

**To:** NEPOOL Transmission Committee

**From:** ISO New England

**Date:** September 20, 2016

**Subject:** Proposed Clustering Methodology in the ISO New England Interconnection Queue

## Summary

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ISO New England is proposing to incorporate a clustering methodology in the Interconnection Procedures.<sup>1</sup> The proposed clustering methodology will allow, under specific circumstances outlined below, for two or more Interconnection Requests (*i.e.*, Large Generating Facility, Small Generating Facility or Elective Transmission Upgrade (ETU); collectively, Projects) to be analyzed in the same System Impact Study (SIS) effort. The Projects participating in a cluster would share cost responsibility for certain shared interconnection related transmission upgrades and take on sole cost responsibility for individual interconnection facilities that are needed solely for the interconnection of a particular Project in the cluster. As is the case today, none of the shared or individual interconnection transmission upgrade and facility costs will be incorporated into regional transmission rates.

The proposed clustering methodology is comprised of two key phases. In the first phase, in advance of the cluster SIS, the ISO will identify the initial upgrade designs of Cluster-Enabling Transmission Upgrades (CETUs) in the Regional System Planning process. In the second phase, the ISO will conduct the cluster SIS to study the interconnection of the Projects, together with the identified CETU.

Apart from those Projects participating in a cluster SIS, all other Interconnection Requests would continue to be studied individually, in serial queue order. There are no changes to the Interconnection, OATT or Market Services that result from the completion of the interconnection process whether studied as part of the proposed cluster or individually under the existing serial queue order. The interaction of the interconnection queue with the Forward Capacity Market and the associated method of qualifying new resources for deliverability will be unchanged.

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<sup>1</sup> The Interconnection Procedures include Schedule 22 Large Generator Interconnection Procedures, Schedule 23 Small Generator Interconnection Procedures, and Schedule 25 Elective Transmission Upgrade Interconnection Procedures.

## Introduction and Background

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### Reasons and Drivers for the Clustering Proposal

The ISO New England interconnection queue has, in recent years, experienced a persistent backlog of Interconnection Requests in a specific part of the system. In Northern and Western Maine, several thousand megawatts of proposed resources have requested Interconnection Service under the ISO-NE OATT. However, for reasons that have been described by the ISO and discussed with Stakeholders,<sup>2</sup> the processing of these Interconnection Requests has been challenging and a backlog has developed.

All of the other ISO/RTOs in the United States use some form of clustering methodology within their interconnection procedures that have been designed to address unique circumstance experienced in the respective regions. In June 2015, the American Wind Energy Association petitioned the Federal Energy Regulatory Commission (FERC) to initiate a rulemaking process to address interconnection queue processing issues that have been experienced throughout the industry. In September 2015, the ISO responded to the AWEA petition, detailing the nature and scope of the issues being experienced in New England.<sup>3</sup> FERC convened a technical conference in May 2016 (FERC Docket No. RM16-12-000), where various aspects of the interconnection process were discussed.

### ISO Design Review and Stakeholder Discussion

In 2015, the ISO began a two-phase discussion with Stakeholders to address specific interconnection issues. The first phase of the ISO-NE interconnection process improvements was approved by FERC in April 2016 (FERC Docket No. ER16-946-000). These improvements were primarily designed to make wind and other inverter-based generator projects more “study-ready,” similar to conventional generators. The changes achieved this by incorporating: (1) reactive performance requirements for wind generators; and, (2) new technical data requirements for wind and inverter-based generators, including detailed project design descriptions and standardizing model requirements. Other changes included: (1) adding clarifications throughout the procedures, such as in relation to access to Base Case databases and the application of Material Modification; (2) incorporating an optional alternative scope of a Feasibility Study, focusing on the expected areas of concern for the proposed interconnection; and, (3) adopting certain modeling and performance requirements consistent with recent industry initiatives.

