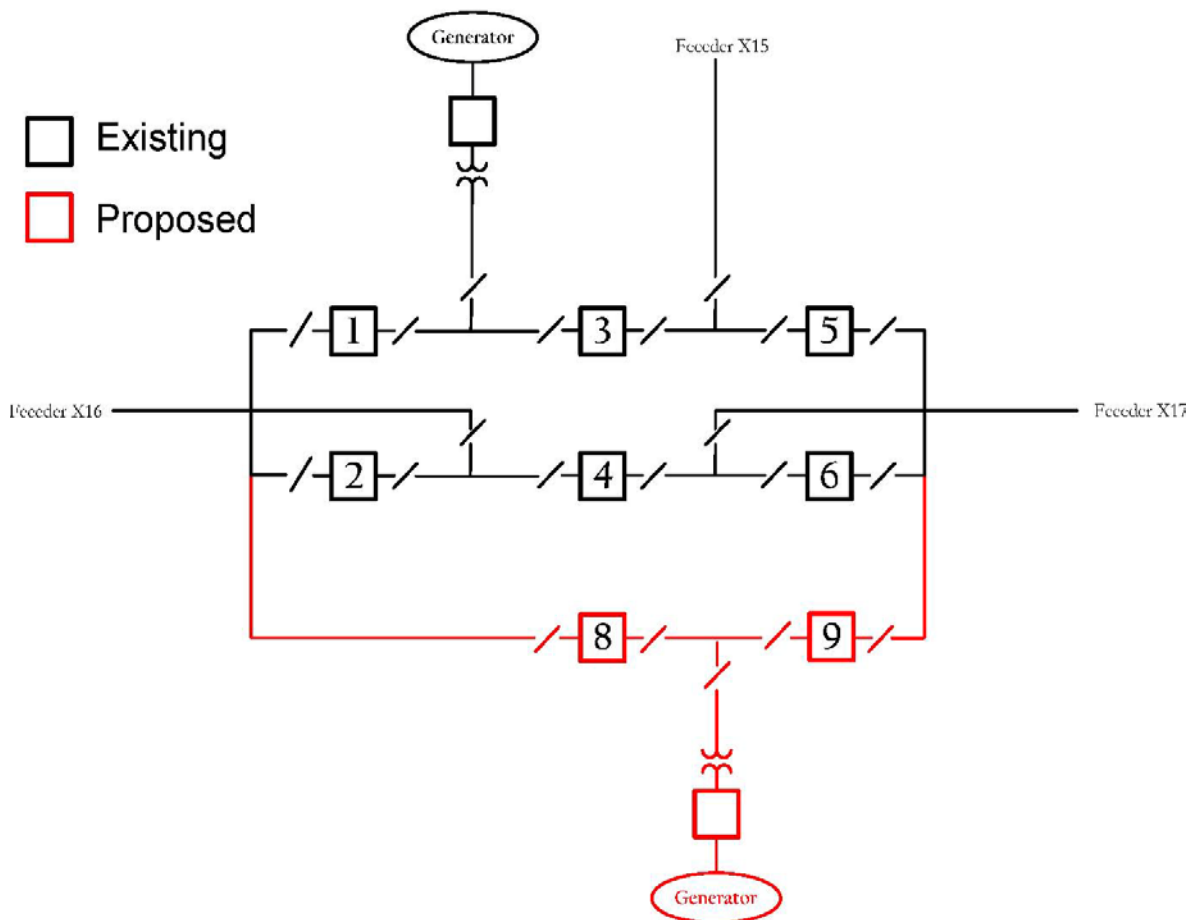


Figure 1 - Example of an Acceptable Interconnection One-Line Diagram

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- There may also be instances when it is not considered prudent or practical to further extend an existing substation. For example, when a ring bus grows beyond a certain size, the probability increases that during multiple system events the substation could become fragmented into multiple pieces thereby losing its level of reliability.
- The final design should consider the possibility that any piece of equipment to be installed may fail. The equipment should be arranged so that such a failure will disrupt the station to the least possible extent and not jeopardize station nor system reliability. Particular attention should be given to the space requirements for on-site repair, maintenance activities of existing equipment, or removal of any failed equipment.
- Con Edison's Central Engineering specification CE-ES-2002 provides the following checklist for Transmission Substation Design:
 - Primary and secondary voltage to be used
 - Substation capacity, current and future
 - Future expansion needs
 - BIL rating of equipment
 - Number of transmission feeder positions, initial and final
 - Size and layout of station property
 - Air insulated versus SF6 bus (Momentary rating of bus)
 - Maintenance requirements
 - Electrical clearances
 - Light and power requirements
 - Grounding design
 - Control room layout
 - Cable and trench layout
 - Metering scheme
 - Roadway layout
 - Primary and secondary voltage relaying schemes
 - Aesthetic appearance of station
 - Type of primary feeder cables
 - Alarm panel design and requirements
 - One line high tension drawing
 - Accuracies of current transformers
 - Lighting design
 - Security protection
 - Type of structure
 - Number and location of shunt/series reactors
 - Environmental aspects
 - Type of circuit switchers and interrupters (interrupting rating)
 - Type of metal clad switchgear
 - Transformer MVA rating and impedance
 - Circuit breaker ratings (Continuous and short circuit)
 - Phase angle regulators
 - Bus configuration (Ring or breaker and half)
 - Automation / SCADA / HMI
 - Communications

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- Lightning / Surge protection

While the NYISO's Large Facility Interconnection procedures do not specifically address these, Con Edison requires all tasks on the above checklist to be completed before the substation configuration can be accepted as final.

