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SMALL DISTRIBUTED WIND GENERATION PURCHASE TARIFF

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INTERCONNECTION ON-SITE WIND GENERATION

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INTERCONNECTION AGREEMENT

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SMALL DISTRIBUTED WIND TECHNICAL GUIDELINES

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**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF**

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**DISTRIBUTED GENERATION STANDARD INTERCONNECTION
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**DISTRIBUTED GENERATION STANDARD INTERCONNECTION
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**DISTRIBUTED GENERATION STANDARD
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DISTRIBUTED GENERATION STANDARD
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DISTRIBUTED GENERATION STANDARD
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**DISTRIBUTED GENERATION STANDARD
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**DISTRIBUTED GENERATION STANDARD
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(Continued)**

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**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF**

Section No. 10
2nd Revised Sheet No. 73

AVAILABILITY

Available to retail electric customers at distribution voltages and who operate a qualifying distributed generating (DG) facility, as defined below, with nameplate rating of 10,000 kW or less, which is operated in parallel with Company's distribution system. Such DG facilities may be up to 35,000 volts at three-phase. Single-phase DG facilities, generally, must not exceed a nameplate rating of 25 kW. Single phase facilities larger than 25 kW may be permitted if the capacity of the DG facility does not exceed the customer's single phase service capacity. Company will evaluate and approve all DG facility interconnection plans on case-by-case basis.

QUALIFICATION

1. Qualifying DG facilities may include but are not limited to, fuel cell, wind, solar, micro turbine generators and other utility industry accepted DG technologies, subject to Company's approval.
2. Qualifying DG facilities may be those which do not qualify as "Qualifying Facilities" (QFs) under the Public Utility Regulatory Policy Act of 1978 (PURPA) or those which are QFs but where the customer elects not to exercise its rights to the pricing provided for under PURPA.
3. Qualifying DG facilities must be a permanently installed or similarly dedicated mobile generator serving the customer receiving retail electric service from the Company at the same site.

APPLICATION

Customer seeking to interconnect and to operate a DG facility in parallel with the Company's system must complete and submit to Company a signed Generation Interconnection Application Form ("Interconnection Application") along with the applicable Interconnection Application Fee. Company will initiate a review of the DG project upon receipt of complete information needed for Interconnection Application. This tariff contains two different sets of interconnection processes and interconnection agreement documents.

The first set was initially developed by Commission order in Docket No. E999/CI-01-1023 and applies to all interconnection applications submitted prior to June 17, 2019 that have been deemed complete no later than August 16, 2019. This first set consists of "*The State of Minnesota Interconnection Process for Distributed Generation Systems*" (at Sheet Nos. 10-83 through 10-134.2, which also includes the corresponding Interconnection Agreement), and the "*State of Minnesota Distributed Generation Interconnection Requirements*" (at Sheet Nos. 10-135 through 10-159.6).

The second set was initially developed by Commission order in Docket No. E999/CI-16-521 and applies to all interconnection applications submitted on or after June 17, 2019, as well as those submitted prior to that date that have not been deemed complete by August 16, 2019, as well as other applications that the parties mutually agree should be subject to this second set. This second set consists of the "*State of Minnesota Distributed Energy Resources Interconnection Process (MN DIP)*" (at Sheet Nos. 10-163 through 10-249), that also incorporates the "*Minnesota Distributed Energy Resource Interconnection Agreement (MN DIA)*" (at Sheet Nos. 10-250 through 10-284). The "*Minnesota Distributed Energy Resource Technical Interconnection and Interoperability Requirements (MN Technical Requirements)*" are referenced in the MN DIP and MN DIA but are not tariffed.

(Continued on Sheet No. 10-74)

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DISTRIBUTED GENERATION STANDARD

Section No. 10

INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)

5th Revised Sheet No. 74

STUDIES

Interconnection study or studies are required and shall be conducted by Company as part of the terms and conditions of service under this tariff. Any other studies and services provided pursuant to agreement between the customer and Company, may be subject to Commission review. All review and study fees are non-refundable, whether or not the customer decides to pursue the project.

CONTRACTS

Customers must execute an Interconnection Agreement to provide for the interconnection of DG facilities. If customer intends to sell energy and capacity to the Company, customer must also execute a Power Purchase Agreement (PPA) with the Company. The term of these agreements not subject to the MN DIP or MN DIA may be up to 20 years. Each customer DG project under this tariff will be evaluated on a customer-specific and site-specific basis, to determine eligibility, system reliability and impact on Company's transmission and distribution systems.

To qualify for a contract under this tariff, the customer must be doing one of the following: (1) Selling all of the DG energy to the Company, (2) Supplying all of the DG energy to itself, or (3) Self generating part of its needs and selling the remaining energy to the Company. The Company shall purchase all electricity generated and offered for sale to the Company by the DG facility pursuant to the terms, conditions and price schedule provided in the PPA. Under certain circumstances the customer may qualify for a Distribution Facility Credit, which shall be governed under the Interconnection Agreement.

STANDBY SERVICE REQUIREMENTS

As indicated above, customer may sell the DG energy to the Company or use the DG energy to serve customer's own load. There is no requirement to contract for Standby Services if all of the DG energy is sold to the Company. There is also no requirement to contract for Standby Services in cases where the customer uses the DG energy to serve their own load, provided the maximum capacity of the DG is 100 kW or less. See the Company's Standby Service Rider tariff for details concerning the provision of Standby Service.

A customer choosing to use DG to serve more than 100 kW of their own load must either contract for Standby Services under the Company's Standby Service Rider or choose to be a "physical assurance" customer. A physical assurance customer is a customer who agrees to not require standby services and has a mechanical device that ensures that standby service is not taken. The cost of the physical assurance device, is to be paid by the DG customer.

(Continued on Sheet No. 10-75)

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**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)**

Section No. 10
2nd Revised Sheet No. 75

DISTRIBUTION FACILITY CREDIT

Customer may also be eligible for a Distribution Facility Credit (DFC). Upon request, a list of substation areas or feeders that may be candidates for distribution credits, as determined through the Company's normal distribution planning process, shall be provided to the Customer. The terms and conditions of such credit shall be determined from a case-specific study of avoided distribution costs. Such study shall include review of both avoided distribution lines and avoided distribution transformers.

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The value of the DFC shall be equal to the Company's avoided distribution costs resulting from the installation of the DG facility. The avoided distribution costs are based on Company's annual distribution capacity planning study that identifies capacity needs, any corresponding required upgrades and load growth on area distribution feeders. Upon receiving a DG application, and as part of the case specific study, the Company will perform an initial screen of the DG project to determine if the project is located on a distribution feeder that has potential for a DFC. The DG customer is responsible for the cost of such screening study. If the screening study shows that there exists potential for a DFC, the Company shall, at its own cost, pursue further study to determine the DFC, as part of an annual distribution capacity study. Once established by contract and accepted by Company and customer, DFC shall be fixed over the term of the contract.

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LINE LOSS CREDITS

If Customer requests the Company to provide a specific line loss study, Customer may be eligible for additional line loss credits if the study supports such credits. The Customer is responsible for the cost of the study, regardless of the study's outcome.

RENEWABLE ENERGY AND EMISSION CREDITS

The definition of and the ownership rights to any and all renewable energy credits, emissions reduction credits, or allowances associated with the energy purchased by the Company from the DG customer will be specified by the terms and conditions of the PPA.

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(Continued on Sheet No. 10-76)

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**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF
(Continued)**

Section No. 10
1st Revised Sheet No. 76

POWER PURCHASE AGREEMENT TERMS

Energy and Capacity Purchase Payments

Energy Payment: The energy payment rate schedule shall be based on Company's expected average marginal energy costs for on-peak and off-peak periods for each month of the year. The energy payment rate shall be updated annually. The table below is intentionally left blank. However, upon written request by customer and after signing a confidentiality agreement, Company shall provide Customer the current schedule of energy payments.

Payment Schedule for Energy Delivered to Company
Energy Payment per kWh

Month	On-Peak	Off-Peak
January		
February		
March		
April		
May		
June		
July		
August		
September		
October		
November		
December		

(Continued on Sheet No. 10-77)

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MINNESOTA ELECTRIC RATE BOOK - MPUC NO. 2

**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF
(Continued)**

Section No. 10
1st Revised Sheet No. 77

Energy and Capacity Purchase Payments (Continued)

Capacity Payment: The capacity payment shall be based on the total accredited DG capacity made available to the Company. The capacity payment rate shall be set for the term of the PPA agreement based on the year in which the agreement is signed and that rate may escalate during the term of the agreement.

The total dollar capacity payment shall be the product of the monthly accredited capacity in kW for the billing month and the capacity payment rate. The procedure to determine monthly accredited capacity is defined in the PPA and the method of determining the capacity payment rate is indicated below.

Upon written request of the customer, which includes the required customer specified parameters, Company shall determine the capacity payment rate. The starting value for capacity payment rate will be taken from the Company's *Annual Filing of Cogeneration and Small Power Production Tariffs* and will be adjusted based on project specifics characteristics as described below. The fixed escalation rate is 2.5% per year to be applied on the anniversary of the commercial operation date.

- 1) The need for capacity is established in the utility's most recent integrated resource plan (IRP). A need exists if the utility shows a deficit at any year of the 5-year planning period.
- 2) Capacity payments should be made for the total accredited DG capacity, regardless of when the power is delivered to the system.
- 3) The expected life of a capacity addition is the expected life of the specific capacity addition from the utility's most recently approved integrated resource plan (IRP).
- 4) If the contract to purchase power from a DG source happens to begin at the time the utility needs the capacity, the full capacity payment is made and would be adjusted only for the length of the contract (i.e., in such a case, there is no discount to the capacity payment for adding capacity sooner than IRP indicates that it is needed).
- 5) The formula for potential adjustments to capacity payments based on the timing difference between IRP indicated need and the actual DG in-service date is:

$$A2 = \frac{(1+i)^m - 1}{(1+i)^n - 1} \cdot \frac{(1+i)^{n-a} - (1+e)^{n-a}}{(1+i)^m - (1+e)^m} \cdot A1$$

Where:

A1 = Levelized annual value of a capacity purchase at the time of need.

A2 = Levelized annual value of the capacity paid for in a power purchase contract.

m = Expected lifetime of ordinary (alternative) future capacity addition.

n = Length of power purchase contract.

i = Utility Cost of Capital.

e = Escalation rate affecting value of new capacity additions.

a = Length of time between beginning of contract and time of need for capacity.

(Continued on Sheet No. 10-78)

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MINNESOTA ELECTRIC RATE BOOK - MPUC NO. 2

**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF
(Continued)**

Section No. 10
3rd Revised Sheet No. 78

Definition of Peak Periods

The on-peak period is defined as those hours between 9:00 a.m. and 9:00 p.m. Monday through Friday, except the following holidays: New Year's Day, Good Friday, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, and Christmas Day.

When a designated holiday occurs on a Saturday, the preceding Friday will be designated a holiday. When a designated holiday occurs on a Sunday, the following Monday will be designated a holiday. The off-peak period is defined as all other hours not designated as on-peak hours.

Summer months are July and August; Non-Summer months are all other months. Definition of on-peak and off-peak periods is subject to change with change in Company's system operating characteristics or electric energy market standards.

TERMS AND CONDITIONS OF SERVICE

1. Electric service provided by Company to customer at the same site during the same billing period shall be billed in accordance with the appropriate retail electric rates; thus, supplemental load service shall be provided to the DG customer through the Company's base electric rates. Company shall pay customer each month according to the applicable Energy and Capacity Purchase Payments and any applicable Distribution Facility Credit, established in the contracts under this tariff.
2. The customer must enter an Interconnection Agreement with the Company for the interconnection and parallel operation of any qualifying DG facility under this tariff.
3. In order to receive energy and capacity payments, the customer must execute a Power Purchase Agreement with Company.
4. Customer is responsible for any applicable study fees and interconnection costs. The customer must pay all such costs as specified in the Interconnection Agreement.
5. The customer shall be responsible for all costs associated with the installation, operation, and maintenance of the facility.
6. Company may assess a monthly fee for metering and billing the Energy and Capacity Purchase Payments and any applicable Distribution Facility Credit transactions. Metering charges are shown below. For most DG installations, two meters are required. The appropriate metering options available are determined by the Minnesota Technical Requirements or utility requirements.
7. The voltage and phase of customer's distributed generation facility must be consistent with existing retail service configuration and is approved by the Company in accordance with the Company's interconnection requirements.
8. For interconnections not subject to the MN DIP or MN DIA, the customer must maintain a power factor close to unity as possible or as specified in the "Power Factor" provision of the "Distributed Generation Interconnection Requirements" section of this tariff. For interconnections that are subject to the MN DIP, the Power Factor shall be consistent with the MN Technical Requirements and MN DIA, including the Operating Agreement attached to the MN DIA or Uniform Statewide Contract.

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(Continued on Sheet No. 10-79)

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**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF
(Continued)**

Section No. 10
3rd Revised Sheet No. 79

TERMS AND CONDITIONS OF SERVICE (Continued)

9. Customer's DG facility shall not commence parallel operation until it has established, to the satisfaction of the Company that it complies with and has met the standards set forth in any applicable Commission or the Midwest Reliability Organization (MRO) or any successor organization rules, as well as the requirements specified in the *"Distributed Generation Interconnection Requirements"* or MN DIP, as applicable. Where the MN DIP applies, the provisions of the MN Technical Requirements and MN DIA (with its attachments) shall apply.
10. In addition to an automatic fail-safe device, the Company will require an accessible, company approved disconnection device having the capability of isolating the energy generated by each distributed generation facility. This device may be operated by either party at any time in order to maintain safe operating conditions.
11. The DG customer shall be responsible for any additional expense not covered in the terms and conditions of the Interconnection Agreement, which may be incurred by the Company on behalf of the customer or as a result of the customer's DG facility. The range of typical DG interconnection costs is shown below along with typical modifications and upgrades included in the interconnection cost.
12. During the term of the Interconnection Agreement the DG customer shall maintain liability insurance which insures customer against all claims for property damage and for personal injury or death arising out of, resulting from, or in any manner connected with the installation, operation, and maintenance of the DG facility. The amount of such insurance coverage shall be as specified in the Interconnection Agreement.
13. The Company is under no obligation to revise or transfer customer's existing Qualifying Facility (QF) contract(s) still in effect to an alternative PPA, which is subsequently made available.
14. In order to be eligible to receive a capacity payment, the facility must meet the requirements for capacity accreditation in the Midwest Reliability Organization (MRO) or any successor organization, as specified in the rules and procedures of the Midwest Reliability Organization (MRO) or any successor organization.
15. The Company shall have the right to seek capacity accreditation through its own effort with its affiliated power pool and customer will provide reasonable cooperation.
16. The Company shall recover energy costs associated with these purchases pursuant to the provisions of the Fuel Clause Rider.

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(Continued on Sheet No. 10-80)

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MINNESOTA ELECTRIC RATE BOOK - MPUC NO. 2

**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF
(Continued)**

Section No. 10
3rd Revised Sheet No. 80

METERING PRICING APPLICABLE TO DER FACILITIES OPERATING IN PARALLEL WITH THE COMPANY

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The metering pricing in the tables below apply depending on the size of the meter, the customer class, payment type (pre-paid or bundled) , and whether or not the customer has a production meter installed. The rates below are additional to the metering costs included in the customer's retail billing. Where the customer has a production meter under a program tariff that provides that the customer does not pay for the production meter (i.e., 1st and 2nd generation Solar*Rewards at tariff sheets 9-17 and 9-37), then the production meter costs below do not apply.

Labor costs associated with the installation, maintenance, repair, or replacement of the meter are included in the tariff pricing for all non-Solar*Rewards Community DER under 250 kW AC. However, for all Solar*Rewards Community DER and non-Solar*Rewards Community DER sized 250kW AC and larger, labor costs are not reflected in the tariff rates but are billed separately to a customer based on actual costs.

The following service options include a mobile network charge for DER sized at 250kW AC and larger, and a metering charge that includes the meter and meter enclosure, but excludes the costs of transformers, wiring, PTs, CTs, overhead poles, rack and non-meter related materials and equipment.

- bundled pricing where a production meter is installed– Table 10-81,
- upfront and monthly ancillary pricing where a production meter is installed – Table 10-81.1,
- bundled pricing where no production meter is installed – Table 10-81.2, and
- upfront and monthly ancillary pricing where no production meter is installed – Table 10-81.3,

The excluded materials or equipment or associated labor are the cost responsibility of the customer.

Where the Customer has selected upfront pricing (Tables 10-81.1 and 10-81.3), to the extent to which the manufacturer of the meter has a warranty that applies to that meter, the Customer will receive the benefit of that warranty. Other than this, if the meter is repaired or replaced, the Interconnection Customer is responsible for the cost of the repair or replacement. Where there is a warranty that applies, and the meter needs to be repaired or replaced, the Customer needs to pay for Company labor costs (and other material and equipment costs) associated with the repair and replacement to the extent to which labor costs (and other material and equipment costs) are not covered by the warranty. Where the Customer has paid an upfront metering charge, the Customer is responsible for replacement metering costs.

Where the Interconnection Customer has selected bundled pricing - Table 10-81, or metering pricing where no production meter is installed (where the upfront and ancillary metering charges are included in the monthly charges) – Table 10-81.2, repair and replacement costs are included in the tariffed rate, except that for all Solar*Rewards Community (and non-Solar*Rewards Community DER sized 250kW AC and larger) labor costs are not reflected in the tariff rates but are billed separately to a customer based on actual costs.

The type of metering charge selected by the Customer at the time of meter installation remains for the duration of the DER.

Where a particular meter or metering requirement that is applicable to the Customer is not reflected in the tables below, then the closest applicable tariffed charges shall apply. However, if the meter or metering requirement is so different from the tariffed description then individual case basis pricing should apply.

In the tables below, the distinction between Small Commercial and Large Commercial Customers is that Small Commercial Customers are non-demand billed, and Large Commercial Customers are demand billed.

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(Continued on Sheet No. 10-81)

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MINNESOTA ELECTRIC RATE BOOK - MPUC NO. 2

**DISTRIBUTED GENERATION STANDARD
 INTERCONNECTION AND POWER PURCHASE TARIFF
 (Continued)**

Section No. 10
 3rd Revised Sheet No. 81

Table 10-81: Bundled Metering Pricing (upfront and ancillary metering charges are included in the following monthly charges)

Meter Description	Customer Class	Bundled Monthly Metering Service (upfront and ancillary metering costs included)
Single Phase, under 100 kW	Residential	\$3.40
	Small Commercial	\$4.60
	Large Commercial	\$6.10
Three Phase, under 100 kW	Residential	\$4.20
	Small Commercial	\$5.40
	Large Commercial	\$6.90
100kW to 249.99kW Self-Contained Production Meter (not requiring real-time data)	All	\$6.90
100kW to 249.99kW – Three Phase, Instrument-rated Production Meter (not requiring real-time data)	All	\$12.00
250kW to 10 MW – Three Phase, Instrument-rated Production Meter (requiring real-time data)	All	\$72.00*
Under 250kW Point of Interconnection Meter for Solar*Rewards Community	Solar*Rewards Community	\$12.00
250kW to 10 MW Point of Interconnection Meter for Solar*Rewards Community	Solar*Rewards Community	\$72.00*

Note: The above pricing is per production meter. Where telemetry has been installed, but the applicable rate above does not reference a *, then a mobile network charge of \$25.00 per month shall be applied in addition to that rate.

* Includes monthly mobile network costs and annual maintenance

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(Continued on Sheet No. 10-81.1)

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**DISTRIBUTED GENERATION STANDARD
 INTERCONNECTION AND POWER PURCHASE TARIFF
 (Continued)**

Section No. 10
 Original Sheet No. 81.1

Table 10-81.1: Upfront Metering Pricing (upfront charges are assessed and monthly ancillary metering charges are assessed that are not reflected in the upfront pricing)

Meter Description	Customer Class	Upfront Metering Price (customer is responsible for maintenance and replacement costs)	Monthly Ancillary Metering Service (metering costs are pre-paid)
Single Phase, under 100 kW	Residential	\$92.00	\$2.50
	Small Commercial	\$92.00	\$3.70
	Large Commercial	\$92.00	\$5.20
Three Phase, under 100 kW	Residential	\$170.00	\$2.50
	Small Commercial	\$170.00	\$3.70
	Large Commercial	\$170.00	\$5.20
100kW to 249.99kW Self-Contained Production Meter (not requiring real-time data)	All	\$170.00	\$5.20
100kW to 249.99kW – Three Phase, Instrument-rated Production Meter (not requiring real-time data)	All	\$690.00	\$5.20
250kW to 10 MW – Three Phase, Instrument-rated Production Meter (requiring real-time data)	All	\$2740.00	\$44.00*
Under 250kW Point of Interconnection Meter for Solar*Rewards Community	Solar*Rewards Community	\$690.00	\$5.20
250kW to 10 MW Point of Interconnection Meter for Solar*Rewards Community	Solar*Rewards Community	\$2740.00	\$44.00*

Note: The above pricing is per production meter. Where telemetry has been installed, but the applicable rate above does not reference a *, then a mobile network charge of \$25.00 per month shall be applied in addition to that rate.

* Includes monthly mobile network costs and annual maintenance

(Continued on Sheet No. 10-81.2)

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**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF
(Continued)**

Section No. 10
Original Sheet No. 81.2

Table 10-81.2: Metering Pricing Where No Production Meter is Installed (upfront and ancillary metering charges are included in the following monthly charges)

Meter Description	Customer Class	Monthly Ancillary Metering Service (where no production meter installed)
Single & Three Phase, under 40 kW	Residential	\$1.90
	Small Commercial	\$2.60
	Large Commercial	\$3.50

Note: The above pricing is per bi-directional meter. Where telemetry has been installed a mobile network charge of \$25.00 per month shall be applied in addition to the shown rate.

(Continued on Sheet No. 10-81.3)

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**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF
(Continued)**

Section No. 10
Original Sheet No. 81.3

Table 10-81.3:

Upfront Metering Pricing Where No Production Meter is Installed

(upfront charges are assessed and monthly ancillary metering charges are assessed that are not reflected in the upfront pricing)

Meter Description	Customer Class	Upfront Metering Price (customer is responsible for maintenance and replacement costs)	Monthly Ancillary Metering Service
Single & Three Phase, under 40 kW	Residential	\$42.00	\$1.50
	Small Commercial	\$42.00	\$2.20
	Large Commercial	\$42.00	\$3.10

Note: The above pricing is per bi-directional meter. Where telemetry has been installed a mobile network charge of \$25.00 per month shall be applied in addition to the shown rate.

(Continued on Sheet No. 10-82)

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Northern States Power Company, a Minnesota corporation
and wholly owned subsidiary of Xcel Energy Inc.
Minneapolis, Minnesota 55401

MINNESOTA ELECTRIC RATE BOOK - MPUC NO. 2

DISTRIBUTED GENERATION STANDARD

Section No. 10

INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)

1st Revised Sheet No. 82

Unusual Costs That May Apply

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When a generation facility is large compared to the substation or transmission capacity, the DG may have a transmission impact. In these cases, transmission requirements may be imposed by the transmission company or system operator (MISO). These costs are in accordance with the reliability and operation requirements as governed by FERC and posted publicly by the transmission company or system operator.

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(Continued on Sheet No. 10-83)

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DISTRIBUTED GENERATION STANDARD

Section No. 10

INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)

1st Revised Sheet No. 83

**State of Minnesota
Interconnection Process
for Distributed Generation Systems**

INTRODUCTION

This document (Sheet Nos. 10-83 through 10-134.2) has been prepared to explain the process established in the State of Minnesota, to interconnect a Generation System with Xcel Energy for applications submitted prior to June 17, 2019 that have been deemed complete no later than August 16, 2019. This document covers the interconnection process for all types of Generation Systems which are rated 10MW's or less of total generation Nameplate Capacity; are planned for interconnection with Xcel Energy; are not intended for wholesale transactions and aren't anticipated to affect the transmission system. This document does not discuss the interconnection Technical Requirements, which are covered in the **"State of Minnesota Distributed Generation Interconnection Requirements"** document (at Sheet Nos. 10-135 through 10-159.6). This other interconnection requirements document also provides definitions and explanations of the terms utilized within this document. To interconnect a Generation System with Xcel Energy, there are several steps that must be followed. This document outlines those steps and the Parties' responsibilities. At any point in the process, if there are questions, please contact the Generation Interconnection Coordinator at Xcel Energy. Since this document has been developed to provide an interconnection process which covers a very diverse range of Generation Systems, the process appears to be very involved and cumbersome. For many Generation Systems the process is streamlined and provides an easy path for interconnection.

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The promulgation of interconnection standards for Generation Systems by the Minnesota Public Utilities Commission (MPUC) must be done in the context of a reasonable interpretation of the boundary between state and federal jurisdiction. The Federal Energy Regulatory Commission (FERC) has asserted authority in the area, at least as far as interconnection at the transmission level is concerned. This, however, leaves open the question of jurisdiction over interconnection at the distribution level. The Midwest Independent System Operator's (MISO) FERC Electric Tariff, (first revised volume 1, August 23, 2001) Attachment R (Generator Interconnection Procedures and Agreement) states in section 2.1 that "Any existing or new generator connecting at transmission voltages, sub-transmission voltages, or distribution voltages, planning to engage in the sale for resale of wholesale energy, capacity, or ancillary services requiring transmission service under the Midwest ISO OATT must apply to the Midwest ISO for interconnection service". Further in section 2.4 it states that "A Generator not intending to engage in the sale of wholesale energy, capacity, or ancillary services under the Midwest ISO OATT, that proposes to interconnect a new generating facility to the distribution system of a Transmission Owner or local distribution utility interconnected with the Transmission System shall apply to the Transmission Owner or local distribution utility for interconnection". It goes on further to state "Where facilities under the control of the Midwest ISO are affected by such interconnection, such interconnections may be subject to the planning and operating protocols of the Midwest ISO...."

Through discussions with MISO personnel and as a practical matter, if the Generation System Nameplate Capacity is not greater in size than the minimum expected load on the distribution substation, that is feeding the proposed Generation System, and Generation System's energy is not being sold on the wholesale market, then that installation may be considered as not "affecting" the transmission system and the interconnection may be considered as governed by this process. If the Generation System will be selling energy on the wholesale market or the Generation System's total Nameplate Capacity is greater than the expected distribution substation minimum load, then the Applicant shall contact MISO (Midwest Independent System Operator) and follow their procedures.

(Continued on Sheet No. 10-84)

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**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)**

Section No. 10
Original Sheet No. 84

GENERAL INFORMATION

A. Definitions

1. "Applicant" is defined as the person or entity who is requesting the interconnection of the Generation System with Xcel Energy and is responsible for ensuring that the Generation System is designed, operated and maintained in compliance with the Technical Requirements.
2. "Area EPS" is defined as an electric power system (EPS) that serves Local EPS's. For the purpose of this tariff, the Xcel Energy system is the Area EPS. Note. Typically, Xcel Energy has primary access to public rights-of-way, priority crossing of property boundaries, etc.
3. "Area EPS Operator" is the entity who operates the electric power system. For the purpose of this tariff, Xcel Energy is the Area EPS Operator.
4. "Dedicated Facilities" is the equipment that is installed due to the interconnection of the Generation System and not required to serve other Xcel Energy customers.
5. "Distribution System" is the Xcel Energy facilities that are not part of the Xcel Energy Transmission System or any Generation System.
6. "Extended Parallel" means the Generation System is designed to remain connected with Xcel Energy for an extended period of time.
7. "Generation" is defined as any device producing electrical energy, i.e., rotating generators driven by wind, steam turbines, internal combustion engines, hydraulic turbines, solar, fuel cells, etc.; or any other electric producing device, including energy storage technologies.
8. "Generation Interconnection Coordinator" is the person or persons designated by Xcel Energy to provide a single point of coordination with the Applicant for the generation interconnection process.
9. "Generation System" is the interconnected generator(s), controls, relays, switches, breakers, transformers, inverters and associated wiring and cables, up to the Point of Common Coupling.
10. "Interconnection Customer" is the party or parties who will own/operate the Generation System and are responsible for meeting the requirements of the agreements and Technical Requirements. This could be the Generation System applicant, installer, owner, designer, or operator.

(Continued on Sheet No. 10-85)

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MINNESOTA ELECTRIC RATE BOOK - MPUC NO. 2

**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF
(Continued)**

Section No. 10
1st Revised Sheet No. 85

GENERAL INFORMATION (Continued)

A. Definitions (Continued)

11. "Local EPS" is an electric power system (EPS) contained entirely within a single premises or group of premises.
12. "Nameplate Capacity" is the total nameplate capacity rating of all the Generation included in the Generation System. For this definition the "standby" and/or maximum rated kW capacity on the nameplate shall be used.
13. "Open Transfer" is a method of transferring the local loads from Xcel Energy to the generator such that the generator and Xcel Energy are never connected together.
14. "Point of Common Coupling" is the point where the Local EPS is connected to Xcel Energy.
15. "Quick Closed" is a method of generation transfer which does not parallel or parallels for less than 500 msec with Xcel Energy and has utility grade timers which limit the parallel duration to less than 500 msec with Xcel Energy.
16. "Technical Requirements" is the State of Minnesota Distributed Generation Interconnection Requirements".
17. "Transmission System" means those facilities as defined by using the guidelines established by the Minnesota State Public Utilities Commission; "In the Matter of Developing Statewide Jurisdictional Boundary Guidelines for Functionally Separating Interstate Transmission from Generation and Local Distribution Functions" Docket No. E-015/M-99-1002.

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B. Dispute Resolution

The following is the dispute resolution process to be followed for problems that occur with the implementation of this process.

1. Each Party agrees to attempt to resolve all disputes arising hereunder promptly, equitably and in a good faith manner.
2. In the event a dispute arises under this process, and if it cannot be resolved by the Parties within thirty (30) days after written notice of the dispute to the other Party, the Parties shall submit the dispute to mediation by a mutually acceptable mediator, in a mutually convenient location in the State of Minnesota. The Parties agree to participate in good faith in the mediation for a period of 90 days. If the parties are not successful in resolving their disputes through mediation, then the Parties may refer the dispute for resolution to the Minnesota Public Utilities Commission, which shall maintain continuing jurisdiction over this process.

(Continued on Sheet No. 10-86)

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**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)**

Section No. 10
Original Sheet No. 86

GENERAL INFORMATION (Continued)

C. Xcel Energy Generation Interconnection Coordinator

Xcel Energy shall designate a Generation Interconnection Coordinator(s) and this person or persons shall provide a single point of contact for an Applicant's questions on this Generation Interconnection process. Xcel Energy may have several Generation Interconnection Coordinators assigned, due to the geographical size of its electrical service territory or the amount of interconnection applications. This Generation Interconnection Coordinator will typically not be able to directly answer or resolve all of the issues involved in the review and implementation of the interconnection process and standards, but shall be available to provide coordination assistance with the Applicant

D. Engineering Studies

During the process of design of a Generation System interconnection between a Generation System and Xcel Energy, there are several studies which may need to be undertaken. On the Local EPS (Customers side of the interconnection) the addition of a Generation System may increase the fault current levels, even if the generation is never interconnected with Xcel Energy's system. The Interconnection Customer may need to conduct a fault current analysis of the Local EPS in conjunction with adding the Generation System. The addition of the Generation System may also affect Xcel Energy, and special engineering studies may need to be undertaken looking at Xcel Energy with the Generation System included. Appendix D, lists some of the issues that may need to receive further analysis for the Generation System interconnection.

While, it is not a straightforward process to identify which engineering studies are required, we can at least develop screening criteria to identify which Generation Systems may require further analysis. The following is the basic screening criteria to be used for this interconnection process.

- 1) Generation System total Nameplate Capacity does not exceed 5% of the radial circuit expected peak load. The peak load is the total expected load on the radial circuit when the other generators on that same radial circuit are not in operation.
- 2) The aggregate generation's total Nameplate Capacity, including all existing and proposed generation, does not exceed 25% of the radial circuit peak load and that total is also less than the radial circuit minimum load.
- 3) Generation System does not exceed 15% of the Annual Peak Load for the Line Section, which it will interconnect with. A Line Section is defined as that section of the distribution system between two sectionalizing devices within the distribution system.
- 4) Generation System does not contribute more than 10% to the distribution circuit's maximum fault current at the point at the nearest interconnection with Xcel Energy's primary distribution voltage.

(Continued on Sheet No. 10-87)

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**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)**

Section No. 10
Original Sheet No. 87

GENERAL INFORMATION (Continued)

D. Engineering Studies (Continued)

- 5) The proposed Generation System total Nameplate Capacity, in aggregate with other generation on the distribution circuit, will not cause any distribution protective devices and equipment to exceed 85 percent of the short circuit interrupting capability.
- 6) If the proposed Generation System is to be interconnected on a single-phase shared secondary, the aggregate generation Nameplate Capacity on the shared secondary, including the proposed generation, does not exceed 20kW.

1. Generation System will not be interconnected with a "networked" system

E. Scoping Meeting

During Step 2 of this process, the Applicant or Xcel Energy has the option to request a scoping meeting. The purpose of the scoping meeting shall be to discuss the Applicant's interconnection request and review the application filed. This scoping meeting is to be held so that each Party can gain a better understanding of the issues involved with the requested interconnection. Xcel Energy and Applicant shall bring to the meeting personnel, including system engineers, and other resources as may be reasonably required, to accomplish the purpose of the meeting. The Applicant shall not expect Xcel Energy to complete the preliminary review of the proposed Generation System at the scoping meeting. If a scoping meeting is requested, Xcel Energy shall schedule the scoping meeting within the 15-business day review period allowed for in Step 2. Xcel Energy shall then have an additional 5 days, after the completion of the scoping meeting, to complete the formal response required in Step 2. The Application fee shall cover Xcel Energy's costs for this scoping meeting. There shall be no additional charges imposed by Xcel Energy for this initial scoping meeting

(Continued on Sheet No. 10-88)

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**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)**

Section No. 10
Original Sheet No. 88

GENERAL INFORMATION (Continued)

F. Insurance

1. At a minimum, in connection with the Interconnection Customer's performance of its duties and obligations under this Agreement, the Interconnection Customer shall maintain, during the term of the Agreement, general liability insurance, from a qualified insurance agency with a B+ or better rating by "Best" and with a combined single limit of not less than:
 - a) Two million dollars (\$2,000,000) for each occurrence if the Gross Nameplate Rating of the Generation System is greater than 250kW.
 - b) One million dollars (\$1,000,000) for each occurrence if the Gross Nameplate Rating of the Generation System is between 40kW and 250kW.
 - c) Three hundred thousand (\$300,000) for each occurrence if the Gross Nameplate Rating of the Generation System is less than 40kW.
 - d) Such general liability insurance shall include coverage against claims for damages resulting from (i) bodily injury, including wrongful death; and (ii) property damage arising out of the Interconnection Customer's ownership and/or operating of the Generation System under this agreement.
2. The general liability insurance required shall, by endorsement to the policy or policies, (a) include Xcel Energy as an additional insured; (b) contain a severability of interest clause or cross-liability clause; (c) provide that Xcel Energy shall not by reason of its inclusion as an additional insured incur liability to the insurance carrier for the payment of premium for such insurance; and (d) provide for thirty (30) calendar days' written notice to Xcel Energy prior to cancellation, termination, alteration, or material change of such insurance.
3. If the Generation System is connected to an account receiving residential service from Xcel Energy, and its total generating capacity is smaller than 40kW, then the endorsements required in Section F.2 shall not apply.
4. The Interconnection Customer shall furnish the required insurance certificates and endorsements to Xcel Energy prior to the initial operation of the Generation System. Thereafter, Xcel Energy shall have the right to periodically inspect or obtain a copy of the original policy or policies of insurance.
5. Evidence of the insurance required in Section F.1. shall state that coverage provided is primary and is not excess to or contributing with any insurance or self-insurance maintained by Xcel Energy.
6. If the Interconnection Customer is self-insured with an established record of self-insurance, the Interconnection Customer may comply with the following in lieu of Section F.1 – 5.

(Continued on Sheet No. 10-89)

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**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)**

Section No. 10
Original Sheet No. 89

GENERAL INFORMATION (Continued)

F. Insurance (Continued)

7. Interconnection Customer shall provide to Xcel Energy, at least thirty (30) days prior to the date of initial operation, evidence of an acceptable plan to self-insure to a level of coverage equivalent to that required under section F.1.
8. If Interconnection Customer ceases to self-insure to the level required hereunder, or if the Interconnection Customer is unable to provide continuing evidence of its ability to self-insure, the Interconnection Customer agrees to immediately obtain the coverage required under section F.1.
9. Failure of the Interconnection Customer or Xcel Energy to enforce the minimum levels of insurance does not relieve the Interconnection Customer from maintaining such levels of insurance or relieve the Interconnection Customer of any liability.

G. Pre-Certification

The most important part of the process to interconnect generation with Local EPS and Xcel Energy is safety. One of the key components of ensuring the safety of the public and employees is to ensure that the design and implementation of the elements connected to the electrical power system operate as required. To meet this goal, all of the electrical wiring in a business or residence, is required by the State of Minnesota to be listed by a recognized testing and certification laboratory, for its intended purpose. Typically we see this as "UL" listed. Since Generation Systems have tended to be uniquely designed for each installation they have been designed and approved by Professional Engineers. This process has been set up to be able to deal with these uniquely designed systems. As the number of Generation Systems installed increase, vendors are working towards creating equipment packages that can be tested in the factory and then will only require limited field testing. This will allow us to move towards "plug and play" installations. For this reason, this interconnection process recognizes the efficiency of "pre-certification" of Generation System equipment packages that will help streamline the design and installation process.

(Continued on Sheet No. 10-90)

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**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)**

Section No. 10
Original Sheet No. 90

GENERAL INFORMATION (Continued)

G. Pre-Certification (Continued)

An equipment package shall be considered certified for interconnected operation if it has been submitted by a manufacture, tested and listed by a nationally recognized testing and certification laboratory (NRTL) for continuous utility interactive operation in compliance with the applicable codes and standards. Presently generation paralleling equipment that is listed by a nationally recognized testing laboratory as having met the applicable type-testing requirements of UL 1741 and IEEE 929 shall be acceptable for interconnection without additional protection system requirements. An "equipment package" shall include all interface components including switchgear, inverters, or other interface devices and may include an integrated generator or electric source. If the equipment package has been tested and listed as an integrated package which includes a generator or other electric source, it shall not required further design review, testing or additional equipment to meet the certification requirements for interconnection. If the equipment package includes only the interface components (switchgear, inverters, or other interface devices), then the Interconnection Customer shall show that the generator or other electric source being utilized with the equipment package is compatible with the equipment package and consistent with the testing and listing specified for the package. Provided the generator or electric source combined with the equipment package is consistent with the testing ad listing performed by the nationally recognized testing and certification laboratory, no further design review, testing or additional equipment shall be required to meet the certification requirements of this interconnection procedure. A certified equipment package does not include equipment provided by Xcel Energy.

The use of Pre-Certified equipment does not automatically qualify the Interconnection Customer to be interconnected to Xcel Energy. An application will still need to be submitted and an interconnection review may still need to be performed, to determine the compatibility of the Generation System with Xcel Energy.

H. Confidential Information

Except as otherwise agreed, each Party shall hold in confidence and shall not disclose confidential information, to any person (except employees, officers, representatives and agents, who agree to be bound by this section). Confidential information shall be clearly marked as such on each page or otherwise affirmatively identified. If a court, government agency or entity with the right, power, and authority to do so, requests or requires either Party, by subpoena, oral disposition, interrogatories, requests for production of documents, administrative order, or otherwise, to disclose Confidential Information, that Party shall provide the other Party with prompt notice of such request(s) or requirements(s) so that the other Party may seek an appropriate protective order or waive compliance with the terms of this Agreement. In the absence of a protective order or waiver the Party shall disclose such confidential information which, in the opinion of its counsel, the party is legally compelled to disclose. Each Party will use reasonable efforts to obtain reliable assurance that confidential treatment will be accorded any confidential information so furnished.

(Continued on Sheet No. 10-91)

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**DISTRIBUTED GENERATION STANDARD
 INTERCONNECTION AND POWER PURCHASE TARIFF
 (Continued)**

Section No. 10
 1st Revised Sheet No. 91

GENERAL INFORMATION (Continued)

I. Non-Warranty

Neither by inspection, if any, or non-rejection, nor in any other way, does Xcel Energy give any warranty, expressed or implied, as to the adequacy, safety, or other characteristics of any structures, equipment, wires, appliances or devices owned, installed or maintained by the Applicant or leased by the Applicant from third parties, including without limitation the Generation System and any structures, equipment, wires, appliances or devices pertinent thereto.

J. Required Documents

The chart below lists the documents required for each type and size of Generation System proposed for interconnection.

Find your type of Generation System interconnection, across the top, then follow the chart straight down, to determine what documents are required as part of the interconnection process.

GENERATION INTERCONNECTION DOCUMENT SUMMARY						
Open Transfer ≤ 1 MW	Open Transfer > 1 MW Only	Quick Closed Transfer	Soft Loading Transfer	Extended Parallel Operation		
				QF facility ≤ 40 kW	Non-Exporting	Exporting & Net
Interconnection Process (This document, beginning at Sheet No. 10-83)						
State of Minnesota Distributed Generation Interconnection Requirements (beginning at Sheet No. 10-135)						
	Generation Interconnection Application (Appendix B-beginning at Sheet No. 10-102)					
				Engineering Data Submittal (Appendix C-beginning at Sheet No. 10-105)		
				Interconnection Agreement (Appendix E-beginning at Sheet No. 10-113)		
					MISO / FERC	
						PPA

(Continued on Sheet No. 10-92)

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**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)**

Section No. 10
Original Sheet No. 92

GENERAL INFORMATION (Continued)

J. Required Documents (Continued)

Interconnection Process = "State of Minnesota Interconnection Process for Distributed Generation Systems."
(This document)

State of Minnesota Distributed Generation Interconnection Requirements = "State of Minnesota Distributed
Generation Interconnection Requirements"

Generation Interconnection Application = The application form in Appendix B of this document.

Engineering Data Submittal = The Engineering Data Form/Agreement, which is attached as Appendix C of
this document.

Interconnection Agreement = "Minnesota State Interconnection Agreement for the Interconnection of
Extended Parallel Distributed Generation Systems with Electric Utilities", which is attached as Appendix E to
this document.

MISO = Midwest Independent System Operator, www.midwestiso.org.

FERC = Federal Energy Regulatory Commission, www.ferc.gov.

PPA = Power Purchase Agreement.

Process for Interconnection

Step 1 Application (By Applicant)

Once a decision has been made by the Applicant that they would like to interconnect a Generation System with Xcel
Energy, the Applicant shall supply Xcel Energy with the following information:

- 1) Completed Generation Interconnection Application (Appendix B), including;
 - a) One-line diagram showing;
 - i) Protective relaying.
 - ii) Point of Common Coupling.
 - b) Site plan of the proposed installation.
 - c) Proposed schedule of the installation.
- 2) Payment of the application fee, according to the following sliding scale.

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**DISTRIBUTED GENERATION STANDARD
 INTERCONNECTION AND POWER PURCHASE TARIFF
 (Continued)**

Section No. 10
 1st Revised Sheet No. 93

Process for Interconnection (Continued)

Step 1 Application (By Applicant) (Continued)

Generation Interconnection Application and Engineering Study Fees

Interconnection Type	≤ 20 kW	> 20 kW & ≤ 250 kW	> 250 kW & ≤ 500 kW	>500 kW & ≤ 1000 kW	> 1 MW & ≤ 10 MW
Open Transfer	\$0	\$0	\$0	\$0	\$250
Quick Closed Transfer	\$100	\$250	\$250	\$250	\$250
Soft Closed Transfer	\$100	\$250	\$500	\$500	\$1000
Extended Parallel Non-exporting Pre-certified	\$100	\$250	\$250	\$1000	\$1500*
Extended Parallel Non-exporting	\$100	\$250	\$1000	\$1000	\$2000*
Extended Parallel Pre-certified	\$100	\$500	\$2000	\$2000	\$1500*
Extended Parallel Non-Pre-certified	\$100	\$1000	\$3000	\$2000*	\$2000*

* Engineering study fees may apply. Firm cost estimate for study will be given at the time of preliminary review, based on scope provided in application. If scope changes after estimate is provided, then firm cost estimate may be updated.

This application fee is to contribute to Xcel Energy's labor costs for administration, review of the design concept and interconnection engineering review, except additional studies may be needed for the large, complex categories designated with an "*" in the above table.

For the Application Fees chart, above:

The size (kW) of the Generation System is the total maximum Nameplate Capacity of the Generation System.

(Continued on Sheet No. 10-94)

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**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF
(Continued)**

Section No. 10
1st Revised Sheet No. 94

Process for Interconnection (Continued)
Step 2 Preliminary Review (By Xcel Energy)

Within 15 business days of receipt of all the information listed in Step 1, the Xcel Energy Generation Interconnection Coordinator shall respond to the Applicant with the information listed below. (If the information required in Step 1 is not complete, the Applicant will be notified, within 10 business days of what is missing and no further review will be completed until the missing information is submitted. The 15-day clock will restart with the new submittal)

- 1) A single point of contact with Xcel Energy will be designated for this project. (Generation Interconnection Coordinator)
- 2) Approval or rejection of the generation interconnection request.
 - a) Rejection – Xcel Energy shall supply the technical reasons, with supporting information, for rejection of the interconnection Application.
 - b) Approval - An approved Application is valid for 6 months from the date of the approval. The Generation Interconnection Coordinator may extend this time if requested by the Applicant
- 3) If additional specialized engineering studies are required for the proposed interconnection, the following information will be provided to the Applicant. Categories which may require additional study are noted in the Generation Interconnection Application Fees table in Step 1. Typical Engineering Studies are outlined in Appendix D.
 - a) General scope of the engineering studies required.
 - b) Estimated cost of the engineering studies.
 - c) Estimated duration of the engineering studies.
 - d) Additional information required to allow the completion of the engineering studies.
 - e) Study authorization agreement.
- 4) Comments on the schedule provided.
- 5) If the rules of MISO (Midwest Independent System Operator) require that this interconnection request be processed through the MISO process, the Generation Interconnection Coordinator will notify the Applicant that the generation system is not eligible for review through the State of Minnesota process.

(Continued on Sheet No. 10-95)

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**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF
(Continued)**

Section No. 10
1st Revised Sheet No. 95

Process for Interconnection (Continued)

Step 3 Go - No Go Decision for Engineering Studies (By Applicant)

In this step, the Applicant will decide whether or not to proceed with the required engineering studies for the proposed generation interconnection. If no specialized engineering studies are required by Xcel Energy, Xcel Energy and the Applicant will automatically skip this step.

If the Applicant decides NOT to proceed with the engineering studies, the Applicant shall notify the Generation Interconnection Coordinator, so other generation interconnection requests in the queue are not adversely impacted. Should the Applicant decide to proceed, the Applicant shall provide the following to the Generation Interconnection Coordinator:

- 1) Payment, if required by Xcel Energy for the specialized engineering studies for the categories indicated in the fee table on Sheet No. 10-93.
- 2) Additional information requested by Xcel Energy to allow completion of the engineering studies.

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Step 4 Engineering Studies (By Xcel Energy)

In this step, Xcel Energy will be completing the specialized engineering studies for the proposed generation interconnection, as outlined in Step 2. These studies should be completed in the time frame provided in step 2, by Xcel Energy. It is expected that Xcel Energy shall make all reasonable efforts to complete the Engineering Studies within the time frames shown below. If additional time is required to complete the engineering studies the Generation Interconnection Coordinator shall notify the Applicant and provide the reasons for the time extension. Upon receipt of written notice to proceed, payment of applicable fee, and receipt of all engineering study information requested by Xcel Energy in step 2, Xcel Energy shall initiate the engineering studies.

Generation System Size	Engineering Study Completion
<20kW	20 working days
20kW – 250kW	30 working days
250kW – 1MW	40 working days
> 1MW	90 working days

Once it is known by Xcel Energy that the scope of the project has changed, then the Applicant shall be notified. Xcel Energy shall then provide an updated firm cost estimate for the engineering studies. The Applicant shall be given the option of either withdrawing the application and having any unspent fees refunded, or paying the additional estimated amount to continue with the engineering studies.

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**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)**

Section No. 10
Original Sheet No. 96

Process for Interconnection (Continued)

Step 5 Study Results and Construction Estimates (By Xcel Energy)

Upon completion of the specialized engineering studies, or if none was necessary, the following information will be provided to the Applicant.

- 1) Results of the engineering studies, if needed.
- 2) Monitoring & control requirements for the proposed generation.
- 3) Special protection requirements for the Generation System interconnection.
- 4) Comments on the schedule proposed by the Applicant.
- 5) Distributed Generation distribution constrained credits available
- 6) Interconnection Agreement (if applicable).
- 7) Cost estimate and payment schedule for required Xcel Energy work, including, but not limited to;
 - a) Labor costs related to the final design review.
 - b) Labor & expense costs for attending meetings
 - c) Required Dedicated Facilities and other Xcel Energy modification(s).
 - d) Final acceptance testing costs.

Step 6 Final Go-No Go Decision (By Applicant)

In this step, the Applicant shall again have the opportunity to indicate whether or not they want to proceed with the proposed generation interconnection. If the decision is NOT to proceed, the Applicant will notify the Generation Interconnection Coordinator, so that other generation interconnections in the queue are not adversely impacted. Should the Applicant decide to proceed, a more detailed design, if not already completed by the Applicant, must be done, and the following information is to be supplied to the Generation Interconnection Coordinator:

- 1) Applicable up-front payment required by Xcel Energy, per Payment Schedule, provided in Step 5 (if applicable).
- 2) Signed Interconnection Agreement (if applicable).

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**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)**

Section No. 10
Original Sheet No. 97

Process for Interconnection (Continued)

Step 6 Final Go-No Go Decision (By Applicant) (Continued)

- 3) Final proposed schedule, incorporating Xcel Energy's comments. The schedule of the project should include such milestones as foundations poured, equipment delivery dates, all conduit installed, cutover (energizing of the new switchgear/transfer switch), Xcel Energy work, relays set and tested, preliminary vendor testing, final Xcel Energy acceptance testing, and any other major milestones.
- 4) Final proposed schedule, incorporating Xcel Energy's comments. The schedule of the project should include such milestones as foundations poured, equipment delivery dates, all conduit installed, cutover (energizing of the new switchgear/transfer switch), Xcel Energy work, relays set and tested, preliminary vendor testing, final Xcel Energy acceptance testing, and any other major milestones.
- 5) Detailed one-line diagram of the Generation System, including the generator, transfer switch/switchgear, service entrance, lockable and visible disconnect, metering, protection and metering CT's / VT's, protective relaying and generator control system.
- 6) Detailed information on the proposed equipment, including wiring diagrams, models and types.
- 7) Proposed relay settings for all interconnection required relays.
- 8) Detailed site plan of the Generation System.
- 9) Drawing(s) showing the monitoring system (as required per table 5A and section 5 of the "State of Minnesota Distributed Generation Interconnection Requirements". Including a drawing which shows the interface terminal block with the Xcel Energy monitoring system.
- 10) Proposed testing schedule and initial procedure, including;
 - a) Time of day (after-hours testing required?).
 - b) Days required.
 - c) Testing steps proposed.

Step 7 Final Design Review (By Xcel Energy)

Within 15 business days of receipt of the information required in Step 6, The Generation Interconnection Coordinator will provide the Applicant with an estimated timetable for final review. If the information required in Step 6 is not complete, the Applicant will be notified, within 10 business days of what information is missing. No further review may be completed until the missing information is submitted. The 15-business day clock will restart with the new submittal. This final design review shall not take longer than 15 additional business days to complete, for a total of 30 business days.

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**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)**

Section No. 10
Original Sheet No. 98

Process for Interconnection (Continued)

Step 7 Final Design Review (By Xcel Energy) (Continued)

During this step, Xcel Energy shall complete the review of the final Generation System design. If the final design has significant changes from the Generation System proposed on the original Application that invalidate the engineering studies or the preliminary engineering screening, the Generation System Interconnection Application request may be rejected by Xcel Energy, and the Applicant may be requested to reapply with the revised design.

Upon completion of this step the Generation Interconnection Coordinator shall supply the following information to the Applicant.

- 1) Requested modifications or corrections of the detailed drawings provided by the Applicant.
- 2) Approval of and agreement with the Project Schedule. (This may need to be interactively discussed between the Parties, during this Step).
- 3) Final review of Distributed Generation Credit amount(s) (where applicable).
- 4) Initial testing procedure review comments. (Additional work on the testing process will occur during Step 8, once the actual equipment is identified).

Step 8 Order Equipment and Construction (By Both Parties)

The following activities shall be completed during this step. For larger installations this step will involve much interaction between the Parties. It is typical for approval drawings to be supplied by the Applicant to Xcel Energy for review and comments. It is also typical for Xcel Energy to require review and approval of the drawings that cover the interconnection equipment and interconnection protection system. If Xcel Energy also requires remote control and/or monitoring, those drawings are also exchanged for review and comment.

By the Applicant's personnel:

- 1) Ordering of Generation System equipment.
- 2) Installing Generation System.
- 3) Submit approval drawings for interconnection equipment and protection systems, as required by Xcel Energy.
- 4) Provide final relay settings provided to Xcel Energy.
- 5) Submit Completed and signed Engineering Data Submittal form.
- 6) Submit proof of insurance, as required by Xcel Energy tariff(s) or interconnection agreements.
- 7) Submit required State of Minnesota electrical inspection forms ("blue Copy) filed with Xcel Energy.
- 8) Inspecting and functional testing Generation System components.
- 9) Work with Xcel Energy personnel and equipment vendor(s) to finalize the installation testing procedure.

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MINNESOTA ELECTRIC RATE BOOK - MPUC NO. 2

**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)**

Section No. 10
Original Sheet No. 99

Process for Interconnection (Continued)

Step 8 Order Equipment and Construction (By Both Parties) (Continued)

By Xcel Energy personnel:

- 1) Ordering any necessary Xcel Energy equipment.
- 2) Installing and testing any required equipment.
 - a) Monitoring facilities.
 - b) Dedicated Equipment.
- 3) Assisting Applicant's personnel with interconnection installation coordination issues
- 4) Providing review and input for testing procedures.

Step 9 Final Tests (By Xcel Energy / Applicant)

(Due to equipment lead times and construction, a significant amount of time may take place between the execution of Step 8 and Step 9.) During this time the final test steps are developed and the construction of the facilities are completed.

