

Engineering Requirements

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2. Purpose

The purpose of this document is to present the Utility’s design requirements for Net Metering systems to operate in parallel with the Utility’s electric system to ensure the safety of people and property and the integrity of the electrical system.

3. General

- 3.1 As defined in NRS 704.771: “Net metering system” means facility or energy system for the generation of electricity that:
- 3.1.1 Uses renewable energy as its primary source of energy to generate electricity;
 - 3.1.2 Has a generating capacity of not more than 1,000 kilowatts
 - 3.1.3 Is isolated on the customer-generator’s premises;
 - 3.1.4 Operates in parallel with the utility’s transmission and/or distribution facilities; and
 - 3.1.5 Is intended primarily to offset part or all of the customer-generator’s requirements for electricity.
- 3.2 As defined in NRS 704.7811, “Renewable energy” means:
- 3.2.1 Biomass
 - 3.2.2 Geothermal energy
 - 3.2.3 Solar energy
 - 3.2.4 Waterpower
 - 3.2.5 Wind

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4. Applicable Standards

A Net Metering system used by a customer-generator must meet all applicable safety and power quality standards established by:

- 4.1 All articles of the National Electric Code that apply, including but not limited to Articles 685, 690, 694, 702, 705, and 706.
- 4.2 All applicable State and Local codes.
- 4.3 Underwriters Laboratories Inc.
- 4.4 The most recent versions of the Institute of Electrical and Electronic Engineers, (IEEE) Standards 929 and 1547 at the time of the Net Metering system interconnection having a particular application. The readily accessible visible break and lockable disconnect switch of IEEE 1547 is required. A pull-out disconnect is NOT acceptable.
- 4.5 All other applicable NV Energy standards.

5. Definitions


- 5.1 Customer-Generator: A user of a Net Metering system.
- 5.2 Net Metering: Measuring and billing only the difference between electricity supplied by the utility and the electricity generated by the customer-generator that is fed back to the utility over the applicable billing period.
- 5.3 Energy Storage Device: A device that captures energy produced at one time, stores that energy for a period of time, and delivers that energy as electricity for use at a future time.
- 5.4 Backup Operation: The disconnection from the utility grid and continuing operation of a power source in the event of the loss of utility power service. Also called a "Microgrid". All devices must be effectively isolated from the utility grid while in a Backup Operation mode.
- 5.5 Backup Equipment: The hardware that interrupts a Net Metering System's Parallel Operating functions, disconnects a power source from the utility grid, and changes over to a Backup Operation mode.

6. Studies

- 6.1 Technical review of the impact of the Net Metering system interconnection on NV Energy's electric distribution system will be conducted per the requirements set forth in NV Energy's Rule 15. Normally, an Interconnection Study will not be required, but may be if deemed necessary by NV Energy.

7. Metering Arrangement

- 7.1 The Revenue Net Metering will be arranged so that utility measures the net electricity delivered or received during the billing period.
- 7.2 A second (REC/Generation/Production) meter measures the electricity generated by the customer-generator. NV Energy will provide this meter only if the customer participates in the Renewable Generations Program.
- 7.3 Connections to the supply side of the main disconnecting means installed in accordance with NEC Articles 230.82(6) and 705.12, are allowed. The connection shall be on the load side of the metering points. Connections on the load side of the main disconnecting means installed in accordance with NEC Articles 705.12 and 240.21, are allowed.

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- 7.3.1 Modifications to the electrical equipment may compromise the equipment listing. All modifications shall be approved in writing by the Authority Having Jurisdiction, the manufacturer, or a Nationally Recognized Testing Laboratory. Forward the documentation to Meter Operations.
- 7.3.2 The visible break, readily accessible and lockable disconnect switch and REC meter shall be located per section 8 of this standard.
- 7.4 "Solar Ready Service Panels" may be used if they meet NV Energy requirements. Submit the service panel's specification sheets and part numbers used as part of the net metering application for engineering review.

