SECTION 60
GENERATOR INTERCONNECTION TRANSMISSION SYSTEM IMPACT STUDIES

60.1 ISO-NE SECTION I.3.9 APPROVAL REQUIREMENTS

Regardless of whether a Customer-Generator is being interconnected pursuant to the Chapter 324 state-jurisdictional interconnection process, the interconnection of the Customer-Generator facility may require review by ISO New England, Inc. ("ISO-NE") pursuant to Section I.3.9 of the ISO-NE Transmission, Markets and Services Tariff to ensure that proposed system changes do not have a significant adverse impact on the regional power system. The ISO-NE Section I.3.9 process applies to the interconnection of the following Customer-Generator facilities:

- New or increased generation greater than or equal to 5 MW;
- New or increased generation greater than 1 MW and less than 5 MW, where ISO-NE has determined such interconnection(s) will have a cumulative impact on facilities used for the provision of regional transmission service.

For new or increased generation greater than or equal to 5 MW, a Proposed Plan Application ("PPA") must be submitted to ISO-NE. If the Customer-Generator is not an ISO-NE Market Participant, CMP makes the PPA submittal to ISO-NE on the Customer-Generator's behalf.

For New or increased generation greater than 1 MW and less than 5 MW, Generator Notification Forms ("GNF") are required to be submitted to ISO-NE by the Customer-Generator, unless ISO-NE has identified that a PPA is required. If the Customer-Generator is not an ISO-NE Market Participant, CMP makes the GNF submittal to ISO-NE on the Customer-Generator's behalf.

For Customer-Generator's interconnecting with CMP's distribution system under Chapter 324, CMP is responsible for scoping and conducting the Section I.3.9 study, in coordination with ISO-NE. The Customer-Generator shall be responsible to pay all costs incurred by CMP in conducting the Section I.3.9 study related to its facility, including any Transmission System Impact Study costs as described in Section 60.5 below.

Once the Section I.3.9 study is complete, CMP will present the study results and identification of any needed upgrades to the New England Power Pool ("NEPOOL") Reliability Committee for an advisory vote. After an advisory vote by the Reliability Committee, ISO-NE will issue a determination approving or denying the PPA.

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60.2 REQUIREMENT FOR TRANSMISSION SYSTEM IMPACT STUDIES

The Transmission Operating Agreement between Participating Transmission Owners ("PTOs") and ISO-NE requires that PTOs, including CMP, identify to ISO-NE when there is an accumulation of generators seeking to connect to distribution facilities that may in turn have an impact on the regional transmission system. In such cases, CMP is required to consult with ISO-NE in the performance of Section I.3.9 studies for such accumulations of generators. ISO-NE has the responsibility of identifying whether the accumulation of interconnections will have an impact on the regional transmission system. When ISO-NE has made such a determination, CMP will perform a Transmission System Impact Study for an accumulation of generators where feasible, rather than performing an individual Section I.3.9 study for each Customer-Generator facility. Transmission System Impact Studies are also used to assess the impact of Customer-Generators on CMP's voltage subtransmission system.

60.3 DETERMINATION OF CLUSTERS FOR PERFORMING TRANSMISSION SYSTEM IMPACT STUDIES

CMP will perform Transmission System Impact Studies when requested to do so by ISO-NE based upon CMP's identification to ISO-NE of an accumulations of generators individually greater than 1 MW. Individual clusters shall be comprised of those proposed Customer-Generator facilities that are identified by CMP to ISO-NE as comprising an accumulation of generators for which ISO-NE review is necessary pursuant to the Transmission Operating Agreement.

In general, Transmission System Impact Studies of a cluster of Customer-Generators are required when the amount of generation provided by Customer-Generators in aggregate exceeds 20 MW at a Bulk Electric System ("BES") substation or a group of electrically-close BES substations as determined by CMP in consultation with ISO-NE.

Transmission System Impact Study inclusion is based on executed Chapter 324 study agreement dates. CMP in consultation with ISO-NE as needed, determines the Transmission System Impact Study inclusion cut-off dates, opens new Transmission System Impact Studies as needed, and may combine or separate Transmission System Impact Studies as needed to improve efficiency.

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60.4 CLUSTER STUDY PARTICIPATION AND PROCESS

Customer-Generators with executed Chapter 324 study agreements on or before the cluster participation period has closed are eligible to participate in the Transmission System Impact Study.

