



Manual 23

Transmission Expansion and Interconnection Manual

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2.3.3.4. System Impact Study (SIS)

Upon completion of the OFES (or if the Transmission Developer elects to forego an OFES), the next step is the SIS. Unlike the OFES, the NYISO committees (TPAS and OC) are involved in the SIS through the review and approval of the SIS Scope, and the review and approval of the SIS report. OC review and approval of the SIS satisfies the requirements of Section 18.02 of the ISO Agreement.

The purpose and objectives of the SIS are to: evaluate the feasibility of the proposed interconnection (consistent with Section 22.7.2 of Attachment P if feasibility was not evaluated or not fully evaluated in an OFES), evaluate the impact of the project on the pre-existing electric system and interface transfer capability, determine whether the project triggers the need for any Network Upgrade Facilities, and if so, develop a list of the Network Upgrade Facilities that would be required along with nonbinding good faith estimates of the cost responsibility and time to construct those facilities. The SIS evaluates the impact of the project in accordance with the NYISO Transmission Interconnection Standard per Section 22.6.4 of Attachment P, which involves conducting thermal, voltage, stability and short circuit analyses, as well as a transfer limit analysis to determine whether the Transmission Project degrades interface transfer capability by more than 25 MW (a degradation of interface transfer capability by more than 25 MW is considered unacceptable under the Transmission Interconnection Standard). The SIS also may include various “special studies” (e.g., Electro-Magnetic Transients (EMT) study, Sub-Synchronous Resonance (SSR) study, etc.) as considered appropriate for the type and circumstances of the Transmission Project and its interconnection to the system.

If one or more alternative Point(s) of Interconnection configurations were evaluated in the OFES, the Developer must designate which configuration is to be evaluated in the SIS. Only one Point(s) of Interconnection configuration may be evaluated in the SIS.

The process for performing the SIS is outlined in Section 22.8 of Attachment P to the NYISO OATT. The basic steps are:

- Preparation, tender and execution of the SIS Agreement (SISA);
- In conjunction with the SISA, preparation, review and OC approval of the study scope of work (SIS Scope);
- Performance of the study, including completion of all required tasks and review of the study report and documentation by the Parties and any Affected System Operators;
- The study report meeting between the Parties (NYISO, CTO(s), and Developer) and any Affected System Operators;
- Presentation of the SIS report to the TPAS for review, followed by presentation of the SIS report to the OC for approval.

As soon as practicable after receiving the Transmission Developer's election in the Scoping Meeting to proceed with an SIS, or simultaneously with the delivery of an OFES to the Transmission Developer, NYISO prepares and tenders the SISA to the Transmission Developer and the CTO(s) and provides a nonbinding good faith estimate of the cost and time to complete the SIS in accordance with Section 22.8.1 of Attachment P. In conjunction with the SISA, NYISO prepares the scope of work for the study ("SIS Scope") consistent with Section 22.8.3 of Attachment P. NYISO first issues a draft SIS Scope to the Parties and any Affected System Operators for review and comment. (During preparation of the SIS Scope, the Parties may discuss whether any "special studies" should be performed for the Transmission Project, and if so, whether to perform such studies as part of the SIS, or at a later step of the process – either in the Facilities Study, or included as part of the engineering studies that may be performed under the Transmission Project Interconnection Agreement. NYISO will seek to reach mutual agreement among the Parties on whether and what special studies to include in the SIS Scope. However, in the event of failure to reach mutual agreement among the Parties on this, or any aspect of the SIS Scope, may be brought up to TPAS and/or the OC as appropriate.)

After review by the Parties and any Affected System Operators, NYISO submits the SIS Scope to TPAS for review, then to the OC for approval.

The Transmission Developer, NYISO and CTO(s) are required to execute and deliver the SISA to NYISO within thirty (30) Calendar Days after NYISO tenders the SISA. The Transmission Developer is required to provide a study deposit of either \$40,000 (if the Transmission Developer is hiring a third-party consultant to perform the analytical portions of the study) or \$120,000 (if NYISO is responsible for performing the entire study) to the NYISO on or before return of the executed SISA. The Transmission Developer also must provide the technical data required by the SISA to the NYISO on or before return of the executed SISA. The procedures related to any failure of the Transmission Developer to meet the requirements related to

execution of the SISA are described in Section 22.8.2 of Attachment P.