8. Customer Engineering Requirements

This section provides the engineering requirements that the customer must comply with to install a "Net Metering" system:

- 8.1 The preferred location of the REC meter is within 10' of the service entrance equipment. (See Attachment 1).
 - 8.1.1 Electric Meter Operations will consider the REC (generation) meter to be farther than 10' from the existing service entrance equipment if there are extenuating circumstances with the project design. Evaluation of the REC meter location will include, but is not limited to, a review of safety issues and accessibility to the REC meter. Relocation of the REC meter for aesthetic reasons is not sufficient.
- 8.2 Locate the Visible Disconnect switch within 10' of the net meter. (See Attachment 2.)
 - 8.2.1 Distribution equipment including but not limited to subpanels and transformers are allowed to be installed between the Visible Disconnect switch and the REC meter.
 - 8.2.2 The installation of the above distribution equipment must NOT electrically bypass the Visible Disconnect switch. The intent of the Visible Disconnect switch is to isolate applicant owned generation from NV Energy equipment.
 - 8.2.3 For customers served by a dedicated transformer with the net (revenue) meter located on or near the transformer (remote from the service entrance equipment), install the source disconnect within 10' of the service entrance equipment disconnect rather than the net meter.
 - 8.2.4 Under all circumstances the source disconnect must be within 10' of the service entrance disconnect with a direct line of sight and no obstructions (fence, etc.) between the two.
 - 8.2.5 AC disconnect must be wired in accordance to Jurisdictional code.
 - 8.2.6 All sources of generation including but not limited to renewable generation and Energy Storage Devices must be protected by a Visible Disconnect that isolates the source from the grid. Retrofitting equipment into an existing net metering system shall not bypass any existing protections.
- 8.3 During the design phase, it is recommended that design professionals thoroughly investigate the proposed installation for NEC and Utility compliance issues as part of the due diligence process. Any compliance issues are to be addressed prior to finalization and stamping of the designs.
- 8.4 Installations greater than 100 kilowatts may require improvements to the Utility infrastructure at the Customer's expense.
- 8.5 Customers who have primary voltage service and who own all of the service equipment on the load side of NVE owned primary metering equipment (a privately owned and maintained system) may use an NVE primary metering switch having a visible air break and under the control and operation of NVE as the means of disconnect. Note that if the customer's generation remains connected to their system, the potential may exist in such a situation for the customer's renewable generation to feed into the customer owned system upon the loss of NVE source.

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- 8.6 There must be at least 6 inches of clearance below the utility sealed section of a service panel. All customer owned equipment including conduit must provide this clearance.

9. Customer Operating Requirements


This section provides the operating requirements that the customer must follow and the responsibilities that the customer must assume for operating their generation in parallel to the utility system:

- 9.1 Quality of service – The operation of the customer’s generation facility must not reduce the quality of service to the utility’s electric system or other Utility customers. No abnormal voltages, currents, frequencies, or interruptions are permitted.
- 9.2 De-energized utility Circuit – The customer will at no time energize a de-energized utility circuit.
- 9.3 Inhibited Parallel Operation – If while operating parallel to utility’s system, any of the protective devices operate inhibiting parallel operation, the customer will perform the following procedures prior to attempting any further parallel operation with utility:
- 9.3.1 Determine whether utility’s circuit is energized or de-energized.
- 9.3.2 If utility’s circuit has been continuously energized, then the customer will not attempt to reconnect their system in parallel with the utility until the cause of a protective device disoperation has been corrected by a certified person and the utility has inspected and has satisfied itself that the customer’s system is operating properly.
- 9.3.3 If it is determined that the utility circuit is de-energized, the customer must not attempt to re-connect their system until it is confirmed by utility that power has been restored and utility’s circuit is energized.
- 9.4 The customer is responsible for damage caused to other customers and to utility as a result of improper operation or malfunction of their generation facilities.
- 9.5 Utility is not responsible for damage caused to other customers and to utility as a result of improper operation or malfunction of the customer’s generation facilities.
- 9.6 It is recommended that on the loss of power from the utility that the customer-generator not isolate itself from the utility while continuing to generate (islanding). The customer shall coordinate reconnection of their generation to the utility per Section 9.3 after the utility voltage and frequency are restored to normal. Utility is not responsible for damage caused to the customer’s facility as a result of the utilities automatic or manual reclosing of its feeder.

10. Net Metering Energy Storage Device Requirements


This section provides the engineering requirements for an Energy Storage Device that is installed and is paired with a Net Metering System.

- 10.1 Energy Storage Devices do not qualify for Net Metering and must follow the interconnection process described in Rule 15. This RE-3 standard is for Energy Storage Devices paired with Net Metering Systems only.
- 10.2 The operation of the Energy Storage Device must be certified for all applicable anti-islanding, energy storage, and utility interactive equipment standards from IEEE, Underwriter’s Laboratories, NEC, and State and local building codes, particularly the latest versions of IEEE 1547 or UL 1741, UL 9540, NEC 706, and others.

