

# **ATTACHMENT C**

## **Xcel Energy Distributed Generation Engineering Cluster Study Guidelines**

### **Applicable to Northern States Power Company - Minnesota**

## **1.0 Scope**

This document sets forth the guidelines by which multiple distributed energy resource (DER) interconnection requests may be studied in the MN DIP System Impact Study and Facilities Study as provided for under MN DIP 1.8.3 as a single group (i.e. “cluster”) in lieu of individual applications. While current MN DIP 1.8.3 has a requirement for agreement among all parties for a cluster study, this document outlines guidelines for mandatory cluster studies where the MN DIP is modified to mandate cluster studies under the two scenarios described in par. 4.2(A) and (B) below, and for the voluntary cluster studies in par. 4.2(C) below.

These Cluster Study Guidelines are written assuming the Commission approves the MN DIP revisions as proposed by Northern States Power Company for a mandatory cluster study process.

## **2.0 Definitions**

All definitions as used in the MN DIP and MN DIA apply here. The following definitions also apply:

“Active Cluster Study Project” means any Cluster Study Project that has timely complied with all of the following: 1.) Sign the System Impact Study applicable to the Cluster Study; 2.) Sign the Facilities Study Agreement associated with the Cluster Study; 3.) Fund its share of the Cluster Study and sign the associated Statement of Work for this; 4.) Sign the NDA for the Cluster Study. Once having achieved these steps if an Interconnection Application is later withdrawn or cancelled, it is no longer an Active Cluster Study Project.

“Area EPS Operator” means Northern States Power Company d/b/a Xcel Energy.

“Company” means Northern States Power Company d/b/a Xcel Energy.

“Cluster Study” in context means either the process set forth in these Cluster Study Guidelines or the specific study of the Active Cluster Study Projects.

“Cluster Study Costs” means those costs of the Area EPS Operator to perform the System Impact Study and Facilities Study associated with the Cluster Study Projects.

“Cluster Study Guidelines” means the current document.

“Cluster Study Project” means an Interconnection Application that has been designated by the MN DIP or mutual consent of the parties to be part of a Cluster Study under the Cluster Study Guidelines. Each such Interconnection Application needs to have been “deemed complete” and all Cluster Study Projects together are in sequential queue order (except where sequential queue order is interrupted by smaller DER Interconnection Applications under 40 kW that can be interconnected without going through a System Impact Study or Facilities Study).

“DER Technical Planning Limit” means the interconnection limitation defined by the Area EPS Operator (for example, where the aggregate nameplate capacity of all DER installed or ahead in queue plus the project being studied may not be more than the Daytime Minimum Load (DML) plus 80% of the equipment rating of either the substation transformer or feeder.)

“Distribution Group Study” means a cluster study of interconnection applications that are within the DER Technical Planning Limit and takes place on a mandatory basis per MN DIP provisions.

“Transmission and Distribution Studies (TDS)” means the study process for interconnection applications in the relevant geographic area that exceed the DER Technical Planning Limit or Open DER Capacity Limit, and require study of a new feeder and/or substation transformer.

## **3.0 Parameters and General Considerations**

These Cluster Study Guidelines have several parameters and general considerations applicable to a Cluster Study:

1. Even if there are sequential Interconnection Applications in the same queue, Interconnection Applications may be more expeditiously broken into two or more sets of Cluster Study Projects for the purposes of these Cluster Study Guidelines.
2. A Cluster Study is based upon electrical interdependence of the Cluster Study Projects and is generated at the feeder level, or, in some cases, the substation bus or transformer level at the Area EPS Operator’s discretion. Clusters of applications above this level of aggregation are too geographically and electrically disparate on the distribution system and the group Study Process provides no practical benefit.
3. Other than as provided for in these Cluster Study Guidelines, there should be no other deviations from the standard interconnection procedures in terms of Area EPS Operator engineering review schedules. MN DIP does have provisions for requests of extensions of time, and those MN DIP provisions should be followed. Timing of the System Impact Study itself is as defined below.