- Upon the submission of a valid Interconnection Request to the NYISO, Con Edison will allow a developer supervised access to the desired interconnecting Substation for the purpose of a site visit and technical evaluation, upon the execution of a two party agreement between Con Edison and the project developer. This agreement is separate to the technical study agreements that are executed between the NYISO, Con Edison and the Developer for each interconnection study.
- Con Edison requires developers to make available, electronic copies of all photographs taken during substation visits at the end of the visit. These will be reviewed and those images that are deemed acceptable for release by Con Edison may be kept by the developer. These photographs constitute confidential information and are required to be maintained as such.
- Costs for System Upgrade Facilities (SUFs) and Attachment Facilities (AFs) are determined during the NYISO Class Year Cost Allocation and Facilities Study. As part of the Part 1 Study portion of the Facilities Study, Con Edison provides a cost estimate for required local SUFs and Connecting Transmission Owner Attachment Facilities (CTO-AF).
- New York State Reliability Rules require certain gas fired units in New York City to burn oil at a minimum level on high load days. Consequently, new gas fired units to be installed in New York City must have dual fuel capability. Additionally, new or re-powered generating projects interconnecting to the Con Edison gas transmission system must have automatic fuel switching capability to allow a switch over to liquid fuel when required due to gas system problems.
- New generators connecting to Con Edison's transmission system will be required to possess black start capability if Con Edison's analysis indicates that the new project would provide system restoration benefits.

Specification Request Form

Below is a list of Con Edison specifications (CE-ES-2002, Standard Engineering Design Guidelines for Area Substations, Transmission Substations and PURS Facilities) that project Developers may wish to consult in performing their preliminary design and analyses of interconnection plans. Upon the submission of a valid Interconnection Request to the NYISO, a copy of these specifications can be obtained by forwarding the list, with required specifications checked, to Con Edison, along with an executed copy of the confidentiality agreement included in this Developer Welcome Kit. These do not constitute the complete list of Con Edison specifications that may be pertinent to a particular interconnection design.

<u>Specification Number</u>	<u>Specification Title</u>	<u>Check</u>
CE – ES – 2002 – 1	Control and Instrumentation	<input type="checkbox"/>
CE – ES – 2002 – 2	Relay Protection	<input type="checkbox"/>
CE – ES – 2002 – 3	Communication Facilities	<input type="checkbox"/>
CE – ES – 2002 – 4	DC Power Supply System	<input type="checkbox"/>
CE – ES – 2002 – 5	Cable and Raceway Systems	<input type="checkbox"/>
CE – ES – 2002 – 6	120/208 Volt Light and Power Supply	<input type="checkbox"/>
CE - ES – 2002 – 10	Substation Grounding	<input type="checkbox"/>
CE – ES – 2002 – 11	Inter-Utility Metering	<input type="checkbox"/>
CE – ES – 2002 – 12	Capacitor Banks	<input type="checkbox"/>
CE – ES – 2002 – 13	Environmental Health and Safety Considerations	<input type="checkbox"/>
CE – ES – 2002 – 15	69, 138 and 345 kV Circuit Breakers	<input type="checkbox"/>
CE – ES – 2002 – 18	Power Transformers, Phase Angle Regulators Series Reactors and Shunt Reactors	<input type="checkbox"/>
CE – ES – 2002 – 21	Fire Protection	<input type="checkbox"/>
CE – ES – 2002 – 22	Potential Transformers	<input type="checkbox"/>
CE – ES – 2002 – 23	Lightning Protection	<input type="checkbox"/>
CE – ES – 2002 – 26	SF6 Gas Piping and Systems	<input type="checkbox"/>
CE – ES – 2002 – 30	Circuit Switchers and Circuit Interrupters	<input type="checkbox"/>
CE – ES – 2002 – 31	Disconnect Switches, Ground Switches and High Voltage Bus	<input type="checkbox"/>
CE – ES – 2002 – 32	Current Transformers	<input type="checkbox"/>
CE – ES – 2002 – 33	Coupling Capacitor Potential Devices and Voltage Transformers	<input type="checkbox"/>
CE – ES – 2002 – 38	Foundations	<input type="checkbox"/>

Appendices

1. Con Edison System Design Criteria, EP-7100, "Transmission Planning Criteria".
2. Con Edison Engineering Specification, CE-ES-2002, Section 1, "Standard Engineering Design Guidelines for Area Substations, Transmission Substations and PURS Facilities: General Requirements"
3. Con Edison Drawing #303032, Typical One Line Diagram of a Breaker-and-a-Half Design.
4. Con Edison Drawing #303033, Typical One Line Diagram of a Ring Bus Design.