The second phase of interconnection process improvements focuses on how to address the identified infrastructure issues. This led to the development of the cluster design that is proposed in this document. The ISO conducted a comprehensive survey of the clustering methodologies used by the following ISO/RTOs: New York ISO, PJM, Midwest ISO, SPP and California ISO. The clustering methodologies were presented and discussed with Stakeholders at the March, 2016 Planning

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<sup>2</sup> *The Interconnection Process in New England – Status Update*, Planning Advisory Committee presentation (September 16, 2015), [http://www.iso-ne.com/static-assets/documents/2015/09/a5\\_generator\\_interconnection\\_and\\_queue\\_process\\_issues.pdf](http://www.iso-ne.com/static-assets/documents/2015/09/a5_generator_interconnection_and_queue_process_issues.pdf).

<sup>3</sup> See *American Wind Energy Association*, Comments of ISO New England Inc.; Docket No. RM15-21-000 (Sept. 8, 2015).

Advisory Committee (PAC) meeting. A further review of specific, targeted clustering approaches was discussed at the May, 2016 PAC meeting. The May discussion focused on the Southern California Edison Tehachapi Renewable Transmission Project and the Portland General Electric Company Cascade Project.

### **What is not Changing?**

Unless a generator or ETU Interconnection Request is identified as being included in a cluster, the current “default” serial interconnection procedural approach will be unchanged. Such Interconnection Requests will be studied by the ISO in serial queue order and will be individually allocated transmission upgrade cost responsibility under the existing “but for” cost allocation methodology.

The addition of the proposed cluster methodology in the Interconnection Procedures will not change the existing service products that result from the interconnection processes. Resources that meet all of the applicable procedural milestones will continue to be eligible to request and receive Network Resource Interconnection Service (“NRIS”), or Network Import Capability Interconnection Service (“NIIS”) in the case of eligible external Elective Transmission Upgrades, and Capacity Network Resource Interconnection Service (“CNRIS”), or Capacity Network Import Capability Interconnection Service (“CNIIS”) in the case of eligible external Elective Transmission Upgrades.

Finally, there will be no changes to the existing dispatch, market and OATT structures within the ISO-NE Tariff. There will be no introduction of firm reservations, grandfathering or point-to-point rights over the any Pool Transmission Facilities, including those that are built/upgraded as a result of the cluster or serial SIS processes. Requested CTRs and ARRs will be allocated for system upgrades, as appropriate, in accordance with existing rules.

### **Cluster Initiation (LGIP Section 4.2)**

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The ISO will assess the interconnection queue on a continual basis. The ISO will trigger a cluster when the following combination of circumstances is reflected by the Interconnection Requests in the ISO New England interconnection queue.

- First, there must be a backlog of two or more generator and/or External ETU Interconnection Requests in the same part of the ISO-NE Control Area.
- Second, the ISO determines that none of the applicable Interconnection Requests will be able to interconnect, either on an individual basis or as a cluster, without incurring significant new infrastructure transmission projects (such as one or more new 345 kV transmission line(s) or a new HVDC line). The new infrastructure transmission projects shall be known as Cluster Enabling Transmission Upgrades (CETU).

The ISO will announce and discuss the creation of a given cluster through the Regional System Planning process.

## **Phase I: Developing Cluster Enabling Transmission Upgrades in the Regional System Planning Process (Attachment K)**

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CETUs will be studied in the Regional System Planning process under Attachment K of the ISO OATT. The ISO will announce the initiation of a CETU Regional Planning Study (CRPS) to the PAC. The ISO will present the scope of work of the CRPS to the Planning Advisory Committee. The scope presentation will identify the Queue Positions that are expected to be eligible to participate in the cluster SIS and the initial transmission upgrade concepts that are proposed to be considered. The ISO will seek input from the PAC regarding the CRPS scope. If all, or all but one, of the identified Interconnection Requests withdraw from the queue before the CRPS is completed, the ISO will terminate the CRPS.

In developing the CETU concepts, the ISO will consider previously conducted studies of transmission reinforcements and previously proposed area transmission upgrades (including ETUs). The CRPS will attempt to identify the most appropriate transmission expansion plan to enable the interconnection of potentially all of the identified Interconnection Requests. As described further, later in this document, if the resulting cluster SIS is over-subscribed (i.e., the identified transmission expansion plan does not ultimately accommodate all of the NRIS/NIIS requested by the identified transmission upgrades), the ISO will initiate another area CRPS with the objective of identifying the transmission expansion plan to facilitate the interconnecting another round of Interconnection Requests.