4. The Area EPS Operator has the sole discretion on determining which Interconnection Applications will be eligible to participate in a given Cluster Study even when Cluster Studies are mandatory under MN DIP.
5. The Area EPS Operator reserves the right to decline to perform a Cluster Study for a specific set of Interconnection Applications if in its sole determination such Cluster Study would not comport with safety concerns, reliability concerns, Good Utility Practice, or if such a Cluster Study would not be a productive use of time and resources.
6. The Cluster Study Costs shall be allocated to the individual Active Cluster Study Projects based on proportion of the kW AC nameplate capacity of each Interconnection Application to the total nameplate capacity of all Cluster Study Projects. If specific additional studies are required for a particular Interconnection Application or subset of Interconnection Applications, such as detailed protection review, those Interconnection Applications will be responsible for the added costs, which also will be allocated based on proportion of the kW AC nameplate capacity of each such Interconnection Application to the total nameplate capacity of all such Interconnection Applications in the same additional study.
7. Each Cluster Study Project is responsible to timely comply with all of the following: 1.) Sign the System Impact Study applicable to the Cluster Study; 2.) Sign the Facilities Study Agreement associated with the Cluster Study; 3.) Fund its share of the Cluster Study (covering System Impact Study and Facilities Study anticipated costs) and sign the associated Statement of Work for this; 4.) Sign the NDA for the Cluster Study. Once having achieved these steps if an Interconnection Application is later withdrawn or cancelled, it is no longer an Active Cluster Study Project. The Area EPS Operator will provide Notice of when these items need to be completed.
8. Each Cluster Study Project that has not timely completed ALL of the items in the above paragraph will have its Interconnection Application canceled, and the Cluster Study will move forward with all of the Active Cluster Study Projects.
9. If any at time an Interconnection Customer proposes a Material Modification to an Interconnection Application, and the Material Modification is not timely withdrawn consistent with MN DIP 1.6.2.1, then that Interconnection Application is no longer an Active Cluster Study Project, and its Interconnection Application will be cancelled. The Area EPS Operator will then continue the Cluster Study with the remaining eligible projects subject to terms and conditions of this cluster process. The Area EPS Operator may reach out to the remaining Active Cluster Study Projects to determine if together they and the Area EPS Operator can agree on approaches to avoid cancellation of the Cluster Study.
10. If at any time an Interconnection Customer submits a Dispute to the Area EPS Operator under MN DIP 5.3, then the Area EPS Operator will then in its sole discretion determine whether the Cluster Study will continue or whether the Cluster Study will be cancelled. The Area EPS Operator may reach out to the Active Cluster Study Projects to determine if together all parties can agree on approaches to avoid cancellation of the Cluster Study.

11. The Cluster Study is in three steps as described in Section 4.0 below.

12. The summary or redacted results of the System Impact Study or Facilities Study portions of the Cluster Study can be shared with all projects that participate in the Cluster Study. An NDA for this will be provided ahead of time, and will include a provision that allows all participants in the Cluster Study to see all project information of all other projects in the Cluster Study that is reflected in the study results.

13. The tariffed System Impact Study Agreement form, at tariff sheet 10-237, allows the parties to provide “any additional technical data that is required to adequately perform the System Impact Study.” These Cluster Study Guidelines will be included as an attachment to the System Impact Study Agreement. The Area EPS Operator at any time has sole discretion to make modifications to these Cluster Study Guidelines as applied to any Cluster Study, even after these Cluster Study Guidelines are attached to a signed System Impact Study, or at any time. An attachment to the System Impact Study will identify all of the Cluster Study Projects, such as reflected in the following form:

<b>Project Identification (Case Number)</b>	<b>Project Name</b>	<b>Nameplate Capacity (kW AC)</b>

Also, the following technical data provisions will be included in an attachment to the System Impact Study:

- Consistent with tariff sheet 10-233, par. 8.0 of the System Impact Study Agreement (SISA) and tariff sheet 10-239, par 5.0 of the Facilities Study Agreement (FSA), a separate Statement of Work (SOW) has been issued to the Interconnection Customer showing the Interconnection Customer’s share of the expense of the cluster System Impact Study as conveyed by the study participants to the Area EPS Operator.

- Each project above needs to have a signed System Impact Study Agreement and signed Facilities Study Agreement, with full payment delivered to the Area EPS Operator on or before the due date as communicated by the Area EPS Operator.

14. These Cluster Study Guidelines are general guidelines with the intent to help better implement cluster System Impact and Facilities Studies.

## 4.0 Group/Cluster Study Process

### 4.1 Identifying Cluster Study Projects

At its sole discretion, the Area EPS Operator may determine which Interconnection Applications are eligible to participate in a specific Cluster Study. The timing for making this determination will be made based on the status of a particular queue. When a prior in queue project passes the “trigger point” upon which next in queue application may be studied under the MNDIP process, then the Area EPS Operator may determine which group of Interconnection Applications will participate in a Cluster Study. For simplified and smaller fast track projects, those applications shall have gone through initial and supplemental review, as applicable.

