



# Oncor Application for Interconnection of Distributed Generation

Certified Systems 500 kW or Greater (05/10/2023)

## What is a certified system?

A certified system is one that meets the requirements of UL-1741 Utility Interactive and the applicable portions of IEEE 1547. For inverter systems that are not certified, please contact Oncor for further instructions.

## What is the intended use of this printable version of the Interconnection Application and what is eTRACK?

The intended use of this printable application is for interconnection requests of 500 kW or more of total generation capacity. Oncor has developed a web based application tool (eTRACK) which allows for streamlining the interconnection process for generation projects less than 500 kW. To find more information about the eTRACK interconnection portal, please visit [Oncor.com/dg](http://Oncor.com/dg).

## General Information

Once the Interconnection Application is received, Oncor will screen for acceptance and notify of any objections. An invoice will be provided with the appropriate study fee. A system impact review will be performed and costs for utility equipment upgrades or modifications necessary to accommodate the requested generation will be provided. An Interconnection Agreement will also be provided. Signature and payment are required before utility construction is initiated to complete the interconnection. Final commissioning testing will be performed before permission to operate is issued.

## Distributed Generation Study Fee

A *Distributed Generation Pre-Interconnection Study Fee* schedule follows on page 4 of this document. In most cases, a certified renewable system  $\leq 500$  kW does not require a study fee. Oncor will notify the customer of exceptions. Generally, renewable systems  $> 500$  kW do require study fees, so please utilize this schedule and submit the appropriate payment with your application if required.

Email Application Submissions to: [dg@oncor.com](mailto:dg@oncor.com)  
(Email submittals larger than 8MB will not be delivered through Oncor servers)

**Tariff for Retail Delivery Service  
Oncor Electric Delivery Company LLC**

**6.3 Agreements and Forms**

Applicable: Entire Certified Service Area

Effective Date: May 1, 2023

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## Application for Interconnection and Parallel Operation of Distributed Generation

Return Completed Application to:

Oncor Electric Delivery Company LLC  
Attention: Distributed Resource Specialist  
1616 Woodall Rodgers Fwy  
Dallas, TX 75202-1234

Customer's Name: \_\_\_\_\_

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

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

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

Telephone Number: \_\_\_\_\_

Service Point Address: \_\_\_\_\_

Information Prepared and Submitted By: \_\_\_\_\_

(Name and Address) \_\_\_\_\_

Signature \_\_\_\_\_

The following information shall be supplied by the Customer or Customer's designated representative. All applicable items must be accurately completed in order that the Customer's generating facilities may be effectively evaluated by Oncor (Company) for interconnection with the utility system.

**GENERATOR**

Number of Units: \_\_\_\_\_

Manufacturer: \_\_\_\_\_

Type (Synchronous, Induction, or Inverter): \_\_\_\_\_

Fuel Source Type (Solar, Natural Gas, Wind, etc.): \_\_\_\_\_

Kilowatt Rating (95 F at location) \_\_\_\_\_

Kilovolt-Ampere Rating (95 F at location): \_\_\_\_\_

Power Factor: \_\_\_\_\_

Voltage Rating: \_\_\_\_\_

Number of Phases: \_\_\_\_\_

Frequency: \_\_\_\_\_

Do you plan to export power: \_\_\_\_\_ Yes \_\_\_\_\_ No

If Yes, maximum amount expected: \_\_\_\_\_

Do you wish Oncor to report excess generation to your REP? \_\_\_\_\_ Yes \_\_\_\_\_ No

Pre-Certification Label or Type Number (e.g., UL-1741 Utility Interactive or IEEE 1547.1): \_\_\_\_\_

Expected Energization and Start-up Date: \_\_\_\_\_

Normal Operation of Interconnection: (examples: provide power to meet base load, demand management, standby, back-up, other (please describe)) \_\_\_\_\_

One-line diagram attached: \_\_\_\_\_ Yes

For systems not using pre-certified inverters (e.g., inverters certified to UL-1741 or IEEE 1547.1), does Oncor have the dynamic modeling values from the generator manufacturer? \_\_\_\_\_ Yes \_\_\_\_\_ No

**Tariff for Retail Delivery Service  
Oncor Electric Delivery Company LLC**

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Applicable: Entire Certified Service Area  
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If not, please explain: \_\_\_\_\_  
(Note: For pre-certified equipment, the answer is Yes. Otherwise, applicant must provide the dynamic modeling values if they are available.)