Final acceptance testing will commence when all equipment has been installed, all contractor preliminary testing has been accomplished and all Xcel Energy preliminary testing of the monitoring and dedicated equipment is completed. One to three weeks prior to the start of the acceptance testing of the generation interconnection the Applicant shall provide, a report stating:

- that the Generation System meets all interconnection requirements.
- all contractor preliminary testing has been completed.
- the protective systems are functionally tested and ready.
- and provides a proposed date that the Generation System will be is ready to be energized and acceptance tested.

For non-type certified systems a Professional Electrical Engineer registered in the State of Minnesota is required to provide this formal report.

For smaller systems scheduling of this testing may be more flexible, as less testing time is required than for larger systems.

In many cases, this testing is done after hours to ensure no typical business-hour load is disturbed. If acceptance testing occurs after hours, Xcel Energy labor will be billed at overtime wages. During this testing, Xcel Energy will typically run three different tests. These tests can differ depending on which type of communication / monitoring system(s) Xcel Energy decides to install at the site.

(Continued on Sheet No. 10-100)

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**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)**

Section No. 10
1st Revised Sheet No. 100

Process for Interconnection (Continued)

Step 9 Final Tests (By Xcel Energy / Applicant) (Continued)

For problems created by Xcel Energy or any Xcel Energy equipment that arise during testing, Xcel Energy will fix the problem as soon as reasonably possible. If problems arise during testing that are caused by the Applicant or Applicant's vendor or any vendor supplied or installed equipment, Xcel Energy will leave the project until the problem is resolved. Having the testing resume will then be subject to Xcel Energy personnel time and availability.

Step 10 (By Xcel Energy)

After all of Xcel Energy's acceptance testing has been accomplished and all requirements are met, Xcel Energy shall provide written approval for normal operation of the Generation System interconnection, within 3 business days of successful completion of the acceptance tests.

Step 11 (By Applicant)

Within two (2) months of interconnection, the Applicant shall provide Xcel Energy with updated drawings and prints showing the Generation System as it were when approved for normal operation by Xcel Energy. The drawings shall include all changes that were made during construction and the testing process.

Note: If the Interconnection Application is in connection with a Solar*Rewards Community application, then the provisions in the Section 9 tariff applicable to the Solar*Rewards Community Program also apply.

N
N

ATTACHMENTS:

Attached are several documents, which may be required for the interconnection process. They are as follows:

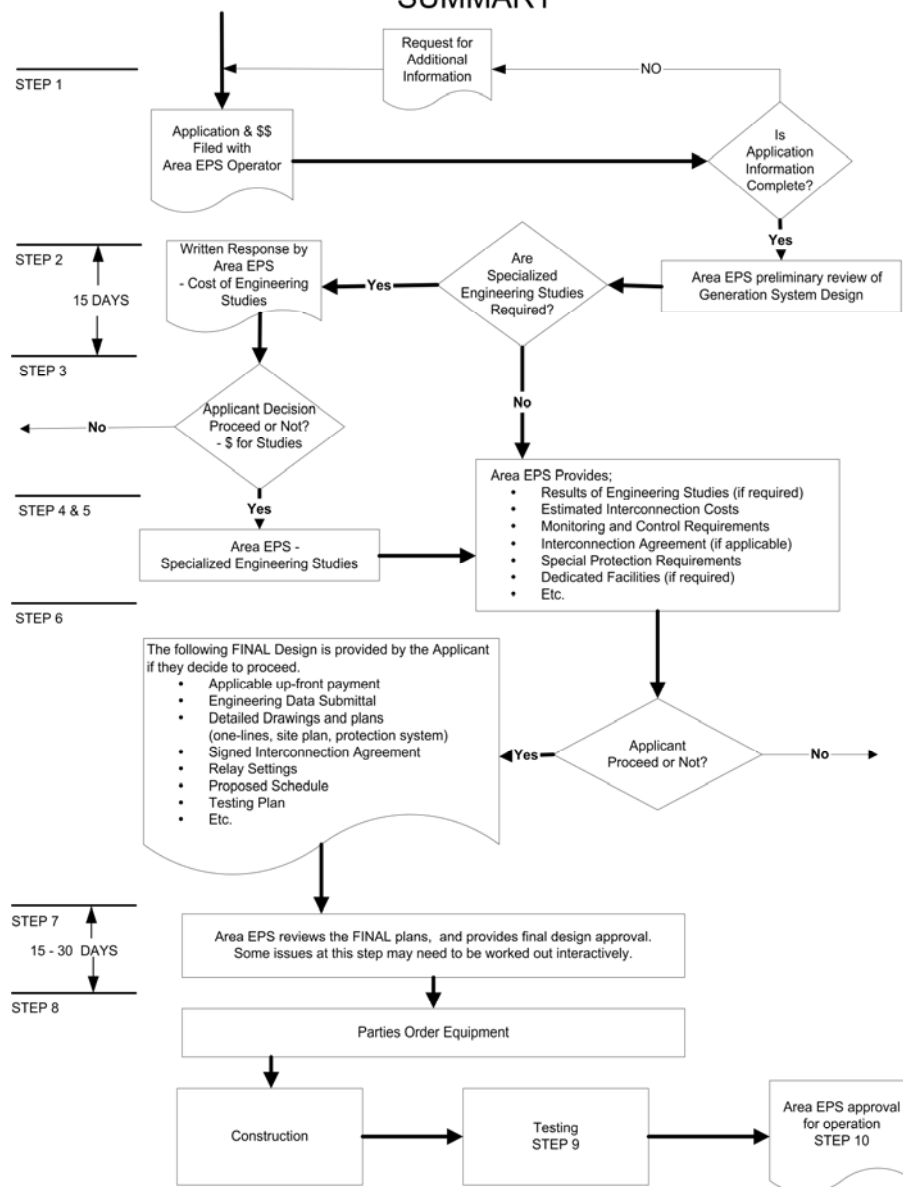
Appendix A	Flow-chart showing summary of the interconnection process.
Appendix B	Generation Interconnection Application Form.
Appendix C	Engineering Data Submittal Form.
Appendix D	Engineering Studies: Brief description of the types of possible Engineering Studies that may be required for the review of the Generation System interconnection.
Appendix E	State of Minnesota Interconnection Agreement for the Interconnection of Extended Paralleled Distributed Generation Systems with Electric Utilities.

(Continued on Sheet No. 10-101)

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APPENDIX A

**DISTRIBUTED GENERATION INTERCONNECTION PROCESS
SUMMARY**



(Continued on Sheet No. 10-102)

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MINNESOTA ELECTRIC RATE BOOK - MPUC NO. 2

**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)**

Section No. 10
Original Sheet No. 102

APPENDIX B: Generation Interconnection Application Form

WHO SHOULD FILE THIS APPLICATION: Anyone expressing interest to install generation which will interconnect with Xcel Energy (Local electric utility). This application should be completed and returned to the Generation Interconnection Coordinator, in order to begin processing the request.

INFORMATION: This application is used by Xcel Energy to perform a preliminary interconnection review. The Applicant shall complete as much of the form as possible. The fields in BOLD are required to be completed to the best of the Applicant's ability. The Applicant will be contacted if additional information is required. The response may take up to 15 business days after receipt of all the required information.

COST: A payment to cover the application fee shall be included with this application. The application fee amount is outlined in the "State of Minnesota Interconnection Process for Distributed Generation Systems".

OWNER/APPLICANT		
Company / Applicant's Name:		
Representative:	Phone Number:	FAX Number:
Title:		
Mailing Address:		
Email Address:		
LOCATION OF GENERATION SYSTEM INTERCONNECTION		
Street Address, legal description or GPS coordinates:		
PROJECT DESIGN / ENGINEERING (if applicable)		
Company:		
Representative:	Phone:	FAX Number:
Mailing Address:		
Email Address:		
ELECTRICAL CONTRACTOR (if applicable)		
Company:		
Representative:	Phone:	FAX Number:
Mailing Address:		
Email Address:		

(Continued on Sheet No. 10-103)

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**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)**

Section No. 10
Original Sheet No. 103

APPENDIX B: Generation Interconnection Application Form (Continued)

GENERATOR		
Manufacturer:		Model:
Type (Synchronous Induction, Inverter, etc):		Phases: 1 or 3
Rated Output (Prime kW):	(Standby kW):	Frequency:
Rated Power Factor (%):	Rated Voltage (Volts):	Rated Current (Amperes):
Energy Source (gas, steam, hydro, wind, etc.)		
TYPE OF INTERCONNECTED OPERATION		
Interconnection / Transfer method: ☐ Open ☐ Quick Open ☐ Closed ☐ Soft Loading ☐ Inverter		
Proposed use of generation: (Check all that may apply) ☐ Peak Reduction ☐ Standby ☐ Energy Sales ☐ Cover Load		Duration Parallel: ☐ None ☐ Limited ☐ Continuous
Pre-Certified System Yes / No (Circle one)		Exporting Energy Yes / No (Circle one)
ESTIMATED LOAD INFORMATION		
The following information will be used to help properly design the interconnection. This Information is not intended as a commitment or contract for billing purposes.		
Minimum anticipated load (generation not operating):	kW:	kVA:
Maximum anticipated load (generation not operating):	kW:	kVA:
ESTIMATED START/COMPLETION DATES		
Construction start date:	Completion (operational) date:	
DESCRIPTION OF PROPOSED INSTALLATION AND OPERATION		
Attach a single line diagram showing the switchgear, transformers, and generation facilities. Give a general description of the manner of operation of the generation (cogeneration, closed-transition peak shaving, open-transition peak shaving, emergency power, etc.). Also, does the Applicant intend to sell power and energy or ancillary services and/or wheel power over Xcel Energy facilities? If there is an intent to sell power and energy, also define the target market.		

(Continued on Sheet No. 10-104)

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MINNESOTA ELECTRIC RATE BOOK - MPUC NO. 2

Section No. 10
Original Sheet No. 104

SIGN OFF AREA:	
With this Application, we are requesting Xcel Energy to review the proposed Generation System Interconnection. We request that Xcel Energy identifies the additional equipment and costs involved with the interconnection of this system and to provide a budgetary estimate of those costs. We understand that the estimated costs supplied by Xcel Energy, will be estimated using the information provided. We also agree that we will supply, as requested, additional information, to allow Xcel Energy to better review this proposed Generation System interconnection. We have read the “State of Minnesota Distributed Generation Interconnection Requirements” and will design the Generation System and interconnection to meet those requirements.	
Applicant Name (print):	
Applicant Signature:	Date:
SEND THIS COMPLETED & SIGNED APPLICATION AND ATTACHMENTS TO THE GENERATION INTERCONNECTION COORDINATOR	

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**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)**

Section No. 10
Original Sheet No. 105

APPENDIX C: Engineering Data Submittal Form

WHO SHOULD FILE THIS SUBMITTAL: Anyone in the final stages of interconnecting a Generation System with Xcel Energy. This submittal shall be completed and provided to the Generation Interconnection Coordinator during the design of the Generation System, as established in the "State of Minnesota Interconnection Process for Distributed Generation Systems".

INFORMATION: This submittal is used to document the interconnected Generation System. The Applicant shall complete as much of the form as applicable. The Applicant will be contacted if additional information is required.

OWNER / APPLICANT		
Company / Applicant:		
Representative:	Phone Number:	FAX Number:
Title:		
Mailing Address:		
Email Address:		

PROPOSED LOCATION OF GENERATION SYSTEM INTERCONNECTION
Street Address, Legal Description or GPS coordinates:

PROJECT DESIGN / ENGINEERING (if applicable)		
Company:		
Representative:	Phone:	FAX Number:
Mailing Address:		
Email Address:		

ELECTRICAL CONTRACTOR (if applicable)		
Company:		
Representative:	Phone:	FAX Number:
Mailing Address:		
Email Address:		

(Continued on Sheet No. 10-106)

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**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)**

Section No. 10
Original Sheet No. 106

APPENDIX C: Engineering Data Submittal Form (Continued)

TYPE OF INTERCONNECTED OPERATION	
Interconnection / Transfer method: ☐ Open ☐ Quick Open ☐ Closed ☐ Soft Loading ☐ Inverter	
Proposed use of generation: (Check all that may apply) ☐ Peak Reduction ☐ Standby ☐ Energy Sales ☐ Cover Load	Duration Parallel: ☐ None ☐ Limited ☐ Continuous
Pre-Certified System: Yes / No (Circle one)	Exporting Energy Yes / No (Circle one)

GENERATION SYSTEM OPERATION / MAINTENANCE CONTACT INFORMATION		
Maintenance Provider:	Phone #:	Pager #:
Operator Name:	Phone #:	Pager #:
Person to Contact before remote starting of units		
Contact Name:	Phone #:	Pager #:
	24hr Phone #:	

GENERATION SYSTEM OPERATING INFORMATION	
Fuel Capacity (gals):	Full Fuel Run-time (hrs):
Engine Cool Down Duration (Minutes):	Start time Delay on Load Shed signal:
Start Time Delay on Outage (Seconds):	

ESTIMATED LOAD		
The following information will be used to help properly design the interconnection. This Information is not Intended as a commitment or contract for billing purposes.		
Minimum anticipated load (generation not operating):	kW:	kVA:
Maximum anticipated load (generation not operating):	kW:	kVA:

(Continued on Sheet No. 10-107)

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**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)**

Section No. 10
Original Sheet No. 107

APPENDIX C: Engineering Data Submittal Form (Continued)

REQUESTED CONSTRUCTION START/COMPLETION DATES	
Design Completion:	
Construction Start Date:	
Footings in place:	
Primary Wiring Completion:	
Control Wiring Completion:	
Start Acceptance Testing:	
Generation operational (In-service):	

(Complete all applicable items. Copy this page as required for additional generators.)

SYNCHRONOUS GENERATOR (if applicable)			
Unit Number:	Total number of units with listed specifications on site:		
Manufacturer:	Type:	Phases: 1 or 3	
Serial Number (each)	Date of manufacture:	Speed (RPM):	Freq. (Hz);
Rated Output (each unit) kW Standby:	kW Prime:	kVA:	
Rated Power Factor (%):	Rated Voltage(Volts):	Rated Current (Amperes):	
Field Voltage (Volts):	Field Current (Amperes):	Motoring Power (kW):	
Synchronous Reactance (Xd):	% on	kVA base	
Transient Reactance (X'd):	% on	kVA base	
Subtransient Reactance (X''d):	% on	kVA base	
Negative Sequence Reactance (Xs):	% on	kVA base	
Zero Sequence Reactance (Xo):	% on	kVA base	
Neutral Grounding Resistor (if applicable):			
$I^2 t$ or K (heating time constant):			
Exciter data:			
Governor data:			
Additional Information:			

(Continued on Sheet No. 10-108)

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**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)**

Section No. 10
Original Sheet No. 108

APPENDIX C: Engineering Data Submittal Form (Continued)

INDUCTION GENERATOR (if applicable)			
Rotor Resistance (Rr):	Ohms	Stator Resistance (Rs):	Ohms
Rotor Reactance (Xr):	Ohms	Stator Reactance (Xs):	Ohms
Magnetizing Reactance (Xm):	Ohms	Short Circuit Reactance (Xd):	Ohms
Design Letter:		Frame Size:	
Exciting Current:		Temp Rise (deg C°):	
Rated Output (kW):			
Reactive Power Required:		kVars (no Load)	kVars (full load)
If this is a wound-rotor machine, describe any external equipment to be connected (resistor, rheostat, power converter, etc.) to rotor circuit, and circuit configuration. Describe ability, if any, to adjust generator reactive output to provide power system voltage regulation.			
Additional Information:			
PRIME MOVER (Complete all applicable items)			
Unit Number:	Type:		
Manufacturer:			
Serial Number:	Date of Manufacture:		
H.P. Rated:	H.P. Max:	Inertia Constant:	lb.-ft. ²
Energy Source (hydro, steam, wind, wind etc.):			

INTERCONNECTION (STEP-UP) TRANSFORMER (If applicable)			
Manufacturer:		kVA:	
Date of Manufacture:	Serial Number:		
High Voltage: kV	Connection: delta wye	Neutral solidly grounded?	
Low Voltage: kV	Connection: delta wye	Neutral solidly grounded?	
Transformer Impedance (Z):	% on	kVA base	
Transformer Resistance (R):	% on	kVA base	
Transformer Reactance (X):	% on	kVA base	
Neutral Grounding Resistor (if applicable)			

(Continued on Sheet No. 10-109)

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**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)**

Section No. 10
Original Sheet No. 109

APPENDIX C: Engineering Data Submittal Form (Continued)

TRANSFER SWITCH (If applicable)	
Model Number:	Type:
Manufacturer:	Rating (amps):

INVERTER (If applicable)	
Manufacturer:	Model:
Rated Power Factor (%):	Rated Voltage (Volts):
Rated Current (Amperes):	
Inverter Type (ferroresonant, step, pulse-width modulation, etc.):	
Type of Commutation: forced line	Minimum Short Circuit Ratio required:
Minimum voltage for successful commutation:	
Current Harmonic Distortion	Maximum Individual Harmonic (%):
	Maximum Total Harmonic Distortion (%):
Voltage Harmonic Distortion	Maximum Individual Harmonic (%):
	Maximum Total Harmonic Distortion (%):
Describe capability, if any, to adjust reactive output to provide voltage regulation:	
NOTE: Attach all available calculations, test reports, and oscillographic prints showing inverter output voltage and current waveforms.	

POWER CIRCUIT BREAKER (if applicable)	
Manufacturer:	Model:
Rated Voltage (kilovolts):	Rated Ampacity (Amperes):
Interrupting Rating (Amperes):	BIL Rating:
Interrupting Medium (vacuum, oil, gas, etc.)	Insulating Medium (vacuum, oil, gas, etc.)
Control Voltage (Closing):	(Volts) AC DC
Control Voltage (Tripping):	(Volts) AC DC Battery Charged Capacitor
Close Energy (circle one):	Spring Motor Hydraulic Pneumatic Other
Trip Energy (circle one):	Spring Motor Hydraulic Pneumatic Other
Bushing Current Transformers (Max. ratio):	Relay Accuracy Class:
CT'S Multi Ratio? (circle one); No / Yes: (Available taps):	

(Continued on Sheet No. 10-110)

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**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)**

Section No. 10
Original Sheet No. 110

APPENDIX C: Engineering Data Submittal Form (Continued)

MISCELLANEOUS (Use this area and any additional sheets for applicable notes and comments)

SIGN OFF AREA
This Engineering Data Submittal documents the equipment and design of the Generation System. We agree to supply Xcel Energy with an updated Engineering Data Submittal any time significant changes are made in the equipment used or the design of the proposed Generation System. The Applicant agrees to design, operate and maintain the Generation System within the requirements set forth by the "State of Minnesota Distributed Generation Interconnection Requirements".
Applicant Name (print):
Applicant Signature: Date:
SEND THIS COMPLETED & SIGNED ENGINEERING DATA SUBMITTAL AND ANY ATTACHMENTS TO THE GENERATION INTERCONNECTION COORDINATOR

(Continued on Sheet No. 10-111)

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APPENDIX D: Engineering Studies

For the engineering studies there are two main parts of the study: 1. Does the distributed generator cause a problem? and 2. What would it cost to make a change to handle the problem? The first question is relatively straightforward to determine, as Xcel Energy reviews the proposed installation. The second question typically has multiple alternatives and can turn into an iterative process. This iterative process can become quite large for more complex generation installations. For the Engineer there is no "cook book" solution that can be applied.

For some of the large generation installations and/or the more complex interconnections, Xcel Energy may suggest dividing up the engineering studies into the two parts: identify the scope of the problems and attempt to identify solutions to resolve the problems. By splitting the engineering studies into two steps, it will allow for the Applicant to see the problems identified and to provide the Applicant the ability to remove the request for interconnection if the problems are too large and expensive to resolve. This would then save the additional costs to the Applicant for the more expensive engineering studies; to identify ways to resolve the problem(s).

This appendix provides an overview of some of the main issues that are looked at during the engineering study process. Every interconnection has its unique issues, such as relative strength of the distribution system, ratio of the generation size to the existing area loads, etc. Thus many of the generation interconnections will require further review of one or several of the issues listed.

- Short circuit analysis – the system is studied to make sure that the addition of the generation will not over stress any of the Xcel Energy equipment, and that equipment will still be able to clear during a fault. It is expected that the Applicant will complete their own short circuit analysis on their equipment to ensure that the addition of the generation system does not overstress the Applicant's electrical equipment.
- Power Flow and Voltage Drop
 - Reviews potential islanding of the generation
 - Will Xcel Energy Equipment be overloaded
 - Under normal operation?
 - Under contingent operation? With backfeeds?
- Flicker Analysis –
 - Will the operation of the generation cause voltage swings?
 - When it loads up? When it off loads?
 - How will the generation interact with Xcel Energy voltage regulation?
 - Will Xcel Energy capacitor switching affect the generation while on-line
- Protection Coordination
 - Reclosing issues – this is where the reclosing for the distribution system and transmission system are looked at to see if the Generation System protection can be set up to ensure that it will clear from the distribution system before the feeder is reenergized.
 - Is voltage supervision of reclosing needed?

(Continued on Sheet No. 10-112)

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**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)**

Section No. 10
Original Sheet No. 112

APPENDIX D: Engineering Studies (Continued)

- Protection Coordination (Continued)
 - Is transfer-trip required?
 - Do we need to modify the existing protection systems? Existing settings?
 - At which points do we need "out of sync" protection?
 - Is the proposed interconnection protection system sufficient to sense a problem with Xcel Energy?
 - Are there protection problems created by the step-up transformer?
- Grounding Reviews
 - Does the proposed grounding system for the Generation System meet the requirements of the NESC? "National Electrical Safety Code" published by the Institute of Electrical and Electronics Engineers (IEEE)
- System Operation Impact.
 - Are special operating procedures needed with the addition of the generation?
 - Reclosing and out of sync operation of facilities.
 - What limitations need to be placed on the operation of the generation?
 - Operational Var requirements?

(Continued on Sheet No. 10-113)

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**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)**

Section No. 10
Original Sheet No. 113

APPENDIX E: Interconnection Agreement

State of Minnesota

Proposed Interconnection Agreement

For the Interconnection of Extended Parallel Distributed Generation Systems With Electric Utilities

This Generating System Interconnection Agreement is entered into by and between Xcel Energy, "_____" and the Interconnection Customer "_____". The Interconnection Customer and Xcel Energy are sometimes also referred to in this Agreement jointly as "Parties" or individually as "Party".

In consideration of the mutual promises and obligations stated in this Agreement and its attachments, the Parties agree as follows:

I. SCOPE AND PURPOSE

- A. Establishment of Point of Common Coupling. This Agreement is intended to provide for the Interconnection Customer to interconnect and operate a Generation System with a total Nameplate Capacity of 10MWs or less in parallel with Xcel Energy at the location identified in Exhibit C and shown in the Exhibit A one-line diagram.
- B. This Agreement governs the facilities required to and contains the terms and condition under which the Interconnection Customer may interconnect the Generation System to Xcel Energy. This Agreement does not authorize the Interconnection Customer to export power or constitute an agreement to purchase or wheel the Interconnection Customer's power. Other services that the Interconnection Customer may require from Xcel Energy, or others, may be covered under separate agreements.
- C. To facilitate the operation of the Generation System, this agreement also allows for the occasional and inadvertent export of energy to Xcel Energy. The amount, metering, billing and accounting of such inadvertent energy exporting shall be governed by Exhibit D (Operating Agreement). This Agreement does not constitute an agreement by Xcel Energy to purchase or pay for any energy, inadvertently or intentionally exported, unless expressly noted in Exhibit D or under a separately executed power purchase agreement (PPA).
- D. This agreement does not constitute a request for, nor the provision of any transmission delivery service or any local distribution delivery service.
- E. The Technical Requirements for interconnection are covered in a separate Technical Requirements document know as, the "State of Minnesota Distributed Generation Interconnection Requirements", a copy of which as been made available to the Interconnection Customer and incorporated and made part of this Agreement by this reference.

(Continued on Sheet No. 10-114)

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APPENDIX E: Interconnection Agreement (Continued)

II. DEFINITIONS

- A. "Area EPS" is an electric power system (EPS) that serves Local EPS's. For the purpose of this agreement, the Xcel Energy system is the Area EPS. Note: Typically, Xcel Energy has primary access to public rights-of-way, priority crossing of property boundaries, etc.
- B. "Area EPS Operator" is the entity that operates the electric power system. For purpose of this agreement, Xcel Energy is the Are EPS Operator.
- C. "Dedicated Facilities" is the equipment that is installed due to the interconnection of the Generation System and not required to serve other Xcel Energy customers.
- D. "EPS" (Electric Power System) are facilities that deliver electric power to a load. Note: This may include generation units.
- E. "Extended Parallel" means the Generation System is designed to remain connected with Xcel Energy for an extended period of time.
- F. "Generation" is any device producing electrical energy, i.e., rotating generators driven by wind, steam turbines, internal combustion engines, hydraulic turbines, solar, fuel cells, etc.; or any other electric producing device, including energy storage technologies.
- G. "Generation Interconnection Coordinator" is the person or persons designated by Xcel Energy to provide a single point of coordination with the Applicant for the generation interconnection process.
- H. "Generation System" is the interconnected generator(s), controls, relays, switches, breakers, transformers, inverters and associated wiring and cables, up to the Point of Common Coupling.
- I. "Interconnection Customer" is the party or parties who will own/operate the Generation System and are responsible for meeting the requirements of the agreements and Technical Requirements. This could be the Generation System applicant, installer, owner, designer, or operator.
- J. "Local EPS" is an electric power system (EPS) contained entirely within a single premises or group of premises.
- K. "Nameplate Capacity" is the total nameplate capacity rating of all the Generation included in the Generation System. For this definition the "standby" and/or maximum rated kW capacity on the nameplate shall be used.

(Continued on Sheet No. 10-115)

Date Filed: 11-02-05

By: Cynthia L. Leshner

Effective Date: 02-01-07

President and CEO of Northern States Power Company

Docket No. E002/GR-05-1428

Order Date: 09-01-06

Northern States Power Company, a Minnesota corporation
and wholly owned subsidiary of Xcel Energy Inc.
Minneapolis, Minnesota 55401

MINNESOTA ELECTRIC RATE BOOK - MPUC NO. 2

**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)**

Section No. 10
Original Sheet No. 115

APPENDIX E: Interconnection Agreement (Continued)

II. DEFINITIONS (Continued)

- L. "Point of Common Coupling" is the point where the Local EPS is connected to Xcel Energy
- M. "Point of Delivery" is the point where the energy changes possession from one party to the other. Typically this will be where the metering is installed but it is not required that the Point of Delivery is the same as where the energy is metered
- N. "Technical Requirements" are the State of Minnesota Requirements for Interconnection of Distributed Generation

III. DESCRIPTION OF INTERCONNECTION CUSTOMER'S GENERATION SYSTEM

- A) A description of the Generation System, including a single-line diagram showing the general arrangement of how the Interconnection Customer's Generation System is interconnected with Xcel Energy's distribution system, is attached to and made part of this Agreement as Exhibit A. The single-line diagram shows the following:
 - 1) Point of Delivery (if applicable)
 - 2) Point of Common Coupling
 - 3) Location of Meter(s)
 - 4) Ownership of the equipment
 - 5) Generation System total Nameplate Capacity _____ kW
 - 6) Scheduled operational (on-line) date for the Generation System.

IV. RESPONSIBILITIES OF THE PARTIES

- A) The Parties shall perform all obligations of this Agreement in accordance with all applicable laws and regulations, operating requirements and good utility practices.
- B) Interconnection Customer shall construct, operate and maintain the Generation System in accordance with the applicable manufacturer's recommended maintenance schedule, the Technical Requirements and in accordance with this Agreement.

(Continued on Sheet No. 10-116)

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MINNESOTA ELECTRIC RATE BOOK - MPUC NO. 2

**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)**

Section No. 10
Original Sheet No. 116

APPENDIX E: Interconnection Agreement (Continued)

IV. RESPONSIBILITIES OF THE PARTIES (Continued)

- C) Xcel Energy shall carry out the construction of the Dedicated Facilities in a good and workmanlike manner, and in accordance with standard design and engineering practices.

V. CONSTRUCTION

The Parties agree to cause their facilities or systems to be constructed in accordance with the laws of the State of Minnesota and to meet or exceed applicable codes and standards provided by the NESC (National Electrical Safety Code), ANSI (American National Standards Institute), IEEE (Institute of Electrical and Electronic Engineers), NEC (National Electrical Code), UL (Underwriter's Laboratory), Technical Requirements and local building codes and other applicable ordinances in effect at the time of the installation of the Generation System.

A) Charges and payments

The Interconnection Customer is responsible for the actual costs to interconnect the Generation System with Xcel Energy, including, but not limited to any Dedicated Facilities attributable to the addition of the Generation System, Xcel Energy labor for installation coordination, installation testing and engineering review of the Generation System and interconnection design. Estimates of these costs are outlined in Exhibit B. While estimates, for budgeting purposes, have been provided in Exhibit B, the actual costs are still the responsibility of the Interconnection Customer, even if they exceed the estimated amount(s). All costs, for which the Interconnection Customer is responsible for, must be reasonable under the circumstances of the design and construction.

1) Dedicated Facilities

- a) During the term of this Agreement, Xcel Energy shall design, construct and install the Dedicated Facilities outlined in Exhibit B. The Interconnection Customer shall be responsible for paying the actual costs of the Dedicated Facilities attributable to the addition of the Generation System.
- b) Once installed, the Dedicated Facilities shall be owned and operated by Xcel Energy, and all costs associated with the operating and maintenance of the Dedicated Facilities, after the Generation System is operational, shall be the responsibility of Xcel Energy, unless otherwise agreed.
- c) By executing this Agreement, the Interconnection Customer grants permission for Xcel Energy to begin construction and to procure the necessary facilities and equipment to complete the installation of the Dedicated Facilities, as outlined in Exhibit B. If for any reason, the Generation System project is canceled or modified, so that any or all of the Dedicated Facilities are not required, the Interconnection Customer shall be responsible for all costs incurred by Xcel Energy,

(Continued on Sheet No. 10-117)

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		President and CEO of Northern States Power Company		
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APPENDIX E: Interconnection Agreement (Continued)

V. CONSTRUCTION (Continued)

including, but not limited to the additional costs to remove and/or complete the installation of the Dedicated Facilities. The Interconnection Customer may, for any reason, cancel the Generation System project, so that any or all of the Dedicated Facilities are not required to be installed. The Interconnection Customer shall provide written notice to Xcel Energy of cancellation. Upon receipt of a cancellation notice, Xcel Energy shall take reasonable steps to minimize additional costs to the Interconnection Customer, where reasonably possible.

2) Payments

- a) The Interconnection Customer shall provide reasonable adequate assurances of credit, including a letter of credit or personal guaranty of payment and performance from a creditworthy entity acceptable under Xcel Energy credit policy and procedures for the unpaid balance of the estimated amount shown in Exhibit B.
- b) The payment for the costs outlined in Exhibit B, shall be as follows:
 - i. 1/3 of estimated costs, outlined in Exhibit B, shall be due upon execution of this agreement.
 - ii. 1/3 of estimated costs, outlined in Exhibit B, shall be due prior to initial energization of the Generation System, with Xcel Energy.
 - iii. Remainder of actual costs, incurred by Xcel Energy, shall be due within 30 days from the date the bill is mailed by Xcel Energy after project completion.

VI. DOCUMENTS INCLUDED WITH THIS AGREEMENT

- A) This agreement includes the following exhibits, which are specifically incorporated herein and made part of this Agreement by this reference: *(if any of these Exhibits are deemed not applicable for this Generation System installation, they may be omitted from the final Agreement by Xcel Energy.)*
 - 1) Exhibit A – Description of Generation System and single-line diagram. This diagram shows all major equipment, including, visual isolation equipment, Point of Common Coupling, Point of Delivery for Generation Systems that intentionally export, ownership of equipment and the location of metering.

(Continued on Sheet No. 10-118)

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APPENDIX E: Interconnection Agreement (Continued)

VI. DOCUMENTS INCLUDED WITH THIS AGREEMENT (Continued)

- 2) Exhibit B – Estimated installation and testing costs payable by the Interconnection Customer. Included in this listing shall be the description and estimated costs for the required Dedicated Facilities being installed by Xcel Energy for the interconnection of the Generation System and a description and estimate for the final acceptance testing work to be done by Xcel Energy.
- 3) Exhibit C – Engineering Data Submittal – A standard form that provides the engineering and operating information about the Generation System.
- 4) Exhibit D – Operating Agreement – This provides specific operating information and requirements for this Generation System interconnection. This Exhibit has a separate signature section and may be modified, in writing, from time to time with the agreement of both parties.
- 5) Exhibit E – Maintenance Agreement – This provides specific maintenance requirements for this Generation System interconnection. This Exhibit has a separate signature section and may be modified, in writing, from time to time with the agreement of both parties.

VII. TERMS AND TERMINATION

- A) This Agreement shall become effective as of the date when both the Interconnection Customer and Xcel Energy have both signed this Agreement. The Agreement shall continue in full force and effect until the earliest date that one of the following events occurs:
- 1) The Parties agree in writing to terminate the Agreement; or
 - 2) The Interconnection Customer may terminate this agreement at any time, by written notice to Xcel Energy, prior to the completion of the final acceptance testing of the Generation System by Xcel Energy. Once the Generation System is operational, then VII.A.3 applies. Upon receipt of a cancellation notice, Xcel Energy shall take reasonable steps to minimize additional costs to the Interconnection Customer, where reasonably possible.
 - 3) Once the Generation System is operational, the Interconnection Customer may terminate this agreement after 30 days written notice to Xcel Energy, unless otherwise agreed to within the Exhibit D, Operating Agreement; or

(Continued on Sheet No.10-119)

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**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF
(Continued)**

Section No. 10
1st Revised Sheet No. 119

APPENDIX E: Interconnection Agreement (Continued)

VII. TERMS AND TERMINATION

- 4) Xcel Energy may terminate this agreement after 30 days written notice to the Interconnection Customer if:
- a) The Interconnection Customer fails to interconnect and operate the Generation System per the terms of this Agreement; or
 - b) The Interconnection Customer fails to take all corrective actions specified in Xcel Energy's written notice that the Generation System is out of compliance with the terms of this Agreement, within the time frame set forth in such notice, or
 - c) If the Interconnection Customer fails to complete Xcel Energy's final acceptance testing of the generation system within 24 months of the date proposed under section III.A.6.

- B) Upon termination of this Agreement the Generation System shall be disconnected from Xcel Energy. The termination of this Agreement shall not relieve either Party of its liabilities and obligations, owed or continuing, at the time of the termination.

VIII. OPERATIONAL ISSUES

Each Party will, at its own cost and expense, operate, maintain, repair and inspect, and shall be fully responsible for, the facilities that it now or hereafter may own, unless otherwise specified.

- A) Technical Standards: The Generation System shall be installed and operated by the Interconnection Customer consistent with the requirements of this Agreement; the Technical Requirements; the applicable requirements located in the National Electrical Code (NEC); the applicable standards published by the American National Standards Institute (ANSI) and the Institute of Electrical and Electronic Engineers (IEEE); and local building and other applicable ordinances in effect at the time of the installation of the Generation System.
- B) Right of Access: At all times, Xcel Energy's personnel shall have access to the disconnect switch of the Generation System for any reasonable purpose in connection with the performance of the obligations imposed on it by this Agreement, to meet its obligation to operate the electric power system safely and to provide service to its customers. If necessary for the purposes of this Agreement, the Interconnection Customer shall allow Xcel Energy access to Xcel Energy's equipment and facilities located on the premises.

(Continued on Sheet No. 10-120)

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			President and CEO of Northern States Power Company, a Minnesota corporation		
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MINNESOTA ELECTRIC RATE BOOK - MPUC NO. 2

**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)**

Section No. 10
Original Sheet No. 120

APPENDIX E: Interconnection Agreement (Continued)

VIII. OPERATIONAL ISSUES (Continued)

- C) Electric Service Supplied: will supply the electrical requirements of the Local EPS that are not supplied by the Generation System. Such electric service shall be supplied, to the Interconnection Customer's Local EPS, under the rate schedules applicable to the Customer's class of service as revised from time to time by Xcel Energy.
- D) Operation and Maintenance: The Generation System shall be operated and maintained, by the Interconnection Customer in accordance with the Technical Standards and any additional requirements of Exhibit D and Exhibit E, attached to this document, as amended, in writing, from time to time.
- E) Cooperation and Coordination: Both Xcel Energy and the Interconnection Customer shall communicate and coordinate their operations, so that the normal operation of the electric power system does not unduly effect or interfere with the normal operation of the Generation System and the Generation System does not unduly effect or interfere with the normal operation of the electric power system. Under abnormal operations of either the Generation System or the Xcel Energy system, the responsible Party shall provide reasonably timely communication to the other Party to allow mitigation of any potentially negative effects of the abnormal operation of their system.
- F) Disconnection of Unit: Xcel Energy may disconnect the Generation System as reasonably necessary, for termination of this Agreement; non-compliance with this Agreement; system emergency, imminent danger to the public or Xcel Energy personnel; routine maintenance, repairs and modifications to the electric power system. When reasonably possible, Xcel Energy shall provide prior notice to the Interconnection Customer explaining the reason for the disconnection. If prior notice is not reasonably possible, Xcel Energy shall after the fact, provide information to the Interconnection Customer as to why the disconnection was required. It is agreed that Xcel Energy shall have no liability for any loss of sales or other damages, including all consequential damages for the loss of business opportunity, profits or other losses, regardless of whether such damages were foreseeable, for the disconnection of the Generation System per this Agreement. Xcel Energy shall expend reasonable effort to reconnect the Generation System in a timely manner and to work towards mitigating damages and losses to the Interconnection Customer where reasonably possible.
- G) Modifications to the Generation System: When reasonably possible the Interconnection Customer shall notify Xcel Energy, in writing, of plans for any modifications to the Generation System interconnection equipment, including all information needed by Xcel Energy as part of the review described in this paragraph, at least twenty (20) business days prior to undertaking such modification(s). Modifications to any of the interconnection equipment, including, all interconnection required protective systems, the generation control systems, the transfer switches/breakers, interconnection protection VT's & CT's, and Generation System capacity, shall be included in the notification to Xcel Energy. When reasonably possible the

(Continued on Sheet No. 10-121)

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APPENDIX E: Interconnection Agreement (Continued)

VIII. OPERATIONAL ISSUES (Continued)

Interconnection Customer agrees not to commence installation of any modifications to the Generating System until Xcel Energy has approved the modification, in writing, which approval shall not be unreasonably withheld. Xcel Energy shall have a minimum of five (5) business days to review and respond to the planned modification. Xcel Energy shall not take longer than a maximum of ten (10) business days, to review and respond to the modification after the receipt of the information required to review the modifications. When it is not reasonably possible for the Interconnection Customer to provide prior written notice, the Interconnection Customer shall provide written notice to Xcel Energy as soon as reasonably possible, after the completion of the modification(s).

- H) Permits and Approvals: The Interconnection Customer shall obtain all environmental and other permits lawfully required by governmental authorities prior to the construction of the Generation System. The Interconnection Customer shall also maintain these applicable permits and compliance with these permits during the term of this Agreement.

IX. LIMITATION OF LIABILITY

- A) Each Party shall at all times indemnify, defend, and save the other Party harmless from any and all damages, losses, claims, including claims and actions relating to injury or death of any person or damage to property, costs and expenses, reasonable attorneys' fees and court costs, arising out of or resulting from the Party's performance of its obligations under this agreement, except to the extent that such damages, losses or claims were caused by the negligence or intentional acts of the other Party.
- B) Each Party's liability to the other Party for failure to perform its obligations under this Agreement, shall be limited to the amount of direct damage actually incurred. In no event shall either Party be liable to the other Party for any punitive, incidental, indirect, special, or consequential damages of any kind whatsoever, including for loss of business opportunity or profits, regardless of whether such damages were foreseen.
- C) Notwithstanding any other provision in this Agreement, with respect to Xcel Energy's provision of electric service to any customer including the Interconnection Customer, the Xcel Energy's liability to such customer shall be limited as set forth in Xcel Energy's tariffs and terms and conditions for electric service, and shall not be affected by the terms of this Agreement.

X. DISPUTE RESOLUTION

- A) Each Party agrees to attempt to resolve all disputes arising hereunder promptly, equitably and in a good faith manner.

(Continued on Sheet No. 10-122)

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APPENDIX E: Interconnection Agreement (Continued)

X. DISPUTE RESOLUTION (Continued)

- B) In the event a dispute arises under this Agreement, and if it cannot be resolved by the Parties within thirty (30) days after written notice of the dispute to the other Party, the Parties agree to submit the dispute to mediation by a mutually acceptable mediator, in a mutually convenient location in the State of Minnesota. The Parties agree to participate in good faith in the mediation for a period of 90 days. If the parties are not successful in resolving their disputes through mediation, then the Parties may refer the dispute for resolution to the Minnesota Public Utilities Commission (MPUC), which shall maintain continuing jurisdiction over this Agreement.

XI. INSURANCE

- A) At a minimum, In connection with the Interconnection Customer's performance of its duties and obligations under this Agreement, the Interconnection Customer shall maintain, during the term of the Agreement, general liability insurance, from a qualified insurance agency with a B+ or better rating by "Best" and with a combined single limit of not less than:
- 1) Two million dollars (\$2,000,000) for each occurrence, if the Gross Nameplate Rating of the Generation System is greater than 250kW.
 - 2) One million dollars (\$1,000,000) for each occurrence if the Gross Nameplate Rating of the Generation System is between 40kW and 250kW.
 - 3) Three hundred thousand (\$300,000) for each occurrence if the Gross Nameplate Rating of the Generation System is less than 40kW.
 - 4) Such general liability insurance shall include coverage against claims for damages resulting from (i) bodily injury, including wrongful death; and (ii) property damage arising out of the Interconnection Customer's ownership and/or operating of the Generation System under this agreement.
- B) The general liability insurance required shall, by endorsement to the policy or policies, (a) include Xcel Energy as an additional insured; (b) contain a severability of interest clause or cross-liability clause; (c) provide that Xcel Energy shall not by reason of its inclusion as an additional insured incur liability to the insurance carrier for the payment of premium for such insurance; and (d) provide for thirty (30) calendar days' written notice to Xcel Energy prior to cancellation, termination, alteration, or material change of such insurance.

(Continued on Sheet No. 10-123)

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		President and CEO of Northern States Power Company		
Docket No.	E002/GR-05-1428		Order Date:	09-01-06

APPENDIX E: Interconnection Agreement (Continued)

XI. INSURANCE (Continued)

- C) If the Generation System is connected to an account receiving residential service from Xcel Energy and its total generating capacity is smaller than 40kW, then the endorsements required in Section XI.B shall not apply.
- D) The Interconnection Customer shall furnish the required insurance certificates and endorsements to Xcel Energy prior to the initial operation of the Generation System. Thereafter, Xcel Energy shall have the right to periodically inspect or obtain a copy of the original policy or policies of insurance
- E) Evidence of the insurance required in Section XI.A. shall state that coverage provided is primary and is not excess to or contributing with any insurance or self-insurance maintained by Xcel Energy.
- F) If the Interconnection Customer is self-insured with an established record of self-insurance, the Interconnection Customer may comply with the following in lieu of Section XI.A – E:
 - 1) Interconnection Customer shall provide to Xcel Energy, at least thirty (30) days prior to the date of initial operation, evidence of an acceptable plan to self-insure to a level of coverage equivalent to that required under section XI.A.
 - 2) If Interconnection Customer ceases to self-insure to the level required hereunder, or if the Interconnection Customer is unable to provide continuing evidence of it's ability to self-insure, the Interconnection Customer agrees to immediately obtain the coverage required under Section XI.A.
- G) Failure of the Interconnection Customer or Xcel Energy to enforce the minimum levels of insurance does not relieve the Interconnection Customer from maintaining such levels of insurance or relieve the Interconnection Customer of any liability.
- H) All insurance certificates, statements of self-insurance, endorsements, cancellations, terminations, alterations, and material changes of such insurance shall be issued and submitted to the Generation Interconnection Coordinator assigned.

XII. MISCELLANEOUS

A) FORCE MAJEURE

- 1) An event of Force Majeure means any act of God, act of the public enemy, war, insurrection, riot, fire, storm or flood, explosion, breakage or accident to machinery or equipment, any curtailment, order,

(Continued on Sheet No. 10-124)

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APPENDIX E: Interconnection Agreement (Continued)

XII. MISCELLANEOUS (Continued)

regulation or restriction imposed by governmental, military or lawfully established civilian authorities, or any other cause beyond a Party's control. An event of Force Majeure does not include an act of negligence or intentional wrongdoing. Neither Party will be considered in default as to any obligation hereunder if such Party is prevented from fulfilling the obligation due to an event of Force Majeure. However, a Party whose performance under this Agreement is hindered by an event of Force Majeure shall make all reasonable efforts to perform its obligations hereunder.

- 2) Neither Party will be considered in default of any obligation hereunder if such Party is prevented from fulfilling the obligation due to an event of Force Majeure. However, a Party whose performance under this Agreement is hindered by an event of Force Majeure shall make all reasonable efforts to perform its obligations hereunder.

B) NOTICES

- 1) Any written notice, demand, or request required or authorized in connection with this Agreement ("Notice") shall be deemed properly given if delivered in person or sent by first class mail, postage prepaid, to the person specified below:
 - a) Generation Interconnection Coordinator assigned
 - b) If to Interconnection Customer:

A Friendly Interconnection Customer
Attention: Generation Coordinator
12345 Interconnection Drive.
Anytown, MN 55000
- 2) A Party may change its address for notices at any time by providing the other Party written notice of the change, in accordance with this Section.
- 3) The Parties may also designate operating representatives to conduct the daily communications, which may be necessary or convenient for the administration of this Agreement. Such designations, including names, addresses, and phone numbers may be communicated or revised by one Party's notice to the other Party.

(Continued on Sheet No. 10-125)

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**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)**

Section No. 10
Original Sheet No. 125

APPENDIX E: Interconnection Agreement (Continued)

C) ASSIGNMENT

The Interconnection Customer shall not assign its rights nor delegate its duties under this Agreement without Xcel Energy's written consent. Any assignment or delegation the Interconnection Customer makes without Xcel Energy's written consent shall not be valid. Xcel Energy shall not unreasonably withhold its consent to the Generating Entities assignment of this Agreement.

D) NON-WAIVER

None of the provisions of this Agreement shall be considered waived by a Party unless such waiver is given in writing. The failure of a Party to insist in any one or more instances upon strict performance of any of the provisions of this Agreement or to take advantage of any of its rights hereunder shall not be construed as a waiver of any such provisions or the relinquishment of any such rights for the future, but the same shall continue and remain in full force and effect.

E) GOVERNING LAW AND INCLUSION OF XCEL ENERGY'S TARIFFS AND RULES.

- 1) This Agreement shall be interpreted, governed and construed under the laws of the State of Minnesota as if executed and to be performed wholly within the State of Minnesota without giving effect to choice of law provisions that might apply to the law of a different jurisdiction.
- 2) The interconnection and services provided under this Agreement shall at all times be subject to the terms and conditions set forth in the tariff schedules and rules applicable to the electric service provided by Xcel Energy, which tariff schedules and rules are hereby incorporated into this Agreement by this reference.
- 3) Notwithstanding any other provisions of this Agreement, Xcel Energy shall have the right to unilaterally file with the MPUC, pursuant to the MPUC's rules and regulations, an application for change in rates, charges, classification, service, tariff or rule or any agreement relating thereto.

F) AMENDMENT AND MODIFICATION

This Agreement can only be amended or modified by a writing signed by both Parties.

G) ENTIRE AGREEMENT

This Agreement, including all attachments, exhibits, and appendices, constitutes the entire Agreement between the Parties with regard to the interconnection of the Generation System of the Parties at the Point(s) of Common Coupling expressly provided for in this Agreement and supersedes all prior agreements.

(Continued on Sheet No. 10-126)

Date Filed: 11-02-05

By: Cynthia L. Leshner
President and CEO of Northern States Power Company

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DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)

Section No. 10
1st Revised Sheet No. 126

APPENDIX E: Interconnection Agreement (Continued)

G) ENTIRE AGREEMENT (Continued)

or understandings, whether verbal or written. It is expressly acknowledged that the Parties may have other agreements covering other services not expressly provided for herein, which agreements are unaffected by this Agreement. Each party also represents that in entering into this Agreement, it has not relied on the promise, inducement, representation, warranty, agreement or other statement not set forth in this Agreement or in the incorporated attachments, exhibits and appendices. Notwithstanding this paragraph, if the Interconnection Agreement is in connection with a Solar*Rewards Community application, then the provisions in the Section 9 tariff applicable to the Solar*Rewards Community Program also apply.

N
N
N

H) CONFIDENTIAL INFORMATION

Except as otherwise agreed or provided herein, each Party shall hold in confidence and shall not disclose confidential information, to any person (except employees, officers, representatives and agents, who agree to be bound by this section). Confidential information shall be clearly marked as such on each page or otherwise affirmatively identified. If a court, government agency or entity with the right, power, and authority to do so, requests or requires either Party, by subpoena, oral disposition, interrogatories, requests for production of documents, administrative order, or otherwise, to disclose Confidential Information, that Party shall provide the other Party with prompt notice of such request(s) or requirements(s) so that the other Party may seek an appropriate protective order or waive compliance with the terms of this Agreement. In the absence of a protective order or waiver the Party shall disclose such confidential information which, in the opinion of its counsel, the party is legally compelled to disclose. Each Party will use reasonable efforts to obtain reliable assurance that confidential treatment will be accorded any confidential information so furnished.

I) NON-WARRANTY

Neither by inspection, if any, or non-rejection, nor in any other way, does Xcel Energy give any warranty, expressed or implied, as to the adequacy, safety, or other characteristics of any structures, equipment, wires, appliances or devices owned, installed or maintained by the Interconnection Customer or leased by the Interconnection Customer from third parties, including without limitation the Generation System and any structures, equipment, wires, appliances or devices appurtenant thereto.

L

(Continued on Sheet No. 10-127)

Date Filed:	12-18-15	By: Christopher B. Clark	Effective Date:	12-18-15
		President, Northern States Power Company, a Minnesota Corporation		
Docket No.	E002/M-13-867		Order Date:	12-15-15

**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)**

Section No. 10
1st Revised Sheet No. 127

APPENDIX E: Interconnection Agreement (Continued)

J) NO PARTNERSHIP

This Agreement shall not be interpreted or construed to create an association, joint venture, agency relationship, or partnership between the Parties or to impose any partnership obligation or partnership liability upon either Party. Neither Party shall have any right, power or authority to enter into any agreement or undertaking for, or act on behalf of, or to act as or be an agent or representative of, or to otherwise bind, the other Party.

XIII. SIGNATURES

IN WITNESS WHEREOF, the Parties hereto have caused two originals of this Agreement to be executed by their duly authorized representatives. This Agreement is effective as of the last date set forth below.

Interconnection Customer

By: _____

Name: _____

Title: _____

Date: _____

Xcel Energy

By: _____

Name: _____

Title: _____

Date: _____

(Continued on Sheet No. 10-128)

Date Filed:	12-18-15	By: Christopher B. Clark	Effective Date:	12-18-15
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Northern States Power Company, a Minnesota corporation
and wholly owned subsidiary of Xcel Energy Inc.
Minneapolis, Minnesota 55401

MINNESOTA ELECTRIC RATE BOOK - MPUC NO. 2

**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)**

Section No. 10
Original Sheet No. 128

EXHIBIT A

**GENERATION SYSTEM DESCRIPTION
AND SINGLE-LINE DIAGRAM**

(Continued on Sheet No. 10-129)

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		President and CEO of Northern States Power Company		
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Northern States Power Company, a Minnesota corporation
and wholly owned subsidiary of Xcel Energy Inc.
Minneapolis, Minnesota 55401

MINNESOTA ELECTRIC RATE BOOK - MPUC NO. 2

**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)**

Section No. 10
Original Sheet No. 129

EXHIBIT B

**SUMMARY OF XCEL ENERGY COSTS AND DESCRIPTION OF DEDICATED FACILITIES BEING INSTALLED BY
XCEL ENERGY FOR THE INTERCONNECTION OF THE GENERATION SYSTEM**

This Exhibit shall provide the estimated total costs that will be the responsibility of the Interconnection Customer. It is assumed that the Initial application has been filed and the engineering studies have been paid for and completed. So those costs are not included on this listing.

What is listed below is a general outline of some of the major areas where costs could occur. Costs other than those listed below may be included by Xcel Energy, provided that those costs are a direct result from the request to interconnect the Generation System. The following list is only a guideline and Xcel Energy, for each installation will be creating a unique Exhibit B that is tailored for that specific Generation System interconnection.

- A) Dedicated Facilities (equipment, design and installation labor)
- B) Monitoring & Control System (equipment, design and installation labor)
- C) Design Coordination and Review
- D) Construction Coordination labor costs
- E) Testing (development of tests and physical testing)
- F) Contingency

(Continued on Sheet No. 10-130)

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Northern States Power Company, a Minnesota corporation
and wholly owned subsidiary of Xcel Energy Inc.
Minneapolis, Minnesota 55401

MINNESOTA ELECTRIC RATE BOOK - MPUC NO. 2

**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)**

Section No. 10
Original Sheet No. 130

EXHIBIT C

ENGINEERING DATA SUBMITTAL

Attach a completed Engineering Data Submittal form from Appendix C of "State of Minnesota Interconnection Process for Distributed Generation Systems".

(Continued on Sheet No. 10-131)

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**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)**

Section No. 10
Original Sheet No. 131

EXHIBIT D

OPERATING AGREEMENT

Each Generation System interconnection will be unique and will require a unique Operating Agreement. The following is a listing of some of the possible areas that will be covered in an operating agreement. The following has not been developed into a standard agreement due to the unique nature of each Generation System. It is envisioned that this Exhibit will be tailored by Xcel Energy for each Generation System interconnection. It is also intended that this Operating Agreement Exhibit will be reviewed and updated periodically, to allow the operation of the Generation System, to change to meet the needs of both Xcel Energy and the Interconnection Customer, provided that the change does not negatively affect the other Party. There may also be operating changes required by outside issues, such as changes in FERC and MISO requirements and/or policies which will require this Operating Agreement to be modified.

The following items are provided to show the general types of items that may be included in this Operating Agreement. The items included in the Operating Agreement shall not be limited to the items shown on this list.

