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## Level 2, Level 3, and Level 4 Small Generator Facility Interconnection Request

### Electric Distribution Company: NorthWestern Energy (“NorthWestern”)

Designated Contact Person: Interconnection Specialist

Address: 11 East Park  
Butte, MT 59701

Telephone: 406-497-4165

E-Mail: northwesternenergynetmeter@northwestern.com

Request for Interconnection (“Request”) is considered complete when all applicable information required below is provided. Additional information to evaluate the Request may be required.

### Instructions

When used in this Request, with initial capitalization, the terms specified shall have the meanings indicated or specified in the Request.

An Applicant who requests a Montana Public Service Commission jurisdictional interconnection must submit this Request by hand delivery, mail, e-mail, or fax to NorthWestern’s Designated Contact Person shown above.

### Processing Fee or Deposit:

Level 2, Level 3, and Level 4 Requests shall be submitted with a non-refundable processing fee, as defined below:

- Level 2 Interconnection Request - **\$500 Request Fee**
- Level 3 Interconnection Request - **\$200 Request Fee**
- Level 4 Interconnection Request - **\$1,000 Deposit**

If the Request is submitted under the Level 4 review process, whether a new submission or a Request that did not pass the Level 1, 2, or 3 review process, the Applicant shall submit to NorthWestern a deposit not to exceed \$1,000 towards the cost of the feasibility study.

**Interconnection Customer Information**

Legal Name of the Interconnection Customer (or, if an individual, individual's name)

Name: \_\_\_\_\_

Premise Number (To be provided by NorthWestern): \_\_\_\_\_

Contact Person: \_\_\_\_\_

Mailing Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Facility Location (if different from above):

\_\_\_\_\_

Telephone (Day): \_\_\_\_\_ Telephone (Evening): \_\_\_\_\_

E-Mail: \_\_\_\_\_

Alternative Contact Information (if different from the Interconnection Customer)

Contact Name: \_\_\_\_\_

Title: \_\_\_\_\_

Address: \_\_\_\_\_

Telephone (Day): \_\_\_\_\_ Telephone (Evening): \_\_\_\_\_

E-Mail: \_\_\_\_\_

**Project Name:** \_\_\_\_\_

**Application is for:**     New Small Generator Facility  
                                   Capacity Addition to Existing Small Generator Facility

**Requested Point of Interconnection:** \_\_\_\_\_

**Interconnection Customer's Requested In-Service Date:** \_\_\_\_\_

**Select Type of Interconnection Request – Check One:**

**Level 2 Interconnection – \$500 Request Fee**

NorthWestern shall use Level 2 procedures for interconnection requests if:

1. The generator facility has a nameplate capacity of 2 MW or less; and
2. The interconnection equipment proposed for the small generator facility is certified; or
3. The small generator facility was reviewed under Level 1 review procedures but not approved and the applicant has submitted a new interconnection request for consideration.

**Level 3 Interconnection – \$200 Request Fee**

NorthWestern shall use Level 3 review procedures for evaluating interconnection requests where power will not be exported onto NorthWestern’s Electric Distribution System.

**Level 4 Interconnection –\$1,000 Deposit**

NorthWestern shall use the Level 4 study procedures for evaluating interconnection requests if:

1. The interconnection request was not approved under Level 1, Level 2, or Level 3 expedited review and the applicant has submitted an interconnection request for consideration under a Level 4 study review; or
2. The interconnection request does not meet the criteria for expedited review under Level 1, Level 2, or Level 3 review procedures.

For installations at locations with existing electric service to which the proposed Small Generator Facility will interconnect, provide:

**Address of Existing Service**

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**Existing Electric Account Number**

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**Small Generator Facility Information**

Data applies only to the Small Generator Facility, not the Interconnection Facilities.

Energy Source:  Solar  Wind  Hydro  Hydro Type (e.g. Run-of-River):

Diesel  Natural Gas  Fuel Oil  Other (state type)

Prime Mover:  Fuel Cell  Reciprocating Engine  Gas Turbine  Steam Turbine

Microturbine  Wind  Solar Photovoltaic

Other (state type)\_\_\_\_\_  Non Applicable

Generator Type:  Synchronous  Induction  Not applicable

Generator Nameplate Rating: kW (Typical) Generator Nameplate kVAR:

Interconnection Customer or Customer-Site Load: \_\_\_\_\_ kW (if none, so state)

Typical Reactive Load (if known):

Maximum Physical Export Capability Requested: \_\_\_\_\_ kW

List components of the Small Generator Facility electrical equipment package, the certifying entity, and standard number. Attach additional sheets as needed for the components list and attach manufacturer specification sheets for all certified or standardized equipment, including Manufacturer and Model information.