Layout sketch showing lockable, "visible" disconnect device is attached: \_\_\_\_\_ Yes

**Authorized Release of Information List**

By signing this Application in the space provided below, Customer authorizes Oncor to release Customer's proprietary information to the extent necessary to process this Application to the following persons:

	Name	Phone Number	E-Mail Address
<b>Project Manager</b>			
<b>Electrical Contractor</b>			
<b>Consultant</b>			
<b>Other</b>			

Customer represents and warrants that it does not meet any of the ownership, control, or headquarters criteria listed in Lone Star Infrastructure Protection Act, Chapter 113 of the Texas Business and Commerce Code, as added by Act of June 18, 2021, 87th Leg., R.S., Ch. 975 (S.B. 2116) (relating to China, Iran, North Korea, Russia, and any other country designated by the Texas governor as a threat to critical infrastructure).

[ COMPANY NAME ]

[CUSTOMER NAME]

BY: \_\_\_\_\_

BY: \_\_\_\_\_

PRINTED NAME: \_\_\_\_\_

PRINTED NAME: \_\_\_\_\_

TITLE: \_\_\_\_\_

TITLE: \_\_\_\_\_

DATE: \_\_\_\_\_

DATE: \_\_\_\_\_

**Tariff for Retail Delivery Service  
Oncor Electric Delivery Company LLC**

**6.1.4 Discretionary Charges**

Applicable: Entire Certified Service Area

Effective Date: May 1, 2023

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**6.1.4.4 Distributed Generation**

DD36	<p><b>Distributed Generation Pre-Interconnection Study Fee</b> Applicable to requests for studies that may be required and conducted by Company for the interconnection of distributed generation on the Company's delivery system.</p> <p style="text-align: center;"><b>NON-EXPORTING</b></p> <p>A. 0 to 10 kW</p> <ol style="list-style-type: none"> <li>1. Pre-certified, not on network</li> <li>2. Not pre-certified, not on network</li> <li>3. Pre-certified, on network</li> <li>4. Not pre-certified on network</li> </ol> <p>B. 10+ to 500 kW</p> <ol style="list-style-type: none"> <li>1. Pre-certified, not on network</li> <li>2. Not pre-certified, not on network</li> <li>3. Pre-certified, on network</li> <li>4. Not pre-certified on network</li> </ol> <p>C. 500+ to 2000 kW</p> <ol style="list-style-type: none"> <li>1. Pre-certified, not on network</li> <li>2. Not pre-certified, not on network</li> <li>3. Pre-certified, on network</li> <li>4. Not pre-certified on network</li> </ol> <p>D. 2000+ kW</p> <ol style="list-style-type: none"> <li>1. Pre-certified, not on network</li> <li>2. Not pre-certified, not on network</li> <li>3. Pre-certified, on network</li> <li>4. Not pre-certified on network</li> </ol> <p style="text-align: center;"><b>EXPORTING</b></p> <p>A. 0 to 10 kW</p> <ol style="list-style-type: none"> <li>1. Pre-certified, not on network</li> <li>2. Not pre-certified, not on network</li> <li>3. Pre-certified, on network</li> <li>4. Not pre-certified on network</li> </ol> <p>B. 10+ to 500 kW</p> <ol style="list-style-type: none"> <li>1. Pre-certified, not on network</li> <li>2. Not pre-certified, not on network</li> <li>3. Pre-certified, on network</li> <li>4. Not pre-certified on network</li> </ol> <p>C. 500+ to 2000 kW</p> <ol style="list-style-type: none"> <li>1. Pre-certified, not on network</li> <li>2. Not pre-certified, not on network</li> <li>3. Pre-certified, on network</li> <li>4. Not pre-certified on network</li> </ol> <p>D. 2000+ kW</p> <ol style="list-style-type: none"> <li>1. Pre-certified, not on network</li> <li>2. Not pre-certified, not on network</li> <li>3. Pre-certified, on network</li> <li>4. Not pre-certified on network</li> </ol> <p>* No cost for inverter systems less than 20 kW. ** No cost if generator supplies less than 15% of feeder load and less than 25% of feeder fault current.</p>	<p>\$ 0.00 \$ 144.15 \$ 144.15 * \$ 144.15</p> <p>\$ 296.30 ** \$ 296.30 \$ 296.30 * \$ 296.30</p> <p>\$ 3,960.30 \$ 3,960.30 \$ 6,623.45 \$ 6,623.45</p> <p>\$ 6,927.85 \$ 6,927.85 \$ 9,591.00 \$ 9,591.00</p> <p>\$ 0.00 \$ 144.15 \$ 144.15 * \$ 144.15</p> <p>\$ 296.30 ** \$ 296.30 \$ 296.30 * \$ 296.30</p> <p>\$ 3,960.30 \$ 3,960.30 \$ 6,623.45 \$ 6,623.45</p> <p>\$ 7,458.30 \$ 7,458.30 \$ 9,591.00 \$ 9,591.00</p>
DD37	<p><b>Distributed Renewable Generation Metering</b> Applicable to installation, upon request pursuant to Substantive Rule § 25.213(b), by Retail Customer or Retail Customer's Competitive Retailer, of metering equipment that separately measures both the Customer's consumption from the distribution network and the out-flow that is delivered from the Customer's side of the Meter to the distribution network. Equipment shall be installed within 30 days of receipt of request.</p>	As Calculated