The ISO will use reasonable efforts to complete the CRPS within twelve months of the CPRS announcement. Steady state thermal, voltage and transient stability analysis will be conducted within the CPRS. The scope of these analyses will be similar to the SIS under Schedule 22 of the ISO OATT. Where appropriate, other analyses, such as weak-grid issues, will be studied.

The completed CRPS will:

- identify the Interconnection Requests (only Queue Positions will be identified) that are eligible to participate in the Cluster System Impact Study. These Interconnection Requests are those large generation, small generation and ETU resources that are electrically located in the relevant part of the transmission system to the CETU and that do not yet have a completed System Impact Study.
- provide a conceptual description and cost estimate for the CETU(s);
- identify other upgrades and associated cost estimates that may be needed in addition to the CETU(s);
- identify the approximate MW quantity of eligible Interconnection Requests that could meet the NCIS and CCIS as a result of the CETU(s) and the associated upgrades.

## Phase 2: Cluster SIS Entry

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The ISO will announce the Cluster System Impact Study (CSIS) entry deadline at the same time that the final CRPS is presented to the PAC. The CSIS entry deadline will apply to the eligible Interconnection Requests that were identified in the CRPS and will be 30 calendar days from the day that the final CRPS is presented to the PAC. Any Interconnection Customer with an Interconnection Request that is identified by the ISO as eligible to participate in the CSIS that does not meet the requirements of the CSIS entry deadline will be automatically withdrawn from the interconnection queue as of the deadline date without further time to cure. Note that the resulting subsequent update of the Interconnection Queue will make public those Interconnection Requests that continue to remain in the queue because they have met the CSIS entry requirements.

The following will be required by the 30 calendar day deadline to enter the CSIS:

- Cluster Application;
- Site Control;
- To the extent not already provided to the ISO, a signed System Impact Study Agreement and System Impact Study deposit. If there is a Feasibility Study Agreement in place for the project, it will be terminated and any unused portion of the Feasibility Study deposit will be handled in accordance with the existing rules;
- All of the data and model requirements of Attachment A of the LGIP IR (or the applicable attachments in the SGIP or ETUIP). The 65-day SIS commencement notice will not apply to the CSIS; and
- A potentially non-refundable Cluster Participation Deposit (CPD):
  - In the case of a generator or an External ETU Interconnection Request, a CPD equal to 5% of the Interconnection Customer's projected cost-allocation, as described further later in this document, towards the overall cost of the CETU(s) and any identified associated upgrades. The projected overall cost will have been identified in the CRPS. Interconnection Customer's projected cost allocation will be the projected overall cost times the ratio of the eligible resource's Summer Network Resource Capability divided by the MW quantity of eligible Interconnection Requests that could meet the NCIS as identified in the CRPS. In the case of an External ETU, the higher of the resource's requested import and export capability will be used for this calculation.
  - In the case of an Internal ETU Interconnection Request, a CPD equal to the lesser of \$1,000,000 or 5% of the Interconnection Customer's estimated cost – as provided by the Internal ETU Interconnection Customer at the time of the provision of the CPD

## **Cluster Filling, Over-Subscription and Backfill upon Withdrawal**

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The identified Interconnection Requests considered in the CSIS will be limited to the approximate quantity of MW that had been identified as being potentially enabled by the CRPS. The cluster will be filled in interconnection queue order, based on the existing assigned Queue Positions, by those Interconnection Requests that meet the CSIS entry deadline requirements. Note that a requested reduction in project size, with the effect of reducing the project cost allocation, after entry into a cluster would automatically be material and would not be allowed. If, after the filling of the cluster, there is still more than one Interconnection Requests that had been identified that did not make it into the cluster as a result of the quantity of MW identified as potentially enabled by the CRPS but otherwise met the CSIS entry deadline requirements, (i) the individual IR CPDs will be returned, (ii) the IRs will be placed on a backfill waiting list, and (iii) if there is more than one IR on the backfill waiting list, the ISO will initiate/schedule another area CRPS with the objective of identifying the transmission expansion to enable the interconnection of another round of Projects.