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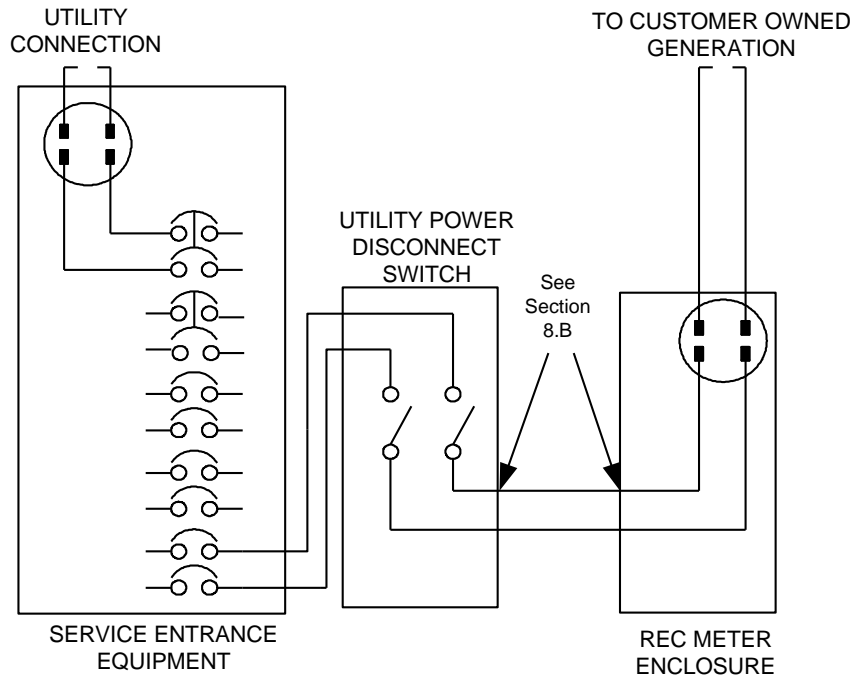
- 10.3 Electrical line drawings and manufacturer specification sheets for Energy Storage Devices must be submitted as part of the net metering application for engineering review.
- 10.4 There must be signage indicating the presence of an Energy Storage Device on the property. The signage shall be outdoors on the service entrance equipment and shall be weatherized and rated for outdoor use.
- 10.4.1 The breaker panel must have a label indicating which breaker is for the Energy Storage Device.
- 10.5 The Energy Storage Device must have a readily accessible, visible-break, and lockable Visible Disconnect that effectively isolates it from the grid.
- 10.5.1 The retrofitting of an Energy Storage Device into an existing Net Metering System must not bypass any existing Visible Disconnects.
- 10.5.2 Each power source (renewable generator, Energy Storage Device, etc) must have its own Utility Source Disconnect in order to provide a safe means to service solar REC meters and other meters that may be on those circuits.
- 10.5.3 The Visible Disconnect must be located within 10 feet and within line of sight from the service entrance equipment.
- 10.6 Backup Operation and Backup Equipment of an Energy Storage Device
- 10.6.1 Whole or partial building Backup Operation during a loss of utility power service using Energy Storage Devices is permitted.
- 10.6.2 The Backup Equipment used to engage the Backup Operating mode must prevent any and all exporting of power to the grid while in Backup Operating mode.
- 10.6.3 The Backup Equipment must use hardware that uses a physical break to interrupt the circuit. This hardware can include switches or relays. Devices that do not use a physical break to engage Backup Operation such as solid state relays or other semiconductors are not permitted.
- 10.6.4 For partial building backup designs, the set of backup loads must be located on a panel designated for Backup Operation that is separate from the main service panel.
- 10.6.5 For whole building backup designs, the main service panel may be used for Backup Operation if it will be isolated from the point of common coupling with the utility grid during outage conditions.
- 10.6.6 The Backup Equipment may be located either internally or externally to the Energy Storage Device.
- 10.6.7 The Backup Equipment does not preclude the requirement for an effective Visible Disconnect.
- 10.6.8 The Energy Storage Device and renewable generators must follow procedures outlined in the latest version of IEEE 1547 for reconnecting to the utility grid once power service is restored.
- 10.7 Dedicated Utility Meter for Energy Storage Devices
- 10.7.1 Energy Storage Devices are to be measured with a utility smart meter on the AC side of the inverter.
- 10.7.2 The Energy Storage Device meter must be located within 10 feet of the service entrance equipment.
- 10.7.3 Regular metering installation procedures found in other applicable standards including but not limited to: RPM-G, RPI-G, RPI-2, etc., apply.