Electrical Equipment Description	Certifying Entity	Standard #
1.		
2.		
3.		
4.		
5.		
6.		

Is the prime mover compatible with the certified protective relay package?  Yes  No

Generator (or solar photovoltaic collector)

Manufacturer, Model Name & Number:

Version Number:

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

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

Individual Generator Power Factor

Rated Power Factor: Leading: Lagging:

Total Number of Generators in wind farm to be interconnected pursuant to this Interconnection Request (if applicable): Elevation:

Phase:  Single phase  Three phase

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

**Small Generator Facility Characteristic Data (for inverter-based machines)**

Max design fault contribution current: Instantaneous  RMS

Harmonics characteristics:

Start-up requirements:

**Small Generator Facility Characteristic Data (for rotating machines)**

RPM Frequency:

Neutral Grounding Resistor (if applicable):

Synchronous Generators:

Direct Axis Synchronous Reactance,  $X_d$ : P.U.

Direct Axis Transient Reactance,  $X'_d$ : P.U.

Direct Axis Subtransient Reactance,  $X''_d$ : P.U.

Negative Sequence Reactance,  $X_2$ : P.U.

Zero Sequence Reactance,  $X_0$ : P.U.

KVA Base:

Field Volts:

Field Amperes:

Induction Generators:

Motoring Power (kW):

$I_2^2t$  or K (Heating Time Constant):

Rotor Resistance,  $R_r$ :

Stator Resistance,  $R_s$ :

Stator Reactance,  $X_s$ :

Rotor Reactance,  $X_r$ :

Magnetizing Reactance,  $X_m$ :

Short Circuit Reactance,  $X_d''$ :

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: Per Unit on kVA Base

**Interconnection Facilities Information**

Will a transformer be used between the generator 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

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

**Level 3 Interconnection Customer must select one of the following options:**

Interconnection Protective Relays

Level 3 Interconnection applications where power will not be exported onto NorthWestern’s Electric Distribution System require reverse power protection systems to be installed per the requirements described by the Rule 17 - 7.2.1 (ii). (clarification on pages 9-11 of this application). Please indicate which required reverse power protection system option(s) will be installed (if applicable):

- |  |  |
|--|--|
| <input type="checkbox"/> Option 1 – Reverse Power Protection Relay | <input type="checkbox"/> Option 2 – Minimum Power Protection Relay |
| <input type="checkbox"/> Option 3 – Gen Rating Less than Min Load  | <input type="checkbox"/> Option 4 – Certified Power Control System |

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:

Potential Transformer Data (If Applicable):

Manufacturer:		
Type:	Accuracy Class:	Proposed Ratio Connection:
Manufacturer: :		
Type:	Accuracy Class:	Proposed Ratio Connection:

**General Information**

Enclose copy of site electrical one-line diagram showing the configuration of all Small Generator Facility equipment, current and potential circuits, and protection and control schemes. This one-line diagram must be signed and stamped by a licensed Professional Engineer if the Small Generator Facility is larger than 50 kilowatts (kW) alternating current (AC). Is One-Line Diagram Enclosed?  Yes  No

Enclose a detailed site diagram and any other documentation necessary to indicate the precise physical location of the proposed Small Generator Facility and related equipment (e.g., solar array diagram, inverter location, USGS topographic map or other diagram or documentation including solar array, inverter location, disconnect location, etc.)

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

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

**Applicant Signature**

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

For Interconnection Customer:

Print Name: \_\_\_\_\_

Signature: \_\_\_\_\_

Title: \_\_\_\_\_ Date: \_\_\_\_\_



## Level 3 Reverse Power Protection Clarification for Rule No. 17



Date Issued: 9/21/2022

This reverse power protection clarification document is being written to further explain Rule 17 Section 7.2.1 (ii) regarding which methods of reverse power protection are currently considered acceptable for Level 3 Non-Export Interconnection applications. Rule 17 Section 7.2.1 (ii) is shown here for reference:

### 7.2 Level 3 Screens

7.2.1 For Interconnection Requests to a Radial Distribution Circuit, the following criteria must be satisfied:

- (ii) The Small Generator Facility will use reverse power relays or other protection functions that prevent power flow onto the Electric Distribution System;

Unless otherwise mutually agreed upon in writing between the Customer-Generator and the Electric Distribution Company, Level 3 Non-Export Small Generator Facilities shall utilize one or more of the following options in order to provide reverse power protection as required in Rule 17 Section 7.2.1 (ii). An on-site witness test with an Electric Distribution Company representative may be required to demonstrate proper relay and/or control system set-up and operation at the Electric Distribution Company's discretion.