After the SISA has been fully executed by the Parties and the OC has approved the SIS Scope, the responsible Parties proceed to perform the SIS in accordance with Section 22.8.4 of Attachment P, the SISA, and the approved SIS Scope. NYISO serves as the overall coordinator for the study, including coordination of review of the draft SIS report and associated documentation by the Parties and any Affected System Operators. NYISO prepares the initial steady state, short circuit and dynamic base cases to be used for the SIS following the requirements outlined in Section 22.6.1 of Attachment P and the SIS Scope. Other parties involved in the study that need the steady state, short circuit and/or dynamic base cases must request the base cases from the NYISO following the NYISO CEII request procedures. A CEII Request Form and NDA are available from the NYISO website and can be accessed via the Interconnection Projects portion of the NYISO website.

As soon as practicable after completion of the initial draft of the SIS report, NYISO will provide the draft study report to the Transmission Developer, CTO(s) and any Affected System Operators for review and comment, and coordinates the review process. Upon completion of the review process, NYISO arranges and holds a study report meeting with the Transmission Developer, CTO(s) and any Affected System Operators to discuss the results of the SIS per Section 22.8.5 of Attachment P.

Following the study report meeting, NYISO arranges for submittal of the SIS report to TPAS for review and consideration for recommendation for OC approval. If the SIS was not performed by NYISO staff, NYISO staff prepares and submits a “NYISO Review Report” to accompany the SIS report, to summarize NYISO staff’s review and conclusions regarding the SIS. Following TPAS review, NYISO arranges for submittal of the SIS report to the OC for consideration for approval. Upon OC approval of the SIS, the SIS for that project is considered to be completed.

After OC approval of the SIS, NYISO initiates final accounting and settlement billing of the NYISO and CTO(s) actual study costs with the Transmission Developer in accordance with Section 22.8.1 of Attachment P and the SISA.

2.3.3.5. Facilities Study

At any time following OC approval of the SIS, the Transmission Developer may initiate the next step of the TIP by requesting the NYISO to tender a Facilities Study Agreement for its Transmission project. The NYISO committees (TPAS and the OC) are not involved in the Facilities Study.

The purpose of the Facilities Study, per Section 22.9.3 of Attachment P to the NYISO OATT, is to update and refine the description of Network Upgrade Facilities identified in the SIS, including the equipment, work and related cost and time estimates necessary to construct the required Network Upgrade Facilities.

If not performed in the SIS, the Facilities Study may include various “special studies” (*e.g.*, Electro-Magnetic Transients (EMT) study, Sub-Synchronous Resonance (SSR) study, etc.) as considered appropriate for the type and circumstances of the Transmission Project and its interconnection to the system. To the extent the NYISO or Connecting Transmission Owner determine, in accordance with Good Utility Practice, that such studies need to be performed after the Facilities Study, the Transmission Developer will be responsible for the study costs for such studies and any upgrade costs resulting from such studies, to the extent consistent with Attachment P. The Facilities Study also will provide a nonbinding estimate as to the feasible TCCs resulting from the construction of the new facilities, as applicable. Transmission Developer will be responsible for posting Security in the amount of the cost estimates for the Network Upgrade Facilities documented in the final Facilities Study report pursuant to Section 22.11.1 of Attachment P.

The process for performing the Facilities Study is outlined in Section 22.9 of Attachment P. The basic steps are:

- Preparation and execution of the Facilities Study Agreement (FSA);
- In conjunction with the FSA, preparation and review of the study scope of work by the Parties and any Affected System Operators;
- Performance of the study, including completion of all required tasks and review of the study report and documentation by the Parties and any Affected System Operators; and
- The study report meeting between the Parties (NYISO, CTO(s), and Developer) and any Affected System Operators.

As soon as practicable after receiving the Transmission Developer’s request to proceed with a Facilities Study, NYISO prepares and tenders the FSA to the Transmission Developer and the CTO(s) and provides a nonbinding good faith estimate of the cost and time to complete the study in accordance with Section 22.9.1 of Attachment P. In conjunction with the FSA, NYISO prepares the scope of work for the study (“FS Scope”) consistent with Section 22.9.3 of Attachment P (and, if applicable, including any special studies as described above). NYISO first issues a draft FS Scope to the Parties and any Affected System Operators for review and comment, then issues the final FS Scope to those parties.

The Transmission Developer, NYISO and CTO(s) are required to execute and deliver the FSA to the NYISO within thirty (30) Calendar Days after NYISO tenders the FSA. The Transmission Developer is required to provide a study deposit of \$100,000 to the NYISO on or before return of the executed FSA. The Transmission Developer also must provide the technical data required by the FSA to the NYISO on or before return of the executed FSA. The procedures related to any failure of the Transmission Developer to meet the requirements related to execution of the FSA are described in Section 22.9.2 of Attachment P.