### 4.2 Cluster Study Formats

The proposed updates to MN DIP 1.8.3 and the creation of MN DIP 1.9 as set forth in Xcel Energy’s August 25, 2021 filing with the Commission would have three separate cluster study formats available for interconnection applications. This section shall describe each study format in detail, and provide the distinctions separating each format.

*(A) Distribution Group Studies – Consistent with proposed revisions to MN DIP 1.8.3.* The first mandatory cluster study format is Distribution Group Study, which are only relevant for Interconnection Applications that do not exceed the DER Technical Planning Limit and are sized greater than a 40kW AC nameplate. These cluster studies will be initiated to efficiently analyze in-queue generation with a set focus on upgrades to the existing distribution system rather than construction of new service facilities such as feeders or substation transformer replacements. A cluster study in this format will be triggered when there are five or more Interconnection Applications in queue for a given feeder or substation, and if the Area EPS Operator determines that upgrades required for interconnection focus on the distribution system as described above.

*(B) Transmission and Distribution Studies (TDS) – Consistent with proposed MN DIP 1.9.* The second mandatory cluster study format is Transmission and Distribution Study (TDS) which focuses solely on interconnection applications that exceed their original feeder’s DER Technical Planning Limit (or exceeds the Open DER Capacity Limit as defined in the proposed MN DIP 1.9). This would therefore study construction of new feeders or substation transformer replacements. A Cluster Study Project in a DER TDS Queue can include projects other than in the queue originally assigned to it as determined by the Area EPS Operator, but all Cluster

Study Projects in a given Cluster Study must be within a relevant geographical area for feasible study. As stated, the Area EPS Operator shall determine whether an application is geographically or electrically feasible to include in a DER TDS Cluster Study group. The trigger point for a DER TDS Cluster Study will be once a year if there are two or more interconnection applications in the TDS queue. If there is just one Interconnection Application in any specific DER TDS Queue and after six months no other Interconnection Application has been added to that DER TDS Queue, then the application may be studied in a non-cluster format.

*(C) Voluntary Cluster Studies* – Consistent with MN DIP 1.8.3. If the Area EPS Operator and the Interconnection Customer(s) agree, Interconnection Applications may be studied in clusters. At any point an Interconnection Applicant or group of Applicants may suggest a cluster study of two or more projects, including other in-queue applications. These voluntary cluster studies may occur in either Distribution Group Study queue or DER TDS Queue but may not mix application types between the queues or with a DER application below the 40kW AC nameplate rating.

### **4.3 Cluster Study Process**

At the time that the Area EPS Operator notifies an Interconnection Applicant that it will be eligible or required to participate in a Cluster Study, the Area EPS Operator shall provide a good faith estimate of Cluster Study costs, which includes anticipated costs for conducting the System Impact Study (including Cluster Study Step 1 and Cluster Study Step 2 described below) and Facilities Study. Additionally, DER TDS Queue Cluster Studies will require a substation and transmission study preceding the standard Cluster Study Step 1. These costs shall be allocated to the individual Cluster Study Projects based on proportion of the kW AC nameplate capacity of each Interconnection Application to the total nameplate capacity of all Cluster Study Projects. Each Interconnection Customer shall have twenty (20) Business Days to comply with all requirements to be an Active Cluster Study Project as defined above.

Upon all Active Cluster Study Projects being determined for any specific Cluster Study, the Area EPS Operator shall proceed with a Cluster System Impact Study.

If any Affected System or Transmission System impacts are identified, then the cluster will proceed to a MN DIP Affected System Study or Transmission System Impact Study. The Area EPS Operator will coordinate with Affected Systems and Transmission Systems, but any applicable tariffs, procedures, costs, and timelines for those studies will follow the applicable rules and tariffs, and any applicable MISO or other Transmission Service Provider processes. Additional costs and time frames will apply.

DER TDS Queue Cluster Studies will begin with a substation and transmission study to determine any needed capacity upgrades (new feeder bays, transformer replacements, etc.). At the study's conclusion, the Area EPS Operator will provide a Substation and Transmission System Impact Study report noting the issues identified with capacity constraints, continuity of service, and transmission system upgrades, as well as providing a non-binding good faith cost estimate of the required upgrades. Within 10 Business Days of receipt of this substation and transmission study report, each of the Active Cluster Study Projects shall advise the Area EPS

Operator if it will withdraw its Interconnection Application. The substation and transmission study does not currently have an associated timeline due to scope of work variability. Following the withdrawal of any study participants the Area EPS Operator will determine whether a second substation and transmission study is required.