Within 15 business days of a cluster's closure, CMP will issue a Transmission System Impact Study Agreement to eligible Customer-Generators along with a data request if required. Each Customer-Generator shall have 10 business days from receipt to execute the Transmission System Impact Study Agreement, provide the study fee as indicated in Section 60.5, and return the completed data request. Completion of the requirements ensures participation in Phase 1 of the Transmission System Impact Study. Phase 1 includes the steady-state, dynamic stability, and short circuit analyses and these analyses may be performed on a variety of generation dispatches and load levels as needed. Failure to complete any of the Transmission System Impact Study requirements for eligibility will result in removal from participation in the Transmission System Impact Study. A Customer-Generator may elect to execute a Non-Disclosure Agreement to obtain study results which contain Critical Energy Infrastructure Information ("CEII"), not unduly withheld, to obtain Phase 1 or Phase 2 results.

Each Customer-Generator shall provide CMP via the Transmission System Impact Study Agreement with a single designated valid email address for all Transmission System Impact Study related data requests. After receipt of the completed agreements, CMP will hold a scoping meeting for the Cluster study within 5 business days. In this meeting CMP will discuss the preliminary assumptions and models that may be used for the study and will provide a high-level timeline for the cluster participants.

CMP will make best efforts to complete Phase 1 study within 140 business days of the scoping meeting and notify Customer-Generators of the results of the steady-state load flow, dynamic stability, and short circuit analyses as soon as those analyses are complete. CMP will coordinate data gathering, model building and verification for Phase 2 in parallel with conducting the Phase 1 analysis. Upon completion of Phase 1, CMP will release a Phase 1 system impact study report for review within 5 business days and will host a results meeting within 5 business days thereafter. The Phase 1 system impact study report will include the results of the analyses, identification of Network Upgrades, and identification of projects that do not contribute to the need for Network Upgrades. The Phase I results will include alternatives that have been considered, including alternatives to Network Upgrades, and an order of magnitude cost accuracy and construction time estimates of the proposed Network Upgrades required to mitigate identified reliability criteria violations as well as cost allocation of the Network Upgrades. Cost allocation shall be determined per Section 60.6.

Within 10 business days of the results meeting, Customer-Generators must signal their intent to be included in Phase 2 of the Transmission System Impact Study by submitting the second non-refundable Transmission System Impact Study fee per Section 60.5. Phase 2 of the Transmission System Impact Study will restudy the analyses in Phase 1 as required with the remaining Customer-Generators, will include the Power Systems – Computer Aided Design ("PSCAD") analysis, and will provide cost allocation of Network Upgrades if required based on the remaining Customer-Generators and results of the Phase 2 analyses.

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60.4 CLUSTER STUDY PARTICIPATION AND PROCESS (continued)

In parallel with Phase 2, CMP will perform additional study analyses to refine the scope, schedule and cost of the Network Upgrades identified by the Phase 1 analysis. CMP will make best efforts to complete the Phase 2 analysis within 100 business days, including any potential restudy, updates to mitigation and cost allocation, and the PSCAD analysis. CMP will conduct a customer meeting to inform Customer-Generators of the results of the re-study within Phase 2. The Phase 2 results will include the identification of projects that do not contribute to the need for Network Upgrades that can interconnect and operate prior to completion of Network Upgrades. CMP will provide the results and Transmission System Impact Study Report to Customer-Generators before submittal of PPAs to ISO-NE.

Customer-Generators participating in Phase 2 of the Transmission System Impact Study will have their PPA submitted to ISO-NE for Section I.3.9 approval. Additional study work to address Transmission System Impact Study attrition following receipt of Section I.3.9 approval will be addressed per Section 60.7. The Section I.3.9 approved Transmission System Impact Study will also be provided to the Office of the Public Advocate.

Data requests may be made by CMP throughout the course of a Transmission System Impact Study. CMP will make every reasonable effort to notify Customer-Generators of data requests as early as possible. Customer-Generators shall have 10 business days from receipt to respond to a CMP data request or the Customer-Generator will forfeit its participation in the current Transmission System Impact Studyincluding any study costs.