- A) Applicable Xcel Energy Tariffs: discussion on which tariffs are being applied for this installation and possibly how they will be applied.
- B) Var Requirements: How will the Generation System be required to operate so as to control the power factor of the energy flowing in either direction across the interconnection?
- C) Inadvertent Energy: This Operating Agreement needs to provide the method(s) that will be used to monitor, meter and account for the inadvertent energy used or supplied by the Generation System. Tariffs and operating rules that apply for this Generation System interconnection shall be discussed in this Operating Agreement.
- D) Control Issues: Starting and stopping of the generation, including the remote starting and stopping, if applicable.
- E) Dispatch of Generation Resources: What are the dispatch requirements for the Generation System, Can it only run during Peak Hours? Are there a limited number of hours that it can run? Is it required to have met an availability percentage? This will greatly depend upon the PPA and other requirements. Is the Interconnection Customer required to coordinate outages of the Generation System, with Xcel Energy?
- F) Outages of Distribution System: How are emergency outages handled? How are other outages scheduled? If the Interconnection Customer requires Xcel Energy to schedule the outages during after-hours, who pays for Xcel Energy's overtime?

(Continued on Sheet No. 10-132)

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**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)**

Section No. 10
Original Sheet No. 132

EXHIBIT D (Continued)

OPERATING AGREEMENT (Continued)

- G) Notification / Contacts: Who should be notified? How should they be notified? When should they be notified? For what reasons, should the notification take place?
- 1) Starting of the Generation
 - 2) Dispatching of Generation
 - 3) Notification of failures (both Xcel Energy and Generation System failures)
- H) Documentation of Operational Settings: How much fuel will the generation System typically have on hand? How long can it run with this fuel capacity? How is the generation system set to operate for a power failure? These may be issues that should be documented in the Operating Agreement. The following are a couple of examples:
- 1) "The Generation System will monitor the Xcel Energy phase voltage and after 2 seconds of any phase voltage below 90% the generation will be started and the load transferred to the generator, if the generation is not already running."
 - 2) "The Generation System will wait for 30 minutes after it senses the return of the Xcel Energy frequency and voltage, before it will automatically reconnect to Xcel Energy."
- I) Cost of testing for future failures: If a component of the Generation System fails or needs to be replaced, which effects the interconnection with Xcel Energy, what is the process for retesting, and for replacement? Who pays for the additional costs of Xcel Energy to work with the Interconnection Customer to resolve these problems and/or to complete retesting of the modified equipment?
- J) Right of Access: At all times, Xcel Energy shall have access to the disconnect switch of the Generation System for any reasonable purpose in connection with the performance of the obligations imposed on it by this Agreement, to meet its obligation to operate the Xcel Energy system safely and to provide service to its customers, at all times. If necessary for the purposed of this Agreement, the Interconnection Customer shall allow Xcel Energy access to Xcel Energy's equipment and facilities located on the premises.

(Continued on Sheet No. 10-133)

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and wholly owned subsidiary of Xcel Energy Inc.
Minneapolis, Minnesota 55401

MINNESOTA ELECTRIC RATE BOOK - MPUC NO. 2

**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)**

Section No. 10
Original Sheet No. 133

EXHIBIT D (Continued)

OPERATING AGREEMENT (Continued)

SIGNATURES

IN WITNESS WHEREOF, the Parties hereto have caused two originals of this Agreement to be executed by their duly authorized representatives. This Agreement is effective as of the last date set forth below.

Interconnection Customer

By: _____

Name: _____

Title: _____

Date: _____

Xcel Energy

By: _____

Name: _____

Title: _____

Date: _____

(Continued on Sheet No. 10-134)

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**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)**

Section No. 10
1st Revised Sheet No. 134

EXHIBIT E

MAINTENANCE AGREEMENT

Each Generation System interconnection will be unique and will require a unique Maintenance Agreement. It is envisioned that this Exhibit will be tailored for each Generation System interconnection. It is also intended that this Maintenance Agreement Exhibit will be reviewed and updated periodically, to allow the maintenance of the Generation System be allowed to change to meet the needs of both Xcel Energy and the Interconnection Customer, provided that change does not negatively affect the other Party. There may also be changes required by outside issues; such as changes in FERC and MISO requirements and/or policies that will require this agreement to be modified.

A) Routine Maintenance Requirements –

- 1) Who is providing maintenance – Contact information
- 2) Periods of maintenance

B) Modifications to the Generation System - The Interconnection Customer shall notify Xcel Energy, in writing of plans for any modifications to the Generation System interconnection equipment at least twenty (20) business days prior to undertaking such modification. Modifications to any of the interconnection equipment, including all required protective systems, the generation control systems, the transfer switches/breakers, VT's & CT's, generating capacity and associated wiring shall be included in the notification to Xcel Energy. The Interconnection Customer agrees not to commence installation of any modifications to the Generating System until Xcel Energy has approved the modification, in writing. Xcel Energy shall have a minimum of five (5) business days and a maximum of ten (10) business days, to review and respond to the modification, after the receipt of the information required to review the modifications.

SIGNATURES

IN WITNESS WHEREOF, the Parties hereto have caused two originals of this Agreement to be executed by their duly authorized representatives. This Agreement is effective as of the last date set forth below.

Interconnection Customer

Xcel Energy

By: _____

By: _____

Name: _____

Name: _____

Title: _____

Title: _____

Date: _____

Date: _____

(Continued on Sheet No. 10-134.1)

Date Filed: 12-18-15

By: Christopher B. Clark

Effective Date: 12-18-15

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**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)**

Section No. 10
Original Sheet No. 134.1

**ASSIGNMENT OF
INTERCONNECTION AGREEMENT**

An Interconnection Agreement, including any and all Exhibits thereto ("Contract") having been made as of [insert date of Interconnection Agreement] (a copy of which is attached hereto), by and between **Northern States Power Company, a Minnesota corporation**, having its principal office and place of business located at 414 Nicollet Mall, Minneapolis, Minnesota, 55401, hereinafter referred to as the Company, and [insert name of current party to the Interconnection Agreement] ("Assignor") for a Generation System with a nameplate capacity of _____ kW (AC) located at [insert address]; and

WHEREAS, the Assignor intends to convey its interest in the above-referenced Generation System to [insert name of new purchaser of the Service Address] ("Assignee"); and

WHEREAS, the Assignor intends to assign the Contract to the Assignee; and

NOW, THEREFORE, upon the execution of this Assignment of Contract by Company, the Assignor, and the Assignee and the delivery of all signatures to Company, the attached Contract is hereby further amended as follows:

1. The Assignor hereby irrevocably assigns the attached Contract in all respects to the Assignee and the Assignee accepts the assignment thereof in all respects.
2. Company consents to this assignment and, as assigned, the attached Contract is hereby amended so that wherever the name of the Assignor is used therein it shall mean the Assignee.
3. Any and all payments made by Company under the Contract to either the Assignor or the Assignee shall be deemed to have been made to both and shall discharge Company from any further liability with regard to said payment.
4. Any and all financial liability, including but not limited to amounts due, from the Interconnection Customer to the Company, occurring or accruing under the Contract on or before the date of the Company's signature to this Assignment shall be deemed to be the obligation of both the Assignor and Assignee, and the Company may recover any such amounts jointly and severally from the Assignor and Assignee.

(Continued on Sheet No. 10-134.2)

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**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)**

Section No. 10
Original Sheet No. 134.2

**ASSIGNMENT OF
INTERCONNECTION AGREEMENT
(Continued)**

5. The contact information, including name, primary contact, address, telephone number and email address for the Assignee is as follows, and this information amends the Notice provisions in Section XII.B.1.b of the Contract:

6. It is further agreed that all terms and conditions of the Contract, as amended, shall remain in full force and effect.

Facsimile signatures, or signatures to the Assignment of Contract sent electronically, shall have the same effect as original signatures. Photocopies, or electronically stored versions of this Assignment of Contract, shall have the same validity as the original.

IN WITNESS WHEREOF, Company, the Assignor, and the Assignee have executed this Assignment of Solar*Rewards Contract as of this _____ day of _____, 20__.

Assignor – [insert actual name]

By: _____

Name: _____

Title: _____

Assignee – [insert actual name]

By: _____

Name: _____

Title: _____

**Northern States Power Company
d/b/a Xcel Energy**

By: _____

Name: _____

Title: _____

(Continued on Sheet No. 10-135)

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**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF
(Continued)**

Section No. 10
1st Revised Sheet No. 135

STATE OF MINNESOTA
DISTRIBUTED GENERATION INTERCONNECTION REQUIREMENTS

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Minneapolis, Minnesota 55401

MINNESOTA ELECTRIC RATE BOOK - MPUC NO. 2

**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)**

Section No. 10
Original Sheet No. 136

FOREWORD

Electric distribution system connected generation units span a wide range of sizes and electrical characteristics. Electrical distribution system design varies widely from that required to serve the rural customer to that needed to serve the large commercial customer. With so many variations possible, it becomes complex and difficult to create one interconnection standard that fits all generation interconnection situations.

In establishing a generation interconnection standard there are three main issues that must be addressed; Safety, Economics and Reliability.

The first and most important issue is safety; the safety of the general public and of the employees working on the electrical systems. This standard establishes the technical requirements that must be met to ensure the safety of the general public and of the employees working with Xcel Energy. Typically designing the interconnection system for the safety of the general public will also provide protection for the interconnected equipment.

The second issue is economics; the interconnection design must be affordable to build. The interconnection standard must be developed so that only those items, that are necessary to meet safety and reliability, are included in the requirements. This standard sets the benchmark for the minimum required equipment. If it is not needed, it will not be required.

The third issue is reliability; the generation system must be designed and interconnected such that the reliability and the service quality for all customers of the electrical power systems are not compromised. This applies to all electrical systems, not just Xcel Energy.

Many generation interconnection standards exist or are in draft form. The IEEE, FERC and many states have been working on generation interconnection standards. There are other standards such as the National Electrical Code (NEC) that, establish requirements for electrical installations. The NEC requirements are in addition to this standard. This standard is designed to document the requirements where the NEC has left the establishment of the standard to "the authority having jurisdiction" or to cover issues which are not covered in other national standards.

This standard covers installations, with an aggregated capacity of 10MW's or less. Many of the requirements in this document do not apply to small, 40kW or less generation installations. As an aid to the small, distributed generation customer, these small unit interconnection requirements have been extracted from this full standard and are available as a separate, simplified document titled: "Standards for Interconnecting Generation Sources, Rated Less than 40kW with Minnesota Electric Utilities".

1. Introduction

This standard has been developed to document the technical requirements for the interconnection between a Generation System and an area electrical power system "Utility system or Xcel Energy". This standard covers 3 phase Generation Systems with an aggregate capacity of 10 MW's or less and single phase Generation Systems

(Continued on Sheet No. 10-137)

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**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)**

Section No. 10
Original Sheet No. 137

1. Introduction (Continued)

with an aggregate capacity of 40kW or less at the Point of Common Coupling. This standard covers Generation Systems that are interconnected with Xcel Energy's distribution facilities. This standard does not cover Generation Systems that are directly interconnected with Xcel Energy's Transmission System. Contact Xcel Energy for their Transmission System interconnection standards.

While, this standard provides the technical requirements for interconnecting a Generation System with a typical radial distribution system, it is important to note that there are some unique electric power systems, which have special interconnection needs. One example of a unique electric power system would be one operated as a "networked" system. This standard does not cover the additional special requirements of those systems. The Interconnection Customer must contact the Owner/Operator of the electric power system with which the interconnection is intended, to make sure that the Generation System is not proposed to be interconnected with a unique electric power system. If the planned interconnection is with a unique electric power system, the Interconnection Customer must obtain the additional requirements for interconnecting with Xcel Energy.

Xcel Energy has the right to limit the maximum size of any Generation System or number of Generation Systems that may want to interconnect, if the Generation System would reduce the reliability to the other customers connected to Xcel Energy.

This standard only covers the technical requirements and does not cover the interconnection process from the planning of a project through approval and construction. Please read the companion document "[State of Minnesota Interconnection Process for Distributed Generation Systems](#)" for the description of the procedure to follow and a generic version of the forms to submit. It is important to also get copies of Xcel Energy's tariff's concerning generation interconnection which will include rates, costs and standard interconnection agreements. The earlier the Interconnection Customer gets Xcel Energy involved in the planning and design of the Generation System interconnection the smoother the process will go.

A) Definitions

The definitions defined in the "[IEEE Standard for Interconnecting Distributed Resources with Electric Power Systems](#)" (1547 Draft Ver. 11) apply to this document as well. The following definitions are in addition to the ones defined in IEEE 1547, or are repeated from the IEEE 1547 standard.

- i) "[Area EPS](#)" is an electric power system (EPS) that serves Local EPS's. For the purposes of this tariff, the Xcel Energy system is the Area EPS. Note. Typically, Xcel Energy has [primary access to public rights-of-way, priority crossing of property boundaries, etc.](#)
- ii) "[Generation](#)" is any device producing electrical energy, i.e., rotating generators driven by wind, steam turbines, internal combustion engines, hydraulic turbines, solar, fuel cells, etc.; or any other electric producing device, including energy storage technologies.

(Continued on Sheet No. 10-138)

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**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)**

Section No. 10
Original Sheet No. 138

A) Definitions (Continued)

- iii) "Generation System" is the interconnected Distributed Generation(s), controls, relays, switches, breakers, transformers, inverters and associated wiring and cables, up to the Point of Common Coupling.
- iv) "Interconnection Customer" is the party or parties who are responsible for meeting the requirements of this standard. This could be the Generation System applicant, installer, designer, owner or operator.
- v) "Local EPS" is an electric power system (EPS) contained entirely within a single premises or group of premises.
- vi) "Point of Common Coupling" is the point where the Local EPS is connected to Xcel Energy.
- vii) "Transmission System" are those facilities as defined by using the guidelines established by the Minnesota State Public Utilities Commission; "In the Matter of Developing Statewide Jurisdictional Boundary Guidelines for Functionally Separating Interstate Transmission from Generation and Local Distribution Functions" Docket No. E-015/M-99-1002.
- viii) "Type-Certified" is Generation paralleling equipment that is listed by an OSHA listed national testing laboratory as having met the applicable type testing requirement of UL 1741. At the time this document was prepared this was the only national standard available for certification of generation transfer switch equipment. This definition does not preclude other forms of type-certification if agreeable to Xcel Energy.

B) Interconnection Requirements Goals

This standard defines the minimum technical requirements for the implementation of the electrical interconnection between the Generation System and Xcel Energy. It does not define the overall requirements for the Generation System. The requirements in this standard are intended to achieve the following:

- i) Ensure the safety of utility personnel and contractors working on the electrical power system.
- ii) Ensure the safety of utility customers and the general public.
- iii) Protect and minimize the possible damage to the electrical power system and other customer's property.
- iv) Ensure proper operation to minimize adverse operating conditions on the electrical power system.

(Continued on Sheet No. 10-139)

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MINNESOTA ELECTRIC RATE BOOK - MPUC NO. 2

**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)**

Section No. 10
Original Sheet No. 139

C) Protection

The Generation System and Point of Common Coupling shall be designed with proper protective devices to promptly and automatically disconnect the Generation from Xcel Energy in the event of a fault or other system abnormality. The type of protection required will be determined by:

- i) Size and type of the generating equipment.
- ii) The method of connecting and disconnecting the Generation System from the electrical power system.
- iii) The location of generating equipment on the electric power system.

D) Xcel Energy Modifications

Depending upon the match between the Generation System, Xcel Energy and how the Generation System is operated, certain modifications and/or additions may be required to the existing electric power system with the addition of the Generation System. To the extent possible, this standard describes the modifications which could be necessary to the electric power system for different types of Generation Systems. For some unique interconnections, additional and/or different protective devices, system modifications and/or additions will be required by Xcel Energy. In these cases Xcel Energy will provide the final determination of the required modifications and/or additions. If any special requirements are necessary they will be identified by Xcel Energy during the application review process.

E) Generation System Protection

The Interconnection Customer is solely responsible for providing protection for the Generation System. Protection systems required in this standard, are structured to protect Xcel Energy's electrical power system and the public. The Generation System Protection is not provided for in this standard. Additional protection equipment may be required to ensure proper operation for the Generation System. This is especially true while operating disconnected, from Xcel Energy. Xcel Energy does not assume responsibility for protection of the Generation System equipment or of any portion of a Local EPS.

F) Electrical Code Compliance

Interconnection Customer shall be responsible for complying with all applicable local, independent, state and federal codes such as building codes, National Electric Code (NEC), National Electrical Safety Code (NESC) and noise and emissions standards. As required by Minnesota State law, Xcel Energy will require proof of complying with the National Electrical Code before the interconnection is made, through installation approval by an electrical inspector recognized by the Minnesota State Board of Electricity.

The Interconnection Customer's Generation System and installation shall comply with latest revisions of the ANSI/IEEE standards applicable to the installation, especially IEEE 1547; "Standard for Interconnecting Distributed Resources with Electric Power Systems". See the reference section in this document for a partial list of the standards that apply to the generation installations covered by this standard.

(Continued on Sheet No. 10-140)

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MINNESOTA ELECTRIC RATE BOOK - MPUC NO. 2

**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)**

Section No. 10
Original Sheet No. 140

2. References

The following standards shall be used in conjunction with this standard. When the stated version of the following standards is superseded by an approved revision then that revision shall apply.

IEEE Std 100-2000, "IEEE Standard Dictionary of Electrical and Electronic Terms"

IEEE Std 519-1992, "IEEE Recommended Practices and Requirements for Harmonic Control in Electric Power Systems"

IEEE Std 929-2000, "IEEE Recommended Practice for Utility Interface of Photovoltaic (PV) Systems"

IEEE Std 1547, "IEEE Standard for Interconnecting Distributed Resources with Electric Power Systems"

IEEE Std C37.90.1-1989 (1995), "IEEE Standard Surge Withstand Capability (SEC) Tests for Protective Relays and Relay Systems"

IEEE Std C37.90.2 (1995), "IEEE Standard Withstand Capability of Relay Systems to Radiated Electromagnetic Interference from Transceivers"

IEEE Std C62.41.2-2002, "IEEE Recommended Practice on Characterization of Surges in Low Voltage (1000V and Less) AC Power Circuits"

IEEE Std C62.42-1992 (2002), "IEEE Recommended Practice on Surge Testing for Equipment Connected to Low Voltage (1000V and less) AC Power Circuits"

ANSI C84.1-1995, "Electric Power Systems and Equipment – Voltage Ratings (60 Hertz)"

ANSI/IEEE 446-1995, "Recommended Practice for Emergency and Standby Power Systems for Industrial and Commercial Applications"

ANSI/IEEE Standard 142-1991, "IEEE Recommended Practice for Grounding of Industrial and Commercial Power Systems – Green Book"

UL Std. 1741 "Inverters, Converters, and Controllers for use in Independent Power Systems"

NEC – "National Electrical Code", National Fire Protection Association (NFPA), NFPA-70-2002

NESC – "National Electrical Safety Code". ANSI C2-2000, Published by the Institute of Electrical and Electronics Engineers, Inc.

(Continued on Sheet No. 10-141)

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**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)**

Section No. 10
Original Sheet No. 141

3. Types of Interconnections

- A) The manner in which the Generation System is connected to and disconnected from Xcel Energy can vary. Most transfer systems normally operate using one of the following five methods of transferring the load from Xcel Energy to the Generation System.
- B) If a transfer system is installed which has a user accessible selection of several transfer modes, the transfer mode that has the greatest protection requirements will establish the protection requirements for that transfer system.
- i) Open Transition (Break-Before-Make) Transfer Switch – With this transfer switch, the load to be supplied from the Distributed Generation is first disconnected from Xcel Energy and then connected to the Generation. This transfer can be relatively quick, but voltage and frequency excursions are to be expected during transfer. Computer equipment and other sensitive equipment will shut down and reset. The transfer switch typically consists of a standard UL approved transfer switch with mechanical interlocks between the two source contactors that drop the Xcel Energy source before the Distributed Generation is connected to supply the load.
- (1) To qualify as an Open Transition switch and the limited protective requirements, mechanical interlocks are required between the two source contacts. This is required to ensure that one of the contacts is always open and the Generation System is never operated in parallel with Xcel Energy. If the mechanical interlock is not present, the protection requirements are as if the switch is a closed transition switch.
- (2) As a practical point of application, this type of transfer switch is typically used for loads less than 500kW. This is due to possible voltage flicker problems created on the electric power system, when the load is removed from or returned to the Xcel Energy source. Depending upon Xcel Energy's stiffness this level may be larger or smaller than the 500kW level.
- (3) Figure 1 at the end of this document provides a typical one-line of this type of installation.
- ii) Quick Open Transition (Break-Before-Make) Transfer Switch – The load to be supplied from the Distributed Generation is first disconnected from Xcel Energy and then connected to the Distributed Generation, similar to the open transition. However, this transition is typically much faster (under 500 ms) than the conventional open transition transfer operation. Voltage and frequency excursions will still occur, but some computer equipment and other sensitive equipment will typically not be affected with a properly designed system. The transfer switch consists of a standard UL approved transfer switch, with mechanical interlocks between the two source contacts that drop the Xcel Energy source before the Distributed Generation is connected to supply the load.
- (1) Mechanical interlocks are required between the two source contacts to ensure that one of the contacts is always open. If the mechanical interlock is not present, the protection requirements are as if the switch is a closed transition switch.

(Continued on Sheet No. 10-142)

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MINNESOTA ELECTRIC RATE BOOK - MPUC NO. 2

**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)**

Section No. 10
Original Sheet No. 142

3. Types of Interconnections (Continued)

(2) As a practical point of application this type of transfer switch is typically used for loads less than 500kW. This is due to possible voltage flicker problems created on the electric power system, when the load is removed from or returned to the Xcel Energy source. Depending upon Xcel Energy's stiffness this level may be larger or smaller than the 500kW level.

(3) Figure 2 at the end of this document provides a typical one-line of this type of installation and shows the required protective elements.

iii) Closed Transition (Make-Before-Break) Transfer Switch – The Distributed Generation is synchronized with Xcel Energy prior to the transfer occurring. The transfer switch then parallels with Xcel Energy for a short time (100 msec. or less) and then the Generation System and load is disconnect from Xcel Energy. This transfer is less disruptive than the Quick Open Transition because it allows the Distributed Generation a brief time to pick up the load before the support of Xcel Energy is lost. With this type of transfer, the load is always being supplied by Xcel Energy or the Distributed Generation.

(1) As a practical point of application this type of transfer switch is typically used for loads less than 500kW. This is due to possible voltage flicker problems created on the electric power system, when the load is removed from or returned to the Xcel Energy source. Depending upon Xcel Energy's stiffness this level may be larger or smaller than the 500kW level.

(2) Figure 2 at the end of this document provides a typical one-line of this type of installation and shows the required protective elements. The closed transition switch must include a separate parallel time limit relay, which is not part of the generation control PLC and trips the generation from the system for a failure of the transfer switch and/or the transfer switch controls.

iv) Soft Loading Transfer Switch

(1) With Limited Parallel Operation – The Distributed Generation is paralleled with Xcel Energy for a limited amount of time (generally less than 1-2 minutes) to gradually transfer the load from Xcel Energy to the Generation System. This minimizes the voltage and frequency problems, by softly loading and unloading the Generation System.

(a) The maximum parallel operation shall be controlled, via a parallel timing limit relay (62PL). This parallel time limit relay shall be a separate relay and not part of the generation control PLC.

(b) Protective Relaying is required as described in section 6.

(c) Figure 3 at the end of this document provide typical one-line diagrams of this type of installation and show the required protective elements.

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**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)**

Section No. 10
Original Sheet No. 143

3. Types of Interconnections (Continued)

(2) With Extended Parallel Operation – The Generation System is paralleled with Xcel Energy in continuous operation. Special design, coordination and agreements are required before any extended parallel operation will be permitted. The Xcel Energy interconnection study will identify the issues involved.

(a) Any anticipated use in the extended parallel mode requires special agreements and special protection coordination.

(b) Protective Relaying is required as described in section 6.

(c) Figure 4 at the end of this document provides a typical one-line for this type of interconnection. It must be emphasized that this is a typical installations only and final installations may vary from the examples shown due to transformer connections, breaker configuration, etc.

v) Inverter Connection

This is a continuous parallel connection with the system. Small Generation Systems may utilize inverters to interface to Xcel Energy. Solar, wind and fuel cells are some examples of Generation which typically use inverters to connect to Xcel Energy. The design of such inverters shall either contain all necessary protection to prevent unintentional islanding, or the Interconnection Customer shall install conventional protection to affect the same protection. All required protective elements for a soft-loading transfer switch apply to an inverter connection. Figure 5 at the end of this document, shows a typical inverter interconnection.

(1) Inverter Certification – Prior to installation, the inverter shall be Type-Certified for interconnection to the electrical power system. The certification will confirm its anti-islanding protection and power quality related levels at the Point of Common Coupling. Also, utility compatibility, electric shock hazard and fire safety are approved through UL listing of the model. Once this Type Certification is completed for that specific model, additional design review of the inverter should not be necessary by Xcel Energy.

(2) For three-phase operation, the inverter control must also be able to detect and separate for the loss of one phase. Larger inverters will still require custom protection settings, which must be calculated and designed to be compatible with the specific electric power system being interconnected with.

(3) A visible disconnect is required for safely isolating the Distributed Generation when connecting with an inverter. The inverter shall not be used as a safety isolation device.

(4) When banks of inverter systems are installed at one location, a design review by Xcel Energy must be performed to determine any additional protection systems, metering or other needs. The issues will be identified by Xcel Energy during the interconnection study process.

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**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)**

Section No. 10
Original Sheet No. 144

4. Interconnection Issues and Technical Requirements

- A) General Requirements - The following requirements apply to all interconnected generating equipment. Xcel Energy shall be the source side and the customer's system shall be the load side in the following interconnection requirements.

- i) Visible Disconnect - A disconnecting device shall be installed to electrically isolate Xcel Energy from the Generation System. The only exception for the installation of a visible disconnect is if the generation is interconnected via a mechanically interlocked open transfer switch and installed per the NEC (702.6) "so as to prevent the inadvertent interconnection of normal and alternate sources of supply in any operation of the transfer equipment."

The visible disconnect shall provide a visible air gap between Interconnection Customer's Generation and Xcel Energy in order to establish the safety isolation required for work on the electric power system. This disconnecting device shall be readily accessible 24 hours per day by Xcel Energy field personnel and shall be capable of padlocking by Xcel Energy field personnel. The disconnecting device shall be lockable in the open position.

The visible disconnect shall be a UL approved or National Electrical Manufacture's Association approved, manual safety disconnect switch of adequate ampere capacity. The visible disconnect shall not open the neutral when the switch is open. A draw-out type circuit breaker can be used as a visual open.

The visible disconnect shall be labeled, as required by Xcel Energy to inform Xcel Energy field personnel.

- ii) Energization of Equipment by Generation System – The Generation System shall not energize a de-energized electric power system. The Interconnection Customer shall install the necessary padlocking (lockable) devices on equipment to prevent the energization of a de-energized electrical power system. Lock out relays shall automatically block the closing of breakers or transfer switches on to a de-energized electric power system.

- iii) Power Factor - The power factor of the Generation System and connected load shall be as follows;

- (1) Inverter Based interconnections – shall operate at a power factor of no less than 90% at the inverter terminals.
- (2) Limited Parallel Generation Systems, such as closed transfer or soft-loading transfer systems shall operate at a power factor of no less than 90%, during the period when the Generation System is parallel with Xcel Energy, as measured at the Point of Common Coupling.

(Continued on Sheet No. 10-145)

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**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)**

Section No. 10
Original Sheet No. 145

4. Interconnection Issues and Technical Requirements (Continued)

- (3) Extended Parallel Generation Systems shall be designed to be capable of operating between 90% lagging and 95% leading. These Generation Systems shall normally operate near unity power factor (+/-98%) or as mutually agreed between Xcel Energy and the Interconnection Customer.

iv) Grounding Issues

- (1) Grounding of sufficient size to handle the maximum available ground fault current shall be designed and installed to limit step and touch potentials to safe levels as set forth in "IEEE Guide for Safety in AC Substation Grounding", ANSI/IEEE Standard 80.
- (2) It is the responsibility of the Interconnection Customer to provide the required grounding for the Generation System. A good standard for this is the IEEE Std. 142-1991 "Grounding of Industrial and Commercial Power Systems"
- (3) All electrical equipment shall be grounded in accordance with local, state and federal electrical and safety codes and applicable standards

- v) Sales to Xcel Energy or other parties— Transportation of energy on the Transmission system is regulated by the area reliability council and FERC. Those contractual requirements are not included in this standard. Xcel Energy will provide these additional contractual requirements during the interconnection approval process.

B) For Inverter based, closed transfer and soft loading interconnections, the following additional requirements apply:

- i) Fault and Line Clearing - The Generation System shall be removed from Xcel Energy for any faults, or outages occurring on the electrical circuit serving the Generation System
- ii) Operating Limits in order to minimize objectionable and adverse operating conditions on the electric service provided to other customers connected to Xcel Energy, the Generation System shall meet the Voltage, Frequency, Harmonic and Flicker operating criteria as defined in the IEEE1547 standard during periods when the Generation System is operated in parallel with Xcel Energy.

If the Generation System creates voltage changes greater than 4% on the electric power system, it is the responsibility of the Interconnection Customer to correct these voltage sag/swell problems caused by the operation of the Generation System. If the operation of the interconnected Generation System causes flicker, which causes problems for others customer's interconnected to Xcel Energy, the Interconnection Customer is responsible for correcting the problem.

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**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)**

Section No. 10
Original Sheet No. 146

4. Interconnection Issues and Technical Requirements (Continued)

- iii) Flicker - The operation of Generation System is not allowed to produce excessive flicker to adjacent customers. See the IEEE 1547 standard for a more complete discussion on this requirement.

The stiffer the electric power system, the larger a block load change that it will be able to handle. For any of the transfer systems, the Xcel Energy voltage shall not drop or rise greater than 4% when the load is added or removed from Xcel Energy. It is important to note, that if another interconnected customer complains about the voltage change caused by the Generation System, even if the voltage change is below the 4% level, it is the Interconnection Customer's responsibility to correct or pay for correcting the problem. Utility experience has shown that customers have seldom objected to instantaneous voltage changes of less than 2% on the electric power system, so most Area EPS Operators use a 2% design criteria.

- iv) Interference - The Interconnection Customer shall disconnect the Distributed Generation from Xcel Energy if the Distributed Generation causes radio, television or electrical service interference to other customers, via the EPS or interference with the operation of Xcel Energy. The Interconnection Customer shall either effect repairs to the Generation System or reimburse Xcel Energy for the cost of any required Xcel Energy modifications due to the interference.

v) Synchronization of Customer Generation

- (1) An automatic synchronizer with synch-check relaying is required for unattended automatic quick open transition, closed transition or soft loading transfer systems.
- (2) To prevent unnecessary voltage fluctuations on the electric power system, it is required that the synchronizing equipment be capable of closing the Distributed Generation into the electric power system within the limits defined in IEEE 1547. Actual settings shall be determined by the Registered Professional Engineer establishing the protective settings for the installation.
- (3) Unintended Islanding – Under certain conditions with extended parallel operation, it would be possible for a part of the Xcel Energy system to be disconnected from the rest of the Xcel Energy system and have the Generation System continue to operate and provide power to a portion of the isolated circuit. This condition is called "islanding". It is not possible to successfully reconnect the energized isolated circuit to the rest of the Xcel Energy system since there are no synchronizing controls associated with all of the possible locations of disconnection. Therefore, it is a requirement that the Generation System be automatically disconnected from the Xcel Energy system immediately by protective relays for any condition that would cause the Xcel Energy system to be de-energized. The Generation System must either isolate with the customer's load or trip. The Generation System must also be blocked from closing back into the Xcel Energy system until the Xcel Energy system is reenergized and the Xcel Energy system voltage is within Range B of ANSI C84.1 Table 1 for a minimum of 1 minute. Depending upon the size of the Generation System it may be necessary to install direct transfer trip equipment from the Xcel Energy system source(s) to remotely trip the generation interconnection to prevent islanding for certain conditions.

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**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)**

Section No. 10
Original Sheet No. 147

4. Interconnection Issues and Technical Requirements (Continued)

vi) Disconnection –Xcel Energy may refuse to connect or may disconnect a Generation System from Xcel Energy system under the following conditions:

- (1) Lack of approved Standard Application Form and Standard Interconnection Agreement.
- (2) Termination of interconnection by mutual agreement.
- (3) Non-Compliance with the technical or contractual requirements.
- (4) System Emergency or for imminent danger to the public or Xcel Energy personnel (Safety).
- (5) Routine maintenance, repairs and modifications to the Xcel Energy system. Xcel Energy shall coordinate planned outages with the Interconnection Customer to the extent possible.

5. Generation Metering, Monitoring and Control

Metering, Monitoring and Control – Depending upon the method of interconnection and the size of the Generation System, there are different metering, monitoring and control requirements Table 5A is a table summarizing the metering, monitoring and control requirements.

Due to the variation in Generation Systems and the Xcel Energy system operational needs, the requirements for metering, monitoring and control listed in this document are the expected maximum requirements that Xcel Energy will apply to the Generation System. It is important to note that for some Generation System installations Xcel Energy may wave some of the requirements of this section if they are not needed. An example of this is with rural or low capacity feeders that require more monitoring then larger capacity, typically urban feeders.

Another factor which will effect the metering, monitoring and control requirements will be the tariff under which the Interconnection Customer is supplied by Xcel Energy. Table 5A has been written to cover most application, but some Xcel Energy tariffs may have greater or less metering, monitoring and control requirements then, as shown in Table 5A.

(Continued on Sheet No. 10-148)

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**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)**

Section No. 10
Original Sheet No. 148

5. Generation Metering, Monitoring and Control (Continued)

TABLE 5A: Metering, Monitoring and Control Requirements			
Generation System Capacity at Point of Common Coupling	Metering	Generation Remote Monitoring	Generation Remote Control
< 40 kW with all sales to Xcel Energy	Bi-Directional metering at the point of common coupling	None Required	None Required
< 40 kW with Sales to a party other than Xcel Energy	Recording metering on the Generation System and a separate recording meter on the load	Interconnection Customer supplied direct dial phone line.	None Required
40 – 250kW with limited parallel	Detented Xcel Energy Metering at the Point of Common Coupling	None Required	None Required
40 – 250kW with extended parallel	Recording metering on the Generation System and a separate recording meter on the load	Interconnection Customer supplied direct dial phone line. Xcel Energy to supply it's own monitoring equipment	None Required
250 – 1000 kW with limited parallel	Detented Xcel Energy Metering at the Point of Common Coupling	Interconnection Customer supplied direct dial phone line and monitoring points available. See B (i)	None Required
250 – 1000 kW With extended parallel operation	Recording metering on the Generation System and a separate recording meter on the load.	Required Xcel Energy remote monitoring system See B (i)	None Required
>1000 kW With limited parallel Operation	Detented Xcel Energy Metering at the Point of Common Coupling	Required Xcel Energy SCADA monitoring system. See B (i)	None required
>1000 kW With extended parallel operation	Recording metering on the Generation System and a separate recording meter on the load.	Required Xcel Energy SCADA monitoring system See B (i)	Direct Control via SCADA by Xcel Energy of interface breaker.

"Detented" = A meter which is detented will record power flow in only one direction.

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**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)**

Section No. 10
1st Revised Sheet No. 149

5. Generation Metering, Monitoring and Control (Continued)

A) Metering

- i) As shown in Table 5A the requirements for metering will depend up on the type of generation and the type of interconnection. For most installations, the requirement is a single point of metering at the Point of Common Coupling. Xcel Energy will install a special meter that is capable of measuring and recording energy flow in both directions, for three phase installations or two detented meters wired in series, for single phase installations. A dedicated - direct dial phone line may be required to be supplied to the meter for Xcel Energy's use to read the metering. Some monitoring may be done through the meter and the dedicated – direct dial phone line, so in many installations the remote monitoring and the meter reading can be done using the same dial-up phone line.
- ii) Depending upon which tariff the Generation System and/or customer's load is being supplied under, additional metering requirements may result. Contact Xcel Energy for tariff requirements. In some cases, the direct dial-phone line requirement may be waived by Xcel Energy for smaller Generation Systems.
- iii) All Xcel Energy's revenue meters shall be supplied, owned and maintained by Xcel Energy. All voltage transformers (VT) and current transformers (CT), used for revenue metering shall be approved and/or supplied by Xcel Energy. Xcel Energy's standard practices for instrument transformer location and wiring shall be followed for the revenue metering.
- iv) For Generation Systems that sell power and are greater then 40kW in size, separate metering of the generation and of the load is required. A single meter recording the power flow at the Point of Common Coupling for both the Generation and the load, is not allowed by the rules under which the area transmission system is operated. Xcel Energy is required to report to the regional reliability council (the Midwest Reliability Organization (MRO) and MAPP or any successor organization) the total peak load requirements and is also required to own or have contracted for, accredited generation capacity of 115% of the experienced peak load level for each month of the year. Failure to meet this requirement results in a large monetary penalty for Xcel Energy.
- v) For Generation Systems which are less then 40kW in rated capacity and are qualified facilities under PURPA (Public Utilities Regulatory Power Act – Federal Gov. 1978), net metering is allowed and provides the generation system the ability to back feed Xcel Energy at some times and bank that energy for use at other times. Some of the qualified facilities under PURPA are solar, wind, hydro, and biomass. For these net-metered installations, Xcel Energy may use a single meter to record the bi-directional flow or Xcel Energy may elect to use two detented meters, each one to record the flow of energy in one direction.

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**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)**

Section No. 10
Original Sheet No. 150

5. Generation Metering, Monitoring and Control (Continued)

- B) Monitoring (SCADA) is required as shown in table 5A. The need for monitoring is based on the need of the system control center to have the information necessary for the reliable operation of Xcel Energy. This remote monitoring is especially important during periods of abnormal and emergency operation.

The difference in Table 5A between remote monitoring and SCADA is that SCADA typically is a system that is in continuous communication with a central computer and provides updated values and status, to Xcel Energy, within several seconds of the changes in the field. Remote monitoring on the other hand will tend to provide updated values and status within minutes of the change in state of the field. Remote monitoring is typically less expensive to install and operate.

- i) Where Remote Monitoring or SCADA is required, as shown in Table 5A, the following monitored and control points are required:
- (1) Real and reactive power flow for each Generation System (kW and kVAR). Only required if separate metering of the Generation and the load is required, otherwise #4 monitored at the point of Common Coupling will meet the requirements.
 - (2) Phase voltage representative of Xcel Energy's service to the facility.
 - (3) Status (open/close) of Distributed Generation and interconnection breaker(s) or if transfer switch is used, status of transfer switch(s).
 - (4) Customer load from Xcel Energy service (kW and kVAR).
 - (5) Control of interconnection breaker - if required by Xcel Energy.

When telemetry is required, the Interconnection Customer must provide the communications medium to Xcel Energy's Control Center. This could be radio, dedicated phone circuit or other form of communication. If a telephone circuit is used, the Interconnection Customer must also provide the telephone circuit protection. The Interconnection Customer shall coordinate the RTU (remote terminal unit) addition with Xcel Energy. Xcel Energy may require a specific RTU and/or protocol to match their SCADA or remote monitoring system.

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**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)**

Section No. 10
Original Sheet No. 151

6. Protective Devices and Systems

- A) Protective devices required to permit safe and proper operation of the electric power system while interconnected with customer's Generation System are shown in the figures at the end of this document. In general, an increased degree of protection is required for increased Distributed Generation size. This is due to the greater magnitude of short circuit currents and the potential impact to system stability from these installations. Medium and large installations require more sensitive and faster protection to minimize damage and ensure safety.

If a transfer system is installed which has a user accessible selection of several transfer modes, the transfer mode that has the greatest protection requirements will establish the protection requirements for that transfer system.

The Interconnection Customer shall provide protective devices and systems to detect the Voltage, Frequency, Harmonic and Flicker levels as defined in the IEEE 1547 standard during periods when the Generation System is operated in parallel with Xcel Energy. The Interconnection Customer shall be responsible for the purchase, installation, and maintenance of these devices. Discussion on the requirements for these protective devices and systems follows:

i) Relay settings

- (1) If the Generation System is utilizing a Type-Certified system, such as a UL listed inverter a Professional Electrical Engineer is not required to review and approve the design of the interconnecting system. If the Generation System interconnecting device is not Type-Certified or if the Type-Certified Generation System interconnecting device has additional design modifications made, the Generation System control, the protective system, and the interconnecting device(s) shall be reviewed and approved by a Professional Electrical Engineer, registered in the State of Minnesota.
- (2) A copy of the proposed protective relay settings shall be supplied to Xcel Energy for review and approval, to ensure proper coordination between the generation system and Xcel Energy system.

ii) Relays

- (1) All equipment providing relaying functions shall meet or exceed ANSI/IEEE Standards for protective relays, i.e., C37.90, C37.90.1 and C37.90.2.
- (2) Required relays that are not "draw-out" cased relays shall have test plugs or test switches installed to permit field testing and maintenance of the relay without unwiring or disassembling the equipment. Inverter based protection is excluded from this requirement for Generation Systems <40kW at the Point of Common Coupling.

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**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)**

Section No. 10
Original Sheet No. 152

6. Protective Devices and Systems (Continued)

- (3) Three phase interconnections shall utilize three phase power relays, which monitor all three phases of voltage and current, unless so noted in the appendix one-lines.
- (4) All relays shall be equipped with setting limit ranges at least as wide as specified in IEEE 1547, and meet other requirements as specified in the Xcel Energy interconnect study. Setting limit ranges are not to be confused with the actual relay settings required for the proper operation of the installation. At a minimum, all protective systems shall meet the requirements established in IEEE 1547.
- (a) Over-current relays (IEEE Device 50/51 or 50/51V) shall operate to trip the protecting breaker at a level to ensure protection of the equipment and at a speed to allow proper coordination with other protective devices. For example, the over-current relay monitoring the interconnection breaker shall operate fast enough for a fault on the customer's equipment, so that no protective devices will operate on the electric power system. 51V is a voltage restrained or controlled over-current relay and may be required to provide proper coordination with the Xcel Energy system.
- (b) Over-voltage relays (IEEE Device 59) shall operate to trip the Distributed Generation per the requirements of IEEE 1547.
- (c) Under-voltage relays (IEEE Device 27) shall operate to trip the Distributed Generation per the requirements of IEEE 1547.
- (d) Over-frequency relays (IEEE Device 81O) shall operate to trip the Distributed Generation off-line per the requirements of IEEE 1547.
- (e) Under-frequency relay (IEEE Device 81U) shall operate to trip the Distributed Generation off-line per the requirements of IEEE 1547. For Generation Systems with an aggregate capacity greater than 30kW, the Distributed Generation shall trip off-line when the frequency drops below 57.0-59.8 Hz. typically this is set at 59.5 Hz, with a trip time of 0.16 seconds, but coordination with Xcel Energy is required for this setting.
- Xcel Energy will provide the reference frequency of 60 Hz. The Distributed Generation control system must be used to match this reference. The protective relaying in the interconnection system will be expected to maintain the frequency of the output of the Generation.
- (f) Reverse power relays (IEEE Device 32) (power flowing from the Generation System to Xcel Energy) shall operate to trip the Distributed Generation off-line for a power flow to the system with a maximum time delay of 2.0 seconds.

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**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)**

Section No. 10
Original Sheet No. 153

6. Protective Devices and Systems (Continued)

- (g) Lockout Relay (IEEE Device 86) is a mechanically locking device which is wired into the close circuit of a breaker or switch and when tripped will prevent any close signal from closing that device. This relay requires that a person manually resets the lockout relay before that device can be reclosed. These relays are used to ensure that a deenergized system is not reenergized by automatic control action, and prevents a failed control from auto-reclosing an open breaker or switch.
- (h) Transfer Trip – All Generation Systems are required to disconnect from Xcel Energy when the Xcel Energy system is disconnected from its source, to avoid unintentional islanding. With larger Generation Systems, which remain in parallel with Xcel Energy, a transfer trip system may be required to sense the loss of the Xcel Energy source. When the Xcel Energy source is lost, a signal is sent to the Generation System to separate the Generation from the Xcel Energy system. The size of the Generation System vs. the capacity and minimum loading on the feeder will dictate the need for transfer trip installation. The Xcel Energy interconnection study will identify the specific requirements.
- If multiple Xcel Energy sources are available or multiple points of sectionalizing on the electric power system, then more than one transfer trip system may be required. The Xcel Energy interconnection study will identify the specific requirements. For some installations the alternate Xcel Energy source(s) may not be utilized except in rare occasions. If this is the situation, the Interconnection Customer may elect to have the Generation System locked out when the alternate source(s) are utilized, if agreeable to Xcel Energy.
- (i) Parallel limit timing relay (IEEE Device 62PL) set at a maximum of 120 seconds for soft transfer installations and set no longer than 100ms for quick transfer installations, shall trip the Distributed Generation circuit breaker on limited parallel interconnection systems. Power for the 62 PL relay must be independent of the transfer switch control power. The 62PL timing must be an independent device from the transfer control and shall not be part of the generation PLC or other control system.

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**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)**

Section No. 10
Original Sheet No. 154

6. Protective Devices and Systems (Continued)

TABLE 6A SUMMARY OF RELAYING REQUIREMENTS								
Type of Interconnection	Over-current (50/51)	Voltage (27/59)	Frequency (81 0/U)	Reverse Power (32)	Lockout (86)	Parallel Limit Timer	Sync-Check (25)	Transfer Trip
Open Transition Mechanically Interlocked (Fig. 1)	—	—	—	—	—	—	—	—
Quick Open Transition Mechanically Interlocked (Fig. 2)	—	—	—	—	Yes	Yes	Yes	—
Closed Transition (Fig. 2)	—	—	—	—	Yes	Yes	Yes	—
Soft Loading Limited Parallel Operation (Fig. 3)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	—
Soft Loading Extended Parallel < 250 kW (Fig. 4)	Yes	Yes	Yes	—	Yes	—	Yes	—
Soft Loading Extended Parallel >250kW (Fig.4)	Yes	Yes	Yes	—	Yes	—	Yes	Yes
Inverter Connection (Fig. 5)								
< 40 kW	Yes	Yes	Yes	—	Yes	—	—	—
40 kW – 250kW	Yes	Yes	Yes	—	Yes	—	—	—
> 250 kW	Yes	Yes	Yes	—	Yes	—	—	Yes

(Continued on Sheet No. 10-155)

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MINNESOTA ELECTRIC RATE BOOK - MPUC NO. 2

**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)**

Section No. 10
Original Sheet No. 155

7. Agreements

- A) Interconnection Agreement – This agreement is required for all Generation Systems that parallel with Xcel Energy. Each of Xcel Energy's tariffs contain standard interconnection agreements. There are different interconnection agreements depending upon the size and type of Generation System. This agreement contains the terms and conditions upon which the Generation System is to be connected, constructed and maintained, when operated in parallel with Xcel Energy. Some of the issues covered in the interconnection agreement are as follows:
- i. Construction Process
 - ii. Testing Requirements
 - iii. Maintenance Requirements
 - iv. Firm Operating Requirements such as Power Factor
 - v. Access requirements for Xcel Energy personnel
 - vi. Disconnection of the Generation System (Emergency and Non-emergency)
 - vii. Term of Agreement
 - viii. Insurance Requirements
 - ix. Dispute Resolution Procedures
- B) Operating Agreement – For Generation Systems that normally operate in parallel with Xcel Energy, an agreement separate from the interconnection agreement, called the "operating agreement", is usually created. This agreement is created for the benefit of both the Interconnection Customer and Xcel Energy and will be agreed to between the Parties. This agreement will be dynamic and is intended to be updated and reviewed annually. For some smaller systems, the operating agreement can simply be a letter agreement for larger and more intergraded Generation Systems the operating agreement will tend to be more involved and more formal. The operating agreement covers items that are necessary for the reliable operation of the Local EPS and the Xcel Energy system. The items typically included in the operating agreement are as follows:
- i. Emergency and normal contact information for both the Xcel Energy operations center and for the Interconnection Customer
 - ii. Procedures for periodic Generation System test runs
 - iii. Procedures for maintenance on the electric power system that affects the Generation System.
 - iv. Emergency Generation Operation Procedures

(Continued on Sheet No. 10-156)

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**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)**

Section No. 10
Original Sheet No. 156

8. Testing Requirements

A) Pre-Certification of equipment

The most important part of the process to interconnect generation with Local EPS and the Xcel Energy system is safety. One of the key components of ensuring the safety of the public and employees is to ensure that the design and implementation of the elements connected to the electrical power system operate as required. To meet this goal, all of the electrical wiring in a business or residence, is required by the State of Minnesota to be listed by a recognized testing and certification laboratory, for its intended purpose. Typically we see this as "UL" listed. Since Generation Systems have tended to be uniquely designed for each installation they have been designed and approved by Professional Engineers. As the number of Generation Systems installed increase, vendors are working towards creating equipment packages that can be tested in the factory and then will only require limited field testing. This will allow us to move towards "plug and play" installations. For this reason, this standard recognizes the efficiency of "pre-certification" of Generation System equipment packages that will help streamline the design and installation process.

An equipment package shall be considered certified for interconnected operation if it has been submitted by a manufacture, tested and listed by a nationally recognized testing and certification laboratory (NRTL) for continuous utility interactive operation in compliance with the applicable codes and standards. Presently generation paralleling equipment that is listed by a nationally recognized testing laboratory as having met the applicable type-testing requirements of UL 1741 and IEEE 929, shall be acceptable for interconnection without additional protection system requirements. An "equipment package" shall include all interface components including switchgear, inverters, or other interface devices and may include an integrated generator or electric source. If the equipment package has been tested and listed as an integrated package which includes a generator or other electric source, it shall not required further design review, testing or additional equipment to meet the certification requirements for interconnection. If the equipment package includes only the interface components (switchgear, inverters, or other interface devices), then the Interconnection Customer shall show that the generator or other electric source being utilized with the equipment package is compatible with the equipment package and consistent with the testing and listing specified for the package. Provided the generator or electric source combined with the equipment package is consistent with the testing ad listing performed by the nationally recognized testing and certification laboratory, no further design review, testing or additional equipment shall be required to meet the certification requirements of this interconnection procedure. A certified equipment package does not include equipment provided by Xcel Energy.

The use of Pre-Certified equipment does not automatically qualify the Interconnection Customer to be interconnected to the Xcel Energy system. An application will still need to be submitted and an interconnection review may still need to be performed, to determine the compatibility of the Generation System with the Xcel Energy system.

(Continued on Sheet No. 10-157)

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**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)**

Section No. 10
Original Sheet No. 157

8. Testing Requirements (Continued)

B) Pre-Commissioning Tests

i) Non-Certified Equipment

(1) Protective Relaying and Equipment Related to Islanding

- (a) Distributed generation that is not Type-Certified (type tested), shall be equipped with protective hardware and/or software designed to prevent the Generation from being connected to a de-energized Xcel Energy system.
- (b) The Generation may not close into a de-energized Xcel Energy system and protection provided to prevent this from occurring. It is the Interconnection Customer's responsibility to provide a final design and to install the protective measures required by Xcel Energy. Xcel Energy will review and approve the design, the types of relays specified, and the installation. Mutually agreed upon exceptions may at times be necessary and desirable. It is strongly recommended that the Interconnection Customer obtain Xcel Energy written approval prior to ordering protective equipment for parallel operation. The Interconnection Customer will own these protective measures installed at their facility.
- (c) The Interconnection Customer shall obtain prior approval from Xcel Energy for any revisions to the specified relay calibrations.

C) Commissioning Testing

The following tests shall be completed by the Interconnection Customer. All of the required tests in each section shall be completed prior to moving on to the next section of tests. Xcel Energy has the right to witness all field testing and to review all records prior to allowing the system to be made ready for normal operation. Xcel Energy shall be notified, with sufficient lead time to allow the opportunity for Xcel Energy personnel to witness any or all of the testing.

- i) Pre-testing - The following tests are required to be completed on the Generation System prior to energization by the Generator or Xcel Energy. Some of these tests may be completed in the factory if no additional wiring or connections were made to that component. These tests are marked with a "**".
 - (1) Grounding shall be verified to ensure that it complies with this standard, the NESC and the NEC.
 - (2) * CT's (Current Transformers) and VT's (Voltage Transformers) used for monitoring and protection shall be tested to ensure correct polarity, ratio and wiring.

(Continued on Sheet No. 10-158)

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MINNESOTA ELECTRIC RATE BOOK - MPUC NO. 2

**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)**

Section No. 10
Original Sheet No. 158

8. Testing Requirements (Continued)

- (3) CT's shall be visually inspected to ensure that all grounding and shorting connections have been removed where required.
- (4) Breaker / Switch tests – Verify that the breaker or switch cannot be operated with interlocks in place or that the breaker or switch cannot be automatically operated when in manual mode. Various Generation Systems have different interlocks, local or manual modes etc. The intent of this section is to ensure that the breaker or switches controls are operating properly.
- (5) * Relay Tests – All Protective relays shall be calibrated and tested to ensure the correct operation of the protective element. Documentation of all relay calibration tests and settings shall be furnished to Xcel Energy.
- (6) Trip Checks - Protective relaying shall functionally tested to ensure the correct operation of the complete system. Functional testing requires that the complete system is operated by the injection of current and/or voltage to trigger the relay element and proving that the relay element trips the required breaker, lockout relay or provides the correct signal to the next control element. Trip circuits shall be proven through the entire scheme (including breaker trip)
- For factory-assembled systems, such as inverters the setting of the protective elements may occur at the factory. This section requires that the complete system including the wiring and the device being tripped or activated is proven to be in working condition through the injection of current and/or voltage.
- (7) Remote Control, SCADA and Remote Monitoring tests – All remote control functions and remote monitoring points shall be verified operational. In some cases, it may not be possible to verify all of the analog values prior to energization. Where appropriate, those points may be verified during the energization process
- (8) Phase Tests – the Interconnection Customer shall work with Xcel Energy to complete the phase test to ensure proper phase rotation of the Generation and wiring.
- (9) Synchronizing test – The following tests shall be done across an open switch or racked out breaker. The switch or breaker shall be in a position that it is incapable of closing between the Generation System and the Xcel Energy system for this test. This test shall demonstrate that at the moment of the paralleling-device closure, the frequency, voltage and phase angle are within the required ranges, stated in IEEE 1547. This test shall also demonstrate that is any of the parameters are outside of the ranges stated; the paralleling-device shall not close. For inverter-based interconnected systems this test may not be required unless the inverter creates fundamental voltages before the paralleling device is closed.