After the FSA has been fully executed by the Parties, the responsible Parties proceed to perform the

Facilities Study in accordance with Section 22.9.4 of Attachment P, the FSA, and the approved FS Scope. NYISO serves as the overall coordinator for the study, including coordination of review of the draft Facilities Study report and associated documentation by the Parties and any Affected System Operators.

As soon as practicable after completion of the initial draft of the Facilities Study report, NYISO will provide the draft study report to the Transmission Developer, CTO(s) and any Affected System Operators for review and comment, and coordinates the review process. Upon completion of the review process, NYISO arranges and holds a study report meeting with the Transmission Developer, CTO(s) and any Affected System Operators to discuss the results of the Facilities Study per Section 22.9.5 of Attachment P.

Billing of study costs for the Facilities Study is performed in accordance with Section 22.9.1 of Attachment P and the FSA, and works differently than for an OFES or SIS. During the course of the Facilities Study, NYISO holds the \$100,000 study deposit on account and invoices the Transmission Developer on a monthly basis for NYISO and CTO(s) study costs. After completion of the Facilities Study and after all outstanding invoices for study work for the project have been received by NYISO, NYISO initiates final accounting and settlement billing of NYISO and CTO(s) actual study costs with the Transmission Developer and refunds the study deposit, or any unspent portion thereof, as part of the final billing.

3.3.3.6.3. Basic Steps of the Facilities Study

For each project in the Class Year Study, the basic steps of the Class Year Study process, as outlined in Section 30.8 of Attachment X, are as follows:

- Preparation and execution of the Class Year Study Agreement (CYSA);⁴
- Performance of the Class Year Study by NYISO and other parties as coordinated by NYISO in accordance with Section 30.8.3 of Attachment X and the procedures set forth in Attachment S;
- Presentation of preliminary Class Year Deliverability Study results to TPAS/IPFSWG;
- Presentation of preliminary Class Year Deliverability Study results to Operating Committee for approval;
- Notice of SDUs Requiring Additional Study and elections by the affected Class Year Projects (if applicable);
- Study report meetings among NYISO, CTO(s), Affected Transmission Owner(s), Affected System Operator(s), and the Developer to review the study results for each Class Year Project;
- Presentation of the full Class Year Study report to the TPAS and IPFSWG for review, followed by presentation of the Class Year Study report to the OC for approval;
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- Class Year decision and settlement process;
- Confirmation of Developers' payments or Security postings for accepted system upgrade cost allocations.

Relying in part on the results of the individual SRIS performed for each of the Class Year Projects, the Class Year Study is a more detailed evaluation and identification of all CTOAFs and SUFs that would be required for the reliable interconnection of the Class Year Projects, along with estimates of the cost and time for procurement, construction, and installation of those facilities. And, beginning with Class Year 2007, the Class Year Study includes evaluation of the deliverability of proposed capacity for those Class Year Projects requesting CRIS and any SDUs that would be required to make that proposed capacity fully deliverable. If not performed in the SRIS, the Class Year Study shall include required "special studies" (*e.g.*, Electro-Magnetic Transients (EMT) study, Sub-Synchronous Resonance (SSR) study, etc.) as considered appropriate at the Class Year Study stage for the type and circumstances of the Class Year Project and its interconnection to the system. To the extent the NYISO or CTO(s) determine, in accordance with Good Utility Practice, that such studies need to be performed after the Class Year Study, the Developer will be

⁴ Following tender of the Class Year Study Agreement (FSA), the Developer has ten (10) Calendar Days to complete it and return it unexecuted to NYISO along with the required technical data, deposits, and any qualifying contracts (if applicable); otherwise, the Large Facility project may not be eligible to enter that Class Year. However, for an Interconnection Request seeking CRIS only for a small generator with a pending Interconnection Request in the SGIP, such Developer's failure to execute the Facilities Study Agreement within thirty (30) Calendar Days will not result in withdrawal of the small generator's Interconnection Request under the SGIP. However, the Interconnection Customer will be required to request tendering of a Facilities Study Agreement for CRIS only in accordance with the procedures under the LFIP.

responsible for the study costs for such studies and any upgrade costs resulting from such studies, to the extent consistent with Attachment S to the NYISO OATT.