In addition, if Interconnection Customers withdraw their Interconnection Requests from the CSIS, later queued projects that meet all of the CSIS entry requirements will be eligible, in order of Queue Position, to enter into the current CSIS, through backfill.

## **Cluster System Impact Study**

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Because the CRPS provides an identification of the approximate MW quantity of eligible Interconnection Requests that could achieve meet the NCIS and CNCIS, the Feasibility Study is not applicable to a CSIS. Similarly, the preliminary non-binding overlapping impact study will not be an option for inclusion in the CSIS.

The System Impact Study deposits will be used to pay for the costs of the CSIS. For clarity, the CPD described above is not a study deposit.

CSIS costs that are associated with an individual Interconnection Request assessed within the CSIS will be charged directly to that project. CSIS costs that are associated with the CSIS as a whole will be divided equally, on a per-project basis, among the Interconnection Customers with Projects included in the cluster.

The CSIS scope will address all of the items that would be included in a System Impact Study today, as well as all of the cluster Projects and the CETU. All of the Projects will be studied together at the same time but individual System Impact Study reports will be prepared for each Project.

The Network Capability Interconnection Standard (the minimum interconnection standard) will apply to the CSIS. However, the cluster Projects will not be dispatched against each other, but will be dispatched collectively against existing and/or earlier queued generation and ETUs, consistent with the procedures in Planning Procedure 5-6.

## **Cluster Facility Study**

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In order to develop an adequate quality cost estimate for all of the upgrades associated with the cluster, a Facility Study will be required. Any participating ETU that has been identified by the ISO in the CSIS as serving the role of a CETU (or portion thereof) must provide a Facility-Study-grade cost estimate by the completion date of the Facility Study. After the completion of the Cluster Facility Study (CFS), in order to proceed to the Interconnection Agreement development phase described below, an additional Cluster Participation Deposit equal to 5% of the Interconnection Customer's total projected CETU and other upgrade cost responsibility identified in the CFS will be required.

## **Cluster Withdrawal and Cluster Conclusion**

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Cluster Projects may withdraw their Interconnection Requests from the interconnection queue at any time. Withdrawal can also occur because of failure to meet the requirements of the Interconnection Procedures. Withdrawal of an Interconnection Request of a Project that is included in the cluster will result in the forfeiture of the CPD. Forfeited CPD will be re-allocated, by MW ratio share, to the Projects remaining in the cluster. The re-allocation of the forfeited CPD will occur prior to an addition of any backfilled IR(s). If all, or all but one, of the Interconnection Requests for Projects included in the CSIS withdraw from the queue, then all of the initial CPDs will be returned to the respective Interconnection Customers that originally provided deposits or were added to the CSIS as a backfill IR.

If an Interconnection Customer withdraws its Interconnection Request from the queue, the CSIS will be restudied with the remaining Projects in the cluster to determine if there are any changes in the required Network Upgrades, Distribution Upgrades and Affected System Upgrades. However, the CSIS will continue to be considered with the CETU(s) as identified in the CPRS – a withdrawal would not result in different CETU(s) being considered. Backfilling the withdrawn cluster Project with later-queued Interconnection Requests that are not in the cluster could occur, as noted above. The ISO will notify, in queue order consistent with the methodology used when the cluster was originally filled, any IR that could be used to replace the withdrawn IR and require the IR to meet all of the CSIS entry requirements within 30 days of being notified. If the IR fails to meet this deadline, then the ISO will withdraw the IR from the interconnection queue and consider other IRs later in the queue.

Unspent portions of the System Impact Study deposits of withdrawn Projects will be handled in accordance with the existing rules.

Cluster Participation Deposits will be fully refunded to the Interconnection Customer with Projects in the completed CSIS and CFS at the time the Interconnection Customer makes the 100% cost responsibility deposit described in the Interconnection Agreement section below.

## **IA execution, IA Deposit and withdrawal following the IA**

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The completed Cluster Facilities Study will identify all upgrade costs for each Project in the cluster using the cost allocation methodology described below. Within 15 Business Days after receipt of the final LGIA, an Interconnection Customer with a Project in the cluster will be required to make a cash

payment to the relevant Transmission Owner for 100% of the CETU and Network Upgrade, Distribution Upgrade and Affected System Upgrade costs identified in the Project's CFS.