(Continued on Sheet No. 10-159)

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**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)**

Section No. 10
Original Sheet No. 159

8. Testing Requirements (Continued)

- ii) On-Line Commissioning Test – the following tests will proceed once the Generation System has completed Pre-testing and the results have been reviewed and approved by Xcel Energy. For smaller Generation Systems, Xcel Energy may have a set of standard interconnection tests that will be required. On larger and more complex Generation Systems the Interconnection Customer and Xcel Energy will get together to develop the required testing procedure. All on-line commissioning test shall be based on written test procedures agreed to between Xcel Energy and the Interconnection Customer.

Generation System functionally shall be verified for specific interconnections as follows:

- (1) Anti-Islanding Test – For Generation Systems that parallel with the utility for longer than 100msec.

(a) The Generation System shall be started and connected in parallel with the Xcel Energy source

(b) The Xcel Energy source shall be removed by opening a switch, breaker etc.

(c) The Generation System shall either separate with the local load or stop generating

(d) The device that was opened to remove the Xcel Energy source shall be closed and the Generation System shall not re-parallel with Xcel Energy for at least 5 minutes.

- iii) Final System Sign-off.

- (1) To ensure the safety of the public, all interconnected customer owned generation systems which do not utilize a Type-Certified system shall be certified as ready to operate by a Professional Electrical Engineer registered in the State of Minnesota, prior to the installation being considered ready for commercial use.

- iv) Periodic Testing and Record Keeping

- (1) Any time the interface hardware or software, including protective relaying and generation control systems are replaced and/or modified, Xcel Energy shall be notified. This notification shall, if possible, be with sufficient warning so that Xcel Energy personnel can be involved in the planning for the modification and/or witness the verification testing. Verification testing shall be completed on the replaced and/or modified equipment and systems. The involvement of Xcel Energy personnel will depend upon the complexity of the Generation System and the component being replaced and/or modified. Since the Interconnection Customer and Xcel Energy are now operating an interconnected system. It is important for each to communicate changes in operation, procedures and/or equipment to ensure the safety and reliability of the Local EPS and the Xcel Energy system.

(Continued on Sheet No. 10-159.1)

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Minneapolis, Minnesota 55401

MINNESOTA ELECTRIC RATE BOOK - MPUC NO. 2

**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)**

Section No. 10
Original Sheet No. 159.1

8. Testing Requirements (Continued)

- (2) All interconnection-related protection systems shall be periodically tested and maintained, by the Interconnection Customer, at intervals specified by the manufacture or system integrator. These intervals shall not exceed 5 years. Periodic test reports and a log of inspections shall be maintained, by the Interconnection Customer and made available to Xcel Energy upon request. Xcel Energy shall be notified prior to the period testing of the protective systems, so that Xcel Energy personnel may witness the testing if so desired.
- (a) Verification of inverter connected system rated 15kVA and below may be completed as follows;
The Interconnection Customer shall operate the load break disconnect switch and verify the Generator automatically shuts down and does not restart for at least 5 minutes after the switch is close
- (b) Any system that depends upon a battery for trip/protection power shall be checked and logged once per month for proper voltage. Once every four years the battery(s) must be either replaced or a discharge test performed. Longer intervals are possible through the use of "station class batteries" and Xcel Energy's approval.

(Continued on Sheet No. 10-159.2)

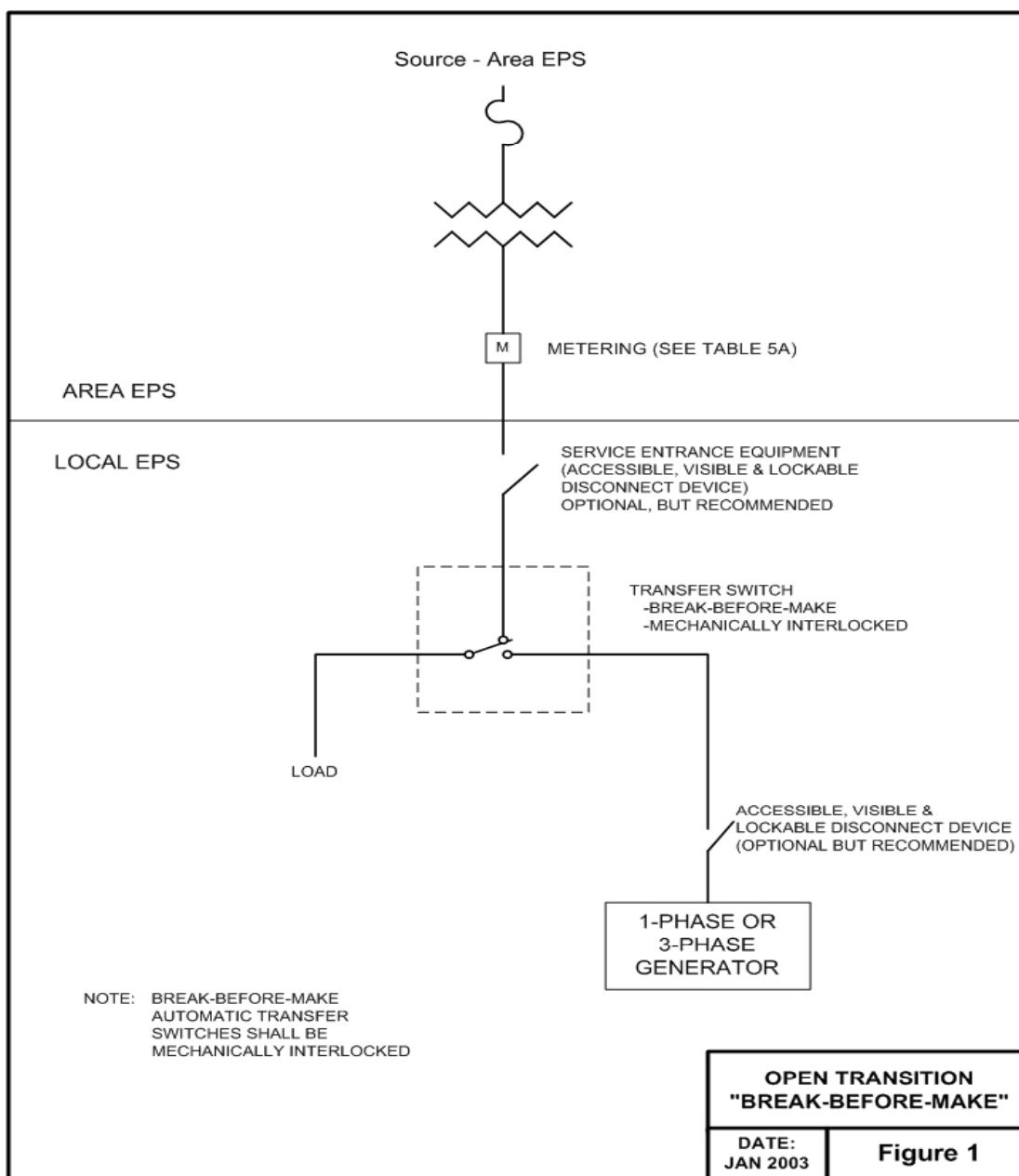
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**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)**

Section No. 10
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8. Testing Requirements (Continued)



(Continued on Sheet No. 10-159.3)

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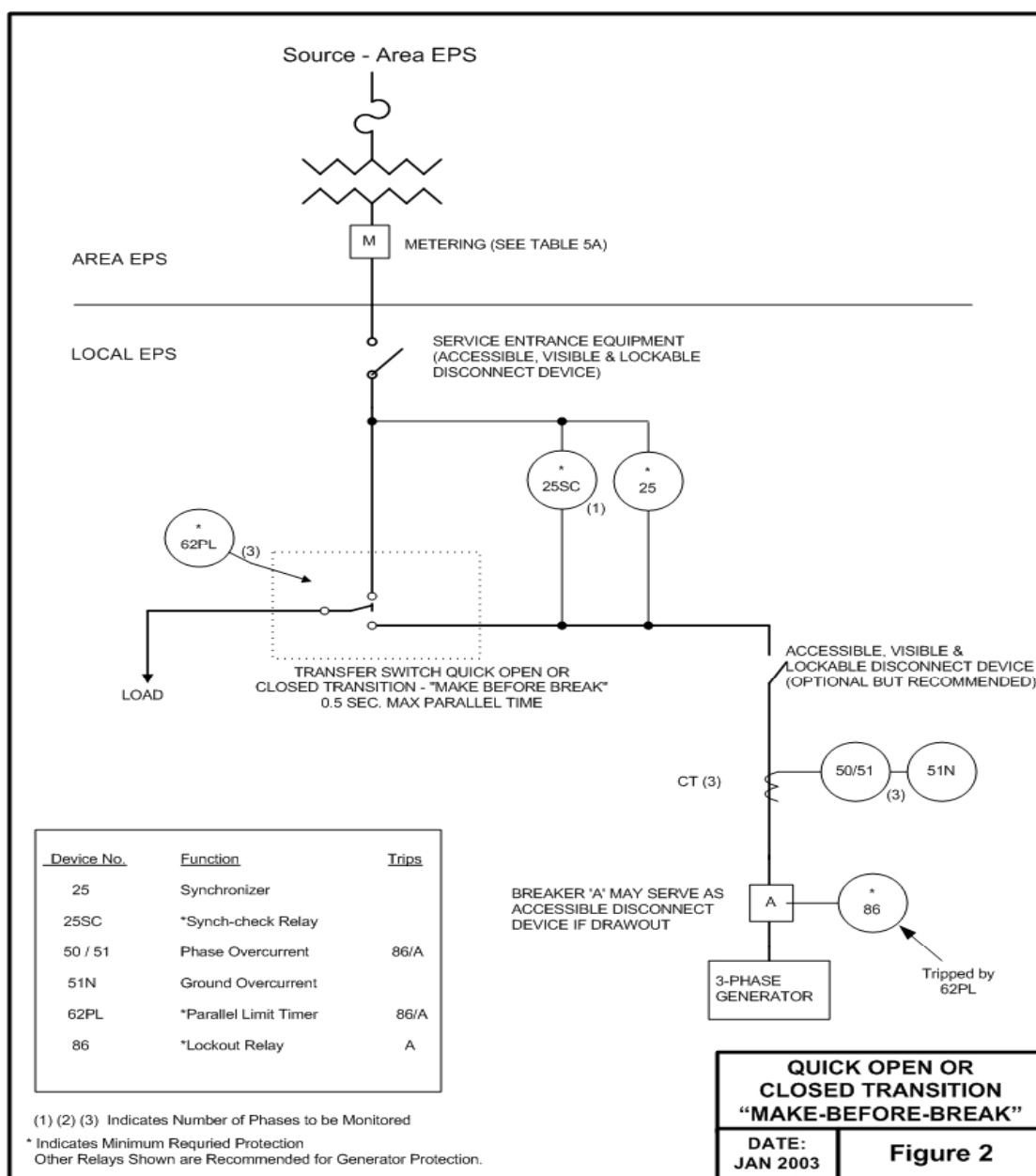
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**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)**

Section No. 10
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8. Testing Requirements (Continued)



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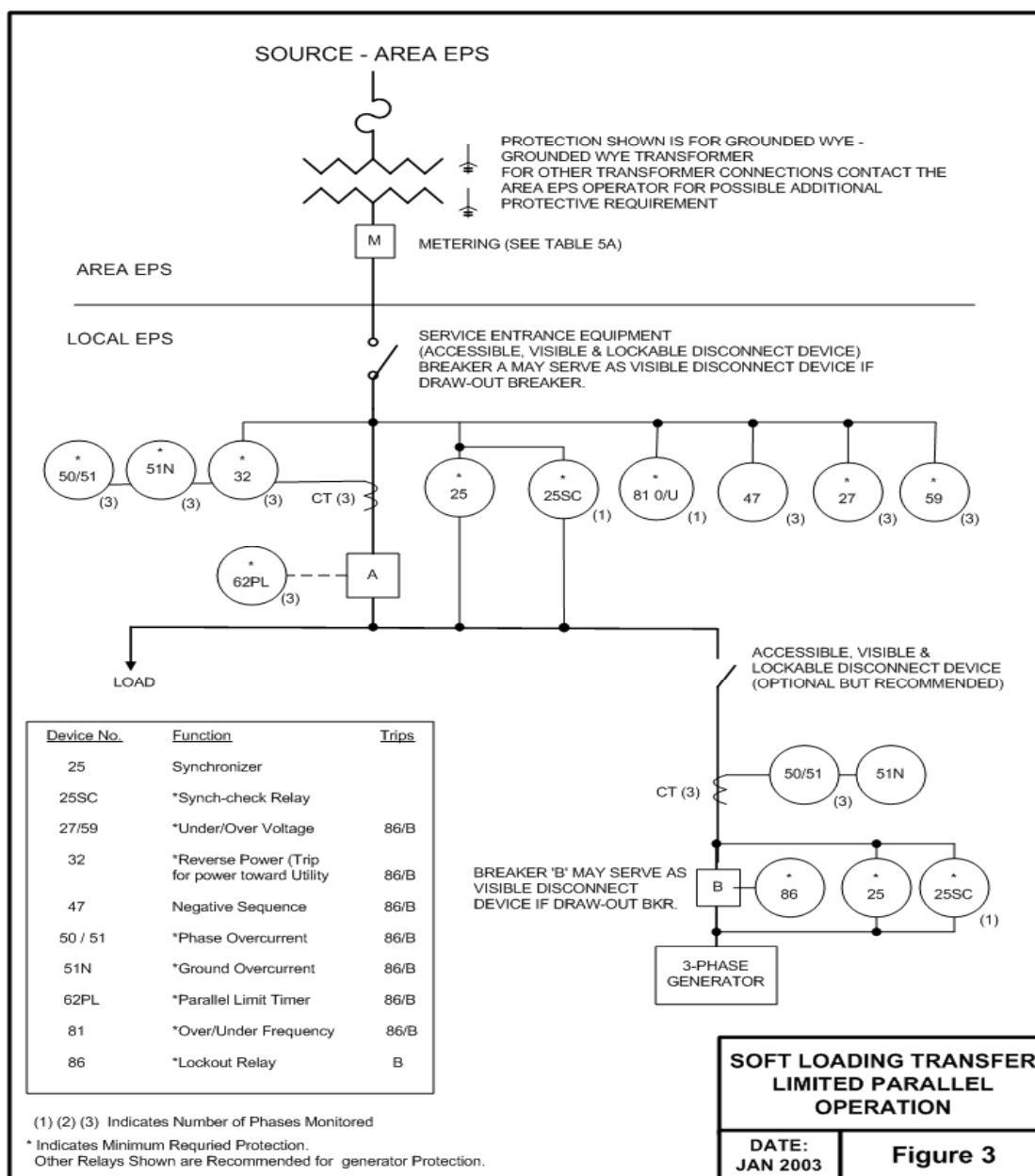
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**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)**

Section No. 10
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8. Testing Requirements (Continued)



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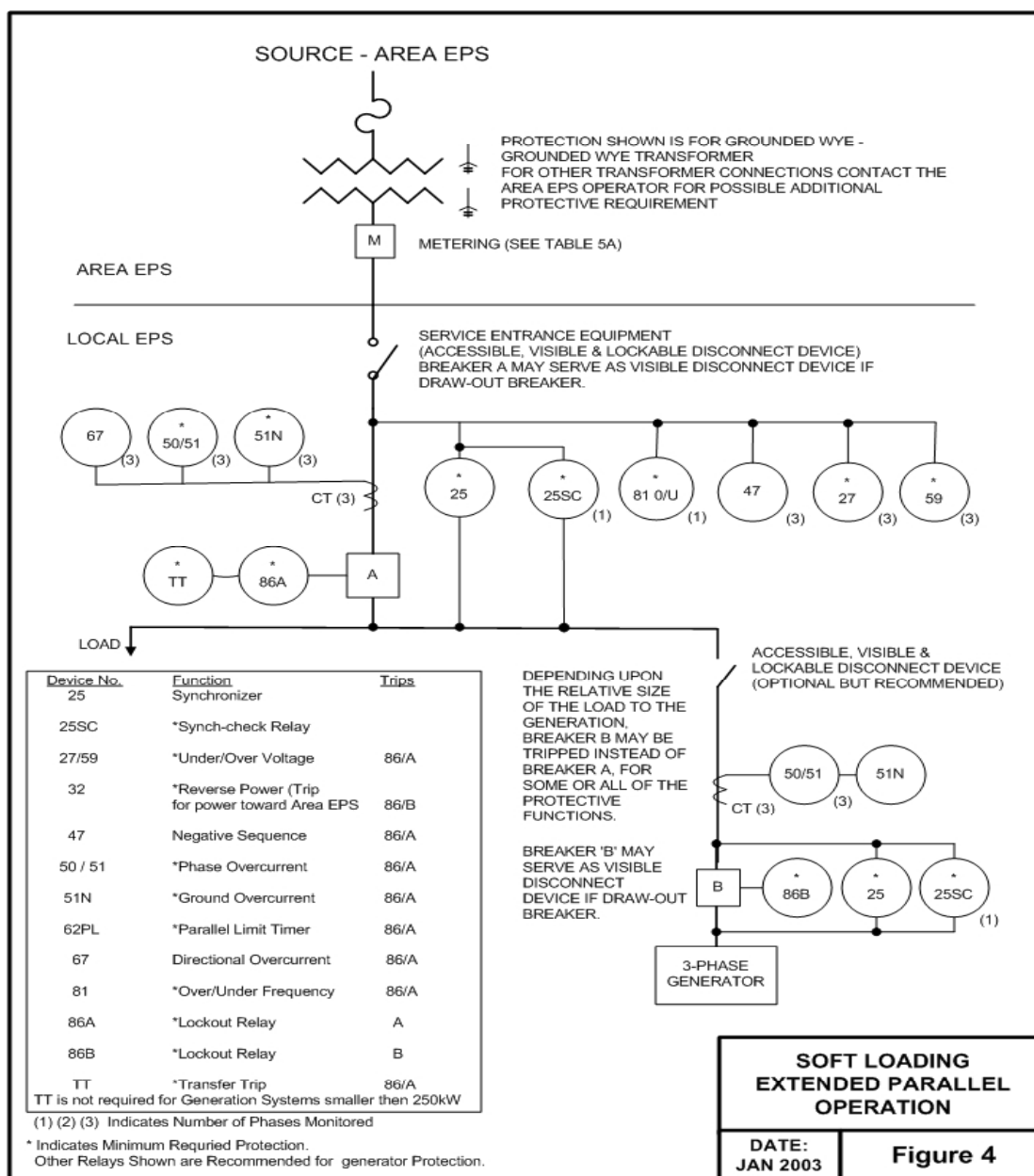
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**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)**

Section No. 10
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8. Testing Requirements (Continued)



(Continued on Sheet No. 10-159.6)

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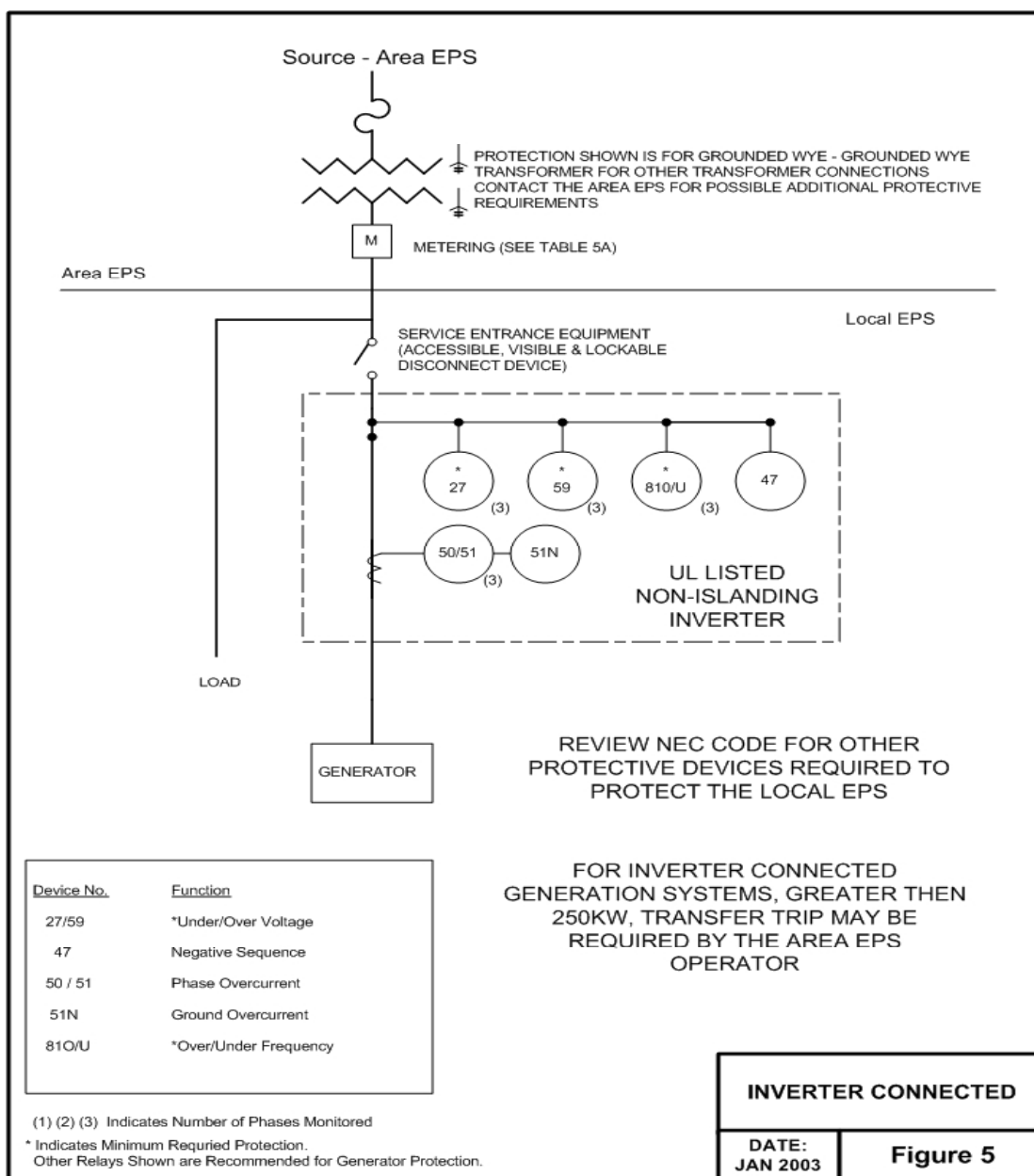
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**DISTRIBUTED GENERATION STANDARD
INTERCONNECTION AND POWER PURCHASE TARIFF (Continued)**

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8. Testing Requirements (Continued)



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**COMMUNITY-BASED ENERGY DEVELOPMENT (C-BED) TARIFF
(CLOSED TO NEW APPLICANTS)**

Section No. 10
3rd Revised Sheet No. 160

AVAILABILITY

Any qualifying community energy partnership, as defined by section 216B.1612 subdivision 8, or community-based renewable power developer who owns a electric generating facility in Minnesota meeting the requirements of this tariff and deliver and sell the renewable energy output to NSP up to the quantity established in the most recent resource plan may apply to the Company for selection. "Renewable" refers to technologies as defined by section 216B.1691, subdivision 1, paragraph (a). The Company must receive Commission approval for all power purchase agreements under this tariff. Purchase power agreements for projects greater than 10 MW installed nameplate may require an exception from the commission Orders relating to competitive bidding for NSP. A project that is operating under a power purchase agreement under a C-BED tariff is not eligible for net energy billing under section 216B.164, subdivision 3, Excess Generation-Average Retail Utility Energy Service Rate Code A50, or for production incentives under section 216C.41. The following information provides guidelines for the negotiated purchase power agreements for service under this tariff. Nothing in this schedule shall be construed to obligate Company to enter into a power purchase agreement. In the alternative, at the discretion of a qualifying beneficiary, the qualifying beneficiary and Company may negotiate a power purchase agreement with terms different from this schedule. Company must receive Minnesota Public Utilities Commission approval of a power purchase agreement for a C-BED project. In addition, service may be provided under the terms described in Section 9 and Section 10 of the Minnesota Electric Rate Book.

T
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QUALIFYING BENEFICIARY

A qualifying beneficiary must be at least one of the following: (1) a Minnesota resident individually or as a member of a Minnesota limited liability company organized under Chapter 322B and formed for the purpose of developing a C-BED project, (2) a Minnesota nonprofit organization organized under chapter 317A of Minnesota state laws; (3) a Minnesota cooperative association organized under chapter 308A or 308B of Minnesota state law, including a rural electric cooperative association or a generation and transmission cooperative on behalf of and at the request of a member distribution utility; (4) a Minnesota political subdivision or local government including, but not limited to, a municipal electric utility, or a municipal power agency on behalf of and at the request of a member distribution utility; the office of the commissioner of Iron Range resources and rehabilitation; a county, statutory or home rule charter city, town, school district, or public or private higher education institution or any other local or regional governmental organization such as a board, commission or association, or (5) a tribal council; or (6) a legal (i) entity formed for a purpose other than to participate in C-BED projects; (ii) whose principal place of business or principal executive office is located in Minnesota; and (iii) that provides labor, services, equipment, components, or debt financing to a C-BED project.

JOINT VENTURE

A qualifying beneficiary, or any combination of qualifying beneficiaries, may develop a joint venture project with a nonqualifying renewable energy project developer. However, the terms of the C-BED tariff may only apply to the portion of the energy production of the total project output that is directly proportional to the equity share of the project owned by the qualifying beneficiaries. The qualifying beneficiary shall not transfer the C-BED project during the initial term of a power purchase agreement if the transfer will result in the project's no longer qualifying under section 216B.1612, subdivision 2, paragraph (h).

(Continued on Sheet No. 10-161)

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**COMMUNITY-BASED ENERGY DEVELOPMENT (C-BED) TARIFF
(CLOSED TO NEW APPLICANTS)
(Continued)**

Section No. 10
2nd Revised Sheet No. 161

QUALIFIED BENEFICIARY BENEFITS

No single qualifying beneficiary, including any parent company or subsidiary of the qualifying beneficiary, may own more than 15 percent of a C-BED wind energy project unless (1) the C-BED wind energy project consists of only one or two turbines; or (2) the qualifying owner is a public entity listed under Minnesota Statute 216B.1612, subd. 2(c), clause (5). Projects must demonstrate that at least 51% of the gross revenues from a power purchase agreement over the life of the project are qualifying revenues. Additionally, projects must demonstrate they have resolution of support adopted by the county board of each county in which the project is to be located, or in the case of a project located within the boundaries of a reservation, the tribal council for that reservation.

CONTRACT

C-BED developers must enter into a power purchase agreement under this program for a term of 20 years, subject to Commission approval. At the discretion of the developer, a community based projects developer and the Company may negotiate a power purchase agreement with the Company that differs from these rate provisions.

RATE

The Company shall pay the developer according to a rate schedule such that the payments over the 20-year life of the agreement compares reasonably to the ranges of prices obtained in recent solicitations and executed power purchase agreements. The rate shall normally be higher in the first ten years of the agreement than in the last ten years. The discount rate required to calculate the net present value is the ten-year United States Treasury Yield as quoted in the Wall Street Journal as of the date of application for determination under subdivision 10, plus five percent; except that the discount rate applicable to any qualifying revenues contingent upon an equity investor earning a specified internal rate of return is the ten-year United States Treasury Yield, plus eight percent. The payment of this rate includes payment for the property rights of all renewable attributes (or, in the event of the development of a Commission-approved renewable energy tracking system, the renewable energy credits) associated with the generation from the C-BED project. That is, receipt of this payment constitutes a transfer of the property rights of all renewable attributes (or renewable energy credits) associated with the generation from the C-BED project to Company, unless otherwise agreed to by the qualifying owners of the project and Company.

SECURITY

Qualifying and nonqualifying beneficiaries must provide sufficient security to secure performance under the power purchase agreement.

(Continued on Sheet No. 10-162)

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**COMMUNITY-BASED ENERGY DEVELOPMENT (C-BED) TARIFF
(CLOSED TO NEW APPLICANTS)
(Continued)**

Section No. 10
2nd Revised Sheet No. 162

PARTICIPATION

To the extent possible, the developer of a C-BED project must provide, in writing, an opportunity to invest in the C-BED project to each property owner on whose property a high-voltage transmission line is constructed that will transmit the energy generated by the C-BED project to market, if the property is located and the owner resides in the county where the C-BED project is located. In addition, developers may include opportunities to invest for property owners on whose property a high voltage transmission line transmitting the energy generated by the C-BED project to market currently exists and who resides in the county where the C-BED project is located or in an adjacent county.

BID PRIORITY

Periodically, the Company may elect to purchase renewable energy from C-BED projects. When evaluating which C-BED projects to purchase from, the Company will consider the net present value of rate after adding the expected cost of curtailments and, if anticipated, wheeling costs. When the Company needs to construct new generation or purchase the output from new generation, then in order to fulfill its obligations under Minnesota Statute 216B.1691, the Company will make a good faith effort to determine if one or more C-BED projects would meet the utility's cost and reliability requirements, applying standard reliability criteria, to fulfill some or all of the identified need at minimal impact to current customers. Standard reliability criteria means the project: (1) can be safely integrated into and operated within the utility's grid without causing any adverse or unsafe consequences; and (2) is consistent with the utility's resource needs as identified in its most recent resource plans submitted under section 216B.2422. Aggregation of C-BED projects is encouraged. Nothing in this section shall be construed to obligate the Company to enter into a power purchase agreement under a C-Bed tariff.

TERMS AND CONDITIONS OF SERVICE

1. A C-BED project must be capable of being integrated into the electric system and operate in a safe manner as determined by the transmission or delivery service provider.
2. The C-BED owner(s) must enter into an appropriate interconnection agreement with the transmission or delivery service provider meeting all applicable technical specifications and interconnection requirements.
3. A power purchase agreement between the Company and the project must be executed and approved by the Minnesota Public Utilities Commission pursuant to Minnesota Statute 216B.1612.

State of Minnesota

Distributed Energy Resources Interconnection Process

(MN DIP)

v.2.3

(As adopted for Northern States Power Company)

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**MINNESOTA DISTRIBUTED ENERGY RESOURCES
INTERCONNECTION PROCESS (MN DIP)
(Continued)**

Section No. 10
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Glossary of Terms

Attachment 1: Pre-Application Report Request Form

Attachment 2: Simplified Application Form

Exhibit A – Terms and Conditions for Interconnecting an Inverter-Based DER No Larger than 20 kW

Exhibit B – For Energy Storage

Exhibit C – Certificate of Completion

Attachment 3: Interconnection Application Form

Attachment 4: Certification Codes and Standards

Attachment 5: Certification of Distributed Energy Resource Equipment

Attachment 6: System Impact Study Agreement

Attachment 7: Facilities Study Agreement

Attachment 8: Flow Charts

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**MINNESOTA DISTRIBUTED ENERGY RESOURCES
INTERCONNECTION PROCESS (MN DIP)
(Continued)**

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Foreword

The Minnesota Public Utilities Commission is charged by Minnesota Statute §216B.1611 to establish generic, statewide standards for the interconnection and parallel operation of distributed energy resources¹ of no more than 10 MW. These updated Minnesota interconnection standards strive to:

- 1) Establish a practical, efficient interconnection process that is easily understandable for everyone involved;
- 2) Maintain a safe and reliable electric system at fair and reasonable rates;
- 3) Give maximum possible encouragement of distributed energy resources consistent with protection of the ratepayers and the public;
- 4) Be consistent statewide and incorporate newly revised national standards;
- 5) Be technology neutral and non-discriminatory.

At a minimum, these standards must:

- 1) To the extent possible, be consistent with industry and other federal and state operational and safety standards;
- 2) Provide for the low-cost, safe, and standardized interconnection of distributed energy resources;
- 3) Take into account differing system requirements and hardware; as well as, the overall demand load requirements of individual utilities;
- 4) Allow for reasonable terms and conditions, consistent with the cost and operating characteristics of the various technologies, so that a utility can reasonably be assured of the reliable, safe and efficient operation of the interconnected equipment;
- 5) Establish a standard interconnection agreement that sets forth the contractual terms under which a company and customer agree that one or more facilities may be interconnected with the company's utility system; and standard applications for interconnection and parallel operation with the utility system.

This standards document is modelled after the Federal Energy Regulatory Commission's Small Generator Interconnection Process (FERC SGIP), and explains the process to interconnect Distributed Energy Resources for parallel operation with the Area Electrical Power System (Area EPS); including templates for applications and study agreements. There are three companion documents: 1) Minnesota Distributed Energy Resource Interconnection Agreement (MN DIA); 2) Minnesota Distributed Energy Resource Technical Interconnection and Interoperability Requirements (MN Technical Requirements or Minnesota Technical Requirements)²; and until updated or replaced 3) Attachment 6 Rates from the statewide interconnection standards adopted in 2004 (September 28, 2004 Order in E-999/CI-01-1023.)

¹ "Distributed Energy Resources" (DER) is emerging terminology used to capture both traditional "distributed generation" and storage technologies; however, this term is not currently defined in Minnesota statute or rules, and at times the Commission applies it to a broader category that includes demand-side management (controlling load like air conditioners or water heaters) and, in some cases, even energy efficiency and electric vehicles. For this document, the definition is consistent with IEEE 1547 and limited to generation and storage, and does not include DER that behave solely as load.

² See MN DIP Attachment 4: Certification Codes and Standards regarding statewide technical requirements in the interim between adoption of MN DIP and adoption of updated MN Technical Requirements.

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Section No. 10
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Section 1. Application

1.1 Applicability

1.1.1 The Minnesota Distributed Energy Resources Interconnection Process (MN DIP) applies to any Distributed Energy Resource (DER) no larger than 10 MW interconnecting to, and operating in parallel with, an Area EPS distribution system in Minnesota.¹ See Minnesota Technical Requirements for more detail on what constitutes parallel operation. For the applicable interconnection process for DERs larger than 10 MW interconnected to, and operated in parallel with, an Area EPS distribution system in Minnesota, contact the Area EPS for details on the applicable interconnection process. The exception is Distributed Energy Resource interconnections that are subject to Federal Energy Regulatory Commission (FERC) jurisdiction.²

1.1.1.1 An application to interconnect a certified³, inverter-based DER no larger than 20 kilowatts (kW) shall be evaluated under the Section 2 Simplified Process.

1.1.1.2 An application to interconnect a DER shall be evaluated under the Section 3 Fast Track Process if the eligibility requirements of Section 3.1 Applicability

1.1.1.3 An application to interconnect a DER that does not meet the Simplified Process or Fast Track Process eligibility requirements, or does not pass the review as described in either process, shall be evaluated under the Study Process.

1.1.1.4 Attachment 8 contains flow charts that provide an overview of the Simplified Process, the Fast Track Process, and the Study Process.

1.1.1.5 Prior to submitting an Interconnection Application, the Interconnection Customer may ask the Area EPS Operator's Interconnection Coordinator whether the proposed interconnection is subject to these procedures. The Area EPS Operator shall respond within fifteen (15) Business Days.

¹ [Minnesota Statute §216B.1611](#)

² The Federal Regulation and Development of Power Act ([16 U.S. Code Subchapter II](#)) outlines federal regulation of wholesale sales and transmission in interstate commerce and state regulation of generation, distribution, and retail sales.

³ See Attachment 4 and Attachment 5 for certification criteria.

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- 1.1.2 Capitalized terms used herein shall have the meanings specified in the Glossary of Terms or the body of these procedures. All references to DER Nameplate Rating or maximum capacity as described in 5.14.3¹ herein are in alternating current (AC).
- 1.1.3 Neither these procedures nor the requirements included hereunder unless by mutual agreement of the Area EPS Operator and the Interconnection Customer apply to DERs interconnected, approved for interconnection or Interconnection Applications submitted to by the Area EPS Operator prior to June 17, 2019, and later deemed complete (provided these applications are later deemed complete following any applicable revisions no later than 60 days following this date). These procedures and the requirements hereunder shall apply to applications to modify existing DERs if the application to modify is submitted on or after June 17, 2019.
- 1.1.3.1 Nothing in this MN DIP affects an Interconnection Customer's Queue Position assigned before the effective date of this MN DIP. The Parties agree to complete work on any interconnection study agreement executed prior to the effective date of this MN DIP in accordance with the terms and conditions of that interconnection study agreement. Any new studies or other additional work will be completed pursuant to this MN DIP.
- 1.1.4 Infrastructure security of electric system equipment and operations and control hardware and software is essential to ensure day-to-day reliability and operational security. All public utilities are expected to meet basic standards for electric system infrastructure and operational security, including physical, operational, and cyber-security practices.
- 1.1.5 References in these procedures to an Interconnection Agreement are to the Uniform Statewide Contract or Minnesota Distributed Energy Resource Interconnection Agreement (MN DIA).
- 1.1.5.1 The Uniform Statewide Contract (Minn. R. 7835.9910) replaces the need to use the MN DIA if all of the following conditions are met and the Interconnection Customer does not request the MN DIA:
- 1.1.5.1.1 Certified equipment
- 1.1.5.1.2 20 kWac or less of a qualifying DER Capacity
- 1.1.5.1.3 No Area EPS system modifications are required to accommodate the DER
- 1.1.5.1.4 Signed Uniform Statewide Contract Attachment 1: Pre-Application Report Request Form

¹ See Minnesota Technical Requirements for more detail on when to apply Nameplate Rating or a limited maximum capacity as defined in 5.14.3.

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- 1.1.5.1.5 Attachment 2: Simplified Application Form
Attachment 2: Simplified Application
- 1.1.5.1.6 The Area EPS Operator may propose in its tariff an increase to the size threshold for the application of the Uniform Statewide Contract as a replacement for the MN DIA in its tariff. There may also be situations where the Interconnection Customer would need to sign both the Uniform Statewide Contract and the MN DIA; such as, where the Nameplate Rating of the system is above the size threshold where the Uniform Statewide Contract replaces the MN DIA but the DER qualifies for net metering (Minn. Stat. §216B.164 and Minn. R. Ch. 7835) under the Uniform Statewide Contract.
- 1.1.5.2 The reference to Interconnection Agreement also applies when the Area EPS Operator and Interconnection Customer modify MN DIA with Commission approval.
- 1.1.6 The Area EPS Operator and Interconnection Customer may jointly seek Commission approval of an amendment to the MN DIA for use between them for a specific Interconnection Application in the following ways:
- 1.1.6.1 File a Petition with the Commission, or
- 1.1.6.2 File a Notice with the Commission of the proposed amendment. The Notice should include a copy of the amendment showing in redline format how the amendment would alter the MN DIA between the Area EPS Operator and Interconnection Customer for the Interconnection Application at issue. If no objection or notice of intent to object is filed within 30 days, then the proposed amendment would be considered to be approved by the Commission. If there is a timely filed objection of notice of intent to object, then the proposed amendment would not be considered to have been approved by the Commission and could only be used if the Commission subsequently issues a written order authorizing its use.
- 1.1.7 Commission approval of an amendment to the Interconnection Agreement is not needed where such an amendment only addresses updating or correcting: 1) information specified in the Interconnection Application; 2) exhibits or attachments to the Interconnection Agreement as long as they are not additional agreements or requirements not covered in the MN DIP or MN Technical Requirements; or 3) information provided in the blank lines to the MN DIA or Uniform Statewide Contract forms.

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1.2 Online Applications and Electronic Submission

1.2.1 The Area EPS Operator shall allow Pre-Application Report requests and Interconnection Applications to be submitted electronically; such as, through the Area EPS Operator's website or via email. The Area EPS Operator may allow the Interconnection Agreement to be submitted electronically.

1.2.1.1 The Area EPS Operator may allow for electronic signatures to be used for the Pre-Application Report request, Interconnection Application and related agreements, including the Interconnection Agreement, and forms.

1.2.2 The Area EPS Operator shall dedicate a page on its website or direct customers to a website with generic information on the MN DIP that the Area EPS Operator finds comports with its process. The relevant information that shall be available to the Interconnection Customer via a website includes:

1.2.2.1 The MN DIP and attachments in an electronically searchable format;

1.2.2.2 The Area EPS Operator's Interconnection Application and all associated forms in a format that allows for electronic entry of data;

1.2.2.3 The Uniform Statewide Contract and the Area EPS Operator's tariff version of the MN DIA;

1.2.2.4 Example documents; including, at a minimum, an example one-line diagram with required labels; and

1.2.2.5 Contact information for the Area EPS Operator's DER interconnection coordinator(s) and submission of Interconnection Applications, including email and phone number.

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1.3 Communications

- 1.3.1 The Area EPS Operator shall designate a DER interconnection coordinator(s) and this person or persons shall serve as a single point of contact from which general information on the application process and on Affected System(s) can be obtained through informal request from the Interconnection Customer presenting a proposed project for a specific site. The name, telephone number, and e-mail address of such contact employee or office shall be made available on the Area EPS Operator's Internet website in accordance with section 1.2.2.5. The Area EPS Operator may have several DER Interconnection Coordinators assigned. The DER Interconnection Coordinator shall be available to provide coordinator assistance with the Interconnection Customer, but is not responsible to directly answer or resolve all of the issues involved in review and implementation of the interconnection process and standards. Upon request, electric system information provided to the Interconnection Customer should include relevant system study results, interconnection studies, and other materials useful to an understanding of an interconnection at a particular point on the Area EPS Operator's System, to the extent such provision does not violate the privacy policies of the Commission, confidentiality provisions of prior agreements or critical infrastructure requirements. This listing does not include a Pre-Application Report under Section 1.4. The Area EPS Operator shall comply with reasonable requests for such information.
- 1.3.2 The Interconnection Customer may designate, on the Interconnection Application or in writing after the Application has been submitted, an Application Agent to serve as the single point of contact to coordinate with the DER Interconnection Coordinator on their behalf. Designation of an Application Agent does not absolve the Interconnection Customer from signing interconnection documents and the responsibilities outlined in the MN DIP and Interconnection Agreement.
- 1.3.3 Engineering Communication: Upon request of either party or the Commission, for the purpose of exchanging information regarding an active Interconnection Application, the Area EPS Operator and the Interconnection Customer shall each identify one point of contact with technical expertise for their organizations.

1.4 Pre-Application Report

- 1.4.1 In addition to the information described in section 1.3.1, which may be provided in response to an informal request, an Interconnection Customer may submit a formal written request form along with a non-refundable fee of up to \$300 for a Pre-Application Report on a proposed project at a specific site. The Area EPS Operator shall provide the data described in section 1.4.2 to the Interconnection Customer within fifteen (15) Business Days of receipt of the completed request form and payment of the up to \$300 fee. The Pre-Application Report produced by the Area EPS Operator is non-binding, does not confer any rights, and the Interconnection Customer must still successfully apply to interconnect to the Area EPS Operator's system. The written Pre-Application Report request form shall include the information in sections 1.4.1.1 through 1.4.1.8 below to clearly and sufficiently identify the location of the proposed Point of Common Coupling.

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- 1.4.1.1 Project contact information, including name, address, phone number, and email address.
- 1.4.1.2 Project location (street address with nearby cross streets and town). Interconnection Customer may choose to also provide an aerial map or GPS coordinates for increased accuracy.
- 1.4.1.3 Meter number, pole number, or other equivalent information identifying proposed Point of Common Coupling, if available.
- 1.4.1.4 DER type(s) (e.g., solar, wind, combined heat and power, storage, solar + storage, etc.).
- 1.4.1.5 Nameplate Rating (alternating current kW).
- 1.4.1.6 Single or three phase DER configuration.
- 1.4.1.7 Stand-alone generator (no onsite load, not including station service – Yes or No?).
- 1.4.1.8 Is new service requested? Yes or No? If there is existing service, include the customer account number, site minimum and maximum current or proposed electric loads in kW (if available) and specify how the load is expected to change.
- 1.4.2 Using the information provided in the Pre-Application Report request form in section 1.4.1, the Area EPS Operator will identify the substation/area bus, bank or circuit likely to serve the proposed Point of Common Coupling. This selection by the Area EPS Operator does not necessarily indicate, after application of the screens and/or study, that this would be the circuit the project ultimately connects to. The Interconnection Customer must request additional Pre-Application Reports if information about multiple Points of Common Coupling is requested. Subject to 1.4.3, the Pre-Application Report will include the following information:
- 1.4.2.1 Total capacity (in megawatts (MW)) of substation/area bus, bank or circuit based on normal or operating ratings likely to serve the proposed Point of Common Coupling.
- 1.4.2.2 Existing aggregate generation capacity (in MW) interconnected to a substation/area bus, bank or circuit (i.e., amount of generation online) likely to serve the proposed Point of Common Coupling.
- 1.4.2.3 Aggregate queued generation capacity (in MW) for a substation/area bus, bank or circuit (i.e., amount of generation in the queue) likely to serve the proposed Point of Common Coupling.

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- 1.4.2.4 Available capacity (in MW) of substation/area bus or bank and circuit likely to serve the proposed Point of Common Coupling (i.e., total capacity less the sum of existing aggregate generation capacity and aggregate queued generation capacity).
- 1.4.2.5 Substation nominal distribution voltage and/or transmission nominal voltage if applicable.
- 1.4.2.6 Nominal distribution circuit voltage at the proposed Point of Common Coupling.
- 1.4.2.7 Approximate circuit distance between the proposed Point of Common Coupling and the substation.
- 1.4.2.8 Relevant line section(s) actual or estimated peak load and minimum load data, including daytime minimum load as described in section 3.4.4.1 below and absolute minimum load, when available.
- 1.4.2.9 Whether the Point of Common Coupling is located behind a line voltage regulator.
- 1.4.2.10 Number and rating of protective devices and number and type (standard, bi-directional) of voltage regulating devices between the proposed Point of Common Coupling and the substation/area. Identify whether the substation has a load tap changer.
- 1.4.2.11 Number of phases available on the Area EPS medium voltage system at the proposed Point of Common Coupling. If a single phase, distance from the three-phase circuit.
- 1.4.2.12 Limiting conductor ratings from the proposed Point of Common Coupling to the distribution substation.
- 1.4.2.13 Whether the Point of Common Coupling is located on a spot network, grid network, or radial supply.
- 1.4.2.14 Based on the proposed Point of Common Coupling, existing or known constraints such as, but not limited to, electrical dependencies at that location, short circuit interrupting capacity issues, power quality or stability issues on the circuit, capacity constraints, or secondary networks.
- 1.4.3 The Pre-Application Report need only include existing data. A request for a Pre-Application Report does not obligate the Area EPS Operator to conduct a study or other analysis of the proposed DER in the event that data is not readily available. If the Area EPS Operator cannot complete all or some of a Pre-Application Report due to lack of available data, the Area EPS Operator shall provide the Interconnection Customer with a Pre-Application Report that includes the data that is available. The confidentiality provisions found in 5.9 apply to Pre-Application Reports.

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- 1.4.4 The provision of information on “available capacity” pursuant to section 1.4.2.4 does not imply that an interconnection up to this level may be completed without impacts since there are many variables studied as part of the interconnection review process. The distribution system is dynamic and subject to change, and data provided in the Pre-Application Report may become outdated at the time of the submission of the complete Interconnection Application. Notwithstanding any of the provisions of this section, the Area EPS Operator shall, in good faith, include data in the Pre-Application Report that represents the best available information at the time of reporting.

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1.5 Interconnection Application

- 1.5.1 The Interconnection Customer shall submit an Interconnection Application to the Area EPS Operator, together with the processing fee or deposit specified in the Interconnection Application. Additional fees or deposits for the interconnection process shall not be required, except as otherwise specified in these procedures. Application form templates are available in Attachment 2: Simplified Application Form and Attachment 3. The specific fees for Simplified Process, Fast Track Process and Study Process are:

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- 1.5.1.1 The processing fee for the Simplified Process Application shall be \$100.
- 1.5.1.2 For certified, Fast Track Process eligible applications, the processing fee shall be \$100 + \$1/kW. For non-certified Fast Track Process eligible applications, the processing fee shall be \$100 + \$2/kW.
- 1.5.1.3 For an Interconnection Application that is not eligible or does not apply for Simplified Process or Fast Track Process, the processing fee shall be a down payment of \$1,000 plus \$2.00 per kW toward the deposit required for the study(s) under Section 4 Study Process.
- 1.5.1.4 Interconnection Applications shall contain a single line diagram and site diagram. A signature from a professional engineer licensed in Minnesota shall be required when: 1) Certified equipment is greater than 250 kW; or 2) non-certified equipment is greater than 50 kW.

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- 1.5.2 The Interconnection Application shall be date- and time-stamped upon initial and, if necessary, resubmission receipt. Unless Section 2 Simplified Process applies, the Interconnection Customer shall be notified of receipt by the Area EPS Operator within three (3) Business Days of receiving the Interconnection Application. The Area EPS Operator shall notify the Interconnection Customer within ten (10) Business Days of the receipt of the Interconnection Application as to whether the Interconnection Application is complete or incomplete. If the Interconnection Application is incomplete, the Area EPS Operator shall provide along with the notice that the Interconnection Application is incomplete, a written list detailing all information that must be provided to complete the Interconnection Application. The Interconnection Customer will have ten (10) Business Days after receipt of the notice to submit all of the listed information. If the Interconnection Customer does not provide the listed information within the deadline the Interconnection Application will be deemed withdrawn. An Interconnection Application will be deemed complete upon submission of documents adhering to Minnesota Technical Requirements and containing the listed information to the Area EPS Operator. The Area EPS Operator will have five (5) Business Days to review the additional material and notify the Interconnection Customer if the Interconnection Application is deemed complete. The date-and time- stamp of receipt of a complete Interconnection Application shall be accepted as the qualifying date for the purposes of establishing queue position as described in section 1.8.
- 1.6 Modification of the Interconnection Application or a DER Interconnection
- 1.6.1 At any time after an Interconnection Application is deemed complete, including after the receipt of Fast Track, supplemental review, system impact study, and/or facilities study results, the Interconnection Customer, the Area EPS Operator, or the Affected System owner may identify modifications to the planned Interconnection that may improve the costs and benefits (including reliability) of the Interconnection, and/or the ability of the Area EPS Operator to accommodate the Interconnection. The Interconnection Customer shall submit to the Area EPS Operator, in writing, all proposed modifications to any information provided in the Interconnection Application. Neither the Area EPS Operator nor the Affected System operator may unilaterally modify the Interconnection Application.
- 1.6.2 Within ten (10) Business Days of receipt of a proposed modification, the Area EPS Operator shall evaluate whether a proposed modification to either an Interconnection Application or an existing DER Interconnection constitutes a Material Modification. If applicable, the Area EPS Operator shall make Reasonable Effort to consult with the Affected System owner. The definition in Glossary of Terms includes examples of what does and does not constitute a Material Modification.

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- 1.6.2.1 If the proposed modification is determined to be a Material Modification, then the Area EPS Operator shall notify the Interconnection Customer in writing that the Customer may: 1) withdraw the proposed modification; or 2) proceed with a new Interconnection Application for such modification. The Interconnection Customer shall provide its determination in writing to the Area EPS Operator within ten (10) Business Days after being provided the Material Modification determination results. If the Interconnection Customer does not provide its determination, the Customer's Application shall be deemed withdrawn.
- 1.6.2.2 If the proposed modification is determined not to be a Material Modification, then the Area EPS Operator shall notify the Interconnection Customer in writing that the modification has been accepted and that the Interconnection Customer shall retain its eligibility for interconnection, including its place in the interconnection queue.
- 1.6.3 Any dispute as to the Area EPS Operator's determination that a modification constitutes a Material Modification shall proceed in accordance with the dispute resolution provisions in section 5.3 of these procedures.
- 1.6.4 Any modification to machine data, equipment configuration or to the interconnection site of the DER not agreed to in writing by the Area EPS Operator and the Interconnection Customer may be deemed a withdrawal of the Interconnection Application and may require submission of a new Interconnection Application, unless proper notification of each Party by the other as described in sections 1.6.1 and 1.6.2.
- 1.7 Site Control
- Documentation of site control must be submitted with the Interconnection Application. Site control may be demonstrated through providing documentation showing any of the following:
- 1.7.1 Ownership of, a leasehold interest in, or a right to develop a site for the purpose of constructing the DER;
- 1.7.2 An option to purchase or acquire a leasehold site for such purpose; or
- 1.7.3 An exclusivity or other business relationship between the Interconnection Customer and the entity having the right to sell, lease, or grant the Interconnection Customer the right to possess or occupy a site for such purpose; or
- 1.7.4 For DERs utilizing the Section 2 Simplified Process, proof of site control may be demonstrated by the site owner's signature on the Interconnection Application.

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1.8 Queue Position

- 1.8.1 Queue Position is assigned by the Area EPS Operator based on when the Interconnection Application is deemed complete as described in section 1.5.2. The Queue Position of each Interconnection Application will be used to determine the cost responsibility for the Upgrades necessary to accommodate the interconnection. The Queue Position also establishes conditional interconnection capacity for an Interconnection Customer, contingent upon all requirements of the MN DIP and MN Technical Requirements being met.
- 1.8.2 Subject to the provisions in sections 1.5, 1.6, and 1.7, the DER shall retain the Queue Position assigned to their Interconnection Application throughout the review process for the purpose of determining cost responsibility and conditional interconnection capacity, including when moving through the processes covered by Section 2 Simplified Process and Section 3 Fast Track Process. Failure by the Interconnection Customer to meet the time frames outlined in these procedures or request a timeline extension shall result in a withdrawal of the Interconnection Application. The Area EPS Operator shall notify the Interconnection Customer of the missed time frame with an opportunity to request a timeline extension as defined in section 5.2.3 before the Interconnection Application is deemed withdrawn.
- 1.8.3 The Area EPS Operator shall maintain a single, administrative queue and may manage the queue by geographical region (i.e. feeder, substation, etc.) This administrative queue shall be used to address Interconnection Customer inquiries about the queue process. If the Area EPS Operator and the Interconnection Customer(s) agree, Interconnection Applications may be studied in clusters for the purpose of the system impact study; otherwise, they will be studied serially.
- 1.8.4 The Area EPS Operator shall maintain a public interconnection queue, available in a sortable spreadsheet format on its website, which it shall update on at least a monthly basis unless no changes to the spreadsheet have occurred in that month. The date of the most recent update shall be clearly indicated.
- 1.8.4.1 At a minimum, the following shall be included in the public interconnection queue:
- 1.8.4.1.1 Application or Queue Number
 - 1.8.4.1.2 Date Application Deemed Complete
 - 1.8.4.1.3 Interconnection Process Track (Simplified, Fast Track, or Study Process)
 - 1.8.4.1.4 Proposed DER Capacity (Nameplate Rating unless limited as defined in 5.14.3)
 - 1.8.4.1.5 DER type (technology)

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1.8.4.1.6 Proposed DER Location by geographic region (i.e. by feeder or line section)

1.8.4.1.7 Status of the Application's progress through the process (e.g. Initial Review, Supplemental Review, Facilities Study, Construction, Inspection, etc.)