The Class Year Study actually consists of several separate studies grouped into two general “Parts” as follows:

“Part 1 Studies”: The Class Year Study includes a Part 1 study for each project participating in the Class Year for ERIS to identify the CTOAFs and Local SUFs involved in the direct connection of the Project to the pre-existing electric system. The Local SUFs addressed in a Part 1 Study include new transmission facilities that may be required, such as a new 3-breaker ring bus to connect into an existing line, and system protection and communication SUFs. These Part 1 studies are generally performed independently of each other. Each study is specific to the Class Year Project and includes a design and preliminary engineering of the identified CTOAFs and Local SUFs and estimates of the cost and time to construct those facilities.

NYISO seeks the assistance of the CTO(s) for much of the Part 1 studies. Consultants may be used for some or all of the work as well.

“Part 2 Studies”: The Class Year Study Part 2 studies include the Annual Transmission Baseline Assessment (ATBA), the Annual Transmission Reliability Assessment (ATRA), and the Class Year Deliverability Study. The ATBA evaluates the pre-existing baseline system before the Class Year Projects are included and identifies any SUFs and associated cost estimates for that system. The ATRA evaluates the condition with the Class Year Projects added to the baseline system, identifies the SUFs required for the Class Year Projects collectively, and then performs a design, preliminary engineering, and estimation of cost and time to construct for each SUF. The ATRA addresses all SUFs required for the Class Year Projects, including SUFs identified in the Part 1 studies. The ATBA and ATRA determine the “cost allocation” of the SUFs between the TOs and the Class Year Project Developers, and the ATRA determines the cost allocation among the Class Year Developers in accordance with Attachment S (these assessments are performed under the Minimum Interconnection Standard).

The Class Year Deliverability Study (CYDS) evaluates the deliverability of CRIS requested by the Developers for the Class Year Projects (including any CRIS only projects), determines the amount of requested CRIS that would be deliverable without SDUs, if any, and identifies the SDUs that would be required to make the requested CRIS fully deliverable. If the NYISO identifies a SDU for a Class Year Project or group of Class Year Projects that is “new”—*i.e.*, not previously studied and cost allocated in a Class Year Study and not substantially similar to a SDU previously studied and cost allocated in a Class Year Study, the NYISO will separately notify the TPAS/IPFSWG and the individual Developers of the affected Class Year Projects that an Additional SDU Study is required (*see* Section 25.7.7.1 of Attachment S to the NYISO OATT).

Developers not electing to pursue further study of the identified SDU in an Additional SDU Study can continue in the Class Year Study but will be limited to accepting or rejecting their Project Cost Allocations for SUFs and the number of Deliverable MWs, if any, that were determined to be deliverable through the CYDS without the need for an SDU.

For each SDU identified that does not require an Additional SDU Study, the deliverability evaluation in the Class Year Study is performed to finalize a design and cost estimate for the SDU. Similar to the ATBA and ATRA performed to determine the cost allocation for SUFs, the CYDS includes an ATBA-D and ATRA-D that are used to determine the cost allocation for SDUs to and among the Class Year Projects in accordance with Attachment S (these assessments are performed under the Deliverability Interconnection Standard). Section 3.6.5 below and Section 25.7 of Attachment S to the NYISO OATT provide further information on the deliverability study methodology.

NYISO conducts most of the analyses for the Part 2 studies, but may use one or more consultants to perform portions of those studies. NYISO will also review and incorporate the results of additional studies performed by CTOs, Affected Transmission Owners, and Affected System Operators when such studies are appropriate to evaluate the Class Year Projects' potential impacts. For studies conducted by Affected System Operators, the Part 2 studies will include the results to the extent they are available.

The major steps of the Class Year Study include:

1. Preparation of Base Cases for the ATBA and ATRA – NYISO requests updates of information from the TOs, neighboring ISOs/RTOs, and Developers and prepares steady state, dynamic, and short circuit base cases for the ATBA and ATRA. In doing so, NYISO prepares data for modeling each of the Class Year Projects to be used in the studies.
2. Part 1 Studies – NYISO identifies, designs and preliminary engineers the CTOAFs and Local SUFs and their integration with the Developer's proposed facilities and with the existing system for each Class Year Project. NYISO also estimates the cost and time to construct the CTOAFs and Local SUFs for each project. As discussed above, the Part 1 study for an individual project may begin in advance of the Class Year Start Date.
3. Re-evaluation and Identification of SUFs (ATBA, ATRA) under MIS – This step involves reviewing the individual SRISs for the Class Year Projects and conducting thermal, voltage, stability, and short circuit analyses, as necessary and appropriate, to re-evaluate the collective impact of the Class Year Projects, to re-evaluate the need and adequacy of any previously identified SUFs, and

to make any necessary adjustments for the final identification and specification of SUFs needed for the Class Year Projects.