Cluster Study Step 1 is the first portion of the System Impact Study for the Active Cluster Study Projects which will determine those system issues or impacts caused by the Cluster Study applicants and identify necessary mitigations and Upgrades specifically to the distribution system. Distribution Group Studies will produce results within 30 Business Days of initiating the Cluster Study System Impact Study, plus 10 Business Days for the second and each additional Active Cluster Study Project. DER TDS Queue Cluster Studies may require additional time due to the complexity of designing new distribution feeders. At the study's conclusion, the Area EPS Operator will provide a Cluster Study Step 1 System Impact Study report noting the issues identified with power flow and protection modeling and providing non-binding good faith cost estimates of the required Upgrades collectively for the cluster of Active Cluster Study Projects (required additions and modifications to the Area EPS Operator's Distribution System at or beyond the Point of Interconnection), and the good faith estimate of costs for metering and Interconnection Facilities separately applicable to each Active Cluster Study Project.

Within 10 Business Days of receipt of this Cluster Study Step 1 report, each of the Active Cluster Study Projects shall advise the Area EPS Operator if it will withdraw its Interconnection Application. If it does indicate that it will be withdrawing its Interconnection Application, then its Interconnection Application needs to be withdrawn or the Area EPS Operator will cancel the Interconnection Application. If an Interconnection Customer elects to withdraw or has been cancelled after the Cluster Study Step 1 report has been issued, it will not receive a refund for its Cluster Study deposit, and it will be unable to apply for interconnection on the studied feeder for a period of one year.

Following issuance of the Cluster Study Step 1 report (and following any applicable Affected System Study or Transmission System Impact Study), the Active Cluster Study Projects will advance to the second phase of the Cluster System Impact Study ("Cluster Study Step 2"). If no projects withdrew or were cancelled following issuance of the Cluster Study Step 1 report, then Cluster Study Step 2 is not needed. If any projects did withdraw following issuance of the Cluster Study Step 1 report, then remodeling and reanalysis of the work done during the Cluster Study Step 1 will be required. Following this, the System Impact Study will proceed to detailed mitigation analysis on the cluster basis for the remaining Active Cluster Study Projects. The Area EPS Operator will have an additional 15 Business Days to complete this step, plus 10 Business Days for each additional Active Cluster Study Project.

Cluster Study Step 1 will not be performed more than twice under a Cluster Study. If following a second Cluster Study Step 1 any project withdraws or is cancelled, then the Cluster Study is cancelled.

Following completion of the above steps, and any required Affected System or Transmission System Impact Studies, if the Cluster Study has not been cancelled then the Area EPS

Operator identifies a need for additional facilities along with a supporting Facilities Study, the Cluster Study shall move to the MN DIP Facilities Study (“Cluster Study Step 3”). The Cluster Facilities Study for the Active Cluster Study Projects will follow the guidelines and considerations noted above. The Area EPS Operator will complete Cluster Study Step 3 within 45 Business Days multiplied by the number of projects in the cluster. Upon completion of the Facilities Study, the Area EPS Operator will provide a summary of the costs required for each clustered interconnection application to proceed. Costs for metering and Interconnection Facilities (such as typically represented in Attachment 2 to the MN DIA) will be assigned directly to each Interconnection Application. Costs for Upgrades (such as typically represented in Attachment 6 to the MN DIA) that are required to mitigate system issues for interconnection of the Cluster projects will be allocated to each of the Active Cluster Study Projects based on proportion of the kW AC nameplate capacity of each Interconnection Application to the total nameplate capacity of all Active Cluster Study Projects.

Following completion of the above, the Area EPS Operator will provide a MN DIA to each Active Cluster Study Project, with indicative cost estimates for individual metering and Interconnection Facilities in Attachment 2 and with indicative cost estimates for the cluster Upgrades allocated on a pro rata basis in Attachment 6.

If any Interconnection Application elects to withdraw their application anytime after the Facilities Study has begun, or fails to timely sign and fund its MN DIA, it will be cancelled. The withdrawing or cancelled project will also be unable to apply for interconnection on the studied feeder for a period of one year. If the Facilities Study has already been performed, the remaining Active Cluster Study Projects may choose to go forward with all of the cluster Upgrades. This process may require modifications to previously tendered MN DIAs referenced in the paragraph above. Because of this, the Area EPS Operator will not be obligated to counter-sign any MN DIA it issues until all of the Cluster Study Projects who were studied have each provided a signed MN DIA with appropriate funding.

If any of the remaining Active Cluster Study Projects fail to timely choose to go forward with all of the cluster Upgrades, then the Cluster Study shall end with no useable results. The next in queue project among the remaining Active Cluster Study Projects will then be studied under the serial review process.