Section 2. Simplified Process

2.1 Applicability

2.1.1 For Certified, inverter-based DERs with a DER Capacity of 20 kW ac or less: The Area EPS Operator shall comport with the Simplified Process, including the time frames described in that process. Simplified Process eligibility does not imply or indicate that a DER will pass the Initial Review Screens, failure to pass the screens will route the application to the Fast Track Process.

2.1.2 Certified Equipment – UL 1741 listing is a common form of DER inverter certification. See Attachment 4: Certification Codes and Standards and Attachment 5: Certification of Distributed Energy Resource Equipment.

2.2 Simplified Process Application Review Process

2.2.1 The Interconnection Customer with an eligible DER shall complete the Simplified Process Application and submit it and the application processing fee to the Area EPS Operator. A Simplified Process Application template is provided in Attachment 2: Simplified Application Form

2.2.2 Within ten (10) Business Days of receipt of the Simplified Process Application, the Area EPS Operator shall acknowledge to the Interconnection Customer receipt of the Simplified Application, evaluate the Simplified Process Application for completeness, and notify the Interconnection Customer whether the Simplified Process Application is or is not complete, and, if not, identify what material is missing. The Area EPS Operator shall to the best of its ability identify all missing material and other errors or omissions at this time. The Interconnection Customer shall submit any additional material within five (5) Business Days of the Area EPS Operator's notice. The Area EPS Operator shall have an additional five (5) Business Days to review the additional material and notify the Interconnection Customer that the Simplified Process Application is complete.

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- 2.2.3 The Area EPS Operator shall determine if the DER can be interconnected safely and reliably using the Initial Review Screens contained in the Fast Track Process at 3.2.1, and without construction of facilities by the Area EPS Operator. The Area EPS Operator has twenty (20) Business Days from receipt of a complete Simplified Process Application to complete this process and inform the Interconnection Customer of the results.

Unless the Area EPS Operator determines and demonstrates that the DER cannot be interconnected safely and reliably or requires construction of facilities by the Area EPS Operator, the Area EPS Operator approves the Application and provides the Interconnection Customer an executable Uniform Statewide Contract or MN DIA within five (5) days as described in sections 1.1.5.1 and 5.1.1.

If the Area EPS Operator determines the DER can be connected safely and reliably only with construction of facilities by the Area EPS Operator, the Area EPS Operator shall follow the procedures set forth in Section 3.2.2.

If the Area EPS Operator does not or cannot determine that the DER may be interconnected safely and reliably unless the Interconnection Customer is willing to consider minor modifications or further study, the Area EPS Operator shall follow the procedures set forth in Section 3.2.3.

2.3 Simplified Interconnection

- 2.3.1 The Interconnection Customer shall sign and return the Interconnection Agreement within thirty (30) Business Days¹ or may request an extension as described in Section 5.1.2 and 5.2. The Interconnection Customer must submit to the Area EPS Operator either 1) a signed copy of the Uniform Statewide Contract, if applicable, which serves as both the power purchase agreement and Interconnection Agreement; or 2) the Interconnection Customer must submit a signed Uniform Statewide Contract, if applicable, and a separate MN DIA as described in section 1.1.5.

- 2.3.1.1 Upon receipt of the signed Interconnection Agreement, and then after fully executing it as provided for in Section 5.1.2, the Area EPS Operator shall schedule and execute appropriate construction of facilities, if necessary, which shall be completed prior to the Interconnection Customer returning the Certificate of Completion. If construction of facilities is required by the Area EPS Operator, the Area EPS Operator shall notify the customer upon completion of construction.

¹ The 30-day timeframe in this step originates from Section 5.1.2 and does not represent a new step or timeframe.

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- 2.3.2 After installation, the Interconnection Customer returns the Certificate of Completion to the Area EPS Operator. Prior to parallel operation, and consistent with the MN DIP, the Area EPS Operator may inspect the DER for compliance with standards, which may include a witness test, and may schedule appropriate metering replacement, if necessary. The Area EPS Operator is obligated to complete the witness test, if required, within ten (10) Business Days of the receipt of the Certificate of Completion. If the Area EPS Operator does not inspect within ten (10) Business Days, the witness test is deemed waived.
- 2.3.3 Within three (3) Business Days of inspection or waiver of inspection, the Area EPS Operator shall notify the Interconnection Customer in writing that interconnection of the DER has permission to operate. If the witness test is not satisfactory, the Area EPS Operator has the right to disconnect the DER. The Interconnection Customer has no right to operate in parallel, except for optional testing not to exceed two hours, until permission to operate is granted by the Area EPS Operator.

Section 3. Fast Track Process

3.1 Applicability

- 3.1.1 The Fast Track Process is available to an Interconnection Customer proposing to interconnect a DER with the Area EPS Operator's Distribution System if the DER capacity does not exceed the size limits identified in this Section, including the table below and does not qualify for the Section 2 Simplified Process. Fast Track eligibility does not imply or indicate that a DER will pass the Fast Track Initial Review Screens in 3.2.1 or the Supplemental Review screens in 3.4 below.

Fast Track eligibility for DERs is determined based upon the generator type, the size of the generator, voltage of the line, and the location of and the type of line at the Point of Common Coupling. All synchronous and induction machines must be no larger than 2 MW to be eligible for Fast Track Process consideration. The Fast Track Process size limits are included in the table below.

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Fast Track Eligibility for Distributed Energy Resources		
Line Voltage	Fast Track Eligibility ¹ Regardless of Location	Fast Track Eligibility for certified, inverter-based DER on a Mainline ² and ≤ 2.5 Electrical Circuit Miles from Substation ³
< 5 kV	≤ 500 kW	≤ 500 kW
≥ 5 kV and < 15 kV	≤ 1 MW	≤ 2 MW
≥ 15 kV and < 30 kV	≤ 3 MW	≤ 4 MW
≥ 30 kV and ≤ 69 kV	≤ 4 MW	≤ 5 MW

3.1.2 In addition to the size threshold, the Interconnection Customer's proposed DER must meet the codes, standards, and certification requirements of Attachment 4 and Attachment 5 of these procedures, or the Area EPS Operator has reviewed the design or tested the proposed DER and is satisfied that it is safe to operate.

3.2 Initial Review

Within 15 Business Days after the Area EPS Operator notifies the Interconnection Customer it has received a complete Interconnection Application, the Area EPS Operator shall perform an initial review using the screens set forth below, notify the Interconnection Customer of the results; including copies of the analysis and data underlying the Area EPS Operator's determinations under the screens.

The technical screens listed in this section shall not preclude the Area EPS Operator from seeking approval of tools that perform screening functions using different methodology given that the analysis is aimed at preventing the same voltage, thermal and protection limitations as the initial and supplemental review screens described below.

¹ Synchronous and induction machines eligibility is limited to no more than 2 MW even when line voltage is greater than 15 kV.

² For purposes of this table, a Mainline is the three-phase backbone of a circuit. It will typically constitute lines with wire sizes of 4/0 American wire gauge, 266 kcmil, 336.4 kcmil, 397.5 kcmil, 477 kcmil and 795 kcmil.

³ An Interconnection Customer can determine this information about its proposed interconnection location in advance by requesting a pre-application report pursuant to section 1.4.

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3.2.1 Initial Review Screens

- 3.2.1.1 The proposed DER's Point of Common Coupling must be on a portion of the Area EPS Operator's Distribution System.
- 3.2.1.2 For interconnection of a proposed DER to a radial distribution circuit, the aggregated generation, including the proposed DER, on the circuit shall not exceed 15% of the line section annual peak load as most recently measured. A line section is that portion of an Area EPS Operator's electric system connected to a customer bounded by automatic sectionalizing devices or the end of the distribution line. The Area EPS Operator may consider 100% of applicable loading (i.e., daytime minimum load for solar), if available, instead of 15% of line section peak load.
- 3.2.1.3 For interconnection of a proposed DER to the load side of network protectors, the proposed DER must utilize an inverter-based equipment package and, together with the aggregated other inverter-based DERs, shall not exceed the smaller of 5% of a network's maximum load or 50 kW.¹
- 3.2.1.4 The proposed DER, in aggregation with other DERs on the distribution circuit, shall not contribute more than 10% to the distribution circuit's maximum fault current at the point on the high voltage (primary) level nearest the proposed Point of Common Coupling.
- 3.2.1.5 The proposed DER, in aggregate with other Distributed Energy Resources on the distribution circuit, shall not cause any distribution protective devices and equipment (including, but not limited to, substation breakers, fuse cutouts, and line reclosers), or Interconnection Customer equipment on the system to exceed 87.5% of the short circuit interrupting capability; nor shall the interconnection be proposed for a circuit that already exceeds 87.5% of the short circuit interrupting capability.
- 3.2.1.6 Using the table below, determine the type of interconnection to a primary distribution line. This screen includes a review of the type of electrical service provided to the Interconnecting Customer, including line configuration and the transformer connection to limit the potential for creating over-voltages on the Area EPS Operator's electric power system due to a loss of ground during the operating time of any anti-islanding function.

Primary Distribution Line Type	Type of Interconnection to Primary Distribution Line	Result/Criteria
Three-phase, three wire	3-phase or single phase, phase-to-phase	Pass screen
Three-phase, four wire	Effectively-grounded 3 phase or Single-phase, line-to-neutral	Pass screen

¹ Network protectors are protective devices used on secondary networks (spot and grid networks) to automatically disconnect its associated transformer when reverse power flow occurs. Secondary networks are most often used in densely populated downtown areas.

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- 3.2.1.7 If the proposed DER is to be interconnected on single-phase shared secondary, the aggregate generation capacity on the shared secondary, including the proposed DER, shall not exceed 20 kW or 65% of the transformer nameplate rating.
- 3.2.1.8 If the proposed DER is single-phase and is to be interconnected on a center tap neutral of a 240 volt service, its addition shall not create an imbalance between the two sides of the 240 volt service of more than 20% of the nameplate rating of the service transformer.
- 3.2.1.9 If the proposed DER is single-phase and is to be interconnected to a three-phase service, its Nameplate Rating shall not exceed 10% of the service transformer nameplate rating.
- 3.2.1.10 If the DER's Point of Common Coupling is behind a line voltage regulator¹, the DER's Nameplate Rating shall be less than 250 kW.
- 3.2.2 If the proposed interconnection passes the screens, or if the proposed interconnection fails the screens, but the Area EPS Operator determines that the DER may nevertheless be interconnected consistent with safety, reliability, and power quality standards, the Interconnection Application shall proceed as follows:
- 3.2.2.1 If the proposed interconnection requires no construction of facilities by the Area EPS Operator on its own system, the Area EPS Operator shall provide the Interconnection Customer an executed Interconnection Agreement within five (5) Business Days after the determination.
- 3.2.2.2 If the proposed interconnection requires construction of any facilities, the Area EPS Operator shall notify the Interconnection Customer of such requirement when it provides the Initial Review results and copies of the analysis and data underlying the Area EPS Operator's determinations under the screens and either: 1) provide a good faith cost estimate; or 2) require a facilities study pursuant to 4.4.1. Within five (5) Business Days, the Interconnection Customer shall inform the Area EPS Operator if the Interconnection Customer elects to proceed with the proposed interconnection. If the Interconnection Customer makes such an election, the Area EPS Operator shall either provide: i) an Interconnection Agreement, along with a non-binding good faith cost estimate and construction schedule for such upgrades, within twenty (20) Business Days after the Area EPS Operator receives such an election or ii) a facilities study agreement pursuant to section 4.4.
- 3.2.3 If the proposed interconnection fails the screens, and the Area EPS Operator does not or cannot determine from the Initial Review that the DER may nevertheless be interconnected consistent with safety, reliability, and power quality standards unless the Interconnection Customer is willing to consider minor modifications or further study, the Area EPS Operator shall provide the Interconnection Customer the opportunity to attend a customer options meeting.

¹ This screen does not include substation voltage regulators.

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3.3 Customer Options Meeting

If the Area EPS Operator determines the Interconnection Application cannot be approved without either 1) supplemental review, other additional studies or actions; or 2) incurring significant cost to address safety, reliability, or power quality problems, the Area EPS Operator shall notify the Interconnection Customer of that determination and provide copies of all directly pertinent data and analyses underlying its conclusion, subject to confidentiality provisions in Section 5.9 and where applicable limited by privacy rules. Within ten (10) Business Days of the Area EPS Operator's determination, unless mutual agreement, the Area EPS Operator and Interconnection Customer shall schedule a customer options meeting with the Interconnection Customer to review possible facility modifications, screen analysis and related results to determine what further steps are needed to permit the DER to be connected safely and reliably. At the time of notification of the Area EPS Operator's determination, or at the customer options meeting, the Area EPS Operator shall:

- 3.3.1 Offer to perform a supplemental review in accordance with section 3.4 and provide a non-binding good faith estimate of the costs of such review; or
- 3.3.2 Obtain the Interconnection Customer's agreement to continue evaluating the Interconnection Application under the Section 4 Study Process.

3.4 Supplemental Review

- 3.4.1 To accept the offer of a supplemental review, the Interconnection Customer shall agree in writing and submit a deposit for the estimated costs of the supplemental review in the amount of the Area EPS Operator's good faith estimate of the costs of such review, both within fifteen (15) Business Days of the offer. If the written agreement and deposit have not been received by the Area EPS Operator within that timeframe, the Interconnection Application shall continue to be evaluated under the Section 4 Study Process unless it is withdrawn by the Interconnection Customer.
- 3.4.2 The Interconnection Customer may specify with the written agreement and deposit the order in which the Area EPS Operator will complete the supplemental review screens. The order specified shall be at the level of sections 3.4.4.1, 3.4.4.2, and 3.4.4.3.
- 3.4.3 The Interconnection Customer shall be responsible for the Area EPS Operator's actual costs for conducting the supplemental review. The Interconnection Customer shall pay any review costs that exceed the deposit within twenty (20) Business Days of receipt of the invoice or resolution of any dispute. If the deposit exceeds the invoiced costs, the Area EPS Operator will return such excess within twenty (20) Business Days of the invoice without interest.

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3.4.4 Within thirty (30) Business Days following receipt of the deposit for a supplemental review, the Area EPS Operator shall: 1) perform a supplemental review using the screens set forth below; 2) notify in writing the Interconnection Customer of the results; and 3) include with the notification copies of the analysis and data underlying the Area EPS Operator's determinations under the screens. Unless the Interconnection Customer provided instructions for how to respond to the failure of any of the supplemental review screens below at the time the Interconnection Customer accepted the offer of supplemental review, the Area EPS Operator shall notify the Interconnection Customer following the failure of any of the screens, or if it is unable to perform the screen in this section within two (2) Business Days of making such determination to obtain the Interconnection Customer's permission to: 1) continue evaluating the proposed interconnection under this section 3.4.4; 2) terminate the supplemental review and continue evaluating the DER under Section 4 Study Process; or 3) terminate the supplemental review upon withdrawal of the Interconnection Application by the Interconnection Customer. The Interconnection Customer shall respond with its choice within five (5) Business Days of notification from the Area EPS Operator.

3.4.4.1 Minimum Load Screen: Where 12 months of line section minimum load data (including onsite load but not station service load served by the proposed DER) are available, can be calculated, can be estimated from existing data, or determined from a power flow model, the aggregate DER capacity on the line section is less than 100% of the minimum load for all line sections bounded by automatic sectionalizing devices upstream of the proposed DER. If minimum load data is not available, or cannot be calculated, estimated or determined, the Area EPS Operator shall include the reason(s) that it is unable to calculate, estimate or determine minimum load in its supplemental review results notification under section 3.4.4.

3.4.4.1.1 The type of generation used by the proposed DER will be taken into account when calculating, estimating, or determining circuit or line section minimum load relevant for the application of screen 3.4.4.1. Solar photovoltaic (PV) generation systems with no battery storage use daytime minimum load (i.e., 10 a.m. to 4 p.m. for fixed panel systems and 8 a.m. to 6 p.m. for PV systems utilizing tracking systems), while all other generation uses absolute minimum load.

3.4.4.1.2 When this screen is being applied to a DER that serves some station service load, only the net injection into the Area EPS Operator's electric system will be considered as part of the aggregate generation.

3.4.4.1.3 Area EPS Operator will not consider as part of the aggregate generation for purposes of this screen DER capacity known to be already reflected in the minimum load data.

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- 3.4.4.2 Voltage and Power Quality Screen: In aggregate with existing generation on the line section: (1) the voltage regulation on the line section can be maintained in compliance with relevant requirements under all system conditions; (2) the voltage fluctuation is within acceptable limits as defined by Institute of Electrical and Electronics Engineers (IEEE) Standard 1453, or utility practice similar to IEEE Standard 1453; and (3) the harmonic levels meet IEEE Standard 519 limits.
- 3.4.4.3 Safety and Reliability Screen: The location of the proposed DER and the aggregate generation capacity on the line section do not create impacts to safety or reliability that cannot be adequately addressed without application of the Study Process. The Area EPS Operator shall give due consideration to the following and other factors in determining potential impacts to safety and reliability in applying this screen.
- 3.4.4.3.1 Whether the line section has significant minimum loading levels dominated by a small number of customers (e.g., several large commercial customers).
- 3.4.4.3.2 Whether the loading along the line section is uniform or even.
- 3.4.4.3.3 Whether the proposed DER is located in close proximity to the substation (i.e., less than 2.5 electrical circuit miles), and whether the line section from the substation to the Point of Common Coupling is a Main line rated for normal and emergency ampacity.
- 3.4.4.3.4 Whether the proposed DER incorporates a time delay function to prevent reconnection of the generator to the system until system voltage and frequency are within normal limits for a prescribed time.
- 3.4.4.3.5 Whether operational flexibility is reduced by the proposed DER, such that transfer of the line section(s) of the DER to a neighboring distribution circuit/substation may trigger overloads or voltage issues.
- 3.4.4.3.6 Whether the proposed DER employs equipment or systems certified by a recognized standards organization to address technical issues such as, but not limited to, islanding, reverse power flow, or voltage quality.
- 3.4.5 If the proposed interconnection passes the supplemental screens in sections 3.4.4.1, 3.4.4.2, and 3.4.4.3 above, or if the proposed interconnection fails the screens, but the Area EPS Operator determines that the DER may nevertheless be interconnected consistent with safety, reliability, and power quality standards, the interconnection shall proceed as follows:

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- 3.4.5.1 If the proposed interconnection passes the supplemental screens in sections 3.4.4.1, 3.4.4.2, and 3.4.4.3 above and does not require construction of facilities by the Area EPS Operator on its own system, the Area EPS Operator shall provide the Interconnection Customer an executable Interconnection Agreement within five (5) Business Days.
- 3.4.5.2 If the proposed interconnection requires construction of any facilities, the Area EPS Operator shall notify the Interconnection Customer of such requirement when it provides the supplemental review results and either: 1) provide a good faith cost estimate; or 2) require a facilities study pursuant to 4.4.1. Within five (5) Business Days, the Interconnection Customer shall inform the Area EPS Operator if the Interconnection Customer elects to proceed with the proposed interconnection. If the Interconnection Customer makes such an election, the Area EPS Operator shall either provide: i) an Interconnection Agreement, along with a non-binding good faith cost estimate and construction schedule for such upgrades, within twenty (20) Business Days after the Area EPS Operator receives such an election or ii) a facilities study agreement pursuant to section 4.4.
- 3.4.6 If the proposed interconnection fails the screens, and the Area EPS Operator does not or cannot determine that the DER may nevertheless be interconnected consistent with safety, reliability, and power quality standards unless the Interconnection Customer is willing to consider minor modifications or further study, the Area EPS Operator shall provide the Interconnection Customer the option of commencing the Section 4 Study Process. If the Interconnection Customer wishes to proceed it shall notify the Area EPS Operator within fifteen (15) Business Days to retain its queue position.

Section 4. Study Process

4.1 Applicability

The Study Process shall be used by an Interconnection Customer proposing to interconnect its DER with the Area EPS Operator's Distribution System if the DER 1) is not eligible for Section 2 Simplified Process review or Section 3 Fast Track Process review, or 2) did not pass the Fast Track Process or the Simplified Process. The application fee described in section 1.5.1.3 shall be applied to the application completeness review costs and the first deposit required in this section.

4.2 Scoping Meeting

- 4.2.1 A scoping meeting shall be held within ten (10) Business Days after the Interconnection Application is deemed complete or, if applicable, the Fast Track Process or Simplified Process has been completed and the Interconnection Customer has elected to continue with the Study Process, or as mutually agreed to by the Parties. The Area EPS Operator and the Interconnection Customer will bring to the meeting personnel, including system engineers and other resources, as may be reasonably required to accomplish the purpose of the meeting.

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- 4.2.2 The purpose of the scoping meeting is to discuss the Interconnection Application and review existing study results and relevant underlying data and assumptions relevant to the Interconnection Application. The Parties shall further discuss whether the Area EPS Operator should perform a system impact study or studies, or proceed directly to a facilities study or an Interconnection Agreement. If the Area EPS Operator determines there is no potential for Transmission System or Distribution System adverse system impacts, the Interconnection Application shall proceed directly to a facilities study or an executable Interconnection Agreement, as agreed to by the Parties.
- 4.2.3 The scoping meeting may be omitted by mutual agreement.
- 4.3 System Impact Study
- 4.3.1 A system impact study shall identify and detail the electric system impacts that would result if the proposed DER(s) were interconnected without project modifications or electric system modifications, and to study potential impacts, including but not limited to those identified in the scoping meeting. A system impact study shall evaluate the impact of the proposed interconnection on the reliability of the electric system.
- 4.3.2 If the Parties agree at the scoping meeting that a system impact study should be performed, the Area EPS Operator shall provide the Interconnection Customer, as soon as possible, but not later than five (5) Business Days after the scoping meeting, a system impact study agreement as defined in 4.3.3.
- If the scoping meeting is omitted by mutual agreement or, if applicable, the Simplified Process or Fast Track Process has been completed and the Interconnection Customer has elected to continue with the Study Process, and a system impact study is required, the Area EPS Operator shall provide the Interconnection Customer a system impact study agreement within ten (10) Business Days.
- 4.3.3 The system impact study agreement (Attachment 6) shall include an outline of the scope of the study and a non-binding good faith estimate of the cost to perform the study. If applicable, the agreement shall list any additional and reasonable technical data on the DER needed to perform the system impact study. The scope of and cost responsibilities for a system impact study are described in the attached system impact study agreement. A deposit of the good faith estimated costs for each system impact study shall be provided by the Interconnection Customer when it returns the study agreements. The additional and reasonable technical data, if applicable, shall be returned with the system impact agreement. Upon Interconnection Customer request, the Area EPS Operator shall grant a time frame extension as described in 5.2.3 if additional technical data is requested.

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- 4.3.4 In order to remain in consideration for interconnection, an Interconnection Customer who has requested a System Impact Study must return the executed system impact study agreement and pay the required study deposit within twenty (20) Business Days.
- 4.3.5 A System Impact Study shall be completed within thirty (30) Business Days after the system impact study agreement is signed by the Parties and delivered with deposit to the Area EPS Operator. The results and, if necessary, facilities study agreement shall be delivered to the Interconnection Customer within five (5) Business Days of completion of the System Impact Study. Upon request, the Area EPS Operator shall provide Interconnection Customer supporting documentation and workpapers developed in the preparation of the system impact study, subject to confidentiality arrangements consistent with these procedures and the System Impact Study agreement.
- 4.3.6 In instances where the System Impact Study shows potential for Transmission System adverse system impacts, within five (5) Business Days following the identification of such impacts by the Area EPS Operator, the Area EPS Operator shall coordinate with the appropriate Transmission Provider to have the necessary studies completed to determine if the DER causes any adverse transmission impacts.
- 4.3.7 In order to remain in consideration for interconnection, an Interconnection Customer must return the executed Transmission System impact study agreement within fifteen (15) Business Days.
- 4.3.8 A Transmission System impact study, if required, shall be completed and the results transmitted to the Interconnection Customer in as timely a manner as possible after the transmission system impact study agreement is signed by the Parties. The Area EPS Operator shall be responsible for coordination with the Transmission Provider as needed. Affected Systems shall participate in the study and provide all information necessary to prepare the study.
- 4.4 Facilities Study
- 4.4.1 If construction of facilities is required, a facilities study may be necessary to specify and estimate the cost of the equipment, engineering, procurement and construction work identified in Initial Review, Supplemental Review, or the Study Process to provide interconnection and interoperability of the DER with the Area EPS Operator's Distribution System as required by Minnesota Technical Requirements. Interconnection Applications reviewed in the Simplified Process and Fast Track Process that require construction of facilities may be eligible, upon determination of the Area EPS Operator, to forego a facilities study as described in section 3.2.2.2.
- The Area EPS Operator shall provide the Interconnection Customer a facilities study agreement in tandem with the results of the Interconnection Customer's system impact study or, if required, Transmission System impact study.
- If no system impact study is required, but a facilities study is required, then the Area EPS Operator shall provide as soon as possible, but not later than five (5) Business Days after the scoping meeting, a facilities study agreement.

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If the scoping meeting is omitted by mutual agreement and no system impact study is required, but a facilities study is required, the Area EPS Operator shall provide the Interconnection Customer a facilities study agreement within ten (10) Business Days after the Interconnection Application is deemed complete and, if applicable, the Simplified Process or Fast Track Process has been completed.

- 4.4.2 The facilities study agreement (Attachment 7) shall be accompanied by an outline of the scope of the study and a non-binding good faith estimate of the cost to perform the facilities study. The scope of and cost responsibilities for the facilities study are described in the attached facilities study agreement. A deposit of the good faith estimated costs for the facilities study shall be provided by the Interconnection Customer at the time it returns the study agreement.
- 4.4.3 In order to remain under consideration for interconnection, the Interconnection Customer must return the executed facilities study agreement and pay the required study deposit within fifteen (15) Business Days.
- 4.4.4 The facilities study shall specify and estimate the cost of the equipment, engineering, procurement and construction work (including overheads) needed to implement the conclusions of the system impact study(s).
- 4.4.5 Design for any required Interconnection Facilities and/or Upgrades shall be performed under the Facilities Study Agreement unless the Interconnection Application is processed under the provisions of section 3.2.2.2. However, in the event that the Interconnection Customer did not provide to the Area EPS Operator all required Conditional Use Permits at the time of entering into the Facilities Study Agreement, any such Design and/or Upgrades by the Area EPS Operator may be delayed until after the Interconnection Customer has provided to the Area EPS Operator all required Conditional Use Permits or provided a final design. The information in the Conditional Use Permits, or changes to the design, may result in significant modifications to the planned design and/or Upgrades. The Interconnection Customer may send to the Area EPS Operator a redacted version of the Conditional Use Permit to ensure confidentiality, but any and all information that the Area EPS Operator would reasonably need to perform an accurate Facilities Study shall not be redacted. If necessary to comply with these requirements, a confidential version of the Conditional Use Permit may be provided to the Area EPS Operator, with the confidential information being clearly marked and subject to the Confidentiality provisions in 5.9. The Area EPS Operator may contract with consultants to perform activities required under the facilities study agreement. The Interconnection Customer and the Area EPS Operator may agree to allow the Interconnection Customer to separately arrange for the design of some of the Interconnection Facilities. In such cases, facilities design will be reviewed and/or modified prior to acceptance by the Area EPS Operator, under the provisions of the Facilities Study Agreement. If the Parties agree to separately arrange for design and construction, and provided security and confidentiality requirements can be met, the Area EPS Operator shall make sufficient information available to the Interconnection Customer in accordance with confidentiality and critical infrastructure requirements to permit the Interconnection Customer to obtain an independent design and cost estimate for any necessary facilities.

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- 4.4.6 In cases where Upgrades are required, the facilities study must be completed within forty-five (45) Business Days of the receipt of the executed facilities study agreement and deposit.
- 4.4.7 In cases where no Upgrades are necessary, and the required facilities are limited to Interconnection Facilities, the facilities study must be completed within thirty (30) Business Days of the receipt of the executed facilities study agreement and deposit.
- 4.4.8 Once the facilities study is completed, a draft facilities study report shall be prepared and transmitted to the Interconnection Customer. Upon request, the Area EPS Operator shall provide Interconnection Customer supporting documentation and workpapers developed in the preparation of the Interconnection Facilities Study, subject to confidentiality arrangements consistent with these procedures and the facilities study agreement.
- 4.4.9 Within ten (10) Business Days of providing a draft facilities study report to Interconnection Customer, the Area EPS Operator and Interconnection Customer shall meet to discuss the results of the facilities study unless the meeting is omitted by mutual agreement.
- 4.4.10 Interconnection Customer may, within twenty (20) Business Days after receipt of the draft report, provide written comments to the Area EPS Operator, which the Area EPS Operator shall address in the final report.
- 4.4.11 The Area EPS Operator shall issue the final facilities study report within fifteen (15) Business Days of receiving Interconnection Customer's comments or promptly upon receiving Interconnection Customer's statement that it will not provide comments. The Area EPS Operator may reasonably extend the time frame upon notice to the Interconnection Customer if the Interconnection Customer's comments require additional analyses or lead to significant modifications by the Area EPS Operator prior to issuance of the final facilities study report.

Section 5. Provisions that Apply to All Interconnection Applications

5.1 Interconnection Agreement

- 5.1.1 The Area EPS Operator shall provide the Interconnection Customer an executable Interconnection Agreement as described in section 1.1.5 within five (5) Business Days after the completion of all required review or study of the Interconnection Application unless sections 3.2.2.2, 3.4.5.1, 3.4.5.2 or 4.2.2 applies.

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5.1.2 After receiving an Interconnection Agreement from the Area EPS Operator, the Interconnection Customer shall have thirty (30) Business Days to sign and return the interconnection agreement. If the Interconnection Customer does not sign the interconnection agreement, request an extension pursuant to these procedures, or ask the Area EPS Operator to file an unexecuted Interconnection Agreement with the Commission within thirty (30) Business Days, the Interconnection Application shall be deemed withdrawn. The Area EPS Operator shall provide the Interconnection Customer a fully executed Interconnection Agreement within five (5) Business Days after receiving a signed interconnection agreement from the Interconnection Customer. After the Interconnection Agreement is signed by the Parties, the interconnection of the DER shall proceed under the provisions of the Interconnection Agreement, except to the extent these procedures remain applicable, including, but not limited to, sections 5.5, 5.6, and 5.7.

5.2 Time Frames and Extensions

5.2.1 Response or Action Timeframes: Unless otherwise stated, all time frames are measured in Business Days. For purposes of measuring these time intervals and consistent with Minn. Stat. §645.15, the time shall be computed so as to exclude the first and include the last day of the prescribed or fixed period or duration of time. Any communication sent or received after 4:30 p.m. (local time in Saint Paul, Minnesota) or on a Saturday, Sunday, or Holiday shall be considered to have been sent on the next Business Day.

5.2.2 The Area EPS Operator shall make Reasonable Efforts to meet all time frames provided in these procedures. If the Area EPS Operator cannot meet a deadline provided herein, it must notify the Interconnection Customer in writing within three (3) Business Days after the deadline to explain the reason for the failure to meet the deadline, and provide an estimated time by which it will complete the applicable interconnection procedure in the process.

5.2.3 For applicable time frames described in these procedures, the Interconnection Customer may request in writing one extension equivalent to half of the time originally allotted (e.g., ten (10) Business Days for a twenty (20) Business Days original time frame) which the Area EPS Operator may not unreasonably refuse. No further extensions for the applicable time frame shall be granted absent a Force Majeure Event or other similarly extraordinary circumstances.

5.3 Disputes

5.3.1 The Parties agree to attempt to resolve all disputes arising out of the interconnection process and associated study and Interconnection Agreements according to the provisions of this article and Minnesota Administrative Rules 7829.1500-7829.1900. More information on the Commission's Consumer Affairs Office dispute resolution services is available on the Commission's website: <https://mn.gov/puc/consumers/help/complaint/>

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- 5.3.2 Prior to a written Notice of Dispute, the Party shall contact the other Party and raise the issue and the relief sought in an attempt to resolve the issue immediately.
- 5.3.3 In the event of a dispute, the disputing Party shall provide the other Party a written Notice of Dispute containing the relevant known facts pertaining to the dispute, the specific dispute and the relief sought, and express notice by the disputing Party that it is invoking the procedures under this article. The Interconnection Customer may utilize the Commission's Consumer Affairs Office's complaint/inquiry form and Informal Complaint dispute resolution process to assist with the written Notice of Dispute. The notice shall be sent to the non-disputing Party's email address and physical address set forth in the Interconnection Agreement or Interconnection Application, if there is no Interconnection Agreement. If the Interconnection Customer chooses not to utilize the Commission's Consumer Affairs Office dispute resolution process, the Interconnection Customer shall provide an informational electronic copy of the Notice of Dispute to the Consumer Affairs Office at the Commission at consumer.puc@state.mn.us.
- 5.3.4 The non-disputing Party shall acknowledge the notice within three (3) Business Days of its receipt and identify a representative with the authority to make decisions for the non-disputing Party with respect to the dispute.
- 5.3.5 The non-disputing Party shall provide the disputing Party with relevant regulatory and/or technical details and analysis regarding the Area EPS Operator interconnection requirements under dispute within ten (10) Business Days of the date of the Notice of Dispute. Within twenty (20) Business Days of the date of the Notice of Dispute, the Parties' authorized representatives will be required to meet and confer to try to resolve the dispute. Parties shall operate in good faith and use best efforts to resolve the dispute.
- 5.3.6 If a resolution is not reached in the thirty (30) Business Days from the date of the notice described in section 5.3.3, the Parties may 1) if mutually agreed, continue negotiations for up to an additional twenty (20) Business Days; or 2) either Party may request the Commission's Consumer Affairs Office provide mediation in an attempt to resolve the dispute within twenty (20) Business Days with the opportunity to extend this timeline upon mutual agreement. Alternatively, both Parties by mutual agreement may request mediation from an outside third-party mediator with costs to be shared equally between the Parties.
- 5.3.7 If the results of the mediation are not accepted by one or more Parties and there is still disagreement, the dispute shall proceed to the Commission's Formal Complaint process as described in Minn. Rules 7829.1700-1900 unless mutually agreed to continue with informal dispute resolution.
- 5.3.8 At any time, either Party may file a complaint before the Commission pursuant to Minn. Stat. §216B.164, if applicable, and Commission rules outlined in Minn. Rules Ch. 7829.

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5.4 Interconnection Metering

Any metering requirements necessitated by the use of the DER shall be installed at the Interconnection Customer's expense. The Interconnection Customer is responsible for replacement meter costs not covered in the Interconnection Customer's general customer charge. The Area EPS Operator may charge Interconnection Customers an ongoing metering-related charge for an estimate of ongoing metering-related costs specifically demonstrated and approved in tariff regardless of the choice of meter payment. The Area EPS Operator shall offer the Interconnection Customer the following payment options:

- 5.4.1 Pay upfront the cost of metering requirements for the DER. Any maintenance or replacement costs may be billed separately to the Interconnection Customer after these costs are incurred.
- 5.4.2 Pay a tariffed monthly charge for the actual, DER-related meter and metering-related costs. If no tariffed monthly charge is an exact match, then the closest applicable tariffed monthly charge shall apply; unless metering requirements are so different that individual case basis pricing should apply.

5.5 Non-Warranty

The Area EPS Operator does not give any warranty, expressed or implied, as to the adequacy, safety, or other characteristics of any structures, equipment, wires, appliances or devices owned, operated, installed or maintained by the Interconnection Customer, including without limitation the DER and any structures, equipment, wires, appliances or devices not owned, operated or maintained by the Area EPS Operator.

5.6 Design, Procurement, Installation and Construction of Interconnection Facilities and Upgrades

- 5.6.1 The Interconnection Customer shall pay for the actual cost of the Interconnection Facilities and Distribution Upgrades as described and itemized pursuant to the Interconnection Agreement and its attachments. If Network Upgrades are required, the actual cost of the Network Upgrades, including overheads, shall be borne by the Interconnection Customer pursuant to the Transmission Provider and associated agreement(s). As indicated in the Interconnection Agreement, the Area EPS Operator shall provide a good faith cost estimate, including overheads, for the purchase and construction of the Interconnection Facilities, Distribution Upgrades, and Network Upgrades, and provide a detailed itemization of such costs.
- 5.6.2 The Interconnection Customer and the Area EPS Operator shall agree on milestones for which each Party is responsible and list them in an attachment to the Interconnection Agreement. To the greatest extent possible, the Parties will identify all design, procurement, installation and construction requirements associated with a project, and clear associated timelines, at the beginning of the design, procurement, installation and construction phase, or as early within the process as possible.

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- 5.6.3 A Party's obligations under this provision may be extended by agreement. If a Party anticipates that it will be unable to meet a milestone for any reason other than a Force Majeure Event, it shall immediately notify the other Party of the reason(s) for not meeting the milestone and 1) propose the earliest reasonable alternate date by which it can attain this and future milestones, and 2) request appropriate amendments to the Interconnection Agreement and its attachments. The Party affected by the failure to meet a milestone shall not unreasonably withhold agreement to such an amendment unless 1) it will suffer significant uncompensated economic or operational harm from the delay, 2) attainment of the same milestone has previously been delayed, or 3) it has reason to believe that the delay in meeting the milestone is intentional or unwarranted notwithstanding the circumstances explained by the Party proposing the amendment. If the Party affected by the failure to meet a milestone disputes the proposed extension, the affected Party may pursue dispute resolution pursuant to 5.3.
- 5.6.4 At the option of the Area EPS Operator, either the "Traditional Security" or the "Modified Security" method shall be used.
- 5.6.4.1 Under the Traditional Security method, the Interconnection Customer shall provide reasonable adequate assurances of credit, including a letter of credit or personal guaranty of payment and performance from a creditworthy entity acceptable under the Area EPS Operator credit policy and procedures for the unpaid balance of the estimated amount shown in Interconnection Agreement for the totality of all anticipated work or expense incurred by the Area EPS Operator associated with the Interconnection Application. The payment for these estimated costs shall be as follows:
- 5.6.4.1.1 1/3 of estimated costs shall be due no later than when the Interconnection Customer signs the Interconnection Agreement.
- 5.6.4.1.2 An additional 1/3 of estimated costs shall be due prior to initial energization of the Generation System with the Area EPS Operator.
- 5.6.4.1.3 Remainder of actual costs, incurred by Area EPS Operator, shall be due within 30 days from the date the bill is mailed by the Area EPS Operator after project completion.
- 5.6.4.2 Under the Modified Security method, at least twenty (20) Business Days prior to the commencement of the design, procurement, installation, or construction of a discrete portion of the Area EPS Operator's Interconnection Facilities and Upgrades, the Interconnection Customer shall provide the Area EPS Operator, at the Interconnection Customer's option, a guarantee, letter of credit or other form of security that is reasonably acceptable to the Area EPS Operator and is consistent with the Minnesota Uniform Commercial Code. Such security for payment shall be in an amount sufficient to cover the costs for constructing, designing, procuring, and installing the applicable portion of the Area EPS Operator's Interconnection Facilities and Upgrades and shall be reduced on a dollar-for-dollar basis for payments made to the Area EPS Operator under the Interconnection Agreement during its term.

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- 5.6.4.3 The guarantee must be made by an entity that meets the creditworthiness requirements of the Area EPS Operator, and contain terms and conditions that guarantee payment of any amount that may be due from the Interconnection Customer, up to an agreed-to maximum amount.
- 5.6.4.4 The letter of credit must be issued by a financial institution or insurer reasonably acceptable to the Area EPS Operator and must specify a reasonable expiration date not sooner than sixty (60) Business Days (three calendar months) after the due date of the final accounting report and bill described in 5.6.6.
- 5.6.5 The Area EPS Operator shall bill the Interconnection Customer for the design, engineering, construction, and procurement costs of Interconnection Facilities and Upgrades described in the Interconnection Agreement on a monthly basis, or as otherwise agreed by the Parties in the interconnection agreement. The Interconnection Customer shall pay each bill within twenty-one (21) Business Days of receipt, or as otherwise agreed to by the Parties in the interconnection agreement.
- 5.6.6 Within eighty (80) Business Days (approximately four (4) calendar months) of completing the construction and installation of the Area EPS Operator's Interconnection Facilities and/or Upgrades described in the interconnection agreement and its attachments, the Area EPS Operator shall provide the Interconnection Customer with a final accounting report of any difference between 1) the Interconnection Customer's cost responsibility for the actual cost of such facilities or Upgrades, and 2) the Interconnection Customer's previous aggregate payments to the Area EPS Operator for such facilities or Upgrades. If the Interconnection Customer's cost responsibility exceeds its previous aggregate payments, the Area EPS Operator shall invoice the Interconnection Customer for the amount due and the Interconnection Customer shall make payment to the Area EPS Operator within twenty (20) Business Days. If the Interconnection Customer's previous aggregate payments exceed its cost responsibility under the Interconnection Agreement, the Area EPS Operator shall refund to the Interconnection Customer an amount equal to the difference within twenty (20) Business Days of the final accounting report.
- 5.7 Inspection, Testing, Commissioning and Authorization
- 5.7.1 The Interconnection Customer shall arrange for the inspection and testing of the DER and the Customer's Interconnection Facilities prior to interconnection pursuant to Minnesota Interconnection Technical Requirements. Commissioning tests of the Interconnection Customer's installed equipment shall be performed pursuant to applicable codes and standards pursuant to Minnesota Technical Requirements.

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- 5.7.2 The Interconnection Customer shall notify the Area EPS Operator of testing and inspection no fewer than five (5) Business Days in advance, or as may be agreed to by the Parties. Testing and inspection shall occur on a Business Day. The Area EPS Operator may, at its own expense if not required in Minnesota Interconnection Technical Requirements, send qualified personnel to the DER site to inspect the interconnection and witness the testing. The Interconnection Customer shall provide the Area EPS Operator a written results report.
- 5.7.3 The Area EPS Operator shall provide the Interconnection Customer written acknowledgment that it has received the Interconnection Customer's written test report. Such written acknowledgment shall not be deemed to be or construed as any representation, assurance, guarantee, or warranty by the Area EPS Operator of the safety, durability, suitability, or reliability of the DER or any associated control, protective, and safety devices owned or controlled by the Interconnection Customer or the quality of power produced by the DER.
- 5.8 Authorization Required Prior to Parallel Operation
- 5.8.1 Area EPS Operator shall use Reasonable Efforts to list applicable parallel operation requirements by attaching the MN Technical Requirements to the Interconnection Agreement. Additionally, the Area EPS Operator shall notify the Interconnection Customer of any changes to these requirements as soon as they are known. The Area EPS Operator shall make Reasonable Efforts to cooperate with the Interconnection Customer in meeting requirements necessary for the Interconnection Customer to commence parallel operations by the in-service date.
- 5.8.2 The Interconnection Customer shall not operate its DER in parallel with the Area EPS Operator's Distribution System without prior written permission to operate authorization from the Area EPS Operator. The Area EPS Operator shall provide such authorization within three (3) Business Days from when the Area EPS Operator receives notification that the Interconnection Customer has complied with all applicable parallel operation requirements and all payments for issued bills under the Interconnection Agreement, System Impact Study Agreement, Facilities Study Agreement or Section 5.6.5 above that are past due have been paid in full. Such authorization shall not be unreasonably withheld, conditioned, or delayed.
- 5.9 Confidentiality
- 5.9.1 Confidential Information shall mean any confidential and/or proprietary information provided by one Party to the other Party that is clearly marked or otherwise designated "Confidential." For purposes of these procedures, design, operating specifications, and metering data provided by the Interconnection Customer may be deemed Confidential Information regardless of whether it is clearly marked or otherwise designated as such. If requested by either Party, the other Party shall provide in writing the basis for asserting that the information warrants confidential treatment. Parties providing a Governmental Authority trade secret, privileged or otherwise not public or nonpublic data under the Minnesota Government Data Practices Act, Minnesota Statutes Chapter 13, shall identify such data consistent with the Commission's September 1, 1999 Revised Procedures for Handling Trade Secret and Privileged Data, available online at:
<https://mn.gov/puc/puc-documents/#4>

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- 5.9.2 Confidential Information does not include information previously in the public domain with proper authorization, required to be publicly submitted or divulged by Governmental Authorities (after notice to the other Party and after exhausting any opportunity to oppose such publication or release), or necessary to be publicly divulged in an action to enforce these procedures. Each Party receiving Confidential Information shall hold such information in confidence and shall not disclose it to any third party nor to the public without the prior written authorization from the Party providing that information, except to fulfill obligations under these procedures, or to fulfill legal or regulatory requirements that could not otherwise be fulfilled by not making the information public.
- 5.9.2.1 Each Party shall hold in confidence and shall not disclose Confidential Information, to any person (except employees, officers, representatives and agents, who agree to be bound by this section). Confidential Information shall be clearly marked as such on each page or otherwise affirmatively identified. If a court, government agency or entity with the right, power, and authority to do so, requests or requires either Party, by subpoena, oral disposition, interrogatories, requests for production of documents, administrative order, or otherwise, to disclose Confidential Information, that Party shall provide the other Party with prompt notice of such request(s) or requirements(s) so that the other Party may seek an appropriate protective order or waive compliance with the terms of this Agreement. In the absence of a protective order or waiver the Party shall disclose such confidential information which, in the opinion of its counsel, the party is legally compelled to disclose. Each Party will use reasonable efforts to obtain reliable assurance that confidential treatment will be accorded any confidential information so furnished.
- 5.9.2.2 Critical infrastructure information or information that is deemed or otherwise designated by a Party as Critical Energy/Electric Infrastructure Information (CEII) pursuant to FERC regulation, 18 C.F.R. §388.133, as may be amended from time to time, may be subject to further protections for disclosure as required by FERC or FERC regulations or orders and the disclosing Party's CEII policies.
- 5.9.2.3 Each Party shall employ at least the same standard of care to protect Confidential Information obtained from the other Party as it employs to protect its own Confidential Information.
- 5.9.2.4 Each Party is entitled to equitable relief, by injunction or otherwise, to enforce its rights under this provision to prevent the release of Confidential Information without bond or proof of damages, and may seek other remedies available at law or in equity for breach of this provision.

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5.10 Insurance

- 5.10.1 At a minimum, the Interconnection Customer shall maintain, during the term of the Interconnection Agreement, general liability insurance, from a qualified insurance agency with a B+ or better rating by "Best" and with a combined single limit of not less than the limits described in the chart below.

Distributed Energy Resource System Size	Liability Insurance Requirement
≤ 40 kWac	\$300,000
> 40 kWac and ≤ 250 kWac	\$1,000,000
> 250 kWac and ≤ 5 MWac	\$2,000,000
> 5 MWac and ≤ 10 MWac	\$3,000,000

Such general liability insurance shall include coverage against claims for damages resulting from (i) bodily injury, including wrongful death; and (ii) property damage arising out of the Interconnection Customer's ownership and/or operation of the DER under this agreement.

- 5.10.2 The general liability insurance required shall, by endorsement to the policy or policies, (a) include the Area EPS Operator as an additional insured; (b) contain a severability of interest clause or cross-liability clause; (c) provide that the Area EPS Operator shall not by reason of its inclusion as an additional insured incur liability to the insurance carrier for the payment of premium for such insurance; and (d) provide for twenty (20) business days' written notice to the Area EPS Operator prior to cancellation, termination, alteration or material change of such insurance.
- 5.10.3 If the DER is connected to an account receiving residential service from the Area EPS Operator and its system size is less than 40kW, then the endorsements required in Section 5.10.2 shall not apply.
- 5.10.4 The Interconnection Customer shall furnish the required insurance certificates and endorsements to the Area EPS Operator prior to the initial operation of the DER. Thereafter, the Area EPS Operator shall have the right to periodically inspect or obtain a copy of the original policy or policies of insurance.
- 5.10.5 Evidence of the insurance required in Section 5.10.1 shall state that coverage provided is primary and is not excess to or contributing with any insurance or self-insurance maintained by the Area EPS Operator.

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5.10.6 If the Interconnection Customer is self-insured with an established record of self-insurance, the Interconnection Customer may comply with the following in lieu of Sections 5.10.1 - 5.10.5.

5.10.6.1 Interconnection Customer shall provide the Area EPS Operator, at least twenty (20) days prior to the date of initial operation, evidence of an acceptable plan to self-insure to a level of coverage equivalent to that required under Section 5.10.1.

5.10.6.2 If the Interconnection Customer ceases to self-insure to the level required hereunder, or if the Interconnection Customer is unable to provide continuing evidence of the ability to self-insure, the Interconnection Customer agrees to immediately obtain the coverage required under Section 5.10.1.

5.10.6.3 Failure of the Interconnection Customer or the Area EPS Operator to enforce the minimum levels of insurance does not relieve the Interconnection Customer from maintaining such levels of insurance or relieve the Interconnection Customer of any liability.

5.10.7 An Interconnection Customer's insurance requirements shall be limited to no more than an aggregate cap of \$35 million if the Interconnection Customer has multiple DER systems in the Area EPS Operator's service territory.

5.11 Comparability

The Area EPS Operator shall receive, process and analyze all Interconnection Applications in a timely manner as set forth in this document. The Area EPS Operator shall use the same Reasonable Efforts in processing and analyzing Interconnection Applications from all Interconnection Customers, whether the DER is owned or operated by the Area EPS Operator, its subsidiaries or affiliates, or others.

5.12 Record Retention

The Area EPS Operator shall maintain for three years records, subject to audit, of all Interconnection Applications received under these procedures, the times required to complete Interconnection Application approvals and disapprovals, and justification for the actions taken on the Interconnection Applications.

5.13 Coordination with Affected Systems

The Area EPS Operator shall coordinate the conduct of any studies required to determine the impact of the Interconnection Application on Affected Systems with Affected System operators and, if possible, include those results (if available) in its applicable interconnection study within the time frame specified in these procedures. The Area EPS Operator will make Reasonable Effort to include the Affected System operator(s) in all relevant meetings held with the Interconnection Customer as required by these procedures. The Interconnection Customer will cooperate with the Area EPS Operator and the Affected System operator(s) in all matters related to the conduct of studies and the determination of modifications to Affected Systems. Affected System operators shall cooperate with the Area EPS Operator and Interconnection Customer(s) with whom interconnection has been requested in all matters related to the conduct of studies and the determination of modifications to Affected Systems.

(Continued on Sheet No. 10-204)

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MINNESOTA ELECTRIC RATE BOOK - MPUC NO. 2

**MINNESOTA DISTRIBUTED ENERGY RESOURCES
INTERCONNECTION PROCESS (MN DIP)
(Continued)**

Section No. 10
Original Sheet No. 204

5.14 Capacity of the Distributed Energy Resource

- 5.14.1 If the Interconnection Application is for an increase in capacity for an existing DER, the Interconnection Application shall be evaluated on the basis of the new total alternating current ("AC") capacity of the Distributed Energy Resource. The maximum capacity of a Distributed Energy Resource shall be the Aggregate Nameplate Rating or may be limited as described in 5.14.3.
- 5.14.2 An Interconnection Application for a DER that includes a single or multiple energy production devices at a site for which the Interconnection Customer seeks a single Point of Common Coupling shall be evaluated on the basis of the Aggregate Nameplate Rating of the multiple DERs unless 5.14.3 applies.
- 5.14.3 If the maximum capacity of the DER(s) is limited (e.g., through use of a control system, power relay(s), or other similar device settings or adjustments), then the Interconnection Customer must obtain the Area EPS Operator's agreement that the manner in which the Interconnection Customer proposes to implement such a limit will effectively limit active power output so as to not adversely affect the safety and reliability of the Area EPS Operator's system. Such agreement shall not be unreasonably withheld. If the Area EPS Operator does not so agree, then the Interconnection Application must be withdrawn or revised. Nothing in this section shall prevent an Area EPS Operator from considering an output higher than the limited output (e.g., Aggregate Nameplate Rating), if the limitations do not provide adequate assurance, when evaluating system impacts. See Minnesota Technical Requirements for more detail.

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(Continued on Sheet No. 10-205)

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Glossary of Terms

Affected System – Another Area EPS Operator's System, Transmission Owner's Transmission System, or Transmission System connected generation which may be affected by the proposed interconnection.

Applicant Agent – A person designated in writing by the Interconnection Customer to represent or provide information to the Area EPS on the Interconnection Customer's behalf throughout the interconnection process.

Area EPS – The electric power distribution system connected at the Point of Common Coupling.

Area EPS Operator – An entity that owns, controls, or operates the electric power distribution systems that are used for the provision of electric service in Minnesota. As used in this tariff, this means Northern States Power Company, a Minnesota corporation, doing business as Xcel Energy.

Business Day – Monday through Friday, excluding Holidays as defined by [Minn. Stat. §645.44, Subd. 5](#). See MN DIP Section 5.2.1 for more on computation of time.

Certified Equipment - UL 1741 listing is a common form of DER inverter certification. See MN DIP Attachment 4: Certification Codes and Standards and Attachment 5: Certification of Distributed Energy Resource Equipment.

Confidential Information – See MN DIP 5.9.

Distributed Energy Resource (DER) – A source of electric power that is not directly connected to a bulk power system. DER includes both generators and energy storage technologies capable of exporting active power to an EPS. An interconnection system or a supplemental DER device that is necessary for compliance with this standard is part of a DER. For the purpose of the MN DIP and MN DIA, the DER includes the Customer's Interconnection Facilities but shall not include the Area EPS Operator's Interconnection Facilities.

Distribution System – The Area EPS facilities which are not part of the Local EPS, Transmission System or any generation system.

Distribution Upgrades – The additions, modifications, and upgrades to the Distribution System at or beyond the Point of Common Coupling to facilitate interconnection of the DER and render the distribution service necessary to effect the Interconnection Customer's connection to the Distribution System. Distribution Upgrades do not include Interconnection Facilities.

Electric Power System (EPS) – The facilities that deliver electric power to a load.

Fast Track Process – The procedure as described in Section 3 for evaluating an Interconnection Application for a DER that meets the eligibility requirements of section 3.1.