60.5 TRANSMISSION SYSTEM IMPACT STUDY COSTS

Transmission System Impact Study costs shall be allocated to each Customer-Generator as follows:

1) For Transmission System Impact Studies with 10 or more Customer-Generators, each Customer-Generator will be allocated a non-refundable Transmission System Impact Study fee for participation in the first phase (“Phase 1”) of the Transmission System Impact Study. This fee will be the Customer-Generator’s pro-rata share of $175,000 based on the relative size (kW) of the facility as of the date of their Transmission System Impact Study Agreement.
2) For Transmission System Impact Studies with 10 or more Customer-Generators, each Customer-Generator will be allocated a non-refundable Transmission System Impact Study fee for participation in the second phase (“Phase 2”) of the Transmission System Impact Study. This fee will be the Customer-Generator’s pro-rata share of $50,000 based on the relative size (kW) of the facility as of the date of their Transmission System Impact Study Agreement. Customer-Generators that are identified as contributing to a Network Upgrade will be individually assessed an incremental $20,000 non-refundable deposit to perform additional study analysis.

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60.5 TRANSMISSION IMPACT STUDY COSTS (continued)

3) For Transmission System Impact Studies with less than 10 Customer-Generators, each Customer-Generator will be allocated a non-refundable Transmission System Impact Study fee of $10,000 for participation in the first phase ("Phase 1") of the Transmission System Impact Study.
4) For Transmission System Impact Studies with less than 10 Customer Generators, each Customer-Generator will be allocated a non-refundable Transmission System Impact Study fee of $2,000 for participation in the second phase ("Phase 2") of the Transmission System Impact Study. Customer-Generators that are identified as contributing to a Network Upgrade will be individually assessed an incremental $50,000 non-refundable deposit to perform additional study analysis.
5) Final invoicing of all Phase 1 Transmission System Impact Study costs will occur at the conclusion of Phase 1 with the Customer-Generators participating in Phase 1 and they will beallocated their pro-rata share of the Phase 1 study costs based on the relative size (kW) of their facility as of the date of their Transmission System Impact Study Agreement.
6) Final invoicing of all Transmission System Impact Study costs will occur pursuant to the invoicing timelines in Chapter 324. Final Transmission System Impact Study costs will be reconciled with the Customer-Generators participating in Phase 2 and they will be allocatedtheir pro-rata share of the final study costs based on the relative size (kW) of their facility asof the date of their Transmission System Impact Study Agreement.

60.6 TRANSMISSION SYSTEM IMPACT STUDY NETWORK UPGRADE COSTS

Network Upgrades shall mean the additions, modifications, and upgrades to the CMP Transmission System required at or beyond the point at which the Customer-Generator connects to CMP's Transmission System to accommodate the interconnection of the Customer-Generator. Network Upgrades are only cost-shared within the Transmission System Impact Study. Network Upgrades and associated Network Upgrade costs will not be reassessed for reasons other than attrition per Section 60.7.

Network Upgrade costs identified through any required Transmission System Impact Study shall be allocated to each Customer-Generator in the following manner:

1) All Network Upgrades required to mitigate reliability criteria violations specifically attributed to a steady state thermal or voltage criteria violation will be allocated based on the proportional impact of each individual Customer-Generator in the Transmission System Impact Studies on each impacted transmission facility. The proportional impact of such Network Upgrades shall be calculated as follows.

    a. Network Upgrades required to mitigate thermal violations shall be allocated using a weighted allocation factor analysis which will identify each Customer-Generator's contribution to the thermal violation.

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TRANSMISSION SYSTEM IMPACT STUDY NETWORK UPGRADE COSTS (continued)

b. Voltage support related Network Upgrades shall be allocated using a voltage impact analysis which will identify each Customer-Generator's contribution to the voltage violation.

Weighted Allocation Factor Methodology

Network Upgrades required to mitigate thermal violations shall be allocated using a weighted allocation factor analysis which will identify each Customer-Generator's contribution to the thermal violation. This means that the costs of those facilities are allocated proportionally to the amount of flow each generator contributes on the existing facility with the reliability criteria violation.

First, the outage and contingency scenarios that cause thermal overloads on an impacted facility are determined.

Each Customer-Generator's distribution factor ("DFAX") is calculated for each outage and contingency scenario.