If any Cluster Study Participant withdraws its project, does not timely take steps to become an Active Cluster Study Project, or if its project gets cancelled, the Area EPS Operator will notify the other Cluster Study Participants.

Where a Cluster Study Participant, after it signs and funds the MN DIA, later withdraws its project or its project is cancelled by the Area EPS Operator, or if there is a Dispute under MN DIP 5.3 that impacts the proposed interconnection, the funding that it submitted for the MN DIA will still be needed to meet the anticipated costs of the cluster to interconnect. Accordingly, it is anticipated that there will be an authorized amendment to the MN DIA that will be part of the MN DIA issued to all Cluster Study Participants that will include different or additional terms such as those new terms shown in bold below:



#### MN DIA 4.2. Distribution Upgrades

The Area EPS Operator shall design, procure, construct, install, and own the Distribution Upgrades described in Attachment 6 of this Agreement. The Area EPS Operator shall provide a good faith estimate cost, including overheads, for the purchase and construction of the Distribution Upgrades and provide a detailed itemization of such costs. If the Area EPS Operator and the Interconnection Customer agree, the Interconnection Customer may construct Distribution Upgrades that are located on land owned **or controlled** by the Interconnection Customer. The actual cost of the Distribution Upgrades, including overheads, shall be directly assigned to the Interconnection Customer. **Because the DER system that is the subject of this Interconnection Agreement is part of a cluster of other DER systems, and in the aggregate this cluster of projects share in the Distribution Upgrades, it is agreed that the Distribution Upgrades will be applied on a cluster basis and allocated in proportion to the kW nameplate capacity of each DER system. Also, in the event that this Interconnection Agreement is cancelled by the Interconnection Customer or the Area EPS Operator before all of the actual costs of the Distribution Upgrade have been paid to the Area EPS Operator then there shall be no refund of the amounts previously paid or funded (such as through a Letter of Credit) until after completion of the Distribution Upgrades and the final bill of actual costs has been issued and there is a surplus that should be refunded. In the event that after completion of the Distribution Upgrades and the final bill of actual costs shows that there are actual costs not covered by the amounts previously paid or funded, then there shall be no refund and the difference between the previously paid or funded amounts and the actual costs will need to be paid by the projects in the cluster that still have an active Interconnection Agreement with costs allocated in proportion to the kW nameplate capacity of each such DER system. Further, if any participant in the cluster study submits a Dispute under MN DIP 5.3 to the Area EPS Operator about the proposed interconnection, then the Area EPS Operator may determine in its sole discretion that all work on the interconnection that is the subject of the current Interconnection Agreement will be placed on hold pending resolution of that Dispute.**

#### MN DIA 5.2. Network Upgrades

The Area EPS Operator or the Transmission Owner shall design, procure, construct, install, and own the Network Upgrades described in Attachment 6 of this Agreement. The Area EPS Operator shall provide a good faith estimate cost, including overheads, for the purchase and construction of the Network Upgrades and provide a detailed itemization of such costs. If the Area EPS Operator and

the Interconnection Customer agree, the Interconnection Customer may construct Network Upgrades that are located on land owned **or controlled** by the Interconnection Customer. Unless the Area EPS Operator elects to pay for Network Upgrades, the actual cost of the Network Upgrades, including overheads, shall be borne initially by the Interconnection Customer. **Because the DER system that is the subject of this Interconnection Agreement is part of a cluster of other DER systems, and in the aggregate this cluster of projects share in the Network Upgrades, it is agreed that the Network Upgrades will be applied on a cluster basis and allocated in proportion to the kW nameplate capacity of each DER system. Also, in the event that this Interconnection Agreement is cancelled by the Interconnection Customer or the Area EPS Operator before all of the actual costs of the Network Upgrade have been paid to the Area EPS Operator then there shall be no refund of the amounts previously paid or funded (such as through a Letter of Credit) until after completion of the Network Upgrades and the final bill of actual costs has been issued and there is a surplus that should be refunded. In the event that after completion of the Network Upgrades and the final bill of actual costs shows that there are actual costs not covered by the amounts previously paid or funded, then there shall be no refund and the difference between the previously paid or funded amounts and the actual costs will need to be paid by the projects in the cluster that still have an active Interconnection Agreement with costs allocated in proportion to the kW nameplate capacity of each such DER system. Further, if any participant in the cluster study submits a Dispute under MN DIP 5.3 to the Area EPS Operator about the proposed interconnection, then the Area EPS Operator may determine in its sole discretion that all work on the interconnection that is the subject of the current Interconnection Agreement will be placed on hold pending resolution of that Dispute.**