(Continued on Sheet No. 10-206)

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MINNESOTA ELECTRIC RATE BOOK - MPUC NO. 2

**MINNESOTA DISTRIBUTED ENERGY RESOURCES
INTERCONNECTION PROCESS (MN DIP)
(Continued)**

Section No. 10
Original Sheet No. 206

Force Majeure Event – An act of God, labor disturbance, act of the public enemy, war, insurrection, riot, fire, storm or flood, explosion, breakage or accident to machinery or equipment, an order, regulation or restriction imposed by governmental, military or lawfully established civilian authorities, or another cause beyond a Party's control. A Force Majeure Event does not include an act of negligence or intentional wrongdoing.

Good Utility Practice – Any of the practices, methods and acts engaged in or approved by a significant portion of the electric industry during the relevant time period, or any of the practices, methods and act which, in the exercise of reasonable judgment in light of the facts known at the time the decision was made, could have been expected to accomplish the desired result at a reasonable cost consistent with good business practices, reliability, safety and expedition. Good Utility Practice is not intended to be limited to the optimum practice, method, or act to the exclusion of all others, but rather to be acceptable practices, methods, or acts generally accepted in the region.

Governmental Authority – Any federal, state, local or other governmental regulatory or administrative agency, court, commission, department, board, or other governmental subdivision, legislature, rulemaking board, tribunal, or other governmental authority having jurisdiction over the Parties, their respective facilities, or the respective services they provide, and exercising or entitled to exercise any administrative, executive, police, or taxing authority or power; provided, however, that such term does not include the Interconnection Customer, the Area EPS Operator, or any Affiliate thereof. The Minnesota Public Utilities Commission is the authority governing interconnection requirements unless otherwise provided for in the Minnesota Technical Requirements.

Interconnection Agreement – The terms and conditions between the Area EPS Operator and Interconnection Customer (Parties). See MN DIP Section 1.1.5 for when the Uniform Statewide Contract or MN DIA applies.

Interconnection Application – The Interconnection Customer's request to interconnect a new or modified, as described in MN DIP Section 1.6, DER. See Attachment 2: Simplified Application Form and Attachment 3 Interconnection Application Form.

Interconnection Customer – The person or entity, including the Area EPS Operator, whom will be the owner of the DER that proposes to interconnect a DER(s) with the Area EPS Operator's Distribution System. The Interconnection Customer is responsible for ensuring the DER(s) is designed, operated and maintained in compliance with the Minnesota Technical Requirements.

Interconnection Facilities – The Area EPS Operator's Interconnection Facilities and the Interconnection Customer's Interconnection Facilities. Collectively, Interconnection Facilities include all facilities and equipment between the DER and the Point of Common Coupling, including any modification, additions or upgrades that are necessary to physically and electrically interconnect the DER to the Area EPS Operator's System. Some examples of Customer Interconnection Facilities include: supplemental DER devices, inverters, and associated wiring and cables up to the Point of DER Connection. Some examples of Area EPS Operator Interconnection Facilities include sole use facilities; such as, line extensions, controls, relays, switches, breakers, transformers and shall not include Distribution Upgrades or Network Upgrades.

(Continued on Sheet No. 10-207)

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**MINNESOTA DISTRIBUTED ENERGY RESOURCES
INTERCONNECTION PROCESS (MN DIP)
(Continued)**

Section No. 10
Original Sheet No. 207

Material Modification – A modification to machine data, equipment configuration or to the interconnection site of the DER at any time after receiving notification by the Area EPS Operator of a complete Interconnection Application that has a material impact on the cost, timing, or design of any Interconnection Facilities or Upgrades, or a material impact on the cost, timing or design of any Interconnection Application with a later Queue Position or the safety or reliability of the Area EPS.¹

MN DIA - The Minnesota Distributed Energy Resource Interconnection Agreement. See MN DIP Section 1.1.5 for when the Uniform Statewide Contract or MN DIA applies.

MN DIP – The Minnesota Distributed Energy Resource Interconnection Process. Statewide interconnection standards in this document.

MN Technical Requirements or Minnesota Technical Requirements – The term including all of the DER technical interconnection requirement documents for the state of Minnesota; including: 1.) Attachment 2 Distributed Generation Interconnection Requirements established in the Commission's September 28, 2004 Order in E-999/CI-01-1023) until superseded and upon Commission approval of 2.) updated Minnesota DER Technical Interconnection and Interoperability Requirements in E-999/CI-16-521 (anticipated in late 2019.)

Nameplate Rating - nominal voltage (V), current (A), maximum active power (kWac), apparent power (kVA), and reactive power (kvar) at which a DER is capable of sustained operation. For a Local EPS with multiple DER units, the aggregate nameplate rating is equal to the sum of all DERs nameplate rating in the Local EPS, not including aggregate capacity limiting mechanisms such as coincidence factors, plant controller limits, etc. that may be applicable for specific cases (Aggregate Nameplate Rating). The nameplate ratings referenced in the MN DIP are alternating current nameplate DER ratings. See Section 5.14 on Capacity of the Distributed Energy Resource and Minnesota Technical Requirements.

¹ A Material Modification shall include, but may not be limited to, a modification from the approved Interconnection Application that: (1) changes the physical location of the point of common coupling; such that it is likely to have an impact on technical review; (2) increases the nameplate rating or output characteristics of the Distributed Energy Resource; (3) changes or replaces generating equipment, such as generator(s), inverter(s), transformers, relaying, controls, etc., and substitutes equipment that is not like-kind substitution in certification, size, ratings, impedances, efficiencies or capabilities of the equipment; (4) changes transformer connection(s) or grounding; and/or (5) changes to a certified inverter with different specifications or different inverter control settings or configuration. A Material Modification shall not include a modification from the approved Interconnection Application that: (1) changes the ownership of a Distributed Energy Resource; (2) changes the address of the Distributed Energy Resource, so long as the physical point of common coupling remains the same; (3) changes or replaces generating equipment such as generator(s), inverter(s), solar panel(s), transformers, relaying, controls, etc. and substitutes equipment that is a like-kind substitution in certification, size, ratings, impedances, efficiencies or capabilities of the equipment; and/or (4) increases the DC/AC ratio but does not increase the maximum AC output capability of the Distributed Energy Resource in a way that is likely to have an impact on technical review.

(Continued on Sheet No. 10-208)

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MINNESOTA DISTRIBUTED ENERGY RESOURCES
INTERCONNECTION PROCESS (MN DIP)
(Continued)

Section No. 10
Original Sheet No. 208

Network Upgrades – Additions, modifications, and upgrades to the Transmission System required at or beyond the point at which the DER interconnects with the Area EPS Operator's System to accommodate the interconnection with the DER to the Area EPS Operator's System. Network Upgrades do not include Distribution Upgrades.

Notice of Dispute – The disputing Party shall provide the other Party this written notice containing the relevant known facts pertaining to the dispute, the specific dispute and the relief sought, and express notice by the disputing Party that it is invoking the procedures under MN DIP 5.3.

Operating Requirements – Any operating and technical requirements that may be applicable due to the Transmission Provider's technical requirements or Minnesota Technical Requirements, including those set forth in the MN DIA.

Party or Parties – The Area EPS Operator and the Interconnection Customer.

Point of Common Coupling (PCC) – The point where the Interconnection Facilities connect with the Area EPS Operator's Distribution System. See figure 1. Equivalent, in most cases, to "service point" as specified by the Area EPS Operator and described in the National Electrical Code and the National Electrical Safety Code.

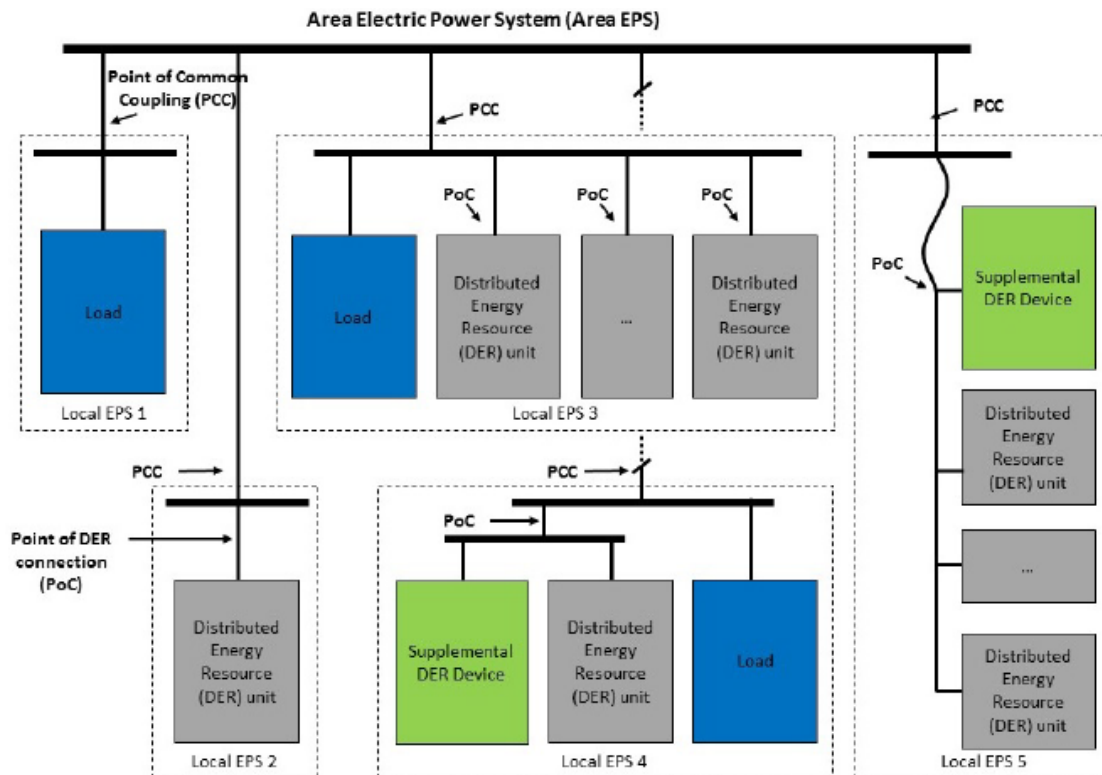


Figure 1: Point of Common Coupling and Point of DER Connection

(Source: IEEE 1547)

(Continued on Sheet No. 10-209)

**MINNESOTA DISTRIBUTED ENERGY RESOURCES
INTERCONNECTION PROCESS (MN DIP)
(Continued)**

Section No. 10
Original Sheet No. 209

Point of DER Connection (PoC) – When identified as the Reference Point of Applicability, the point where an individual DER is electrically connected in a Local EPS and meets the requirements of this standard exclusive of any load present in the respective part of the Local EPS (e.g., terminals of the inverter when no supplemental DER device is required.) For DER unit(s) that are not self-sufficient to meet the requirements without (a) supplemental DER device(s), the Point of DER Connection is the point where the requirements of this standard are met by DER in conjunction with (a) supplemental DER device(s) exclusive of any load present in the respective part of the Local EPS.

Queue Position – The order of a valid Interconnection Application, relative to all other pending valid Interconnection Applications, that is established based upon the date- and time- of receipt of the complete Interconnection Application as described in sections 1.5.2 and 1.8.

Reasonable Efforts – With respect to an action required to be attempted or taken by a Party under these procedures, efforts that are timely and consistent with Good Utility Practice and are otherwise substantially equivalent to those a Party would use to protect its own interests.

Reference Point of Applicability – The location, either the Point of Common Coupling or the Point of DER Connection, where the interconnection and interoperability performance requirements specified in IEEE 1547 apply. With mutual agreement, the Area EPS Operator and Customer may determine a point between the Point of Common Coupling and Point of DER Connection. See Minnesota DER Technical Interconnection and Interoperability Requirements for more information.

Simplified Process – The procedure for evaluating an Interconnection Application for a certified inverter-based DER no larger than 20 kW that uses the screens described in section 3.2. The Simplified Process includes simplified procedures. Attachment 2: Simplified Application Form includes a brief set of terms and conditions, and the option for Interconnection Agreement described in 1.1.5. See Section 2 Simplified Process.

Study Process – The procedure for evaluating an Interconnection Application that includes the Section 4 scoping meeting, system impact study, and facilities study.

Tariff – The Area EPS Operator's Tariff filed in compliance with the Minnesota Distributed Energy Resource Interconnection Procedures (MN DIP) and approved by the Minnesota Public Utilities Commission (MPUC or Commission).

Transmission Owner – The entity that owns, leases or otherwise possesses an interest in the portion of the Transmission System relevant to the Interconnection.

Transmission Provider – The entity (or its designated agent) that owns, leases, controls, or operates transmission facilities used for the transmission of electricity. The term Transmission Provider includes the Transmission Owner when the Transmission Owner is separate from the Transmission Provider. The Transmission Provider may include the Independent System Operator or Regional Transmission Operator.

Transmission System – The facilities owned, leased, controlled or operated by the Transmission Provider or the Transmission Owner that are used to provide transmission service. See the Commission's July 26, 2000 Order Adopting Boundary Guidelines for Distinguishing Transmission from Generation and Distribution Assets in Docket No. E-999/CI-99-1261.

(Continued on Sheet No. 10-210)

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Minneapolis, Minnesota 55401

MINNESOTA ELECTRIC RATE BOOK - MPUC NO. 2

**MINNESOTA DISTRIBUTED ENERGY RESOURCES
INTERCONNECTION PROCESS (MN DIP)
(Continued)**

Section No. 10
Original Sheet No. 210

Uniform Statewide Contract – State of Minnesota's standard, uniform contract that must be applied to all qualifying new and existing interconnections between a utility and DER having capacity less than 40 kilowatts if interconnecting with a cooperative or municipal utility, and 1,000 kilowatts if interconnecting with a public utility. ([Minn. Rules 7835.9910](#))

Upgrades – The required additions and modifications to the Area EPS Operator's Transmission or Distribution System at or beyond the Point of Interconnection. Upgrades may be Network Upgrades or Distribution Upgrades. Upgrades do not include Interconnection Facilities.

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(Continued on Sheet No. 10-211)

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MINNESOTA ELECTRIC RATE BOOK - MPUC NO. 2

**MINNESOTA DISTRIBUTED ENERGY RESOURCES
INTERCONNECTION PROCESS (MN DIP)
(Continued)**

Section No. 10
Original Sheet No. 211

Attachment 1: Pre-Application Report Request Form

Requests for an Interconnection Pre-Application Report shall include the information identified in Sections 1.4.1.1 through 1.4.1.8 of the Minnesota Distributed Energy Resource Interconnection Process (MN DIP) (and as provided in the fields below) to clearly and sufficiently identify the location of the proposed Point of Common Coupling and relevant project details.

Additionally, a non-refundable processing fee of \$300 is required as specified in Section 1.4.1 of the MN DIP.

Upon receipt of a complete Request Form (including site map) and processing fee, the Area EPS Operator shall provide a report containing as much of the data described in Section 1.4.2 as is pre-existing and available within 15 business days. A Pre-Application Report request does not obligate the Area EPS Operator to conduct a study or other analysis of the proposed project if data is not available.

1. Requestor Contact Information:

Name: _____
Company Name (if applicable): _____
Street Address: _____
City/State/Zip: _____
Phone Number: _____
Email Address: _____

2. Project Information:

a) Project Name: _____

b) Planned Equipment:

DER Nameplate Rating: _____ kW
DER Type: Inverter based Other _____
DER Number of Phases: Single Three
Service Voltage (120/240 V, 277/480 V, etc.) : _____ V
Stand-alone Generator (no onsite load)? Yes No
Existing DER? Yes No
Location of Existing DER (include county): _____

(Continued on Sheet No. 10-212)

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**MINNESOTA DISTRIBUTED ENERGY RESOURCES
INTERCONNECTION PROCESS (MN DIP)
(Continued)**

Section No. 10
Original Sheet No. 212

c) Proposed Point of Common Coupling:

Note: The proposed Point of Common Coupling shall be defined by all or some combination of the below information, enough to clearly identify the location of the Point of Common Coupling.

Street Address: _____
City/State/Zip Code: _____
County: _____
Cross streets: _____
Latitude (in degrees/minutes/seconds or 6 decimal places): _____
Longitude: _____
Meter number: _____
Utility equipment number (e.g. pole number): _____
Other identifying information: _____

d) An attached Site Map is required that shows the following:

- True north
- Proposed project location, including general area of project
- Proposed service point location
- Major roads, streets and/or highways

3. Requestor Signature:

I understand that the confidentiality provisions of MN DIP Section 5.9 apply to the contents of the Pre-Application Report. The MN DIP Section 5.9, states in part as follows:

"Each Party shall hold in confidence and shall not disclose Confidential Information, to any person (except employees, officers, representatives and agents, who agree to be bound by this section). Confidential Information shall be clearly marked as such on each page or otherwise affirmatively identified. ... Each Party shall employ at least the same standard of care to protect Confidential Information obtained from the other Party as it employs to protect its own Confidential Information. ... Each Party is entitled to equitable relief, by injunction or otherwise, to enforce its rights under this provision to prevent the release of Confidential Information without bond or proof of damages, and may seek other remedies available at law or in equity for breach of this provision."

I understand that 1) the existence of "Available Capacity" in no way implies that an interconnection up to this level may be completed without impacts since there are many variables studied as part of the interconnection review process, 2) the distribution system is dynamic and subject to change and 3) data provided in the Pre-Application Report may become outdated and not useful at the time of submission of the complete Interconnection Request.

Name (type or print): _____
Signature: _____
Date: _____

Pre-Application Report requests shall be submitted with attachments to the Company through its online portal available at www.xcelenergy.com or other applicable URL. Only if the online portal is unavailable submit to Distributed Energy Resources at MNDER@xcelenergy.com

Fees shall be submitted online through the online application portal or Xcel Energy, Attn: Distributed Energy Resources, at P.O.Box 59 Minneapolis MN 55440-0059.

(Continued on Sheet No. 10-213)

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**MINNESOTA DISTRIBUTED ENERGY RESOURCES
INTERCONNECTION PROCESS (MN DIP)
(Continued)**

Section No. 10
Original Sheet No. 213

Attachment 2: Simplified Application Form

MINNESOTA DISTRIBUTED ENERGY RESOURCES

SIMPLIFIED PROCESS APPLICATION (Form Template)

The Simplified Process is available only for certified, inverter-based Distributed Energy Resources (DER) no larger than 20 kW that meet the requirements of Attachment 4: Certification Codes and Standards and Attachment 5: Certification of Distributed Energy Resource Equipment.

This Application is deemed complete when it provides all applicable and correct information required below. The following additional information must be submitted with an application:

- ☐ Single Line Diagram ☐ Site Plan with site owner signature if different than Interconnection Customer ☐ Specification Sheet(s) ☐ Insurance Document

A DER with an energy storage component must additionally complete Exhibit B - For Energy Storage.

A non-refundable processing fee of \$100 must accompany this Application.

Interconnection Customer/Owner

Name: _____

Account Number: _____ Meter Number: _____

Mailing Address: _____

Telephone: _____ Email: _____

Application Agent / Company: _____

Telephone: _____ Email: _____

Distributed Energy Resource Information

Location (if different from above): _____

The Distributed Energy Resource is a single generating unit or multiple?

Single ☐ Multiple ☐

The Distributed Energy Resource is or includes energy storage?

☐ Yes (Complete Exhibit B - For Energy Storage) ☐ No

Type: ☐ Solar ☐ Wind Other: _____

Inverter Manufacturer: _____ Model: _____

(Continued on Sheet No. 10-214)

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**MINNESOTA DISTRIBUTED ENERGY RESOURCES
INTERCONNECTION PROCESS (MN DIP)
(Continued)**

Section No. 10
Original Sheet No. 214

AC Rated Nameplate Rating: _____ (kWac) _____ (kVAac) Single Phase ☐ Three Phase ☐

Export Capability Limited (e.g., through use of a control system, power relay(s), or other similar device settings of adjustments): Yes ☐ No ☐

If yes, describe: _____

DER capacity (as described in MN DIP 5.14.3): _____ (kWac)

Is equipment certified (i.e. UL 1741 Listed)? ☐ Yes (Certification is a Simplified Process requirement)

Installed DER System Cost (before incentives): _____

Estimated Installation Date: _____

Interconnection Customer Signature [This Section must be completed by the Customer]

The simpler Uniform Statewide Contract replaces the longer Interconnection Agreement (MN DIA) if the conditions of MN DIP 1.1.5 are met. A qualifying customer signing a Uniform Statewide Contract may elect to be additionally provided the MN DIA. Request a MN DIA?:

No ☐ Yes ☐

Disclaimer: The Area EPS Operator shall notify the Interconnection Customer with an opportunity to request a timeline extension (See MN DIP Section 1.8.2 and 5.2.2.) Failure by the Interconnection Customer to meet or request an extension for a timeline outlined in the MN DIP could result in a withdrawn queue position and the need to re-apply. INITIAL: _____

I designate the individual or company listed as my Application Agent to serve as my agent for the purpose of coordinating with the Area EPS Operator on my behalf throughout the interconnection process (see MN DIP 1.3.2) INITIAL: _____

I hereby certify that, to the best of my knowledge, the information provided in this Application is true, and that I have appropriate Site Control in conformance with the MN DIP. I agree to abide by the Terms and Conditions for Interconnecting an Inverter-Based Distributed Energy Resource No Larger than 20 kW (Simplified Process) (see Exhibit A – Terms and Conditions for Interconnecting an Inverter-Based DER No Larger than 20 kW) and return the Certificate of Completion (see Exhibit C – Certificate of Completion) when the DER has been installed.

Interconnection Customer Signature: _____

Name (print): _____ Date: _____

Send a completed and signed copy of this form with attachments to (Northern States Power Company through its online portal available at www.xcelenergy.com or other applicable URL). Send application fee in electronic format as instructed by the online portal. Only if the online portal or electronic method of sending payment is not available, then mail materials to Xcel Energy, Distributed Energy Resources, 414 Nicollet Mall, Minneapolis, MN 55401.

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Attachment 2: Simplified Application Form (cont'd)

Exhibit A – Terms and Conditions for Interconnecting an Inverter-Based DER No Larger than 20 kW

1.0 Construction of the Facility

The Interconnection Customer (the “Customer”) may proceed to construct (including operational testing not to exceed two hours) the Distributed Energy Resource(s) when the Area EPS Operator (Northern States Power Company, a Minnesota corporation, or the “Company”) approves the Interconnection Application (the “Application”).

2.0 Interconnection and Operation

The Customer may operate Distributed Energy Resource(s) and interconnect with the Company’s electric system once all of the following have occurred:

2.1. Upon completing construction, the Customer will cause the Distributed Energy Resource(s) to be inspected or otherwise certified by the appropriate local electrical wiring inspector with jurisdiction, and

2.2. The Customer returns the Certificate of Completion to the Company, and

2.3. The Company:

2.3.1 Shall have the opportunity to witness test as described in Minnesota Technical Requirements, but takes no liability for the results of the test. Completes its inspection of the Distributed Energy Resource(s) to ensure that all equipment has been appropriately installed and that all electrical connections have been made in accordance with applicable codes and standards. All inspections must be conducted by the Company, at its own expense, within ten Business Days after receipt of the Certificate of Completion and shall take place at a time agreeable to the Parties. The Company shall provide a written permission to operate authorization that the Distributed Energy Resource(s) has passed inspection or shall notify the Customer of what steps it must take to pass inspection within three (3) Business Days.

or

2.3.2 Does not schedule an inspection of the Distributed Energy Resource(s) within ten business days after receiving the Certificate of Completion, in which case the witness test is deemed waived (unless the Parties agree otherwise).

or

2.3.3 Waives the right to inspect the Distributed Energy Resource(s).

(Continued on Sheet No. 10-216)

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MINNESOTA ELECTRIC RATE BOOK - MPUC NO. 2

**MINNESOTA DISTRIBUTED ENERGY RESOURCES
INTERCONNECTION PROCESS (MN DIP)
(Continued)**

Section No. 10
Original Sheet No. 216

- 2.4. The Company has the right to disconnect the Distributed Energy Resource(s) in the event of: 1) improper installation or failure to return the Certificate of Completion, or 2) does not meet any of the requirements of this Agreement or, 3) if applicable, refusal to sign Uniform Statewide Contract.
- 2.5. Revenue quality metering equipment must be installed and tested in accordance with applicable Minnesota Technical Requirements.
- 2.6. If the Distributed Energy Resource(s) either: 1) does not use default IEEE 1547-2018 functions and settings; or 2) is not yet subject to a developed national standard or national certification, then at the option of the Area EPS Operator there needs to be in place an operating agreement to document and govern the operation of the Distributed Energy Resource(s).
- 3.0 Safe Operations and Maintenance
- The Customer shall be fully responsible to operate, maintain, and repair the Distributed Energy Resource(s) as required to ensure that it complies at all times with the interconnection standards to which it has been certified.
- 4.0 Access
- The Company shall have access to the disconnect switch, if required by the Area EPS Operator, and metering equipment of the Distributed Energy Resource(s) at all times as described in Minnesota Technical Requirements. The Company shall provide reasonable notice to the Customer when possible prior to using its right of access.
- 5.0 Disconnection
- The Company may temporarily disconnect the Distributed Energy Resource(s) upon the following conditions:
- 5.1. For scheduled outages upon reasonable notice.
- 5.2. For unscheduled outages or emergency conditions.
- 5.3. If the Distributed Energy Resource does not operate in the manner consistent with these Terms and Conditions.
- 5.4. The Company shall inform the Customer in advance of any scheduled disconnection, or as is reasonable after an unscheduled disconnection.
- 5.5. If the Customer is in Default it may be disconnected after a 60-day written notice is provided and the Default is not cured during this 60-day notice. This provision does not apply to disconnection based on outages or emergency conditions.

(Continued on Sheet No. 10-217)

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**MINNESOTA DISTRIBUTED ENERGY RESOURCES
INTERCONNECTION PROCESS (MN DIP)
(Continued)**

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6.0 Treatment Similar to Other Retail Customers

- 6.1. The Customer may be disconnected consistent with the rules and practices for disconnecting other retail electrical customers

7.0 Indemnification

- 7.1. This provision protects each Party from liability incurred to third parties as a result of carrying out the provisions of this Agreement.
- 7.2. The Parties shall at all times indemnify, defend, and save the other Party harmless from, any and all damages, losses, claims, including claims and actions relating to injury to or death of any person or damage to property, demand, suits, recoveries, costs and expenses, court costs, attorney fees, and all other obligations by or to third parties, arising out of or resulting from the other Party's action or inactions of its obligations under this agreement on behalf of the indemnifying Party, except in cases of gross negligence or intentional wrongdoing by the indemnified Party.
- 7.3. This indemnification obligation shall apply notwithstanding any negligent or intentional acts, errors or omissions of the indemnified Party, but the indemnifying Party's liability to indemnify the indemnified Party shall be reduced in proportion to the percentage by which the indemnified Party's negligent or intentional acts, errors or omissions caused the damages.
- 7.4. Neither Party shall be indemnified for its damages resulting from its sole negligence, intentional acts or willful misconduct. These indemnity provisions shall not be construed to relieve any insurer of its obligation to pay claims consistent with the provisions of a valid insurance policy.
- 7.5. If an indemnified person is entitled to indemnification under this article as a result of a claim by a third party, and the indemnifying Party fails, after notice and reasonable opportunity to proceed under this article, to assume the defense of such claim, such indemnified person may at the expense of the indemnifying Party contest, settle or consent to the entry of any judgment with respect to, or pay in full, such claim.
- 7.6. If an indemnifying party is obligated to indemnify and hold any indemnified person harmless under this article, the amount owing to the indemnified person shall be the amount of such indemnified person's actual loss, net of any insurance or other recovery.
- 7.7. Promptly after receipt by an indemnified person of any claim or notice of the commencement of any action or administrative or legal proceeding or investigation as to which the indemnity provided for in this article may apply, the indemnified person shall notify the indemnifying party of such fact. Any failure of or delay in such notification shall not affect a Party's indemnification obligation unless such failure or delay is materially prejudicial to the indemnifying party.

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(Continued)**

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8.0 Insurance

The Parties agree to follow all applicable insurance requirements imposed by Minnesota. All insurance policies must be maintained with insurers authorized to do business in Minnesota. See MN DIP Section 5.10.

9.0 Limitation of Liability

Each party's liability to the other party for any loss, cost, claim, injury, liability, or expense, including reasonable attorney's fees, relating to or arising from any act or omission in its performance of this Agreement, shall be limited to the amount of direct damage actually incurred. In no event shall either party be liable to the other party for any indirect, incidental, special, consequential, or punitive damages of any kind whatsoever, except as allowed under paragraph 6.0.

10.0 Termination

The agreement to operate in parallel may be terminated under the following conditions:

10.1. By the Customer

By providing written notice to the Company.

10.2. By the Company

If the Distributed Energy Resource(s) fails to operate for any consecutive 12 month period or the Customer fails to remedy a violation of these Terms and Conditions.

10.3. Permanent Disconnection

In the event this Agreement is terminated, the Company shall have the right to disconnect its facilities or direct the Customer to disconnect its Distributed Energy Resource.

10.4. Survival Rights

This Agreement shall continue in effect after termination to the extent necessary to allow or require either Party to fulfill rights or obligations that arose under the Agreement.

11.0 Assignment/Transfer of Ownership of the Facility

This Agreement shall survive the transfer of ownership of the Distributed Energy Resource(s) to a new owner when the new owner agrees in writing to comply with the terms of this Agreement and so notifies the Company.

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(Continued)**

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Exhibit B - For Energy Storage

Application for: ☐ Stand-alone storage as the DER
☐ Storage as a component of a DER

This form is required in addition to a completed Minnesota DER Interconnection Process (MN DIP) Application form for any DER with an energy storage component. Additional information in the application may be required. See Minnesota Technical Requirements.

(An application to interconnect is required only for storage designed to operate in parallel with the grid. Backup generators and electric vehicles that do not parallel need not apply.)

Customer Account Number: _____

Address of Generating Facility: _____

City: _____ State: MN Zip: _____

Equipment Manufacturer: _____

Equipment Model: _____

Real Power, max continuous (kW): _____

Apparent Power, max continuous (kVA): _____

Power factor range of adjustability: _____

Real Power, peak AC Energy (kWh): _____

Available control operating modes: _____

Control modes being enabled for interconnection: _____

Is equipment UL 1741 Listed? ☐ Yes ☐ No

Manufacturer specification sheet(s) are required to be additionally attached.

Is the storage 100% charged by a net energy metering eligible energy source? ☐ Yes ☐ No

Source charging the storage (check all that apply): _____ Utility _____ Solar _____ Wind _____ Diesel
Other: _____

Is the storage configured to export energy to the Area EPS? ☐ Yes ☐ No

Are the settings accessible to the end user? ☐ Yes ☐ No

For non-export, how does the system determine the magnitude of customer load?

What is the process for changing operational modes of the energy storage?

(Continued on Sheet No. 10-220)

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Exhibit C – Certificate of Completion

Distributed Energy Resource Certificate of Completion

MN DIP Simplified Process Interconnection

Customer: _____

Account Number: _____ Meter Number: _____

Application ID number: _____

Address of Distributed Energy Resource (DER):

City: _____ State: MN Zip: _____

Is the DER owner-installed? Yes No If no: Install

Company: _____

Contact: _____

Phone: _____ Email: _____

Electrician Name / License#: _____

The DER has been installed and inspected in compliance with the local electrical permitting authority as verified by the signature below or the additionally attached document.

Inspector Signature: _____

Print Name: _____ Date: _____

Authority Having Jurisdiction (city/county): _____

As a condition of interconnection, electronically submit this completed form through the Area EPS Operator's online portal. Only if this online portal is not available, email a completed copy of this form to Northern States Power Company Distributed Energy Resources at MNDER@xcelenergy.com If the online portal is not available, you may also mail the form to: Xcel Energy, Distributed Energy Resources, 414 Nicollet Mall, Minneapolis, MN 55401.

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INTERCONNECTION PROCESS (MN DIP)
(Continued)

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Attachment 3: Interconnection Application Form

MINNESOTA DISTRIBUTED ENERGY RESOURCES

INTERCONNECTION APPLICATION (Form Template)

This form is for Distributed Energy Resources (DERs) that meets the eligibility of the Minnesota Interconnection Process (see Section 1.1) and are not eligible for consideration under the Section 2 Simplified Process.

This Application is considered complete when it provides all applicable and correct information required below. Additional technical data may be necessary prior to the system impact study process as described in 4.3.3, if applicable, but is not relevant to application completeness. The following additional information must be submitted with an application:

- ☐ Single Line Diagram ☐ Proof of Site Control (see Section 1.7) and Site Diagram ☐ Specification Sheet(s)

A DER with an energy storage component must additionally complete Exhibit B – For Energy Storage

Application is for:

- ☐ New DER(s) ☐ Capacity addition or Material Modification to Existing DER (see MN DIP Glossary of Terms)

Select Review Process:

- ☐ Fast Track Process

Confirm eligibility requirements at MN DIP Section 3.1

[For Certified Equipment, the processing fee shall be \$100 + \$1/kW. For non-certified DER, the processing fee shall be \$100 + \$2/kW.]

- ☐ Study Process

Confirm eligibility requirements at MN DIP Section 4.

[The processing fee shall be a deposit of \$1,000 plus \$2.00 per kW towards the cost of the first study under Section 4 Study Process.]

Additional fees or deposits shall not be required, except as otherwise specified in the MN DIP.

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Minneapolis, Minnesota 55401

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**MINNESOTA DISTRIBUTED ENERGY RESOURCES
INTERCONNECTION PROCESS (MN DIP)
(Continued)**

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Interconnection Customer/Owner

Name:

Account Number:

Meter Number:

Mailing Address:

Telephone:

Email:

[If different,] Application

Agent/Company:

Telephone:

Email:

If capacity addition or Material Modification to existing facility, please describe:

Will the DER be used for any of the following?

Net Metering? Yes ___ No ___

To Supply Power to the Interconnection Customer? Yes ___ No ___

To Supply Power to Area EPS? Yes ___ No ___

Requested Point of Common Coupling (at a minimum, provide: 1) an address or nearest cross-section and 2) GPS coordinates or an annotated aerial map):

Installed DER System Cost (before incentives): _____

Interconnection Customer's Requested In-Service Date:

Distributed Energy Resource Information

Data applies only to the Distributed Energy Resource not the Interconnection Facilities.

Energy Source:

☐ Solar

☐ Wind

☐ Storage

☐ Hydro Type (e.g. Run-of-River):

☐ Diesel

☐ Natural
Gas

☐ Fuel Oil

☐ Other (state type, e.g. solar + wind + storage):

(Continued on Sheet No. 10-223)

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**MINNESOTA DISTRIBUTED ENERGY RESOURCES
INTERCONNECTION PROCESS (MN DIP)
(Continued)**

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Prime Mover:

- ☐ Photovoltaic ☐ Microturbine ☐ Reciprocating Engine ☐ Fuel Cell
☐ Gas Turbine ☐ Steam Turbine ☐ Wind Turbine ☐ Other (state type):

Type of Generator: ☐ Inverter ☐ Synchronous ☐ Induction

DER Nameplate Rating (in kWac):

DER Nameplate kVAR:

Interconnection Customer or Customer-
Sited Load (in kW, if none, so state):

Typical Reactive Load (if
known):

Maximum Physical Export Capability
Requested (in kW):

Export Capability Limited (e.g., through use of a control system, power relay(s), or other similar device settings of
adjustments): ☐ Yes ☐ No

If yes, describe: _____

List components of the Distributed Energy Resource Certified Equipment:

	Equipment Type	Certifying Entity
1.	_____	_____
2.	_____	_____
3.	_____	_____
4.	_____	_____
5.	_____	_____

Is the prime mover compatible with the certified protective relay package?

☐ Yes ☐ No

Distributed Energy Resource
Manufacturer, Model Name & Number:

Version Number:

Nameplate Rating in kW: (Summer): (Winter):

Nameplate Rating in kVA: (Summer): (Winter):

(Continued on Sheet No. 10-224)

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**MINNESOTA DISTRIBUTED ENERGY RESOURCES
INTERCONNECTION PROCESS (MN DIP)
(Continued)**

Section No. 10
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Individual Generator Power Factor

Rated Power Factor: Leading: Lagging:

Total Number of Distributed Energy Resources to be interconnected
pursuant to this

☐ Single Phase ☐ Three Phase

Interconnection Application: _____

Inverter Manufacturer, Model Name &
Number (if used):

List of adjustable set points for the
protective equipment or software:

Note: A completed power systems load flow data sheet must be supplied with the Interconnection Application.

Distributed Energy Resource Characteristic Data (for inverter-based machines)

Max design fault contribution Instantaneous or
current: RMS?
Harmonic characteristics:
Start-up requirements:

Distributed Energy Resource Characteristic Data (for rotating machines)

RPM *Neutral Grounding Resistor
frequency: (if applicable):

Synchronous Generators:

Direct Axis Synchronous Reactance, X_d :	Zero Sequence Reactance, X_0 :
Direct Axis Transient Reactance, X'_d :	KVA Base:
Direct Axis Subtransient Reactance, X''_d :	Field Volts:
Negative Sequence Reactance, X_2 :	Field Amperes:

(Continued on Sheet No. 10-225)

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Induction Generators:

Motoring Power (kW):
I22t or K (Heating Time
Constant):
Rotor Resistance, Rr:
Stator Resistance, Rs:
Stator Reactance, Xs:

Exciting Current:
Temperature Rise:

Frame Size:
Design Letter:
Reactive Power Required In Vars
(No Load):
Reactive Power Required In Vars
(Full Load):
Total Rotating Inertia, H:

Rotor Reactance, Xr

Magnetizing Reactance,
Xm:

Per Unit on kVA Base

Short Circuit Reactance,
Xd”:

Note: Please contact the Area EPS Operator prior to submitting the Interconnection Application to determine if the specified information above is required.

Excitation and Governor System Data for Synchronous Generators Only

Provide appropriate IEEE model block diagram of excitation system, governor system and power system stabilizer (PSS) in accordance with the regional reliability council criteria. A PSS may be determined to be required by applicable studies. A copy of the manufacturer's block diagram may not be substituted.

Interconnection Facilities Information

Will a transformer be used between the DER and the Point of Common Coupling?

☐ Yes ☐ No

Will the transformer be provided by the Interconnection Customer?

☐ Yes ☐ No

Transformer Data (If Applicable, for Interconnection Customer-Owned Transformer):

Is the transformer:

☐ Single Phase ☐ Three Phase

Size (kVA):

Transformer
Impedance (%):

on kVA Base:

If Three Phase:

Transformer Primary:	Volts:	Delta:	Wye:	Wye Grounded:
Transformer Secondary:	Volts:	Delta:	Wye:	Wye Grounded:
Transformer Tertiary:	Volts:	Delta:	Wye:	Wye Grounded:

(Continued on Sheet No. 10-226)

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(Continued)**

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Transformer Fuse Data (If Applicable, for Interconnection Customer-Owned Fuse):

(Attach copy of fuse manufacturer's Minimum Melt and Total Clearing Time-Current Curves)

Manufacturer: _____ Type: _____ Size: _____ Speed: _____

Interconnecting Circuit Breaker (if applicable):

Manufacturer: _____ Type: _____

Load Rating Interrupting Rating Trip Speed
(Amps) (Amps): (Cycles):

Interconnection Protective Relays (If Applicable):

If Microprocessor-Controlled:

List of Functions and Adjustable Setpoints for the protective equipment or software:

	Setpoint Function	Minimum	Maximum
1.	_____	_____	_____
2.	_____	_____	_____
3.	_____	_____	_____
4.	_____	_____	_____
5.	_____	_____	_____
6.	_____	_____	_____

If Discrete Components:

(Enclose Copy of any Proposed Time-Overcurrent Coordination Curves)

Manufacturer: _____	Type: _____	Style/Catalog No.: _____	Proposed Setting: _____
Manufacturer: _____	Type: _____	Style/Catalog No.: _____	Proposed Setting: _____
Manufacturer: _____	Type: _____	Style/Catalog No.: _____	Proposed Setting: _____
Manufacturer: _____	Type: _____	Style/Catalog No.: _____	Proposed Setting: _____
Manufacturer: _____	Type: _____	Style/Catalog No.: _____	Proposed Setting: _____

Current Transformer Data (If Applicable):

(Enclose Copy of Manufacturer's Excitation and Ratio Correction Curves)

Manufacturer: _____

Type: _____ Accuracy Class: _____ Proposed Ratio Connection: _____

Manufacturer: _____

Type: _____ Accuracy Class: _____ Proposed Ratio Connection: _____

(Continued on Sheet No. 10-227)

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(Continued)**

Section No. 10
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Potential Transformer Data (If Applicable):

Manufacturer:

Type:	Accuracy Class:	Proposed Ratio Connection:
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Manufacturer:

Type:	Accuracy Class:	Proposed Ratio Connection:
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General Information

Enclose copy of site electrical one-line diagram showing the configuration of all DER equipment, current and potential circuits, and protection and control schemes. The one-line diagram shall include:

Interconnection Customer name.

Application ID (or, if applicable, Customer account number)

Installer name and contact information.

Install address- must match application address.

Correct positions of all equipment, including but not limited to panels, inverter, and DC/AC disconnect. Include distances between equipment, and any labeling found on equipment. See Minnesota Technical Requirements.

This one-line diagram must be signed and stamped by a Professional Engineer licensed in Minnesota if the DER is larger than 50 kW (if uncertified) and 250 kW (if certified.)

Is One-Line Diagram Enclosed? ☐ Yes ☐ No

Enclose copy of any site documentation that indicates the precise physical location of the proposed Distributed Energy Resource (e.g., USGS topographic map or other diagram or documentation). Is Available Documentation Enclosed?

Proposed location of protective interface equipment on property (include address if different from the Interconnection Customer's address)_____

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(Continued)**

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Enclose copy of any site documentation that describes and details the operation of the protection and control schemes. Is Available Documentation Enclosed?

☐ Yes ☐ No

Enclose copies of schematic drawings for all protection and control circuits, relay current circuits, relay potential circuits, and alarm/monitoring circuits (if applicable).

Are Schematic Drawings Enclosed?

☐ Yes ☐ No

Enclose copies of documentation showing site control (MN DIP Section 1.7)

Is Available Documentation Enclosed?

☐ Yes ☐ No

Disclaimer: The Area EPS Operator shall notify the Interconnection Customer with an opportunity to request a timeline extension (See MN DIP Section 1.8.2 and 5.2.3.). Failure by the Interconnection Customer to meet and request an extension as described in MN DIP Section 5.2.3 for a timeline outlined in the MN DIP could result in a withdrawn queue position and the need to re-apply. INITIAL: _____

Interconnection Customer Signature

I hereby certify that, to the best of my knowledge, all the information provided in this Interconnection Application is true and correct.

Interconnection Customer:

Date:

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Attachment 4: Certification Codes and Standards

Prior to Commission approval of the update of Minnesota Technical Requirements (anticipated in February 2019), the existing Minnesota Technical Requirements and the following standards shall be used in conjunction with the Minnesota Interconnection Process (MN DIP) and Minnesota Interconnection Agreement (MN DIA) for Distributed Energy Resources.¹ Once approved, the Minnesota DER Technical Interconnection and Interoperability Requirements will supersede this attachment.

When the stated version of the following standards is superseded by an approved revision then that revision shall apply.

IEEE 1547-2003 IEEE Standard for Interconnecting Distributed Resources with Electric Power Systems

IEEE 1547a-2014 IEEE Standard for Interconnecting Distributed Resources with Electric Power Systems – Amendment 1

IEEE 1547.1-2005 IEEE Standard Conformance Test Procedures for Equipment Interconnecting Distributed Resources with Electric Power Systems

IEEE 1547.1a-2015 (Amendment to IEEE Std 1547.1 – 2005) IEEE Standard Conformance Test Procedures for Equipment Interconnecting Distributed Resources with Electric Power Systems – Amendment 1

UL 1741 Inverters, Converters, Controllers, and Interconnection System Equipment for Use in Distributed Energy Resources (2010)

NFPA 70 (2017), National Electrical Code

IEEE Std C37.90.1(2012) (Revision of IEEE Std C37.90.1-2002), IEEE Standard for Surge Withstand Capability (SWC) Tests for Protective Relays and Relay Systems Associated with Electric Power Apparatus

IEEE Std C37.90.2 (2004) (Revision of IEEE Std C37.90.2-1995), IEEE Standard for Withstand Capability of Relay Systems to Radiated Electromagnetic Interference from Transceivers

IEEE Std C37.108-2002/1989 (Revision of C37.108-1989/2002), IEEE Guide for the Protection of Network Transformers

¹ This is an interim document while the Commission updates the Minnesota Distributed Energy Resource Interconnection and Interoperability Technical Requirements which includes alignment with the anticipated final IEEE 1547-2018 revision. For the transition period between Minnesota's existing statewide interconnection standards and the updated standards, both inverters certified to existing 1547.1 and 1547.1a-2015 (most current version); as well as, certified inverters per the expected revised 1547.1 standard should be acceptable.

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IEEE Std C57.12.44-2014 (Revision of IEEE Std C57.12.44-2005), IEEE Standard Requirements for Secondary Network Protectors

IEEE Std C62.41.2-2002, IEEE Recommended Practice on Characterization of Surges in Low-Voltage (1000V and Less) AC Power Circuits

IEEE Std C62.41.2-2002_Cor 1-2012 (Corrigendum to IEEE Std C62.41.2-2002) - IEEE Recommended Practice on Characterization of Surges in Low-Voltage (1000 V and Less) AC Power Circuits Corrigendum 1: Deletion of Table A.2 and Associated Text

IEEE Std C62.45-2002 (Revision of IEEE Std C62.45-1992) - IEEE Recommended Practice on Surge Testing for Equipment Connected to Low-Voltage (1000 V and less) AC Power Circuits

ANSI C84.1-(2016) Electric Power Systems and Equipment – Voltage Ratings (60 Hertz)

IEEE Standards Dictionary Online, [Online]

NEMA MG 1-2016, Motors and Generators

IEEE Std 519-2014, IEEE Recommended Practices and Requirements for Harmonic Control in Electrical Power Systems

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Attachment 5: Certification of Distributed Energy Resource Equipment

- 1.0 Distributed Energy Resource (DER) equipment proposed for use in an interconnection system shall be considered certified for interconnected operation if: 1) it has been tested in accordance with industry standards for continuous utility interactive operation in compliance with the appropriate codes and standards referenced below by any Nationally Recognized Testing Laboratory (NRTL) recognized by the United States Occupational Safety and Health Administration to test and certify interconnection equipment pursuant to the relevant codes and standards listed in MN DIP Attachment 4, 2) it has been labeled and is publicly listed by such NRTL at the time of the interconnection application, and 3) such NRTL makes readily available for verification all test standards and procedures it utilized in performing such equipment certification, and, with consumer approval, the test data itself. The NRTL may make such information available on its website and by encouraging such information to be included in the manufacturer's literature accompanying the equipment.
- 2.0 The Interconnection Customer must verify that the assembly and use of the equipment falls within the use or uses for which the equipment was tested, labeled, and listed by the NRTL.
- 3.0 Certified equipment shall not require further type-test review, testing, or additional equipment to meet the requirements of this interconnection procedure; however, nothing herein shall preclude the need for a DER Design Evaluation or an on-site commissioning test by the parties to the interconnection as provided for in the Minnesota Technical Requirements.
- 4.0 If the certified equipment package includes only interface components (switchgear, inverters, or other interface devices), then an Interconnection Customer must show that the generator or other electric source being utilized with the equipment package is compatible with the equipment package and is consistent with the testing and listing specified for this type of interconnection equipment.
- 5.0 Provided the generator or electric source, when combined with the equipment package, is within the range of capabilities for which it was tested by the NRTL, and does not violate the interface components' labeling and listing performed by the NRTL, no further type-test review, testing or additional equipment on the customer side of the Point of Common Coupling shall be required to be considered certified for the purposes of this interconnection procedure; however, nothing herein shall preclude the need for a DER Design Evaluation or an on-site commissioning test by the parties to the interconnection as provided for in the Minnesota Technical Requirements.
- 6.0 An equipment package does not include equipment provided by the Area EPS.

(Continued on Sheet No. 10-232)

Date Filed:	12-14-18	By: Christopher B. Clark	Effective Date:	05-09-19
		President, Northern States Power Company, a Minnesota corporation		
Docket No.	E002/M-18-714		Order Date:	05-09-19

Attachment 6: System Impact Study Agreement

THIS AGREEMENT is made and entered into this ____ day of _____
20__ by and between _____,
a _____ organized and existing under the laws of the State of
_____, ("Interconnection Customer"), and Northern States Power Company, a Minnesota corporation, doing
business as Xcel Energy ("Area EPS Operator"). Interconnection Customer and Area EPS Operator each may be
referred to as a "Party," or collectively as the "Parties."

RECITALS

WHEREAS, the Interconnection Customer is proposing to develop a Distributed Energy Resource (DER) or
generating capacity addition to an existing DER consistent with the Interconnection Application completed by the
Interconnection Customer on _____; and

WHEREAS, the Interconnection Customer desires to interconnect the DER with the Area EPS Operator's electric
system;

WHEREAS, the Interconnection Customer has requested the Area EPS Operator to perform a system impact
study(s) to assess the impact of interconnecting the DER with the Area EPS Operator's electric System, and potential
Affected System(s);

NOW, THEREFORE, in consideration of and subject to the mutual covenants contained herein the Parties agreed as
follows:

- 1.0 When used in this Agreement, with initial capitalization, the terms specified shall have the meanings
indicated or the meanings specified in the standard Minnesota Distributed Energy Resources
Interconnection Procedures (MN DIP.)
- 2.0 The Interconnection Customer elects and the Area EPS Operator shall cause to be performed a system
impact study(s) consistent with the MN DIP. The scope of a system impact study shall be subject to the
assumptions set forth in this Agreement; including Attachment A.
- 3.0 A system impact study will be based upon the technical information provided by Interconnection Customer in
the Interconnection Application. The Area EPS Operator reserves the right to request additional technical
information from the Interconnection Customer as may reasonably become necessary consistent with Good
Utility Practice during the course of the system impact study.

(Continued on Sheet No. 10-233)

Date Filed:	12-14-18	By: Christopher B. Clark	Effective Date:	05-09-19
		President, Northern States Power Company, a Minnesota corporation		
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MINNESOTA ELECTRIC RATE BOOK - MPUC NO. 2

**MINNESOTA DISTRIBUTED ENERGY RESOURCES
INTERCONNECTION PROCESS (MN DIP)
(Continued)**

Section No. 10
Original Sheet No. 233

- 4.0 A system impact study may, as necessary, consist of a short circuit analysis, a stability analysis, a power flow analysis, voltage drop and flicker studies, protection and set point coordination studies, and grounding reviews. A system impact study shall state the assumptions upon which it is based, state the results of the analyses, and provide the requirement or potential impediments to providing the requested interconnection service, including a preliminary indication of the cost and length of time that would be necessary to correct any problems identified in those analyses and implement the interconnection. A system impact study shall provide a list of facilities that are required as a result of the Interconnection Application and non-binding good faith estimates of cost responsibility and time to construct.
- 5.0 A distribution system impact study shall incorporate a distribution load flow study, an analysis of equipment interrupting ratings, protection coordination study, voltage drop and flicker studies, protection and set point coordination studies, grounding reviews, and the impact on electric system operation, as necessary.
- 6.0 Affected Systems may participate in the preparation of a system impact study, with a division of costs among such entities as they may agree. All Affected Systems shall be afforded an opportunity to review and comment upon a system impact study that covers potential adverse system impacts on their electric systems.
- 7.0 If the Area EPS Operator uses a queuing procedure for sorting or prioritizing projects and their associated cost responsibilities for any required Network Upgrades, the system impact study shall consider all Distributed Energy Resources (and with respect to paragraph 7.3 below, any identified Upgrades associated with such higher queued interconnection) that, on the date the system impact study is commenced –
- 7.1. Are directly interconnected with the Area EPS Operator's electric system; or
- 7.2. Are interconnected with Affected Systems and may have an impact on the proposed interconnection; and
- 7.3. Have a pending higher queued Interconnection Application to interconnect with the Area EPS Operator's electric system.
- 8.0 A deposit of the equivalent of the good faith estimated cost of a distribution system impact study and the good faith estimated cost of a transmission system impact study shall be required from the Interconnection Customer when the signed Agreement is provided to the Area EPS Operator.
- 9.0 Any study fees shall be based on the Area EPS Operator's actual costs and will be invoiced to the Interconnection Customer within 20 Business Days after the study is completed and delivered and will include a summary of professional time.
- 10.0 The Interconnection Customer must pay any study costs that exceed the deposit without interest within 20 Business Days on receipt of the invoice or resolution of any dispute. If the deposit exceeds the invoiced fees, the Area EPS Operator shall refund such excess within 20 Business Days of the invoice without interest.

(Continued on Sheet No. 10-234)

Date Filed:	12-14-18	By:	Christopher B. Clark	Effective Date:	05-09-19
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**MINNESOTA DISTRIBUTED ENERGY RESOURCES
INTERCONNECTION PROCESS (MN DIP)
(Continued)**

Section No. 10
Original Sheet No. 234

11.0 Governing Law, Regulatory Authority, and Rules

The validity, interpretation and enforcement of this Agreement and each of its provisions shall be governed by the laws of the state of Minnesota. This Agreement is subject to all Applicable Laws and Regulations. Each Party expressly reserves the right to seek changes in, appeal, or otherwise contest any laws, orders, or regulations of a Governmental Authority.

12.0 Amendment

The Parties may amend this Agreement by a written instrument duly executed by both Parties.

13.0 No Third-Party Beneficiaries

This Agreement is not intended to and does not create rights, remedies, or benefits of any character whatsoever in favor of any persons, corporations, associations, or entities other than the Parties, and the obligations herein assumed are solely for the use and benefit of the Parties, their successors in interest and where permitted, their assigns.

14.0 Waiver

14.1. The failure of a Party to this Agreement to insist, on any occasion, upon strict performance of any provision of this Agreement will not be considered a waiver of any obligation, right, or duty of, or imposed upon, such Party.

14.2. Any waiver at any time by either Party of its rights with respect to this Agreement shall not be deemed a continuing waiver or a waiver with respect to any other failure to comply with any other obligation, right, duty of this Agreement. Termination or default of this Agreement for any reason by Interconnection Customer shall not constitute a waiver of the Interconnection Customer's legal rights to obtain an interconnection from the Area EPS Operator. Any waiver of this Agreement shall, if requested, be provided in writing.