A KW Impact is calculated for each Customer-Generator for each outage and contingency scenario as follows:

*KW Impact = DFAX * Gen Output (kW)*

An Allocation Factor is calculated for each Customer-Generator for each outage and contingency scenario as follows:

Allocation Factor = KW Impact / Sum of KW Impact for all Customer-Generators

An Overload Weighting Factor is calculated for each outage and contingency scenario as follows:

Overload Weighting Factor = (% Loading – 100) / Σ (% Loading – 100)

A Weighted Allocation Factor is calculated for each Customer-Generator for each outage and contingency scenario as follows:
*Weighted Allocation = Allocation Factor * Overload Weighting Factor*

Finally, a Total Weighted Allocation Factor for each Customer-Generator is calculated as follows:

Total Weighted Allocation Factor = Σ Weighted Allocation

The Total Weighted Allocation Factor determines each Customer-Generator's cost responsibility for the Network Upgrade which mitigates the thermal overload condition(s).

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60.6 TRANSMISSION SYSTEM IMPACT STUDY NETWORK UPGRADE COSTS (Continued)

Voltage Impact Methodology

Voltage support related Network Upgrades shall be allocated using a voltage impact analysis which will identify each Customer-Generator's contribution to the voltage violation. This means the Cluster Study identifies the worst-case voltage criteria violation at a transmission facility. Costs for this new voltage support resource are allocated by removing a Customer-Generator from the model (each in turn) and evaluating the impact of that generator on the voltage. For a low voltage violation, if the voltage stays constant or decreases when the generator is removed, it is considered a "Helper" generator. If the removal of a generator from the model elevates the contingent voltage and increases it, then such generator is called "Harmer." For those Customer-Generators labeled as "Harmers," cost of voltage mitigation is allocated in proportion to their voltage impact (the voltage delta between the contingent voltage and the contingent voltage with the removal of the Customer-Generator). Customer-Generators labeled "Helpers" will not receive any cost of voltage mitigation or any offset or credit towards any Network Upgrade cost responsibilities or allocation.

2) All Network Upgrades other than those identified in Section 60.6.1 will be allocated based on the per-kW of the facility as of the date of their Transmission System Impact Study Agreement.

60.7 ATTRITION

Customer-Generators may elect to withdraw their Interconnection Application from time to time pursuant to the Chapter 324 state-jurisdictional interconnection process.

1) Study Costs

Customers-Generators electing to withdraw their Interconnection Application during Phase 1 of the Transmission System Impact Study forfeit their non-refundable study fee. To the extent feasible, CMP will attempt to remove the Customer-Generator from the Phase 1 study. If the Transmission System Impact Study analysis is underway or modification of the system base cases would cause delays to the Transmission System Impact Study schedule, the Customer-Generator will remain in-service during Phase 1, but it will be removed for Phase 2 of the Transmission System Impact Study. The Customer-Generator electing to withdraw their Interconnection Application during Phase 1 may be subject to final Transmission System Impact Study Phase 1 costs which will be reconciled in accordance with Section 60.5.5.

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60.7 ATTITION (Continued)

Customers-Generators electing to withdraw their Interconnection Application during Phase 2 of the Transmission System Impact Study forfeit their non-refundable study fee. To the extent feasible, CMP will attempt to remove the Customer-Generator from the Phase 2 study. If the Transmission System Impact Study analysis is underway or modification of the system base cases would cause delays to the Transmission System Impact Study schedule, the Customer-Generator will remain in-service during Phase 2. The Customer-Generator electing to withdraw their Interconnection Application during Phase 2 may be subject to final Transmission System Impact Study costs which will be reconciled in accordance with Section 60.5.6.

2) Restudy

The Transmission System Impact Study results such as identification and cost allocation of Network Upgrades may be impacted if Customer-Generators elect to withdraw their Interconnection Application following completion of Phase 2 of the Transmission System Impact Study. Completion of Phase 2 of the Transmission System Impact Study is determined by receipt of Section I.3.9 approval. Any restudy of the Transmission System Impact Study will occur following completion of Phase 2.

CMP may elect not to complete a restudy if CMP determines that no significant change to the identification of Network Upgrades would likely result. However, a reallocation of Network Upgrades costs may be required if the withdrawing Customer-Generators were assigned a share of these costs.

CMP may elect to complete a restudy if CMP determines that there may be a significant change to the identification of Network Upgrades determined on a case-by-case basis. Remaining Customer-Generators impacted by the restudy shall pay for the restudy costs on a per-kW of the facility as of the date of their Transmission System Impact Study Agreement for Phase 2.