#### **Option 1 – Reverse Power Protection Relay:**

1. To ensure power is never exported past the point of interconnection onto the electric distribution system, a reverse power relay protective function may be provided. The reverse power relay shall be specified as a utility grade device and the relay manufacturer and part number shall be provided in the interconnection application.
2. The default settings for this protective function shall be set as follows unless otherwise instructed in writing by the Electric Distribution Company:
  - a. Reverse Power pick-up level = 0.1% export of customer service transformer kW rating
  - b. Reverse Power pick-up level = 0.1% export of customer's verifiable peak demand in kW over the past 24 months (applicable to primary metered customers only with no Electric Distribution Company owned service transformer installed)
  - c. Reverse Power time delay = 2 seconds maximum time delay

#### **Option 2 – Minimum Power Protection Relay:**

1. To ensure at least a minimum amount of power is imported across the point of interconnection at all times (and, therefore, that power is not exported past the point of interconnection onto the electric distribution system), a minimum power relay protective function may be provided. The minimum power relay shall be specified as a utility grade device and the relay manufacturer and part number shall be provided in the interconnection application.

## Level 3 Reverse Power Protection Clarification for Rule No. 17



Date Issued: 9/21/2022

2. The default settings for this protective function shall be set as follows unless otherwise instructed in writing by the Electric Distribution Company:
  - a. Minimum Power pick-up level = 5% import of the Nameplate Capacity of the Small Generator Facility kW rating
  - b. Minimum Power time delay = 2 seconds maximum time delay

### **Option 3 – Generating Facility Rating Significantly Less than Verifiable Minimum Customer Load:**

1. When the Nameplate Capacity of the Small Generator Facility is very small in comparison to the customer's minimum load, the use of additional protective functions is not required to ensure that power is not exported past the point of interconnection onto the electric distribution system.
2. To utilize this option, the Nameplate Capacity of the Small Generator Facility in kW shall be no greater than 50% of the customer's verifiable minimum load in kW over the past 24 months.
3. If less than 12 months of verifiable minimum load data exist for a given customer, this option cannot be utilized to fulfill the reverse power prevention requirement.

### **Option 4 – Non-Export Utilizing Certified Power Control Systems with an Open Loop Response Time of Less Than 2 Seconds:**

1. The following are the minimum requirements for Non-Export systems that use certified power control systems (PCS) with an open loop response time (OLRT) of less than 2 seconds. Other factors relevant to the Interconnection Study process may necessitate additional technical requirements that are not explicitly noted here.
2. Use a power control system (PCS) that passes the requirements of the 2019 Underwriter Laboratories (UL) Power Control Systems Certification Requirements Decision (CRD) test protocol. Non-export systems may use a PCS that passes later published revisions to the CRD test protocol or may use a PCS that is certified to the UL 1741 certification standard, if UL incorporates the CRD test protocol for the PCS into UL 1741 in the future. The Nationally Recognized Testing Laboratory (NRTL) evaluation must have determined that the PCS conforms to the non-exporting functionality in accordance with the relevant CRD or UL published standard.
3. The power control system (PCS) is certified with an open loop response time (OLRT) of 2 seconds or less, and proof of this certification is submitted in the form of PCS specification data sheets and OLRT test reports as a part of the interconnection application.
4. The power control system (PCS) must reduce export to zero or less within 2 seconds of commencing export and the system power output must reach steady state within 10 seconds or less.
5. The power control system (PCS) must be set to not export (also known as zero export or non-export).
6. The generating facility only utilizes UL 1741 certified non-islanding inverters.

## Level 3 Reverse Power Protection Clarification for Rule No. 17



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7. The Small Generator Facility's control power system (PCS) must limit export to not exceed its Nameplate Capacity multiplied by 0.1 hours per day over a rolling 30-day period (e.g. for a 100 kW Nameplate Capacity Small Generator Facility, the maximum energy allowed to be exported for one day is 10 kWh and the maximum energy allowed to be exported for a rolling 30-day period is 300 kWh).
  8. The expected frequency of power export occurrences should be less than two occurrences per 24 hour period.
  9. The Small Generator Facility must enter a safe operating mode where power export will not occur as a result of failure of the control or inverter system for more than 30 seconds, which results in a loss of control signal, loss of control power, or a single component failure of the power control system (PCS).