15.0 Multiple Counterparts

This Agreement may be executed in two or more counterparts, each of which is deemed an original but all constitute one and the same instrument. Electronic signatures are acceptable if the Area EPS Operator has made such a determination pursuant to MN DIP 1.2.1.1.

16.0 No Partnership

This Agreement shall not be interpreted or construed to create an association, joint venture, agency relationship, or partnership between the Parties or to impose any partnership obligation or partnership liability upon either Party. Neither Party shall have any right, power or authority to enter into any agreement or undertaking for, or act on behalf of, or to act as or be an agent or representative of, or to otherwise bind, the other Party.

(Continued on Sheet No. 10-235)

Date Filed:	12-14-18	By: Christopher B. Clark	Effective Date:	05-09-19
		President, Northern States Power Company, a Minnesota corporation		
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MINNESOTA ELECTRIC RATE BOOK - MPUC NO. 2

**MINNESOTA DISTRIBUTED ENERGY RESOURCES
INTERCONNECTION PROCESS (MN DIP)
(Continued)**

Section No. 10
Original Sheet No. 235

17.0 Severability

If any provision or portion of this Agreement shall for any reason be held or adjudged to be invalid or illegal or unenforceable by any court of competent jurisdiction or other Governmental Authority, (1) such portion or provision shall be deemed separate and independent, (2) the Parties shall negotiate in good faith to restore insofar as practicable the benefits to each Party that were affected by such ruling, and (3) the remainder of this Agreement shall remain in full force and effect.

18.0 Subcontractors

Nothing in this Agreement shall prevent a Party from utilizing the services of any subcontractor as it deems appropriate to perform its obligations under this Agreement; provided, however, that each Party shall require its subcontractors to comply with all applicable terms and conditions of this Agreement in providing such services and each Party shall remain primarily liable to the other Party for the performance of such subcontractor.

18.1. The creation of any subcontract relationship shall not relieve the hiring Party of any of its obligations under this Agreement. The hiring Party shall be fully responsible to the other Party for the acts or omissions of any subcontractor the hiring Party hires as if no subcontract had been made; provided, however, that in no event shall the Area EPS Operator be liable for the actions or inactions of the Interconnection Customer or its subcontractors with respect to obligations of the Interconnection Customer under this Agreement. Any applicable obligation imposed by this Agreement upon the hiring Party shall be equally binding upon, and shall be construed as having application to, any subcontractor of such Party.

18.2. The obligations under this article will not be limited in any way by any limitation of subcontractor's insurance.

19.0 Inclusion of Area EPS Operator Tariffs and Rules

The interconnection services provided under this Agreement shall at all times be subject to the terms and conditions set forth in the tariff schedules and rules applicable to the electric service provided by the Area EPS, which tariff schedules and rules are hereby incorporated into this Agreement by this reference. Notwithstanding any other provisions of this Agreement, the Area EPS Operator shall have the right to unilaterally file with the Minnesota Public Utilities Commission, pursuant to the Commission's rules and regulations, an application for change in rates, charges, classification, service, tariff, or rule or any agreement relating thereto. The Interconnection Customer shall also have the right to unilaterally file with the Minnesota Public Utilities Commission, pursuant to the Commission's rules and regulations, an application for change in rates, charges, classification, service, tariff, or rule or any agreement relating thereto. Each Party shall have the right to protest any such filing by the other Party and/or to participate fully in any proceeding before the Minnesota Public Utilities Commission in which such modifications may be considered, pursuant to the Commission's rules and regulations.

(Continued on Sheet No. 10-236)

Date Filed:	12-14-18	By: Christopher B. Clark	Effective Date:	05-09-19
		President, Northern States Power Company, a Minnesota corporation		
Docket No.	E002/M-18-714		Order Date:	05-09-19

Northern States Power Company, a Minnesota corporation
Minneapolis, Minnesota 55401

MINNESOTA ELECTRIC RATE BOOK - MPUC NO. 2

**MINNESOTA DISTRIBUTED ENERGY RESOURCES
INTERCONNECTION PROCESS (MN DIP)
(Continued)**

Section No. 10
Original Sheet No. 236

IN WITNESS THEREOF, the Parties have caused this Agreement to be duly executed by their duly authorized officers or agents on the day and year first above written.

Northern States Power Company, a Minnesota corporation (Area EPS Operator)	_____ (Interconnection Customer)
Signed: _____	Signed: _____
Name (Printed): _____	Name (Printed): _____
Title: _____	Title: _____

N
|
N

(Continued on Sheet No. 10-237)

Date Filed:	12-14-18	By: Christopher B. Clark	Effective Date:	05-09-19
		President, Northern States Power Company, a Minnesota corporation		
Docket No.	E002/M-18-714		Order Date:	05-09-19

Attachment 6: System Impact Study Agreement (cont'd)

Attachment A

Assumptions Used in Conducting the System Impact Study

The system impact study shall be based upon the following assumptions:

- 1) Designation of Point of Common Coupling and configuration to be studied.
- 2) Designation of alternative Points of DER Interconnection and configuration.

1) and 2) are to be completed by the Interconnection Customer. Other assumptions (listed below) are to be provided by the Interconnection Customer and the Area EPS Operator. The Area EPS Operator shall use the Reference Point for Applicability which is either the Point of Common Coupling or the Point(s) of DER Interconnection as described in IEEE 1547.

Additional DER technical data required for System Impact Study

If applicable, the Area EPS Operator shall list below any additional technical data that is required to adequately perform the System Impact Study. As indicated in MN DIP section 4.3.3, this information is to be returned with the signed system impact study agreement and deposit.

(Continued on Sheet No. 10-238)

Date Filed:	12-14-18	By: Christopher B. Clark	Effective Date:	05-09-19
		President, Northern States Power Company, a Minnesota corporation		
Docket No.	E002/M-18-714		Order Date:	05-09-19

Attachment 7: Facilities Study Agreement

THIS AGREEMENT is made and entered into this ____ day of _____, 20____ by and between _____, a _____ organized and existing under the laws of the State of _____, ("Interconnection Customer,") and Northern States Power Company, a Minnesota corporation, doing business as Xcel Energy, ("Area EPS Operator"). Interconnection Customer and Area EPS Operator each may be referred to as a "Party," or collectively as the "Parties."

RECITALS

WHEREAS, the Interconnection Customer is proposing to develop a Distributed Energy Resource or generating capacity addition to an existing Distributed Energy Resource consistent with the Interconnection Application completed by the Interconnection Customer on _____; and

WHEREAS, the Interconnection Customer desires to interconnect the Distributed Energy Resource with the Area EPS Operator's Distribution System;

WHEREAS, the Area EPS Operator has completed Initial Review, Supplemental Review, and/or a system impact study and provided the results of said review to the Interconnection Customer, or determined none was required; and

WHEREAS, the Interconnection Customer has requested the Area EPS Operator to perform a facilities study to specify, and estimate the cost of, the equipment, engineering, procurement and construction work needed to implement the conclusions of the above noted review in accordance with Good Utility Practice to physically and electrically connect the Distributed Energy Resource with the Area EPS Operator's Distribution System.

NOW, THEREFORE, in consideration of and subject to the mutual covenants contained herein the Parties agreed as follows:

- 1.0 When used in this Agreement, with initial capitalization, the terms specified shall have the meanings indicated or the meanings specified in the standard State of Minnesota Distributed Energy Resources Interconnection Procedures (MN DIP).
- 2.0 The Interconnection Customer elects and the Area EPS Operator shall cause a facilities study consistent with the standard MN DIP to be performed. The scope of the facilities study shall be subject to data provided in Attachment A to this Agreement.
- 3.0 The facilities study shall specify and estimate the cost of the equipment, engineering, procurement and construction work (including overheads) needed to implement the conclusions of the system impact study(s). The facilities study shall also identify: 1) the electrical switching configuration of the equipment, including, without limitation, transformer, switchgear, meters, and other station equipment, 2) the nature and estimated cost of the Area EPS Operator's Interconnection Facilities and Upgrades necessary to accomplish the interconnection, and 3) an estimate of the time required to complete the construction and installation of such facilities.

(Continued on Sheet No. 10-239)

Date Filed:	12-14-18	By:	Christopher B. Clark	Effective Date:	05-09-19
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Docket No.	E002/M-18-714			Order Date:	05-09-19

MINNESOTA ELECTRIC RATE BOOK - MPUC NO. 2

**MINNESOTA DISTRIBUTED ENERGY RESOURCES
INTERCONNECTION PROCESS (MN DIP)
(Continued)**

Section No. 10
Original Sheet No. 239

- 4.0 The Area EPS Operator may propose to group facilities required for more than one Interconnection Customer in order to minimize facilities costs through economies of scale, but any Interconnection Customer may require the installation of facilities required for its own Distributed Energy Resource if it is willing to pay the costs of those facilities.
- 5.0 A deposit of the good faith estimate of the facilities study costs shall be required from the Interconnection Customer and provided when the signed Agreement is provided to the Area EPS Operator.
- 6.0 Any study fees shall be based on the Area EPS Operator's actual costs and will be invoiced to the Interconnection Customer within 20 Business Days after the study is completed and delivered and will include a summary of professional time.
- 7.0 The Interconnection Customer must pay any study costs that exceed the deposit without interest within 20 Business Days on receipt of the invoice or resolution of any dispute. If the deposit exceeds the invoiced fees, the Area EPS Operator shall refund such excess within 20 Business Days of the invoice without interest.
- 8.0 **Governing Law, Regulatory Authority, and Rules**
- The validity, interpretation and enforcement of this Agreement and each of its provisions shall be governed by the laws of the state of Minnesota. This Agreement is subject to all Applicable Laws and Regulations. Each Party expressly reserves the right to seek changes in, appeal, or otherwise contest any laws, orders, or regulations of a Governmental Authority.
- 9.0 **Amendment**
- The Parties may amend this Agreement by a written instrument duly executed by both Parties.
- 10.0 **No Third-Party Beneficiaries**
- This Agreement is not intended to and does not create rights, remedies, or benefits of any character whatsoever in favor of any persons, corporations, associations, or entities other than the Parties, and the obligations herein assumed are solely for the use and benefit of the Parties, their successors in interest and where permitted, their assigns.
- 11.0 **Waiver**
- 11.1 The failure of a Party to this Agreement to insist, on any occasion, upon strict performance of any provision of this Agreement will not be considered a waiver of any obligation, right, or duty of, or imposed upon, such Party.

(Continued on Sheet No. 10-240)

Date Filed:	12-14-18	By:	Christopher B. Clark	Effective Date:	05-09-19
			President, Northern States Power Company, a Minnesota corporation		
Docket No.	E002/M-18-714			Order Date:	05-09-19

11.2. Any waiver at any time by either Party of its rights with respect to this Agreement shall not be deemed a continuing waiver or a waiver with respect to any other failure to comply with any other obligation, right, duty of this Agreement. Termination or default of this Agreement for any reason by Interconnection Customer shall not constitute a waiver of the Interconnection Customer's legal rights to obtain an interconnection from the Area EPS Operator. Any waiver of this Agreement shall, if requested, be provided in writing.

12.0 Multiple Counterparts

This Agreement may be executed in two or more counterparts, each of which is deemed an original but all constitute one and the same instrument. Electronic signatures are acceptable if the Area EPS Operator has made such a determination pursuant to MN DIP 1.2.1.1.

13.0 No Partnership

This Agreement shall not be interpreted or construed to create an association, joint venture, agency relationship, or partnership between the Parties or to impose any partnership obligation or partnership liability upon either Party. Neither Party shall have any right, power or authority to enter into any agreement or undertaking for, or act on behalf of, or to act as or be an agent or representative of, or to otherwise bind, the other Party.

14.0 Severability

If any provision or portion of this Agreement shall for any reason be held or adjudged to be invalid or illegal or unenforceable by any court of competent jurisdiction or other Governmental Authority, (1) such portion or provision shall be deemed separate and independent, (2) the Parties shall negotiate in good faith to restore insofar as practicable the benefits to each Party that were affected by such ruling, and (3) the remainder of this Agreement shall remain in full force and effect.

15.0 Subcontractors

Nothing in this Agreement shall prevent a Party from utilizing the services of any subcontractor as it deems appropriate to perform its obligations under this Agreement; provided, however, that each Party shall require its subcontractors to comply with all applicable terms and conditions of this Agreement in providing such services and each Party shall remain primarily liable to the other Party for the performance of such subcontractor.

(Continued on Sheet No. 10-241)

Date Filed:	12-14-18	By: Christopher B. Clark	Effective Date:	05-09-19
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MINNESOTA ELECTRIC RATE BOOK - MPUC NO. 2

**MINNESOTA DISTRIBUTED ENERGY RESOURCES
INTERCONNECTION PROCESS (MN DIP)
(Continued)**

Section No. 10
Original Sheet No. 241

- 15.1. The creation of any subcontract relationship shall not relieve the hiring Party of any of its obligations under this Agreement. The hiring Party shall be fully responsible to the other Party for the acts or omissions of any subcontractor the hiring Party hires as if no subcontract had been made; provided, however, that in no event shall the Area EPS Operator be liable for the actions or inactions of the Interconnection Customer or its subcontractors with respect to obligations of the Interconnection Customer under this Agreement. Any applicable obligation imposed by this Agreement upon the hiring Party shall be equally binding upon, and shall be construed as having application to, any subcontractor of such Party.
- 15.2. The obligations under this article will not be limited in any way by any limitation of subcontractor's insurance.
- 16.0 Inclusion of Area EPS Operator Tariffs and Rules
- The interconnection services provided under this Agreement shall at all times be subject to the terms and conditions set forth in the tariff schedules and rules applicable to the electric service provided by the Area EPS, which tariff schedules and rules are hereby incorporated into this Agreement by this reference. Notwithstanding any other provisions of this Agreement, the Area EPS Operator shall have the right to unilaterally file with the MPUC, pursuant to the MPUC's rules and regulations, an application for change in rates, charges, classification, service, tariff, or rule or any agreement relating thereto. The Interconnection Customer shall also have the right to unilaterally file with the MPUC, pursuant to the MPUC's rules and regulations, an application for change in rates, charges, classification, service, tariff, or rule or any agreement relating thereto. Each Party shall have the right to protest any such filing by the other Party and/or to participate fully in any proceeding before the MPUC in which such modifications may be considered, pursuant to the MPUC's rules and regulations.
- 17.0 Data to be provided by the Interconnection Customer with the Facilities Study Agreement
- 17.1. The Interconnection Customer shall be available to meet on site with the Area EPS Operator within 5 Business Days of signing the Facilities Study Agreement. The personnel furnished by the Interconnection Customer for this site meeting shall bring detailed information on the site layout. The Area EPS Operator may request the Interconnection Customer physically places stakes at the location of the major components.¹
- 17.2. The Interconnection Customer shall furnish a final site plan detailing the location of major equipment at the time this agreement is returned. The Point of Common Coupling (PCC) and Point of DER Connection (PoC) shall be clearly marked. The site plan shall depict any nearby roads and be labeled with the road name. Accurate dimensions shall be included on the site plan. The proper emergency (911) address, corresponding to the site, shall be labeled on the site plan.

¹ Examples of major components include, but are not limited to, interconnection transformers, breakers, fuses, reclosers, meters, current transformers (CTs), potential transformers (PTs), switch cabinets, inverters.

(Continued on Sheet No. 10-242)

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Docket No.	E002/M-18-714			Order Date:	05-09-19

MINNESOTA ELECTRIC RATE BOOK - MPUC NO. 2

**MINNESOTA DISTRIBUTED ENERGY RESOURCES
INTERCONNECTION PROCESS (MN DIP)
(Continued)**

Section No. 10
Original Sheet No. 242

- 17.3. The Interconnection Customer shall furnish a final one-line diagram detailing the electrical connections between major components. The one-line shall be returned with the signed Facilities Study Agreement.
- 17.4. Technical cut sheets on all equipment related to metering shall be provided by the Interconnection Customer along with the signed Facilities Study Agreement.
- 17.5. If available, copies of Conditional Use Permit(s) from all necessary authorities shall be returned by the Interconnection Customer with the signed Facilities Study Agreement.
- 17.6. The Interconnection Customer shall secure any necessary easements from private land owners prior to signing the Facilities Study Agreement. Documentation of any such agreements shall be provided to the Area EPS Operator.
- 17.7. In the event that the Area EPS Operator determines a site survey is necessary in order to complete a Facilities Study, the Interconnection Customer shall make good faith efforts to complete the site survey in a timely manner.
- 17.8. The Facilities Study assumes all land use permits required for the interconnection will be approved by the proper authorities. Permits are submitted after the Interconnection Agreement is signed and may impact project costs (i.e., overhead to underground requirement.)
- 17.9. The Interconnection Customer and Area EPS Operator shall provide a single point of contact for design and construction related matters. The Interconnection Customer single point of contact shall respond in a timely manner to Area EPS Operator questions during the Facilities Study.
- 17.10. In the event that an Interconnection Customer does not provide the necessary information described in this agreement, or if the Interconnection Customer takes more than five (5) Business Days to respond to a question during the Facilities Study, the Facilities Study timeframe shall pause until the question is resolved.

N

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(Continued on Sheet No. 10-243)

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Northern States Power Company, a Minnesota corporation
Minneapolis, Minnesota 55401

MINNESOTA ELECTRIC RATE BOOK - MPUC NO. 2

**MINNESOTA DISTRIBUTED ENERGY RESOURCES
INTERCONNECTION PROCESS (MN DIP)
(Continued)**

Section No. 10
Original Sheet No. 243

IN WITNESS WHEREOF, the Parties have caused this Agreement to be duly executed by their duly authorized officers or agents on the day and year first above written.

Northern States Power Company, a Minnesota corporation (Area EPS Operator)	_____ (Interconnection Customer)
Signed: _____	Signed: _____
Name (Printed): _____	Name (Printed): _____
Title: _____	Title: _____

N

N

(Continued on Sheet No. 10-244)

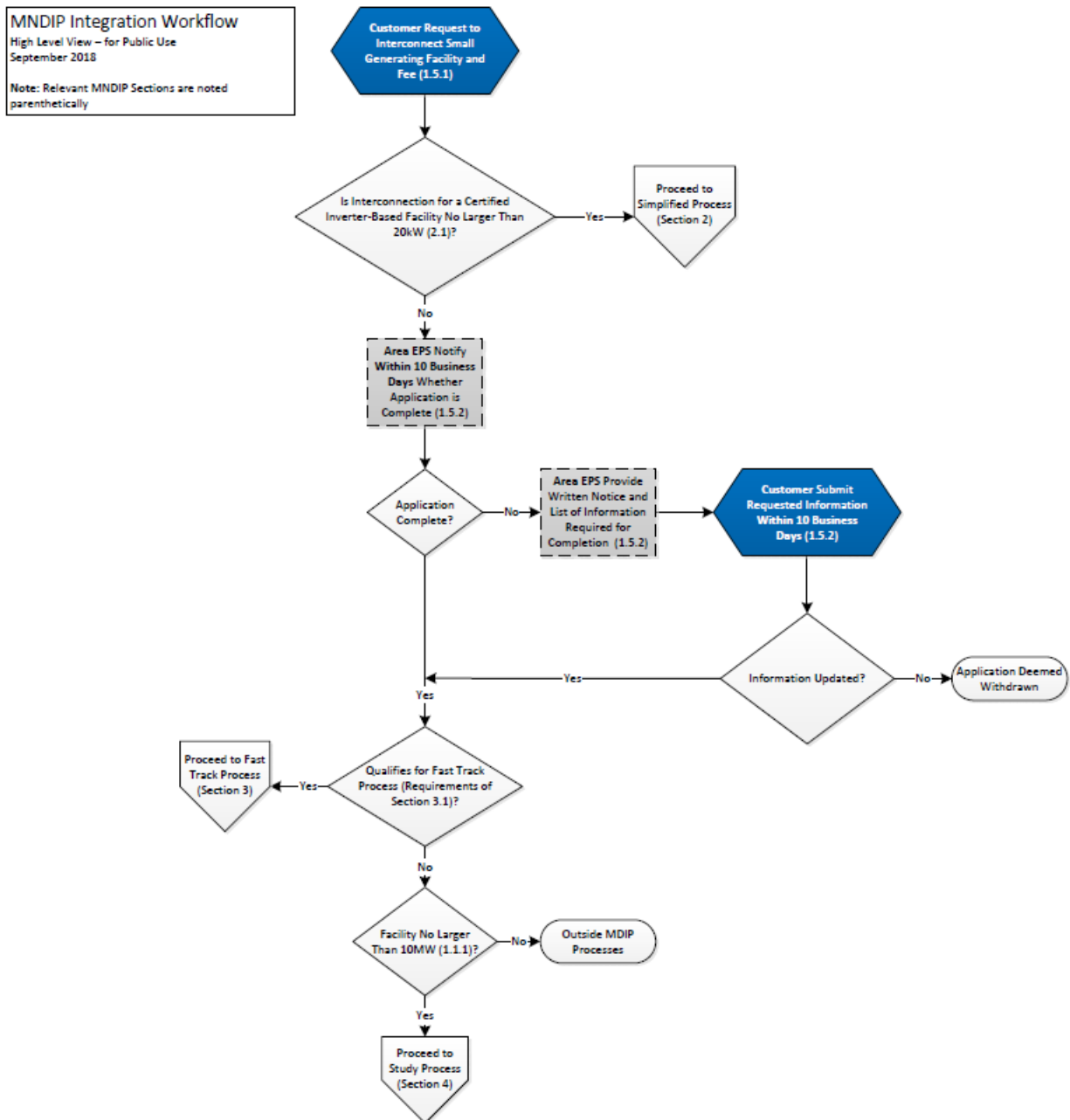
Date Filed:	12-14-18	By: Christopher B. Clark	Effective Date:	05-09-19
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Docket No.	E002/M-18-714		Order Date:	05-09-19

MINNESOTA DISTRIBUTED ENERGY RESOURCES
INTERCONNECTION PROCESS (MN DIP)
(Continued)

Section No. 10
Original Sheet No. 244

Attachment 8: MN DIP Flow Charts

N



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(Continued on Sheet No. 10-245)

Date Filed: 12-14-18

By: Christopher B. Clark

Effective Date: 05-09-19

President, Northern States Power Company, a Minnesota corporation

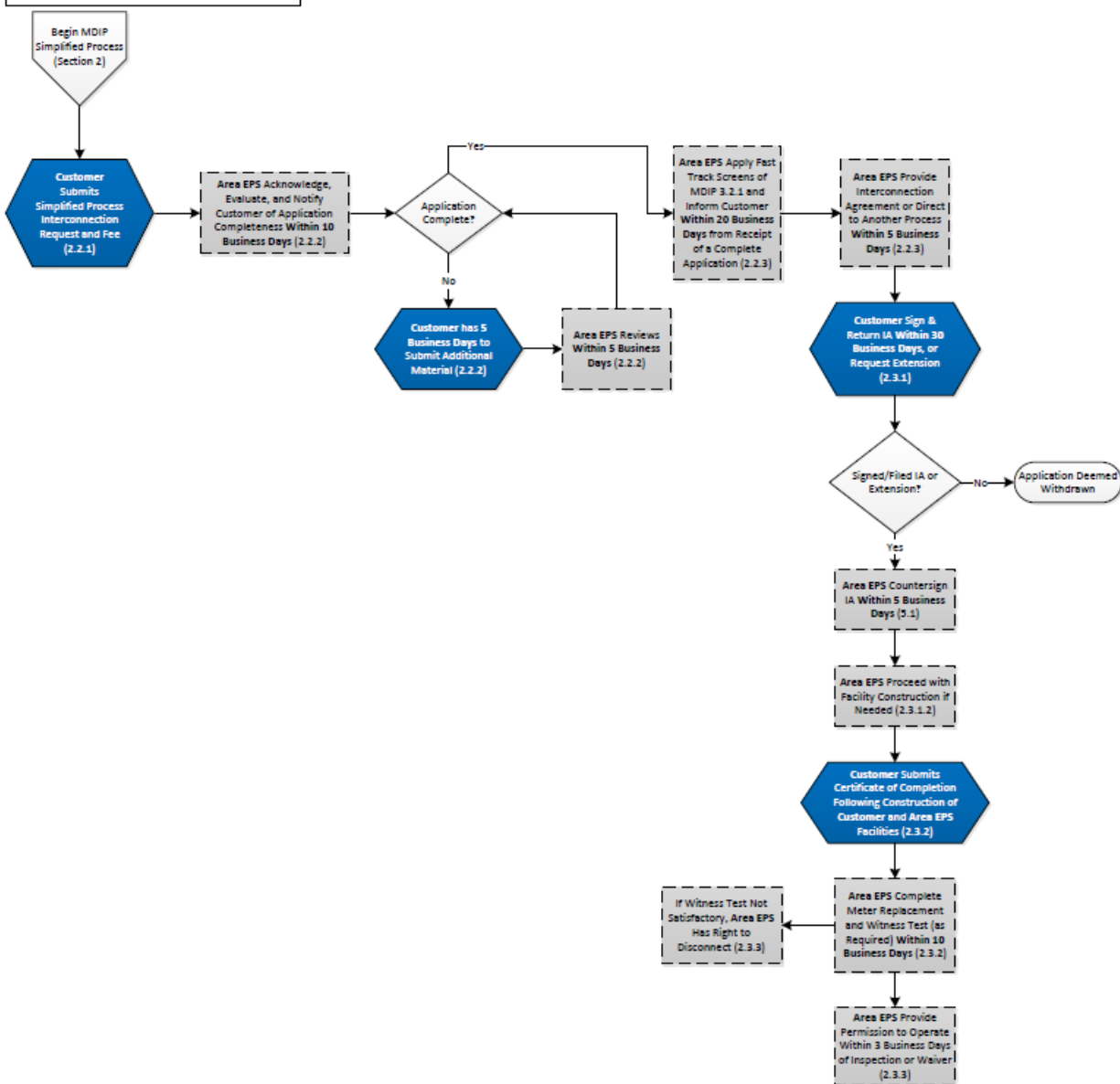
Docket No. E002/M-18-714

Order Date: 05-09-19

**MINNESOTA DISTRIBUTED ENERGY RESOURCES
 INTERCONNECTION PROCESS (MN DIP)
 (Continued)**

Section No. 10
 Original Sheet No. 245

MNDIP Simplified Process Workflow
 High Level View – for Public Use
 September 2018
 Note: Relevant MNDIP Sections are noted parenthetically



(Continued on Sheet No. 10-246)

Date Filed: 12-14-18

By: Christopher B. Clark

Effective Date: 05-09-19

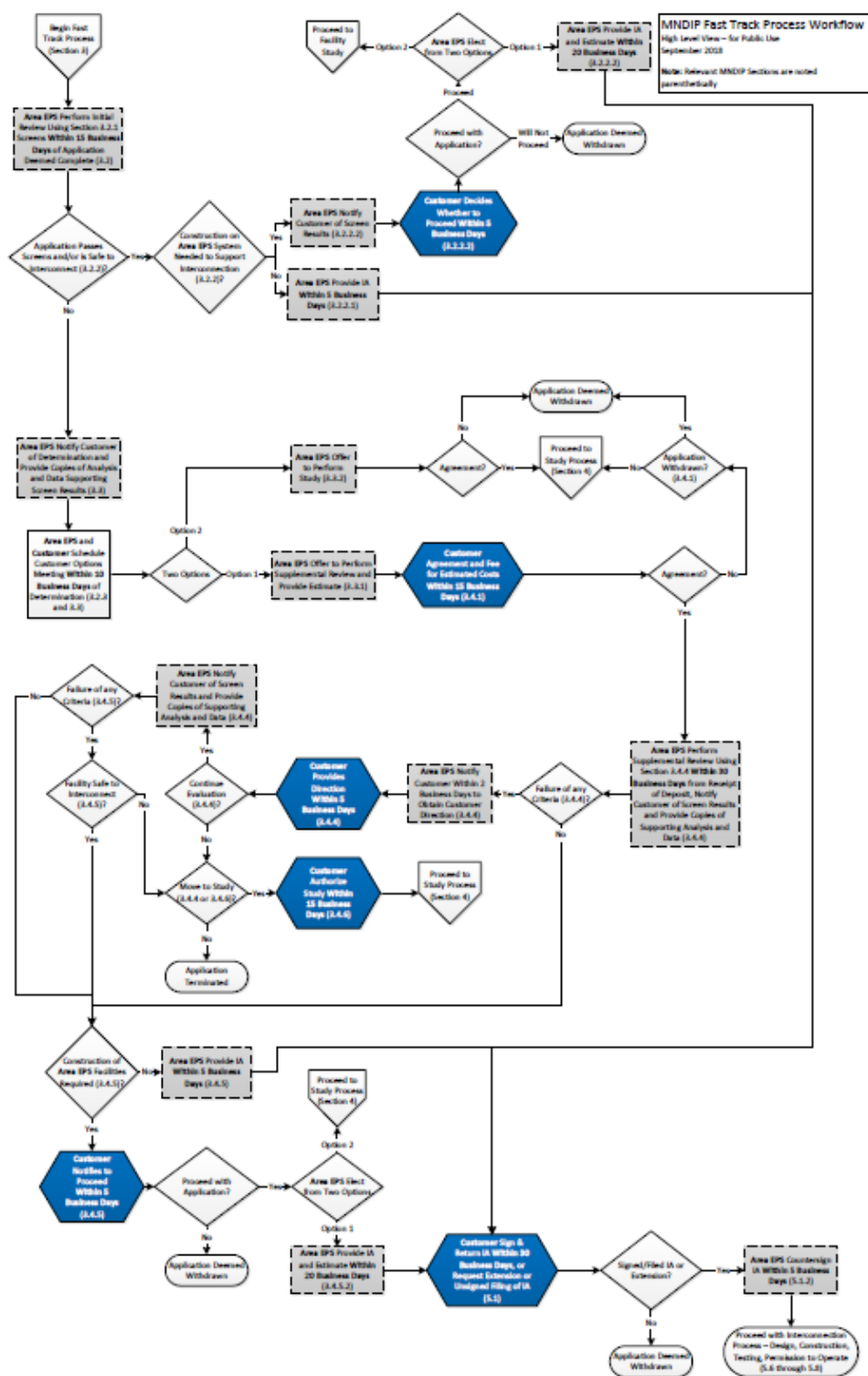
President, Northern States Power Company, a Minnesota corporation

Docket No. E002/M-18-714

Order Date: 05-09-19

**MINNESOTA DISTRIBUTED ENERGY RESOURCES
 INTERCONNECTION PROCESS (MN DIP)**
 (Continued)

Section No. 10
 Original Sheet No. 246



(Continued on Sheet No. 10-247)

Date Filed: 12-14-18

By: Christopher B. Clark

Effective Date: 05-09-19

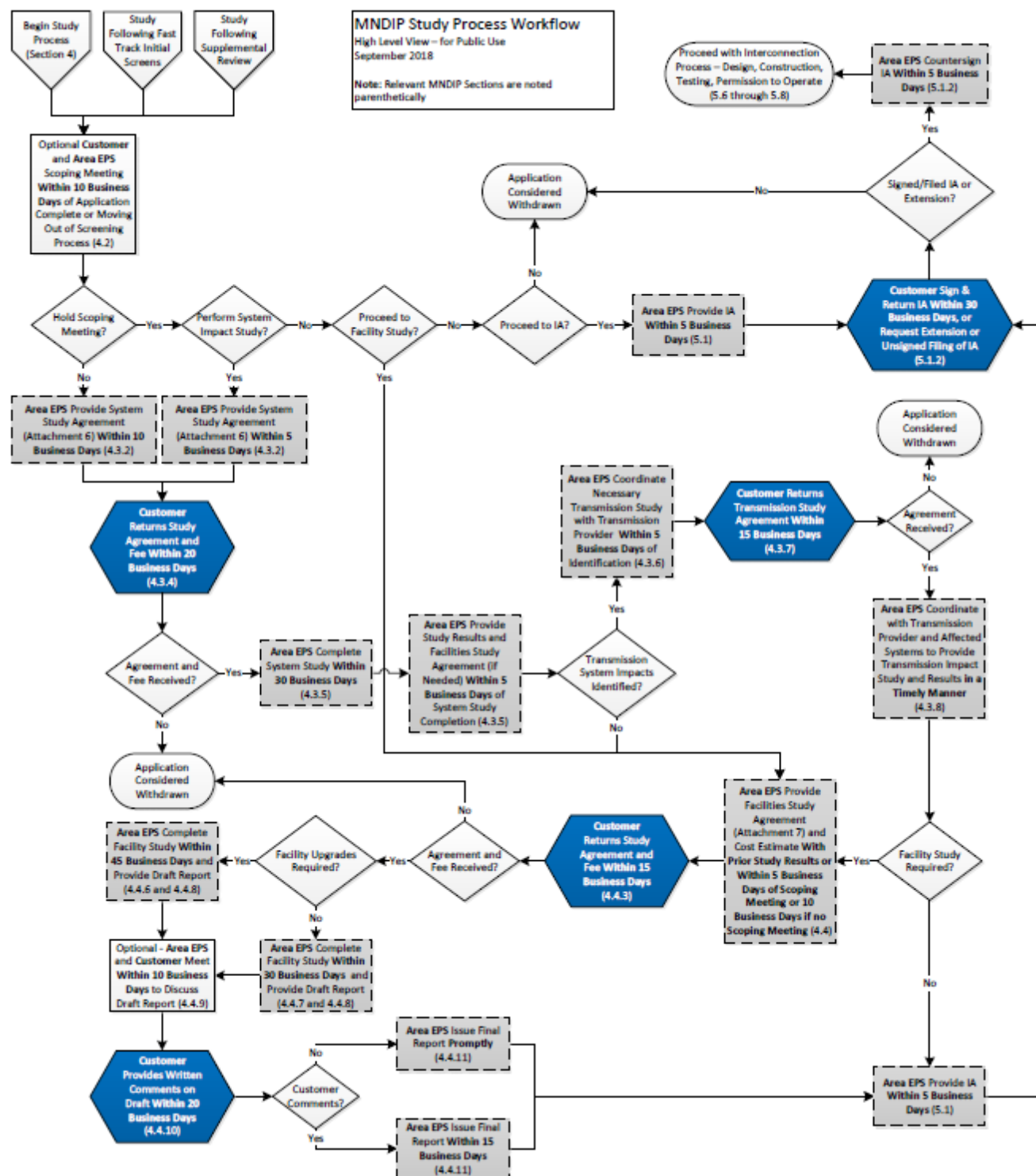
President, Northern States Power Company, a Minnesota corporation

Docket No. E002/M-18-714

Order Date: 05-09-19

**MINNESOTA DISTRIBUTED ENERGY RESOURCES
 INTERCONNECTION PROCESS (MN DIP)
 (Continued)**

Section No. 10
 Original Sheet No. 247



(Continued on Sheet No. 10-248)

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By: Christopher B. Clark

Effective Date: 05-09-19

President, Northern States Power Company, a Minnesota corporation

Docket No. E002/M-18-714

Order Date: 05-09-19

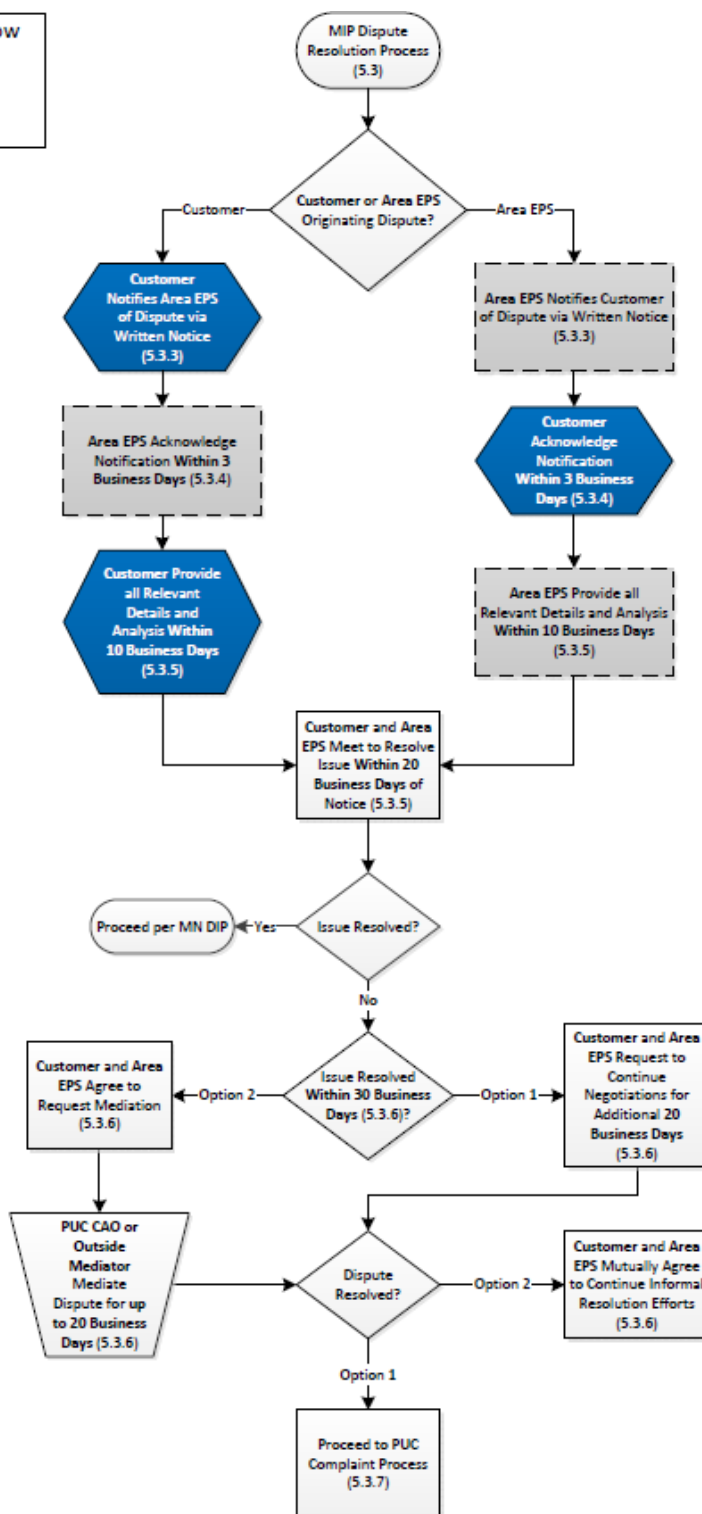
**MINNESOTA DISTRIBUTED ENERGY RESOURCES
 INTERCONNECTION PROCESS (MN DIP)
 (Continued)**

Section No. 10
 Original Sheet No. 248

MNDIP Dispute Process Workflow

High Level View – for Public Use
 September 2018

Note: Relevant MNDIP Sections are noted
 parenthetically



(Continued on Sheet No. 10-249)

Date Filed: 12-14-18

By: Christopher B. Clark
 President, Northern States Power Company, a Minnesota corporation

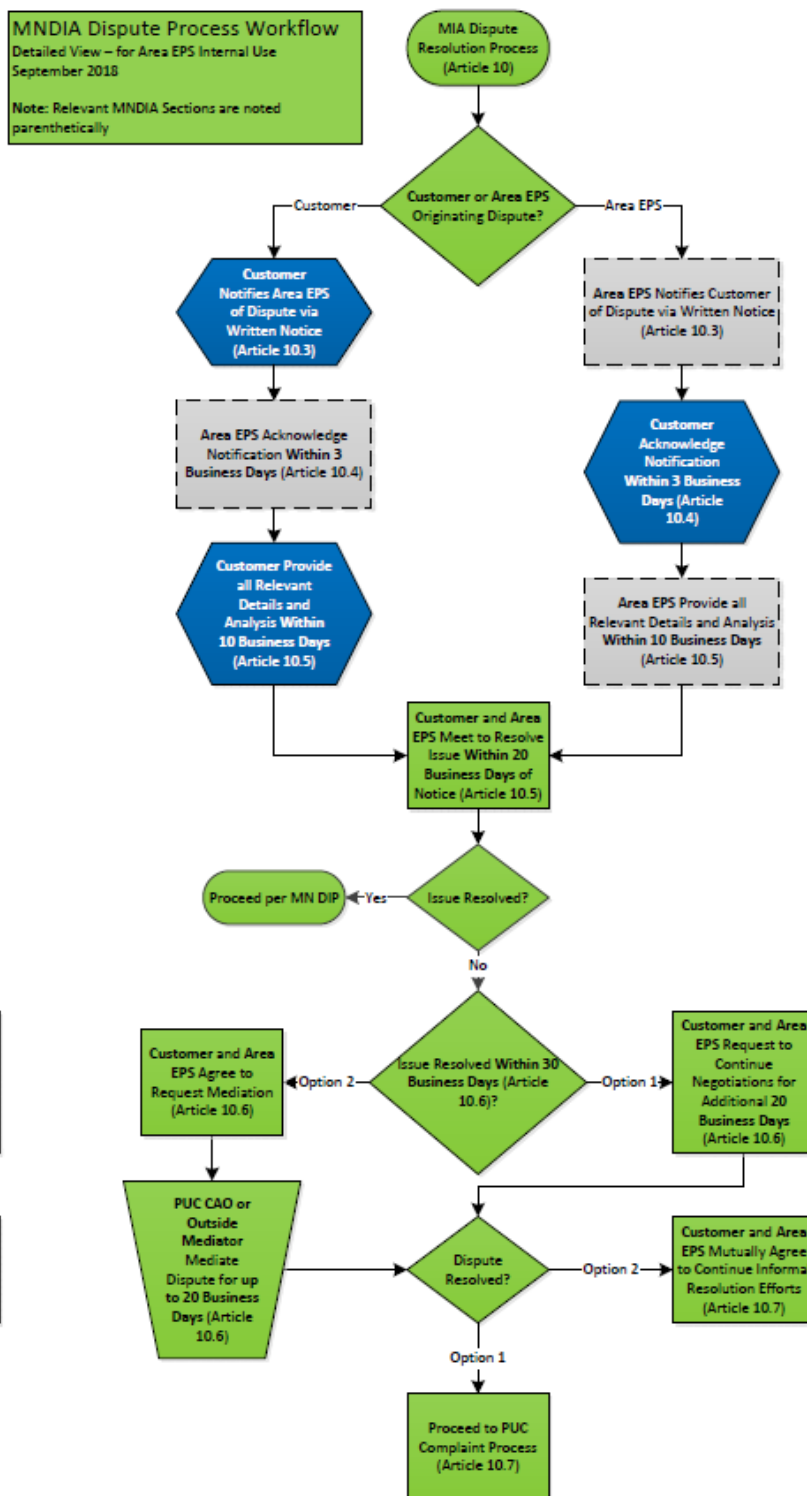
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**MINNESOTA DISTRIBUTED ENERGY RESOURCES
INTERCONNECTION PROCESS (MN DIP)
(Continued)**

Section No. 10
Original Sheet No. 249



Minnesota Distributed Energy Resource Interconnection Agreement (MN DIA)

V. 2.3

(As adopted for Northern States Power Company)

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Northern States Power Company, a Minnesota corporation
Minneapolis, Minnesota 55401

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**MINNESOTA DISTRIBUTED ENERGY RESOURCE
INTERCONNECTION AGREEMENT (MN DIA)
(Continued)**

Section No. 10
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This Interconnection Agreement ("Agreement") is made and entered into this _____ day of _____, 20__, by Northern States Power Company, a Minnesota corporation, doing business as Xcel Energy ("Area EPS Operator"), and _____ ("Interconnection Customer") each hereinafter sometimes referred to individually as "Party" or both referred to collectively as the "Parties."

Area EPS Operator Information

Area EPS Operator: Northern States Power Company, a Minnesota corporation

Attention: _____

Address: _____

City: _____ State: _____ Zip: _____

Phone: _____ Email: _____

Interconnection Customer Information

Interconnection Customer: _____

Attention: _____

Address: _____

City: _____ State: _____ Zip: _____

Phone: _____ Email: _____

Interconnection Customer Application No: _____

Distributed Energy Resource Information (To be completed by the Area EPS Operator)

Type of DER System (e.g.Solar, Wind, CHP, Solar+Storage): _____

Nameplate Rating _____(ac) DER capacity (as described in MN DIP 5.14.3)) _____(ac)

Address of DER system: _____

City _____ State MN Zipcode _____

In consideration of the mutual covenants set forth herein, the Parties agree as follows:

1. Article 1. Scope and Limitations of Agreement

- 1.1. This Agreement is intended to provide for the Interconnection Customer to interconnect at the Point of Common Coupling and operate a Distributed Energy Resource with a Nameplate Rating of 10 Megawatts (MW) or less in parallel with the Area EPS at the location identified above and in the Interconnection Application.

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(Continued)**

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- 1.2. This Agreement shall be used for all Interconnection Applications submitted under the Minnesota Distributed Energy Resources Interconnection Process (MN DIP) except for those submitted and processed under the Simplified Process contained in MN DIP Section 2 or qualify and chooses under MN DIP Section 1.1.5 for the Uniform Statewide Contract to replace the need for this Agreement.
- 1.3. This Agreement governs the terms and conditions under which the Interconnection Customer's Distributed Energy Resource will interconnect with, and operate in parallel with, the Area EPS Operator's Distribution System.
- 1.4. Capitalized terms used herein shall have the meanings specified in the Glossary of Terms in Attachment 1, the MN DIP, or the body of this Agreement.
- 1.5. This Agreement does not constitute an agreement to purchase or deliver the Interconnection Customer's power. The purchase or delivery of power and other services that the Interconnection Customer may require will be covered under separate agreements, if any. The Interconnection Customer will be responsible for separately making all necessary arrangements (including scheduling) for delivery of electricity with the applicable Area EPS Operator.
- 1.6. Nothing in this Agreement is intended to affect any other agreement between the Area EPS Operator and the Interconnection Customer.
- 1.7. Responsibilities of the Parties
- 1.7.1. The Parties shall perform all obligations of this Agreement in accordance with the MN DIP, Minnesota Technical Requirements, all Applicable Laws and Regulations, Operating Requirements, and Good Utility Practice.
- 1.7.2. The Interconnection Customer shall construct, interconnect, operate and maintain its Distributed Energy Resource and construct, operate, and maintain its Interconnection Facilities in accordance with the applicable manufacturer's recommended maintenance schedule and, in accordance with this Agreement, and with Good Utility Practice.
- 1.7.3. The Area EPS Operator shall construct, operate, and maintain its Distribution System and its Interconnection Facilities in accordance with this Agreement, and with Good Utility Practice.

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INTERCONNECTION AGREEMENT (MN DIA)
(Continued)**

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- 1.7.4. The Interconnection Customer agrees to construct its facilities or systems in accordance with the Minnesota Technical Requirements and this Agreement; including, applicable specifications that meet or exceed those provided by the National Electrical Safety Code, the American National Standards Institute, IEEE, Underwriter's Laboratory, and Operating Requirements in effect at the time of construction and other applicable national and state codes and standards. The Interconnection Customer agrees to design, install, maintain, and operate its Distributed Energy Resource so as to reasonably minimize the likelihood of a disturbance adversely affecting or impairing the system or equipment of the Area EPS Operator and any Affected Systems.
- 1.7.5. Each Party shall operate, maintain, repair, and inspect, and shall be fully responsible for the facilities that it now owns or subsequently owns unless otherwise specified in the Attachments to this Agreement. Each Party shall be responsible for the safe installation, maintenance, repair and condition of their respective lines and appurtenances on their respective sides of the point of common coupling. The Area EPS Operator and the Interconnection Customer, as appropriate, shall provide Interconnection Facilities that adequately protect the Area EPS Operator's Distribution System, personnel, and other persons from damage and injury. The allocation of responsibility for the design, installation, operation, maintenance and ownership of Interconnection Facilities shall be delineated in the Attachments to this Agreement.
- 1.7.6. The Area EPS Operator shall coordinate with all Affected Systems to support the interconnection.

1.8. Parallel Operation Obligations

Once the Distributed Energy Resource has been authorized to commence parallel operation, the Interconnection Customer shall abide by all rules and procedures pertaining to the parallel operation of the Distributed Energy Resource in the applicable control area, including, but not limited to; 1) the rules and procedures concerning the operation of generation set forth in the Tariff or by the applicable system operator(s) for the Area EPS Operator's Distribution System provided or referenced in an attachment to this Agreement and; 2) the Operating Requirements set forth in Attachment 5 of this Agreement. The Minnesota Technical Requirements for interconnection are covered in a separate document, a copy of which has been made available to the Interconnection Customer and incorporated and made part of this Agreement by this reference.

1.9. Metering

As described in MN DIP 5.4, the Interconnection Customer shall be responsible for the Area EPS Operator's reasonable and necessary cost for the purchase, installation, operation, maintenance, testing, repair, and replacement of metering and data acquisition equipment specified in Attachments 2 and 3 of this Agreement. The Interconnection Customer's metering (and data acquisition, as required) equipment shall conform to applicable industry rules and Operating Requirements.

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**MINNESOTA DISTRIBUTED ENERGY RESOURCE
INTERCONNECTION AGREEMENT (MN DIA)
(Continued)**

Section No. 10
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- 1.10. Distributed Energy Resource Capabilities and Grid Reliability
- 1.10.1. The Minnesota Technical Requirements outlines the Parties responsibilities consistent with IEEE 1547 Standard for Interconnection and Interoperability of Distributed Energy Resources with Associated Electric Power Systems Interfaces which provides requirements relevant to the interconnection and interoperability performance, operation and testing, and, to safety, maintenance and security considerations.
- 1.10.2. The Area EPS Operator may offer the Interconnection Customer the option to utilize required DER capabilities to mitigate Interconnection Customer costs related to Upgrades or Interconnection Facilities to address anticipated system impacts from the engineering review (i.e., Initial Review, Supplemental Review, or Study Process described in the MN DIP.)
2. Article 2. Inspection, Testing, Authorization, and Right of Access
- 2.1. Equipment Testing and Inspection
- As described in MN DIP Section 5.7, the Interconnection Customer shall test and inspect its Distributed Energy Resource and Interconnection Facilities prior to interconnection pursuant to Minnesota Technical Requirements and this Agreement.
- 2.2. Authorization Required Prior to Parallel Operation
- As described in MN DIP Section 5.8, the Area EPS Operator shall use Reasonable Efforts to list applicable parallel operation requirements by attaching the Minnesota Technical Requirements and/or including them in Attachment 5 to this Agreement. Additionally, the Area EPS Operator shall notify the Interconnection Customer of any changes to these requirements as soon as they are known. Pursuant to the MN DIP 5.8.2, the Interconnection Customer shall not operate its Distributed Energy Resource in parallel with the Area EPS Operator's Distribution System without prior written authorization of the Area EPS Operator.
- 2.3. Right of Access
- 2.3.1. Upon reasonable notice, the Area EPS Operator may send a qualified person to the premises of the Interconnection Customer at or immediately before the time the Distributed Energy Resource first produces energy to inspect the interconnection, and observe the commissioning of the Distributed Energy Resource (including any required testing), startup, and operation for a period of up to three Business Days after initial start-up of the unit. In addition, the Interconnection Customer shall notify the Area EPS Operator at least five Business Days prior to conducting any on-site verification testing of the Distributed Energy Resource.

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- 2.3.2. Following the initial inspection process described above, at reasonable hours, and upon reasonable notice, or at any time without notice in the event of an emergency or hazardous condition, the Area EPS Operator shall have access to the Interconnection Customer's premises for any reasonable purpose in connection with the performance of the obligations imposed on it by this Agreement or if necessary to meet its legal obligation to provide service to its customers.
- 2.3.3. Each Party shall be responsible for its costs associated with following this article as outlined in MN DIP Section 5.7.2 and the Minnesota Technical Requirements.
3. Article 3. Effective Date, Term, Termination, and Disconnection
- 3.1. Effective Date
This Agreement shall become effective upon execution by the Parties.
- 3.2. Term of Agreement
This Agreement shall become effective on the Effective Date and shall remain in effect from the Effective Date unless terminated earlier in accordance with article 3.3 of this Agreement.
- 3.3. Termination
No termination shall become effective until the Parties have complied with all Applicable Laws and Regulations applicable to such termination.
- 3.3.1. The Interconnection Customer may terminate this Agreement at any time by giving the Area EPS Operator 20 Business Days written notice.
- 3.3.2. Either Party may terminate this Agreement after Default pursuant to article 7.7.
- 3.3.3. Upon termination of this Agreement, the Distributed Energy Resource will be disconnected from the Area EPS Operator's Distribution System. All costs required to effectuate such disconnection shall be borne by the terminating Party, unless such termination resulted from the non-terminating Party's Default of this MN DIA or such non-terminating Party otherwise is responsible for these costs under this MN DIA.
- 3.3.4. The termination of this Agreement shall not relieve either Party of its liabilities and obligations, owed or continuing at the time of the termination.
- 3.3.5. The provisions of this article shall survive termination or expiration of this Agreement.

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**MINNESOTA DISTRIBUTED ENERGY RESOURCE
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(Continued)**

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- 3.4. Temporary Disconnection
Temporary disconnection shall continue only for so long as reasonably necessary under Good Utility Practice.
- 3.4.1. Emergency Conditions
Under Emergency Conditions, the Area EPS Operator may immediately suspend interconnection service and temporarily disconnect the Distributed Energy Resource. The Area EPS Operator shall use Reasonable Efforts to notify the Interconnection Customer promptly when it becomes aware of an Emergency Condition that may reasonably be expected to affect the Interconnection Customer's operation of the Distributed Energy Resource. The Interconnection Customer shall use Reasonable Efforts to notify the Area EPS Operator promptly when it becomes aware of an Emergency Condition that may reasonably be expected to affect the Area EPS Operator's Distribution System or any Affected Systems. To the extent information is known, the notification shall describe the Emergency Condition, the extent of the damage or deficiency, the expected effect on the operation of both Parties' facilities and operations, its anticipated duration, and the necessary corrective action.
- 3.4.2. Routine Maintenance, Construction, and Repair
The Area EPS Operator may interrupt interconnection service or curtail the output of the Distributed Energy Resource and temporarily disconnect the Distributed Energy Resource from the Area EPS Operator's Distribution System when necessary for routine maintenance, construction, or repairs on the Area EPS Operator's Distribution System. The Area EPS Operator shall use Reasonable Efforts to provide the Interconnection Customer with three Business Days notice prior to such interruption. The Area EPS Operator shall use Reasonable Efforts to coordinate such reduction or temporary disconnection with the Interconnection Customer.
- 3.4.3. Forced Outage
During any forced outage, the Area EPS Operator may suspend interconnection service to effect immediate repairs on the Area EPS Operator's Distribution System. The Area EPS Operator shall use Reasonable Efforts to provide the Interconnection Customer with prior notice. If prior notice is not given, the Area EPS Operator shall, upon request, provide the Interconnection Customer written documentation after the fact explaining the circumstances of the disconnection.