The CPD of Cluster Project that does not meet the 100% cost responsibility deposit will be withdrawn from the interconnection queue and its CPD will be allocated on a per MW basis to the IRs that met the requirement. If all IRs fail to meet the 100% cost responsibility deposit, then the CPDs will be returned to the respective Interconnection Customers that originally provided deposits or were added to the CSIS as a backfill IR, the IRs will be withdrawn from the interconnection queue.

If the Interconnection Customer for a Project in the cluster withdraws its Interconnection Request after making this post-IA payment to the relevant Transmission Owner or ETU developer, then the payment will have been forfeited and the Transmission Owner(s) will use the monies to offset the cost of the CETU(s) and any identified associated upgrades. If all of the Cluster Projects withdraw after making the IA payment, then all TO costs will be reimbursed and any remaining unused monies returned.

### **Cost Allocation of Interconnection Related Transmission Upgrades**

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For any cluster, there are three categories of upgrades to be considered in the context of cost allocation.

First, there are the Interconnection Facilities for each of the individual Project in the cluster. For example, such facilities would include the generator lead that would connect the generator to the CETU. An Elective Transmission Upgrade could also be in this category. The cost of these upgrades will be allocated directly to the Project.

Second, the costs of the CETUs will be allocated to each Project in the cluster by MW ratio share. Note that Interconnecting Transmission Owner Interconnection Facilities that are used by more than one Project in the cluster will be treated in this category for cost allocation purposes. For example, if a \$500 million CETU enables the interconnection of 500 MW of resources, then a 100 MW (Summer Network Resource Capability) project in the cluster would be allocated a CETU contribution cost of \$100 million. For the purposes of calculating the Cluster Participation Deposit (described above), the expected cost allocation towards the CETU would be based on the cost estimate prepared as part of the CETU Regional Planning Study.

Third, the cost of the cluster's identified associated upgrades (i.e. Network Upgrades, Distribution Upgrades and Affected System Upgrades other than the CETU(s)) will be allocated to each project in the cluster by MW ratio share. Take the example of an existing line that must be reconducted because of the addition of the cluster Projects. If the reconducting costs \$50 million and there are 500 MW of Projects in the cluster, then a 100 MW (Summer Network Resource Capability) Project would be allocated a cost of \$10 million.

### **Interconnection Service Achieved and Interaction with the Forward Capacity Market**

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Projects in the cluster that successfully complete all of the associated milestones in the Interconnection Procedures will achieve Network Capability Interconnection Service to the extent



the proposed Project is eligible for that service. Note that the differences regarding the participation is a Cluster System Impact Study and the sharing of cluster upgrade costs do not alter the existing overall procedural flow and milestone progress of the Interconnection Procedures.

There is no change to the milestones or procedures associated with Capacity Network Capability Interconnection Service. Projects that wish to achieve capacity status must submit a Show of Interest, meet all of the qualification requirements of the Forward Capacity Market and achieve a Capacity Supply Obligation and enter commercial operations in the timeframe required. The evaluation of overlapping interconnection impacts in the FCA qualification CNR Group Study will continue to be conducted in the queue order of those projects (i.e., Cluster Projects and serial/non-Cluster Projects) that have submitted Show of Interest applications.

### **Allocation of CTRs and ARRs**

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CTRs and ARRs will be allocated for PTF system upgrades in the same way as they are today with CTRs and ARRs for shared upgrades allocated pro-rata, based on the contribution made towards the relevant upgrades.

### **Transition**

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The ISO proposes to use the Maine Resource Integration Study as an input to the first Cluster System Impact Study. The scope for the Maine Resource Integration Study was presented to the PAC in March 2016 and the study is expected to be complete by the end of 2016. Interconnection Requests in the interconnection queue located in the relevant portions of Northern and Western Maine that do not have a completed System Impact Study by the effective date of the rules incorporating the clustering methodology will be considered in the associated CRPS. The associated transition CSIS entry deadline will be 30 Calendar Days after the later of the effective date of the rules or the completion of the Maine Resource Integration Study.