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11. Attachments

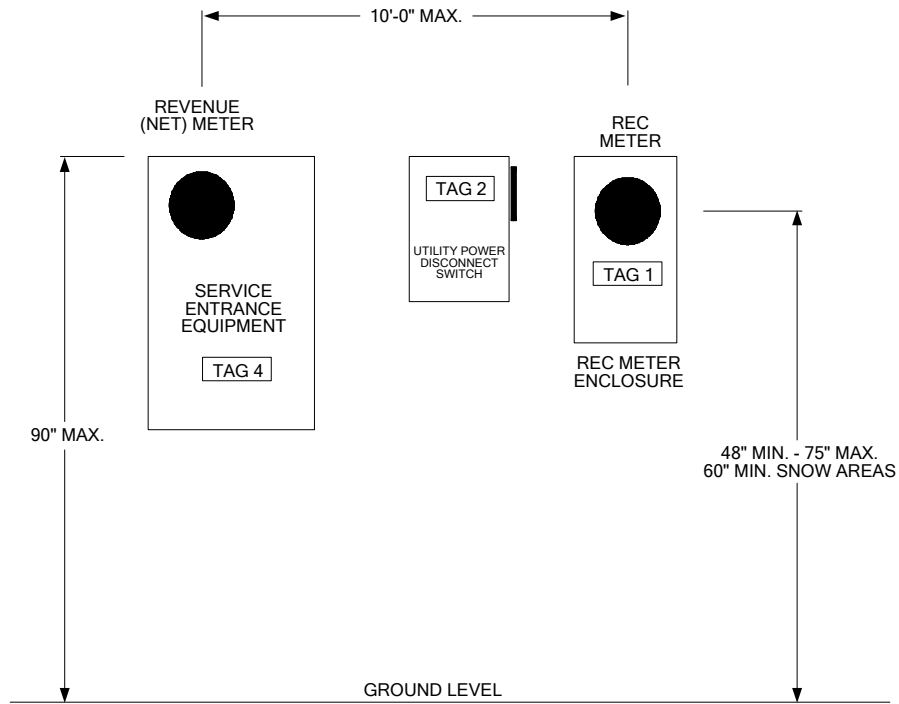
- Attachment 1: Metering One-Line Diagram
- Attachment 2: Metering Arrangement
- Attachment 3: Required Tagging


ATTACHMENT 1: METERING ONE LINE DIAGRAM



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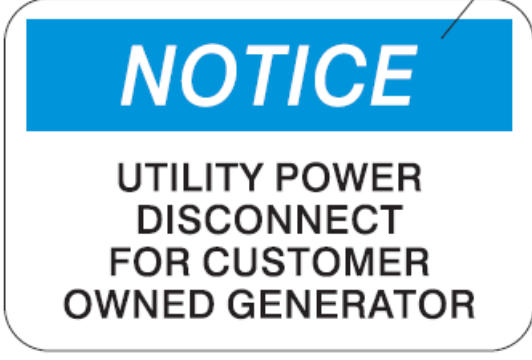

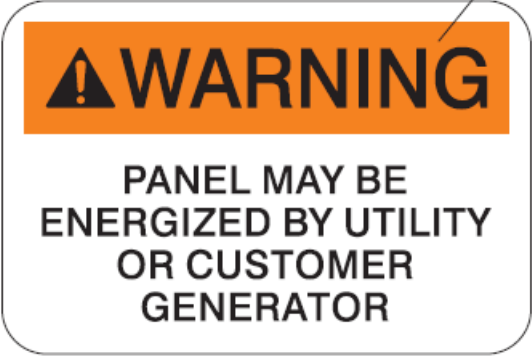
ATTACHMENT 2: METERING ARRANGEMENT




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ATTACHMENT 3: REQUIRED TAGGING

NV ENERGY WILL ATTACH THE TAGS BELOW TO ALL NET METERING SYSTEMS

<p>Tag 1. Install on REC Meter Box (956205)</p> 	<p>Tag 2. Install on Disconnect Switch Box (956200)</p> 
<p>Tag 3. Install on Transformer, J-Bar, or Service Conductor (951022)</p> 	<p>Tag 4. Install on Net Meter Box (956210)</p> 

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