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INTERCONNECTION AGREEMENT (MN DIA)
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3.4.4. Adverse Operating Effects

The Area EPS Operator shall notify the Interconnection Customer as soon as practicable if, based on Good Utility Practice, operation of the Distributed Energy Resource may cause disruption or deterioration of service to other customers served from the same electric system, or if operating the Distributed Energy Resource could cause damage to the Area EPS Operator's Distribution System or Affected Systems. Supporting documentation used to reach the decision to disconnect shall be provided to the Interconnection Customer upon request. If, after notice, the Interconnection Customer fails to remedy the adverse operating effect within a reasonable time, the Area EPS Operator may disconnect the Distributed Energy Resource. The Area EPS Operator shall provide the Interconnection Customer with five Business Day notice of such disconnection, unless the provisions of article 3.4.1 apply.

3.4.5. Modification of the Distributed Energy Resource

The Interconnection Customer must receive written authorization from the Area EPS Operator before making any change to the Distributed Energy Resource that may have a material impact on the safety or reliability of the Distribution System. Such authorization shall not be unreasonably withheld if the modification is not a Material Modification. Material Modifications, including an increase nameplate rating or capacity, may require the Interconnection Customer to submit a new Interconnection Application as described in MN DIP Section 1.6.2. If the Interconnection Customer makes such modification without the Area EPS Operator's prior written authorization, the latter shall have the right to temporarily disconnect the Distributed Energy Resource.

3.4.6. Reconnection

The Parties shall cooperate with each other to restore the Distributed Energy Resource, Interconnection Facilities, and the Area EPS Operator's Distribution System to their normal operating state as soon as reasonably practicable following a temporary disconnection.

3.4.7. Treatment Similar to Other Retail Customers

If the Interconnection Customer receives retail electrical service at the same site as the Distributed Energy Resource, it may also be disconnected consistent with the rules and practices for disconnecting other retail electrical customers.

3.4.8. Disconnection for Default

If the Interconnection Customer is in Default it may be disconnected after a 60 day written notice is provided and the Default is not cured during this 60 day notice. This provision does not apply to disconnection based on Emergency Conditions.

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INTERCONNECTION AGREEMENT (MN DIA)
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4. Article 4. Cost Responsibility for Interconnection Facilities and Distribution Upgrades

4.1. Interconnection Facilities

4.1.1. The Interconnection Customer shall pay for the cost of the Interconnection Facilities itemized in Attachment 2 of this Agreement. The Area EPS Operator shall provide a good faith estimate cost, including overheads, for the purchase and construction of its Interconnection Facilities and provide a detailed itemization of such costs. Costs associated with Interconnection Facilities may be shared with other entities that may benefit from such facilities by agreement of the Interconnection Customer, such other entities, and the Area EPS Operator.

4.1.2. The Interconnection Customer shall be responsible for its share of all reasonable expenses, including overheads, associated with (1) owning, operating, maintaining, repairing, and replacing its own Interconnection Facilities, and (2) operating, maintaining, repairing, and replacing the Area EPS Operator's Interconnection Facilities.

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 by the Interconnection Customer. The actual cost of the Distribution Upgrades, including overheads, shall be directly assigned to the Interconnection Customer.

5. Article 5. Cost Responsibility for Network Upgrades

5.1. Applicability

No portion of this Article 5 shall apply unless the interconnection of the Distributed Energy Resource requires Network Upgrades.

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 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.

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INTERCONNECTION AGREEMENT (MN DIA)
(Continued)

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5.2.1. Repayment of Amounts Advanced for Network Upgrades

The Interconnection Customer shall be entitled to a cash repayment, equal to the total amount paid to the Area EPS Operator and Affected System operator, if any, for Network Upgrades, including any tax gross-up or other tax-related payments associated with the Network Upgrades, and not otherwise refunded to the Interconnection Customer, to be paid to the Interconnection Customer on a dollar-for-dollar basis for the non-usage sensitive portion of transmission charges, as payments are made under the Area EPS Operator's Tariff and Affected System's Tariff for transmission services with respect to the Distributed Energy Resource. Any repayment shall include interest calculated in accordance with the methodology set forth in FERC's regulations at 18 C.F.R. § 35.19a(a)(2)(iii) from the date of any payment for Network Upgrades through the date on which the Interconnection Customer receives a repayment of such payment pursuant to this subparagraph. The Interconnection Customer may assign such repayment rights to any person.

5.2.1.1. Notwithstanding the foregoing, the Interconnection Customer, the Area EPS Operator, and any applicable Affected System operators may adopt any alternative payment schedule that is mutually agreeable so long as the Area EPS Operator and said Affected System operators take one of the following actions no later than five years from the Commercial Operation Date: (1) return to the Interconnection Customer any amounts advanced for Network Upgrades not previously repaid, or (2) declare in writing that the Area EPS Operator or any applicable Affected System operators will continue to provide payments to the Interconnection Customer on a dollar-for-dollar basis for the non-usage sensitive portion of transmission charges, or develop an alternative schedule that is mutually agreeable and provides for the return of all amounts advanced for Network Upgrades not previously repaid; however, full reimbursement shall not extend beyond 20 years from the commercial operation date.

5.2.1.2. If the Distributed Energy Resource fails to achieve commercial operation, but it or another Distributed Energy Resource is later constructed and requires use of the Network Upgrades within five (5) years of being constructed, the Area EPS Operator and Affected System operator (after receiving payment in the amount of the cost to build these Network Upgrades from the other Distributed Energy Resource who is expected to use the Network Upgrades) shall at that time reimburse the Interconnection Customer for the amounts advanced for the Network Upgrades. Before any such reimbursement can occur, the Interconnection Customer, or the entity that ultimately constructs the Distributed Energy Resource, if different, is responsible for identifying the entity to which reimbursement must be made.

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(Continued)**

Section No. 10
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- 5.3. Special Provisions for Affected Systems
Unless the Area EPS Operator provides, under this Agreement, for the repayment of amounts advanced to any applicable Affected System operators for Network Upgrades, the Interconnection Customer and Affected System operator shall enter into an agreement that provides for such repayment. The agreement shall specify the terms governing payments to be made by the Interconnection Customer to Affected System operator as well as the repayment by Affected System operator.
- 5.4. Rights Under Other Agreements
Notwithstanding any other provision of this Agreement, nothing herein shall be construed as relinquishing or foreclosing any rights, including but not limited to firm transmission rights, capacity rights, transmission congestion rights, or transmission credits, that the Interconnection Customer shall be entitled to, now or in the future, under any other agreement or tariff as a result of, or otherwise associated with, the transmission capacity, if any, created by the Network Upgrades, including the right to obtain cash reimbursements or transmission credits for transmission service that is not associated with the Distributed Energy Resource.
6. Article 6. Billing, Payment, Milestones, and Financial Security
- 6.1. Billing and Payment Procedures and Final Accounting
- 6.1.1. The Area EPS Operator shall bill the Interconnection Customer for the design, engineering, construction, and procurement costs of Interconnection Facilities and Upgrades contemplated by this Agreement, and the Interconnection Customer shall pay each bill, pursuant to the MN DIP 5.6.5, or as otherwise agreed to by the Parties.
- 6.1.2. Within 80 Business Days (approximately 4 calendar months) of completing the construction and installation of the Area EPS Operator's Interconnection Facilities and/or Upgrades described in the Attachments to this Agreement, the Area EPS Operator shall provide the Interconnection Customer with a final accounting report, as described in the MN DIP 5.6.6.
- 6.2. Milestones
Pursuant to the MN DIP 4.4.5, 5.6.2 and 5.6.3, the Parties shall agree on milestones for which each Party is responsible and list them in Attachment 4 of this Agreement.
- 6.3. Financial Security Arrangements
Pursuant to the MN DIP 5.6.4, the Interconnection Customer shall provide the Area EPS Operator, at the Interconnection Customer's option, a guarantee, letter of credit or other form of security that is reasonably acceptable to the Area EPS Operator and is consistent with the Minnesota Uniform Commercial Code. Such security for payment shall be in an amount sufficient to cover the costs for constructing, designing, procuring, and installing the applicable portion of the Area EPS Operator's Interconnection Facilities and Upgrades and shall be reduced on a dollar-for-dollar basis for payments made to the Area EPS Operator under this Agreement during its term. In addition:

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- 6.3.1. The guarantee must be made by an entity that meets the creditworthiness requirements of the Area EPS Operator, and contain terms and conditions that guarantee payment of any amount that may be due from the Interconnection Customer, up to an agreed-to maximum amount.
- 6.3.2. The letter of credit must be issued by a financial institution or insurer reasonably acceptable to the Area EPS Operator and must specify a reasonable expiration date not sooner than sixty (60) Business Days (three calendar months) after the due date for the issuance of the final bill.
7. Article 7. Assignment, Liability, Non-Warranty, Indemnity, Force Majeure, Consequential Damages, and Default
- 7.1. Assignment
This Agreement may be assigned by either Party upon 15 Business Days prior written notice and opportunity to object by the other Party; provided that:
- 7.1.1. Either Party may assign this Agreement without the consent of the other Party to any affiliate of the assigning Party with an equal or greater credit rating and with the legal authority and operational ability to satisfy the obligations of the assigning Party under this Agreement, provided that the Interconnection Customer promptly notifies the Area EPS Operator of any such assignment.
- 7.1.2. The Interconnection Customer shall have the right to assign this Agreement, without the consent of the Area EPS Operator, for collateral security purposes to aid in providing financing for the Distributed Energy Resource, provided that the Interconnection Customer will promptly notify the Area EPS Operator of any such assignment.
- 7.1.3. Any attempted assignment that violates this article is void and ineffective. Assignment shall not relieve a Party of its obligations, nor shall a Party's obligations be enlarged, in whole or in part, by reason thereof. An assignee is responsible for meeting the same financial, credit, and insurance obligations as the Interconnection Customer. Where required, consent to assignment will not be unreasonably withheld, conditioned or delayed.
- 7.2. Limitation of Liability
Each Party's liability to the other Party for any loss, cost, claim, injury, liability, or expense, including reasonable attorney's fees, relating to or arising from any act or omission in its performance of this Agreement, shall be limited to the amount of direct damage actually incurred. In no event shall either Party be liable to the other Party for any indirect, special, consequential, or punitive damages, except as authorized by this Agreement.

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7.3. Non-Warranty

The Area EPS Operator does not give any warranty, expressed or implied, as to the adequacy, safety, or other characteristics of any structures, equipment, wires, appliances or devices owned, installed or maintained by the Interconnection Customer, including without limitation the Distributed Energy Resource and any structures, equipment, wires, appliances or devices not owned, operated or maintained by the Area EPS Operator.

7.4. Indemnity

7.4.1. This provision protects each Party from liability incurred to third parties as a result of carrying out the provisions of this Agreement. Liability under this provision is exempt from the general limitations on liability found in article 7.2.

7.4.2. The Parties shall at all times indemnify, defend, and hold the other Party harmless from, any and all damages, losses, claims, including claims and actions relating to injury to or death of any person or damage to property, demand, suits, recoveries, costs and expenses, court costs, attorney fees, and all other obligations by or to third parties, arising out of or resulting from the other Party's action or failure to meet its obligations under this Agreement on behalf of the indemnifying Party, except in cases of gross negligence or intentional wrongdoing by the indemnified Party.

7.4.3. This indemnification obligation shall apply notwithstanding any negligent or intentional acts, errors or omissions of the Indemnified Party, but the Indemnifying Party's liability to indemnify the Indemnified Party shall be reduced in proportion to the percentage by which the Indemnified Party's negligent or intentional acts, errors or omissions caused the damage.

7.4.4. Neither Party shall be indemnified for its damages resulting from its sole negligence, intentional acts or willful misconduct. These indemnity provisions shall not be construed to relieve any insurer of its obligation to pay claims consistent with the provisions of a valid insurance policy.

7.4.5. If an indemnified person is entitled to indemnification under this article as a result of a claim by a third party, and the indemnifying Party fails, after notice and reasonable opportunity to proceed under this article, to assume the defense of such claim, such indemnified person may at the expense of the indemnifying Party contest, settle or consent to the entry of any judgment with respect to, or pay in full, such claim.

7.4.6. If an indemnifying party is obligated to indemnify and hold any indemnified person harmless under this article, the amount owing to the indemnified person shall be the amount of such indemnified person's actual loss, net of any insurance or other recovery.

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- 7.4.7. Promptly after receipt by an indemnified person of any claim or notice of the commencement of any action or administrative or legal proceeding or investigation as to which the indemnity provided for in this article may apply, the indemnified person shall notify the indemnifying party of such fact. Any failure of or delay in such notification shall not affect a Party's indemnification obligation unless such failure or delay is materially prejudicial to the indemnifying party.
- 7.5. **Consequential Damages**
Other than as expressly provided for in this Agreement, neither Party shall be liable under any provision of this Agreement for any losses, damages, costs or expenses for any special, indirect, incidental, consequential, or punitive damages, including but not limited to loss of profit or revenue, loss of the use of equipment, cost of capital, cost of temporary equipment or services, whether based in whole or in part in contract, in tort, including negligence, strict liability, or any other theory of liability; provided, however, that damages for which a Party may be liable to the other Party under another agreement will not be considered to be special, indirect, incidental, or consequential damages hereunder.
- 7.6. **Force Majeure**
If a Force Majeure Event prevents a Party from fulfilling any obligations under this Agreement, the Party affected by the Force Majeure Event (Affected Party) shall promptly notify the other Party, either in writing or via the telephone, of the existence of the Force Majeure Event. The notification must specify in reasonable detail the circumstances of the Force Majeure Event, its expected duration, and the steps that the Affected Party is taking to mitigate the effects of the event on its performance. The Affected Party shall keep the other Party informed on a continuing basis of developments relating to the Force Majeure Event until the event ends. The Affected Party will be entitled to suspend or modify its performance of obligations under this Agreement (other than the obligation to make payments) only to the extent that the effect of the Force Majeure Event cannot be mitigated by the use of Reasonable Efforts. The Affected Party will use Reasonable Efforts to resume its performance as soon as possible.
- 7.7. **Default**
- 7.7.1. No Default shall exist where such failure to discharge an obligation (other than the payment of money) is the result of a Force Majeure Event as defined in this Agreement or the result of an act or omission of the other Party. Upon a Default, the non-defaulting Party shall give written notice of such Default to the defaulting Party. Except as provided in article 7.6.2, the defaulting Party shall have 60 calendar days from receipt of the Default notice within which to cure such Default; provided however, if such Default is not capable of cure within 60 calendar days, the defaulting Party shall commence such cure within 20 calendar days after notice and continuously and diligently complete such cure within six months from receipt of the Default notice; and, if cured within such time, the Default specified in such notice shall cease to exist.

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7.7.2. If a Default is not cured as provided in this article, or if a Default is not capable of being cured within the period provided for herein, the non-defaulting Party shall have the right to terminate this Agreement by written notice at any time until cure occurs, and be relieved of any further obligation hereunder and, whether or not that Party terminates this Agreement, to recover from the defaulting Party all amounts due hereunder, plus all other damages and remedies to which it is entitled at law or in equity. The provisions of this article will survive termination of this Agreement.

8. Article 8. Insurance

- 8.1. An Area EPS Operator may only require an Interconnection Customer to purchase insurance covering damages pursuant to the MN DIP 5.10.
- 8.2. The Area EPS Operator agrees to maintain general liability insurance or self-insurance consistent with the Area EPS Operator's commercial practice. Such insurance or self-insurance shall not exclude coverage for the Area EPS Operator's liabilities undertaken pursuant to this Agreement.
- 8.3. The Parties further agree to notify each other whenever an accident or incident occurs resulting in any injuries or damages that are included within the scope of coverage of such insurance, whether or not such coverage is sought.
- 8.4. Failure of the Interconnection Customer or Area EPS Operator to enforce the minimum levels of insurance does not relieve the Interconnection Customer from maintaining such levels of insurance or relieve the Interconnection Customer of any liability.

9. Article 9. Confidentiality

- 9.1. Confidential Information shall mean any confidential and/or proprietary information provided by one Party to the other Party that is clearly marked or otherwise designated "Confidential." For purposes of this Agreement, design, operating specifications, and metering data provided by the Interconnection Customer may be deemed Confidential Information regardless of whether it is clearly marked or otherwise designated as such. If requested by either Party, the other Party shall provide in writing the basis for asserting that the information warrants confidential treatment. Parties providing a Governmental Authority trade secret, privileged or otherwise not public or nonpublic data under the Minnesota Government Data Practices Act, Minnesota Statutes Chapter 13, shall identify such data consistent with the Commission's September 1, 1999 Revised Procedures for Handling Trade Secret and Privileged Data, available online at: <https://mn.gov/puc/puc-documents/#4>

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- 9.2. Confidential Information does not include information previously in the public domain with proper authorization, required to be publicly submitted or divulged by Governmental Authorities (after notice to the other Party and after exhausting any opportunity to oppose such publication or release), or necessary to be publicly divulged in an action to enforce this Agreement. Each Party receiving Confidential Information shall hold such information in confidence and shall not disclose it to any third party nor to the public without the prior written authorization from the Party providing that information, except to fulfill obligations under this Agreement, or to fulfill legal or regulatory requirements that could not otherwise be fulfilled by not making the information public.
- 9.2.1. Each Party shall hold in confidence and shall not disclose Confidential Information, to any person (except employees, officers, representatives and agents, who agree to be bound by this section). Confidential Information shall be clearly marked as such on each page or otherwise affirmatively identified. If a court, government agency or entity with the right, power, and authority to do so, requests or requires either Party, by subpoena, oral disposition, interrogatories, requests for production of documents, administrative order, or otherwise, to disclose Confidential Information, that Party shall provide the other Party with prompt notice of such request(s) or requirements(s) so that the other Party may seek an appropriate protective order or waive compliance with the terms of this Agreement. In the absence of a protective order or waiver the Party shall disclose such confidential information which, in the opinion of its counsel, the party is legally compelled to disclose. Each Party will use reasonable efforts to obtain reliable assurance that confidential treatment will be accorded any confidential information so furnished.
- 9.2.2. Critical infrastructure information or information that is deemed or otherwise designated by a Party as Critical Energy/Electric Infrastructure Information (CEII) pursuant to FERC regulation, 18 C.F.R. §388.133, as may be amended from time to time, may be subject to further protections for disclosure as required by FERC or FERC regulations or orders and the disclosing Party's CEII policies.
- 9.2.3. Each Party shall employ at least the same standard of care to protect Confidential Information obtained from the other Party as it employs to protect its own Confidential Information.
- 9.2.4. Each Party is entitled to equitable relief, by injunction or otherwise, to enforce its rights under this provision to prevent the release of Confidential Information without bond or proof of damages, and may seek other remedies available at law or in equity for breach of this provision.

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10. Article 10. Disputes

- 10.1. The Parties agree to attempt to resolve all disputes arising out of the interconnection process and associated study and interconnection agreements according to the provisions of this article and Minnesota Administrative Rules 7829.1500-7829.1900. More information on the Commission's Consumer Affairs Office dispute resolution services is available on the Commission's website: <https://mn.gov/puc/consumers/help/complaint/>
- 10.2. Prior to a written Notice of Dispute, the Party shall contact the other Party and raise the issue and the relief sought in an attempt to resolve the issue immediately.
- 10.3. In the event of a dispute, the disputing Party shall provide the other Party a written Notice of Dispute containing the relevant known facts pertaining to the dispute, the specific dispute and the relief sought, and express notice by the disputing Party that it is invoking the procedures under this article. The Interconnection Customer may utilize the Commission's Consumer Affairs Office's complaint/inquiry form and Informal Complaint dispute resolution process to assist with the written Notice of Dispute. The notice shall be sent to the non-disputing Party's email address and physical address set forth in the interconnection agreement or Interconnection Application, if there is no interconnection agreement. If the Interconnection Customer chooses not to utilize the Commission's Consumer Affairs Office dispute resolution process, the Interconnection Customer shall provide an informational electronic copy of the Notice of Dispute to the Consumer Affairs Office at the Commission at consumer.puc@state.mn.us.
- 10.4. The non-disputing Party shall acknowledge the notice within three (3) Business Days of its receipt and identify a representative with the authority to make decisions for the non-disputing Party with respect to the dispute.
- 10.5. The non-disputing Party shall provide the disputing Party with relevant regulatory and/or technical details and analysis regarding the Area EPS Operator interconnection requirements under dispute within ten (10) Business Days of the date of the Notice of Dispute. Within twenty (20) Business Days of the date of the Notice of Dispute, the Parties' authorized representatives will be required to meet and confer to try to resolve the dispute. Parties shall operate in good faith and use best efforts to resolve the dispute.
- 10.6. If a resolution is not reached in the thirty (30) Business Days from the date of the notice described in section 10.3, the Parties may 1) if mutually agreed, continue negotiations for up to an additional twenty (20) Business Days; or 2) either Party may request the Commission's Consumer Affairs Office provide mediation in an attempt to resolve the dispute within twenty (20) Business Days with the opportunity to extend this timeline upon mutual agreement. Alternatively, both Parties by mutual agreement may request mediation from an outside third-party mediator with costs to be shared equally between the Parties.

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- 10.7. If the results of the mediation are not accepted by one or more Parties and there is still disagreement, the dispute shall proceed to the Commission's Formal Complaint process as described in Minn. Rules 7829.1700-1900 unless mutually agreed to continue with informal dispute resolution.
- 10.8. At any time, either Party may file a complaint before the Commission pursuant to Minn. Stat. §216B.164, if applicable, and Commission rules outlined in Minn. Rules Ch. 7829.
11. Article 11. Taxes
- 11.1. The Parties agree to follow all applicable tax laws and regulations, consistent with Internal Revenue Service and any other relevant local, state and federal requirements.
- 11.2. Each Party shall cooperate with the other to maintain the other Party's tax status. It is incumbent on the Party seeking to maintain its tax status to provide formal written notice to the other Party detailing what exact cooperation it is seeking from the other Party well prior to any deadline by which any such action would need to be taken. Nothing in this Agreement is intended to adversely affect, if applicable, the Area EPS Operator's tax exempt status with respect to the issuance of bonds including, but not limited to, local furnishing bonds.
12. Article 12. Miscellaneous
- 12.1. Governing Law, Regulatory Authority, and Rules
The validity, interpretation and enforcement of this Agreement and each of its provisions shall be governed by the Minnesota Public Utilities Commission and the laws of the state of Minnesota, without regard to its conflicts of law principles. This Agreement is subject to all Applicable Laws and Regulations. Each Party expressly reserves the right to seek changes in, appeal, or otherwise contest any laws, orders, or regulations of a Governmental Authority.
- 12.2. Amendment
The Parties may amend this Agreement by a written instrument duly executed by both Parties under the process described below, or under article 12.12 of this Agreement.
- If the Parties seek to amend this Agreement by a written instrument duly executed by both Parties, this amendment will need to receive Commission approval prior to it being effective. The Area EPS Operator and Interconnection Customer may seek Commission approval of an amendment to the Interconnection Agreement for use between them for a specific Interconnection Application in the following ways:

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- 12.2.1. File a Petition with the Commission, or
- 12.2.2. File a Notice with the Commission of the proposed amendment. The Notice should include a copy of the amendment showing in redline format how the amendment would alter the MN DIA between the Area EPS Operator and Interconnection Customer for the Interconnection Application at issue. If no objection or notice of intent to object is filed within 30 days, then the proposed amendment would be considered to be approved by the Commission. If there is a timely filed objection of notice of intent to object, then the proposed amendment would not be considered to have been approved by the Commission and could only be used if the Commission subsequently issues a written order authorizing its use.
- 12.2.3. Commission approval of an amendment to the Interconnection Agreement is not needed where such an amendment only addresses updating or correcting: 1) information specified in the Interconnection Application; 2) exhibits or attachments to the Interconnection Agreement as long as they are not additional agreements or requirements not covered in the MN DIP or Minnesota Technical Requirements; or 3) information provided in the blank lines to the MN DIA or Uniform Statewide Contract forms.
- 12.3. No Third-Party Beneficiaries
This Agreement is not intended to and does not create rights, remedies, or benefits of any character whatsoever in favor of any persons, corporations, associations, or entities other than the Parties, and the obligations herein assumed are solely for the use and benefit of the Parties, their successors in interest and where permitted, their assigns.
- 12.4. Waiver
- 12.4.1. The failure of a Party to this Agreement to insist, on any occasion, upon strict performance of any provision of this Agreement will not be considered a waiver of any obligation, right, or duty of, or imposed upon, such Party.
- 12.4.2. Any waiver at any time by either Party of its rights with respect to this Agreement shall not be deemed a continuing waiver or a waiver with respect to any other failure to comply with any other obligation, right, duty of this Agreement. Termination or default of this Agreement for any reason by Interconnection Customer shall not constitute a waiver of the Interconnection Customer's legal rights to obtain an interconnection from the Area EPS Operator. Any waiver of this Agreement shall, if requested, be provided in writing.

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12.5. Entire Agreement

This Agreement, including all Attachments, constitutes the entire agreement between the Parties with reference to the subject matter hereof, and supersedes all prior and contemporaneous understandings or agreements, oral or written, between the Parties with respect to the subject matter of this Agreement. There are no other agreements, representations, warranties, or covenants which constitute any part of the consideration for, or any condition to, either Party's compliance with its obligations under this Agreement. This Agreement can only be amended or modified in writing signed by both Parties.

12.6. Multiple Counterparts

This Agreement may be executed in two or more counterparts, each of which is deemed an original but all constitute one and the same instrument. Electronic signatures are acceptable if the Area EPS Operator has made such a determination pursuant to MN DIP 1.2.1.1.

12.7. No Partnership

This Agreement shall not be interpreted or construed to create an association, joint venture, agency relationship, or partnership between the Parties or to impose any partnership obligation or partnership liability upon either Party. Neither Party shall have any right, power or authority to enter into any agreement or undertaking for, or act on behalf of, or to act as or be an agent or representative of, or to otherwise bind, the other Party.

12.8. Severability

If any provision or portion of this Agreement shall for any reason be held or adjudged to be invalid or illegal or unenforceable by any court of competent jurisdiction or other Governmental Authority, (1) such portion or provision shall be deemed separate and independent, (2) the Parties shall negotiate in good faith to restore insofar as practicable the benefits to each Party that were affected by such ruling, and (3) the remainder of this Agreement shall remain in full force and effect.

12.9. Security Arrangements

Infrastructure security of electric system equipment and operations and control hardware and software is essential to ensure day-to-day reliability and operational security. All public utilities are expected to meet basic standards for system infrastructure and operational security, including physical, operational, and cyber-security practices.

12.10. Environmental Releases

Each Party shall notify the other Party, first orally and then in writing, of the release of any hazardous substances, any asbestos or lead abatement activities, or any type of remediation activities related to the Distributed Energy Resource or the Interconnection Facilities, each of which may reasonably be expected to affect the other Party. The notifying Party shall (1) provide the notice as soon as practicable, provided such Party makes a good faith effort to provide the notice no later than 24 hours after such Party becomes aware of the occurrence, and (2) promptly furnish to the other Party copies of any publicly available reports filed with any governmental authorities addressing such events.

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12.11. Subcontractors

Nothing in this Agreement shall prevent a Party from utilizing the services of any subcontractor as it deems appropriate to perform its obligations under this Agreement; provided, however, that each Party shall require its subcontractors to comply with all applicable terms and conditions of this Agreement in providing such services and each Party shall remain primarily liable to the other Party for the performance of such subcontractor.

12.11.1. The creation of any subcontract relationship shall not relieve the hiring Party of any of its obligations under this Agreement. The hiring Party shall be fully responsible to the other Party for the acts or omissions of any subcontractor the hiring Party hires as if no subcontract had been made; provided, however, that in no event shall the Area EPS Operator be liable for the actions or inactions of the Interconnection Customer or its subcontractors with respect to obligations of the Interconnection Customer under this Agreement. Any applicable obligation imposed by this Agreement upon the hiring Party shall be equally binding upon, and shall be construed as having application to, any subcontractor of such Party.

12.11.2. The obligations under this article will not be limited in any way by any limitation of subcontractor's insurance.

12.12. Inclusion of Area EPS Operator Tariffs and Rules

The interconnection services provided under this Agreement shall at all times be subject to the terms and conditions set forth in the tariff schedules and rules applicable to the electric service provided by the Area EPS Operator, which tariff schedules and rules are hereby incorporated into this Agreement by this reference. Notwithstanding any other provisions of this Agreement, the Area EPS Operator shall have the right to unilaterally file with the Minnesota Public Utilities Commission pursuant to the Commission's rules and regulations, an application for change in rates, charges, classification, service, tariff, or rule or any agreement relating thereto. The Interconnection Customer shall also have the right to unilaterally file with the Commission, pursuant to the Commission's rules and regulations, an application for change in rates, charges, classification, service, tariff, or rule or any agreement relating thereto. Each Party shall have the right to protest any such filing by the other Party and/or to participate fully in any proceeding before the Commission in which such modifications may be considered, pursuant to the Commission's rules and regulations.

13. Article 13. Notices

13.1. General

Unless otherwise provided in this Agreement, any written notice, demand, or request required or authorized in connection with this Agreement ("Notice") shall be deemed properly given if delivered in person, delivered by recognized national courier service, or sent by first class mail, postage prepaid, to the person specified below:

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If to the Interconnection Customer:

Interconnection Customer: _____

Attention: _____

Address: _____

City: _____ State: _____ Zip: _____

Phone: _____ Email: _____

If to the Area EPS Operator:

Area EPS Operator: Northern States Power Company, a Minnesota Corporation

Attention: _____

Address: _____

City: _____ State: _____ Zip: _____

Phone: _____ Email: _____

13.2. Billing and Payment

Billings and payments shall be sent to the addresses set out below:

Interconnection Customer: _____

Attention: _____

Address: _____

City: _____ State: _____ Zip: _____

Area EPS Operator: Northern States Power Company, a Minnesota Corporation

Attention: _____

Address: _____

City: _____ State: _____ Zip: _____

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13.3. Alternative Forms of Notice

Any notice or request required or permitted to be given by either Party to the other and not required by this Agreement to be given in writing may be so given by telephone or email to the telephone numbers and email addresses set out below:

If to the Interconnection Customer:

Interconnection Customer: _____

Attention: _____

Address: _____

City: _____ State: _____ Zip: _____

Phone: _____ Email: _____

If to the Area EPS Operator:

Area EPS Operator: Northern States Power Company, a Minnesota Corporation

Attention: _____

Address: _____

City: _____ State: _____ Zip: _____

Phone: _____ Email: _____

13.4. Designated Operating Representative

The Parties may also designate operating representatives to conduct the communications which may be necessary or convenient for the administration of this Agreement. This person will also serve as the point of contact with respect to operations and maintenance of the Party's facilities.

Interconnection Customer's Operating Representative:

Interconnection Customer: _____

Attention: _____

Address: _____

City: _____ State: _____ Zip: _____

Phone: _____ Email: _____

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Minneapolis, Minnesota 55401

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Area EPS Operator's Operating Representative:

Area EPS Operator: Northern States Power Company, a Minnesota Corporation

Attention: _____

Address: _____

City: _____ State: _____ Zip: _____

Phone: _____ Email: _____

13.5. Changes to the Notice Information

Either Party may change this information by giving five Business Days written notice to the other Party prior to the effective date of the change.

14. Article 14. Signatures

IN WITNESS WHEREOF, the Parties have caused this Agreement to be executed by their respective duly authorized representatives.

For Northern States Power Company, a Minnesota corporation (Area EPS Operator)–

Signature: _____

Name: _____

Title: _____

Date: _____

For the Interconnection Customer

Signature: _____

Name: _____

Title: _____

Date: _____

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Attachment 1: Glossary of Terms

Affected System – Another Area EPS Operator's system, or Transmission Owner's Transmission System, or Transmission System connected generation which may be affected by the proposed interconnection.

Applicant Agent – A person designated in writing by the Interconnection Customer to represent or provide information to the Area EPS on the Interconnection Customer's behalf throughout the interconnection process.

Area EPS - The electric power distribution system connected at the Point of Common Coupling.

Area EPS Operator – An entity that owns, controls, or operates the electric power distribution systems that are used for the provision of electric service in Minnesota.

Business Day – Monday through Friday, excluding Holidays as defined by [Minn. Stat. §645.44, Subd. 5. See MN DIP 5.2.1 for more on computation of time.](#)

Certified Equipment - UL 1741 listing is a common form of DER inverter certification. See MN DIP Attachment 4: Certification Codes and Standards and Attachment 5: Certification of Distributed Energy Resource Equipment.

Confidential Information – See MN DIA Article 9.

Distributed Energy Resource (DER) – A source of electric power that is not directly connected to a bulk power system. DER includes both generators and energy storage technologies capable of exporting active power to an EPS. An interconnection system or a supplemental DER device that is necessary for compliance with this standard is part of a DER. For the purpose of the MN DIP and MN DIA, the DER includes the Customer's Interconnection Facilities but shall not include the Area EPS Operator's Interconnection Facilities.

Distribution System – The Area EPS facilities which are not part of the Local EPS, Transmission System or any generation system.

Distribution Upgrades – The additions, modifications, and upgrades to the Distribution System at or beyond the Point of Common Coupling to facilitate interconnection of the DER and render the distribution service necessary to effect the Interconnection Customer's connection to the Distribution System. Distribution Upgrades do not include Interconnection Facilities.

Effective Date – Agreement(s) shall become effective upon execution by the Parties.

Electric Power System (EPS) – The facilities that deliver electric power to a load.

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Emergency Conditions – a condition or situation: (1) that in the judgment of the Party making the claim is imminently likely to endanger life or property; or (2) that, in the case of the Area EPS Operator, is imminently likely (as determined in a non-discriminatory manner) to cause a material adverse effect on the security of, or damage to the Distribution System, the Area EPS Operator's Interconnection Facilities or the Distribution Systems of others to which the Distribution System is directly connected; or (3) that, in the case of the Interconnection Customer, is imminently likely (as determined in a non-discriminatory manner) to cause a material adverse effect on the security of, or damage to, the Distributed Energy Resource or the Interconnection Customer's Interconnection Facilities.

Fast Track Process – The procedure as described in MN DIP Section 3 for evaluating an Interconnection Application for a Distributed Energy Resource that meets the eligibility requirements of MN DIP section 3.1.

Force Majeure Event – An act of God, labor disturbance, act of the public enemy, war, insurrection, riot, fire, storm or flood, explosion, breakage or accident to machinery or equipment, an order, regulation or restriction imposed by governmental, military or lawfully established civilian authorities, or another cause beyond a Party's control. A Force Majeure Event does not include an act of negligence or intentional wrongdoing.

Good Utility Practice – Any of the practices, methods and acts engaged in or approved by a significant portion of the electric industry during the relevant time period, or any of the practices, methods and act which, in the exercise of reasonable judgment in light of the facts known at the time the decision was made, could have been expected to accomplish the desired result at a reasonable cost consistent with good business practices, reliability, safety and expedition. Good Utility Practice is not intended to be limited to the optimum practice, method, or act to the exclusion of all others, but rather to be acceptable practices, methods, or acts generally accepted in the region.

Governmental Authority – Any federal, state, local or other governmental regulatory or administrative agency, court, commission, department, board, or other governmental subdivision, legislature, rulemaking board, tribunal, or other governmental authority having jurisdiction over the Parties, their respective facilities, or the respective services they provide, and exercising or entitled to exercise any administrative, executive, police, or taxing authority or power; provided, however, that such term does not include the Interconnection Customer, the Area EPS Operator, or any Affiliate thereof. The Minnesota Public Utilities Commission is the authority governing interconnection requirements unless otherwise provided for in the Minnesota Technical Requirements.

Interconnection Agreement – The terms and conditions between the Area EPS Operator and Interconnection Customer (Parties). See MN DIP Section 1.1.5 for when the Uniform Statewide Contract or MN DIA applies.

Interconnection Application – The Interconnection Customer's request to interconnect a new or modified, as described in MN DIP Section 1.6, Distributed Energy Resource. See MN DIP Attachment 2 Simplified Application Form and MN DIP Attachment 3 Interconnection Application Form.

Interconnection Customer – The person or entity, including the Area EPS Operator, whom will be the owner of the DER that proposes to interconnect a DER(s) with the Area EPS Operator's Distribution System. The Interconnection Customer is responsible for ensuring the Distributed Energy Resource(s) is designed, operated and maintained in compliance with the Minnesota Technical Requirements.

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**MINNESOTA DISTRIBUTED ENERGY RESOURCE
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(Continued)**

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Interconnection Facilities – The Area EPS Operator's Interconnection Facilities and the Interconnection Customer's Interconnection Facilities. Collectively, Interconnection Facilities include all facilities and equipment between the Distributed Energy Resource and Customer Interconnection System and the Point of Common Coupling, including any modification, additions or upgrades that are necessary to physically and electrically interconnect the Distributed Energy Resource to the Area EPS Operator's System. Some examples of Customer Interconnection Facilities include: supplemental DER devices, inverters, and associated wiring and cables up to the Point of DER Connection. Some examples of Area EPS Operator Interconnection Facilities include sole use facilities; such as, line extensions, controls, relays, switches, breakers, transformers and shall not include Distribution Upgrades or Network Upgrades.

Material Modification – A modification to machine data, equipment configuration or to the interconnection site of the DER at any time after receiving notification by the Area EPS Operator of a complete Interconnection Application that has a material impact on the cost, timing, or design of any Interconnection Facilities or Upgrades, or a material impact on the cost, timing or design of any Interconnection Application with a later Queue Position or the safety or reliability of the Area EPS.¹

MN DIA - The Minnesota Distributed Energy Resource Interconnection Agreement. See MN DIP Section 1.1.5 for when the Uniform Statewide Contract or MN DIA applies.

MN DIP – The Minnesota Distributed Energy Resource Interconnection Process. The statewide interconnection standards.

MN Technical Requirements or Minnesota Technical Requirements – The term including all of the DER technical interconnection requirement documents for the state of Minnesota; including: 1) Attachment 2 Distributed Generation Interconnection Requirements established in the Commission's September 28, 2004 Order in E-999/CI-01-1023) until superseded and upon Commission approval of updated Minnesota DER Technical Interconnection and Interoperability Requirements in E-999/CI-16-521 (anticipated February 2019.)

¹ A Material Modification shall include, but may not be limited to, a modification from the approved Interconnection Application that: (1) changes the physical location of the point of common coupling; such that it is likely to have an impact on technical review; (2) increases the nameplate rating or output characteristics of the Distributed Energy Resource; (3) changes or replaces generating equipment, such as generator(s), inverter(s), transformers, relaying, controls, etc., and substitutes equipment that is not like-kind substitution in certification, size, ratings, impedances, efficiencies or capabilities of the equipment; (4) changes transformer connection(s) or grounding; and/or (5) changes to a certified inverter with different specifications or different inverter control settings or configuration. A Material Modification shall not include a modification from the approved Interconnection Application that: (1) changes the ownership of a Distributed Energy Resource; (2) changes the address of the Distributed Energy Resource, so long as the physical point of common coupling remains the same; (3) changes or replaces generating equipment such as generator(s), inverter(s), solar panel(s), transformers, relaying, controls, etc. and substitutes equipment that is a like-kind substitution in certification, size, ratings, impedances, efficiencies or capabilities of the equipment; and/or (4) increases the DC/AC ratio but does not increase the maximum AC output capability of the Distributed Energy Resource.

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Nameplate Rating: nominal voltage (V), current (A), maximum active power (kWac), apparent power (kVA), and reactive power (kvar) at which a DER is capable of sustained operation. For a Local EPS with multiple DER units, the aggregate nameplate rating is equal to the sum of all DERs nameplate rating in the Local EPS, not including aggregate capacity limiting mechanisms such as coincidence factors, plant controller limits, etc. that may be applicable for specific cases. (Aggregate Nameplate Rating). The nameplate ratings referenced in the MN DIP are alternating current nameplate DER ratings See MN DIP Section 5.14 on Capacity of the Distributed Energy Resource.

Network Upgrades – Additions, modifications, and upgrades to the Transmission System required at or beyond the point at which the DER interconnects with the Area EPS Operator's System to accommodate the interconnection with the DER to the Area EPS Operator's System. Network Upgrades do not include Distribution Upgrades.

Notice of Dispute – The disputing Party shall provide the other Party this written notice containing the relevant known facts pertaining to the dispute, the specific dispute and the relief sought, and express notice by the disputing Party that it is invoking the procedures under MN DIP 5.3.

Operating Requirements – Any operating and technical requirements that may be applicable due to the Transmission Provider's technical requirements or Minnesota Technical Requirements, including those set forth in this Agreement.

Party or Parties – The Area EPS Operator and the Interconnection Customer.

Point of Common Coupling (PCC) – The point where the Interconnection Facilities connect with the Area EPS Operator's Distribution System. See figure 1. Equivalent, in most cases, to "service point" as specified by the Area EPS Operator and described in the National Electrical Code and the National Electrical Safety Code.

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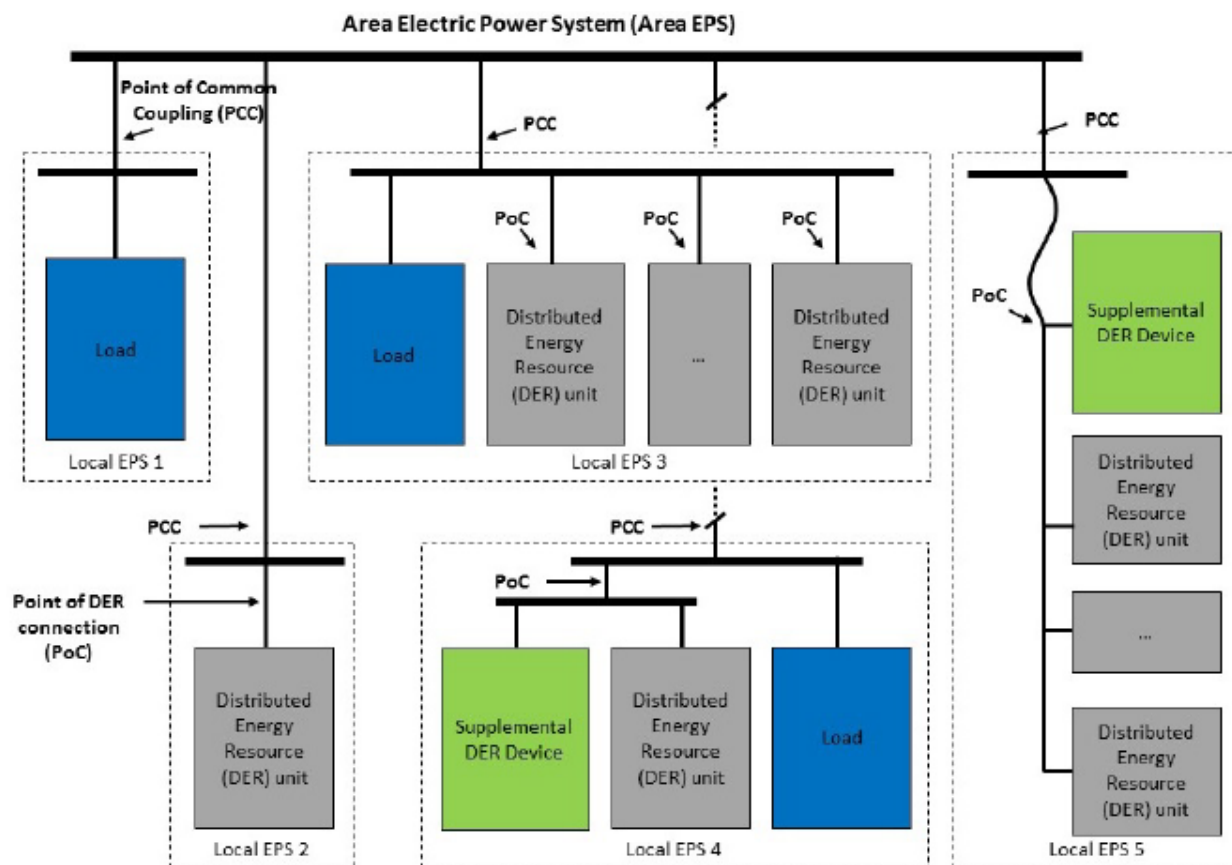


Figure 1: Point of Common Coupling and Point of DER Connection
 (Source: IEEE 1547)

Point of DER Connection (PoC) – When identified as the Reference Point of Applicability, the point where an individual DER is electrically connected in a Local EPS and meets the requirements of this standard exclusive of any load present in the respective part of the Local EPS (e.g., terminals of the inverter when no supplemental DER device is required.) For DER Unit(s) that are not self-sufficient to meet the requirements without (a) supplemental DER device(s), the point of DER connection is the point where the requirements of this standard are met by DER in conjunction with (a) supplemental DER device(s) exclusive of any load present in the respective part of the Local EPS.

Queue Position – The order of a valid Interconnection Application, relative to all other pending valid Interconnection Applications, that is established based upon the date- and time- of receipt of the complete Interconnection Application as described in MN DIP sections 1.5.2 and 1.8.

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Reasonable Efforts – With respect to an action required to be attempted or taken by a Party under these procedures, efforts that are timely and consistent with Good Utility Practice and are otherwise substantially equivalent to those a Party would use to protect its own interests.

Reference Point of Applicability – The location, either the Point of Common Coupling or the Point of DER Connection, where the interconnection and interoperability performance requirements specified in IEEE 1547 apply. With mutual agreement, the Area EPS Operator and Customer may determine a point between the Point of Common Coupling and Point of DER Connection. See Minnesota DER Technical Interconnection and Interoperability Requirements for more information.

Simplified Process – The procedure for evaluating an Interconnection Application for a certified inverter-based DER no larger than 20 kW that uses the screens described in MN DIP section 3.2. The Simplified process includes simplified procedures. MN DIP Attachment 2 Simplified Application Form includes a brief set of terms and conditions and the option for an Interconnection Agreement described in MN DIP 1.1.5. See MN DIP Section 2 Simplified Process.

Study Process – The procedure for evaluating an Interconnection Application that includes the MN DIP Section 4 scoping meeting, system impact study, and facilities study.

Tariff – The Area EPS Operator's Tariff filed in compliance with the Minnesota Distributed Energy Resource Interconnection Procedures (MN DIP) and approved by the Minnesota Public Utilities Commission (MPUC or Commission).

Transmission Owner – The entity that owns, leases or otherwise possesses an interest in the portion of the Transmission System relevant to the Interconnection.

Transmission Provider – The entity (or its designated agent) that owns, leases, controls, or operates transmission facilities used for the transmission of electricity. The term Transmission Provider includes the Transmission Owner when the Transmission Owner is separate from the Transmission Provider. The Transmission Provider may include the Independent System Operator or Regional Transmission Operator.

Transmission System – The facilities owned, leased, controlled or operated by the Transmission Provider or the Transmission Owner that are used to provide transmission service. See the Commission's July 26, 2000 Order Adopting Boundary Guidelines for Distinguishing Transmission from Generation and Distribution Assets in Docket No. E-999/CI-99/1261.

Uniform Statewide Contract – State of Minnesota's standard, uniform contract that must be applied to all qualifying new and existing interconnections between a utility and DER having capacity less than 40 kilowatts if interconnecting with a cooperative or municipal utility and 1,000 kilowatts if interconnecting with a public utility. ([Minn. Rules 7835.9910](#))

Upgrades – The required additions and modifications to the Area EPS Operator's Transmission or Distribution System at or beyond the Point of Interconnection. Upgrades may be Network Upgrades or Distribution Upgrades. Upgrades do not include Interconnection Facilities.

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**MINNESOTA DISTRIBUTED ENERGY RESOURCE
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Section No. 10
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Attachment 2: Description and Costs of the Distributed Energy Resource, Interconnection Facilities, and Metering Equipment

Equipment, including the Distributed Energy Resource, Interconnection Facilities, and metering equipment shall be itemized and identified as being owned by the Interconnection Customer or the Area EPS Operator. The Area EPS Operator will provide a good faith estimate itemized cost, including administrative overheads, of its Interconnection Facilities and metering equipment, and a good faith estimate itemized cost of the annual operation and maintenance expenses associated with its Interconnection Facilities and metering equipment. The Area EPS shall inform the Interconnection Customer of the option to either pay the metering costs upfront or through a monthly metering fee and provide the customer a copy of the tariff with the metering fee pursuant to MN DIP 5.4.

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Attachment 3: One-line Diagram Depicting the Distributed Energy Resource, Interconnection Facilities, Metering
Equipment, and Upgrades

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Attachment 4: Milestones

The Milestone in line (1) below may be a calendar date. All other dates in this Attachment 4 may be number of Business Days from the calendar date in line (1) or from the completion of a different Milestone described in a specified line number. Similarly, the anticipated In-Service Date may be based on the number of Business Days from the completion of a specified line number.

In-Service Date: _____

Critical milestones and responsibility as agreed to by the Parties:

	Milestone/Anticipated Date	Responsible Party
(1)	_____	_____
(2)	_____	_____
(3)	_____	_____
(4)	_____	_____
(5)	_____	_____
(6)	_____	_____
(7)	_____	_____
(8)	_____	_____
(9)	_____	_____
(10)	_____	_____

Agreed to by:

For the Area EPS Operator _____ Date _____

For the Transmission Owner (If Applicable) _____ Date _____

For the Interconnection Customer _____ Date _____

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(Continued)**

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Attachment 5: Additional Operating and Maintenance Requirements for the Area EPS Operator's Distribution System
and Affected Systems Needed to Support the Interconnection Customer's Needs

The Area EPS Operator shall also provide requirements that must be met by the Interconnection Customer prior to initiating parallel operation with the Area EPS Operator's Distribution System. Additional operating and maintenance requirements for an Affected System needed to support the Interconnection Customer's needs may be addressed in a separate agreement as described in Article 5.3.

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INTERCONNECTION AGREEMENT (MN DIA)
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Attachment 6: Area EPS Operator's Description of Distribution and Network Upgrades and Good Faith Estimates of Upgrade Costs

The Area EPS Operator shall describe Distribution and Network Upgrades and provide an itemized good faith estimate of the costs, including administrative overheads, of the Upgrades and annual operation and maintenance expenses associated with such Upgrades. The Area EPS Operator shall functionalize Upgrade costs and annual expenses as either transmission or distribution related. Additional Distribution or Network Upgrades required for an Affected System may be addressed in a separate agreement as described in Article 5.3.

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ASSIGNMENT FOR THE MN DIA

Section No. 10
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Assignment of Minnesota Distributed Energy Resource Interconnection Agreement (MN DIA)

This is an Assignment of Interconnection Agreement ("Assignment").

There is an Interconnection Agreement, including any and all Attachments thereto including any and all amendments ("Agreement") by and between Northern States Power Company, a Minnesota corporation, doing business as Xcel Energy ("Area EPS Operator"), having its principal office and place of business located at 414 Nicollet Mall, Minneapolis, Minnesota 55401, and _____ ("Assignor"), originally signed by the Area EPS Operator on _____ for a Distributed Energy Resource (DER) with a Nameplate Rating of ____ kW (AC) located at _____.

The Assignor intends to convey its interest in the above-referenced DER to [insert name of new purchaser of the service address shown in Interconnection Application and in one line diagram attached to Agreement] ("Assignee"), and the Assignor intends to assign the Agreement to the Assignee.

Upon the execution of this Assignment by the Assignor, Assignee and the Area EPS Operator, agree as follows:

1. **Capitalized Terms.** Capitalized terms used but not defined herein shall have the meanings set forth in the Agreement.
2. **Consent to Assignment.** The Assignor hereby irrevocably assigns the Agreement in all respects to the Assignee and the Assignee accepts the assignment thereof in all respects.
3. **Amendment to Agreement.** The Area EPS Operator consents to this assignment and, as assigned, the Agreement is hereby amended so that wherever the name of the Assignor is used therein it shall mean the Assignee. It is further agreed that all terms and conditions of the Agreement, as amended by this Assignment, shall remain in full force and effect.
4. **Payments by Area EPS Operator.** Any and all payments made by Area EPS Operator under the Agreement to either the Assignor or the Assignee shall be deemed to have been made to both and shall discharge the Area EPS Operator from any further liability with regard to said payment.
5. **Financial Obligations of Assignor and Assignee.** Any and all financial liability, including but not limited to amounts due, from the Interconnection Customer to the Area EPS Operator, occurring or accruing under the Agreement on or before the date of the signature of the Area EPS Operator to this Assignment shall be deemed to be the obligation of both the Assignor and Assignee, and the Area EPS Operator may recover any such amounts jointly and severally from the Assignor and Assignee.
6. **Contact information.** The following information updates and replaces the designated information as set forth on page 3 of the Agreement, and in Articles 13.1, 13.2, 13.3, and 13.4 of the Agreement.

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**ASSIGNMENT FOR THE MN DIA
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Page 3	Interconnection Customer: _____ Attention: _____ Address: _____ City: _____ State: _____ Zip: _____ Phone: _____ Email: _____
Article 13.1 General	Interconnection Customer: _____ Attention: _____ Address: _____ City: _____ State: _____ Zip: _____ Phone: _____ Email: _____
Article 13.2 Billing and Payment	Interconnection Customer: _____ Attention: _____ Address: _____ City: _____ State: _____ Zip: _____
Article 13.3 Alternative Forms of Notice	Interconnection Customer: _____ Attention: _____ Address: _____ City: _____ State: _____ Zip: _____ Phone: _____ Email: _____

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**ASSIGNMENT FOR THE MN DIA
(Continued)**

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Article 13.4 Designated Operating Representative	Interconnection Customer's Operating Representative:
	Interconnection Customer:

	Attention: _____
	Address: _____
	City: _____ State: _____ Zip: _____
	Phone: _____ Email: _____

7. **Signatures.** Facsimile or electronic signatures, or signatures to this Assignment sent electronically, shall have the same effect as original signatures. Photocopies, or electronically stored versions of this Assignment, shall have the same validity as the original.

The Area EPS Operator, Assignor, and Assignee have executed this Assignment as of the dates as set forth below.

Assignor (_____)

Signature: _____

Name: _____

Title: _____

Date: _____

Area EPS Operator (Northern States Power Company, a Minnesota corporation)

Signature: _____

Name: _____

Title: _____

Date: _____

Assignee (_____)

Signature: _____

Name: _____

Title: _____

Date: _____

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President, Northern States Power Company, a Minnesota corporation

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