4. Development of cost allocation and time estimates for SUFs – This task entails engineering and estimations of the cost and time to construct each of the SUFs identified in the previous steps. NYISO uses information from the Part 1 studies as applicable.
5. Deliverability Study and Notice of SDUs Requiring Additional Study (if required) – NYISO identifies SDUs under DIS as described in Section 3.6.4 below. If NYISO determines that an identified SDU for a Class Year Project or group of Class Year Projects is “new,” NYISO will issue a Notice of SDUs Requiring Additional Study to stakeholders of the IPGSWG and a separate notice to the Developers of the Class Year Project(s) that require the SDU(s) necessitating Additional SDU Study(ies) as soon as practical after identifying the SDU(s). Each Developer of a Class Year Project that receives a notice must respond to NYISO within ten (10) calendar days to elect, among other things, to proceed or not proceed with an Additional SDU Study. If a Developer does not elect to proceed with an Additional SDU Study, then it can continue with the Class Year Study but will be limited to accepting its CRIS based on the deliverable MWs, if any, from the Class Year Deliverability Study. If a Developer elects to proceed with the Additional SDU Study, the study would proceed separate and apart from the Class Year Study as described in Section 3.3.3.7 below. A Developer that fails to notify NYISO within ten (10) calendar days will be deemed to have elected not to proceed with an Additional SDU Study and can remain in the Class Year Study for purposes of accepting its SUF cost allocation and deliverable MWs from the Class Year Deliverability Study, if any.
6. Compilation of study results and preparation of draft Class Year Study Report – NYISO has overall responsibility for the Class Year Study Report and provision of the report to the Developers of Class Year Projects and other parties as appropriate. NYISO expects the CTOs or consultants to prepare reports or portions of the Class Year Study Report for which they had contractual responsibility. The SUFs identified via ATRA and ATBA and the SUFs summary from the individual Part 1 studies are documented in a “Class Year Study Report.” The SDUs identified via ATRA-D and ATBA-D are documented in the final Class Year Study Report. If an Additional SDU Study completes prior to OC approval of the draft Class Year Study Report, the results of the Additional SDU Study will be incorporated into the final Class Year Study Report (or prepared as an addendum). Both reports, along with the supporting appendices or addendums, will be reviewed and approved through the TPAS/IPFSWG and OC review and approval process.

7. Review and Approval – This step includes the following sub-steps:
 - a. NYISO schedules a Report Meeting with the IPFSWG (group formed at the beginning of each class, by invitation sent to TPAS and OC members, comprised of Class Developers, CTOs, and other interested parties), to be held within ten (10) Business Days (approximately 2 weeks) of distribution of the applicable draft Class Year Study reports.
 - b. After the Report Meeting, NYISO submits the draft Class Year Study reports to TPAS/IPFSWG for review and action at its next meeting.
 - c. As soon as possible after the TPAS meeting, NYISO submits the draft Class Year Study reports to the OC for approval.
8. Decision Period and Cost Settlement – After the OC approval of the Class Year Study Report, the process enters a 30 calendar day initial decision period during which the Class Year Developers are given the choice to accept or reject their respective cost allocation for SUFs and separately, cost responsibility for any SDUs as summarized in the Class Year Study Report or applicable addendum. Developers that accept their cost allocation for SUFs must provide a confirmed In-Service Date and Commercial Operation Date for their project to NYISO subject to the limitations set forth in Section 30.4.4.5 of Attachment X to the NYISO OATT. If any Developers reject their cost allocation for SUFs, the associated projects are removed from the Class Year. Any Developers that accept their cost allocation for SUFs but reject their cost responsibility for SDUs, remain in the Class Year but would be only eligible for partial CRIS up to the amount determined to be deliverable, if any. If necessary, NYISO re-evaluates the SUFs (and re-evaluates deliverability and associated SDUs as necessary) for the remaining Class Year Projects, makes any necessary adjustments, and issues a revised Class Year Study Round “n” Addendum Report (where “n” is the number of iterations until all remaining Class Developers accept SUF cost allocation) following the schedule set forth in Attachment S.

The Class Year Study is considered complete once (i) the Class Year Study Report has been completed, (ii) all Developers (or remaining Developers) have accepted their respective cost allocations for SUFs and SDUs, as applicable, or deferred making a decision on their respective cost allocations for SUFs due to a pending Additional SDU Study as presented in the OC-approved Class Year Study report or subsequent Round Addendum Reports, and (iii) paid for or posted security for SUFs and SDUs as applicable.