## 1. Owner of Generation Resource – Name for Interconnection Agreement

Please indicate for use in the Interconnection Agreement the name and type of entity who is the owner of the distributed resource:

Legal Name of the Distributed Resource	
Legal Name	
Type of Entity	
DBA (doing business as – if applicable)	

The following are examples of names and types of entities:

<i>XYZ Business Inc.</i>	<i>a Texas corporation</i>
<i>XYZ Company LLC</i>	<i>a Delaware limited liability company</i>
<i>City of XYZ</i>	<i>a Texas governmental agency</i>
<i>XYZ Business LP</i>	<i>a Texas limited partnership</i>
<i>XYZ Business LTD</i>	<i>a Texas limited partnership</i>
<i>XYZ Organization</i>	<i>a Texas non-profit organization</i>
<i>XYZ financial institution N.A.</i>	<i>member FDIC</i>

Ownership & Possession		
Is the owner of the distributed resource also the owner of the property where the distributed resource is located?	Yes	No
If <b>NO</b> , then please list the name of the entity that owns the property:		
Legal Name		
Type of Entity		
DBA (if applicable)		
Is the Legal Name of the Owner of the system (listed above) the same name as listed on the electric bill for this account? (Usually the name shown on your electric bill is the entity Oncor would prefer to use on the Interconnection Agreement)	Yes	No
If <b>NO</b> , then what is the relationship between the Customer Name (on the electric bill) and the owner of the generating system?		

## 2. Account ID & Address Information

Electric Service		
Is this application for a new service account?	Yes	No
If <b>YES</b> , please provide the proposed service address:		
Service Address: City, State, Zip		
If <b>NO</b> , please provide existing account information:		
Existing Service Accounts		
Please provide the 17 digit Electric Service Identifier (ESI ID) (This can be found on your electric bill)	Oncor Company Code (First 10 digits)	Premise ID# (Last 7 digits)
Oncor	1044372000	
(formerly SESCO)	1017699000	
Oncor Meter Number (optional if ESI ID is not provided)		
Is this ESI ID for a temporary service?	Yes	No
Service Address: City, State, Zip		
Correspondence: (If different) City, State, Zip		

## 3. Oncor Delivery Voltage Information

Please indicate the Oncor distribution delivery voltage at the PCC:			
240/120 V – 1 phase, 3 wire	480/277 V – 3 phase, 4 wire	13,200/7,620 V – 3 phase, 4 wire	
240/120 V – 3 phase, 4 wire	4,160/2,400 V – 3 phase, 4 wire	24,900/14,400 V – 3 phase, 4 wire	
208/120 V – 3 phase, 4 wire	12,470/7,200 V – 3 phase, 4 wire	Other:	

## 4. Normal Operation of Interconnection

Briefly summarize the sequence or mode of operations for this project in paragraph form: (Please reference any relevant equipment on the one-line diagram, you may attach a separate document if necessary)

**Please describe your breaker failure scheme in paragraph form (if applicable):**

(In the event that a breaker fails to open, please provide information on what logic or sequence of operation is included in your system. Please reference all breaker and equipment labels on the one-line diagram)

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## 5. Oncor Point of Delivery Information

<b>Oncor / Customer Interconnection Point of Common Coupling (PCC)</b>	
<b>Customer meter base</b> ( <i>Oncor conductors on line side and customer conductors on load side</i> )	
<b>Customer pole</b> ( <i>Served from Oncor overhead transformer with service drop to customer pole</i> )	
<b>Customer weather-head</b> ( <i>Served from Oncor overhead transformation with service drop to customer weather-head on a customer structure</i> )	
<b>Top of an Oncor pole</b> ( <i>Customer conduit goes up an Oncor pole and connections are made at the top of the pole</i> )	
<b>Inside an Oncor pad mounted transformer</b> ( <i>Connections are made in the low voltage or secondary compartment of the transformer</i> )	
<b>Oncor distribution enclosure</b> ( <i>This is typically a locked Oncor enclosure, in some cases multiple Oncor meters serving customers can be fed from the secondary compartment</i> )	
<b>Other</b> ( <i>please describe</i> )	

## 6. Type of Resource / New or Existing / Multiple resources connected to inverter

Type of Resource		Yes	No
Solar application only?			
Wind application only?			
Other (please specify)			
Are multiple resource measures connected to inverter?			
Adding equipment to an existing system?			

## 7. Solar Equipment

Inverter Information							
	Qty	Manufacturer	Model Number	Power Rating (W)	Voltage	Single or Three Phase	UL-1741 Certified (Yes or No)
1							
2							
3							

Panel Information				
	Qty	Panel Manufacturer	Panel Model Number	Watts
1				
2				
3				

Existing Solar Equipment	
<i>If adding to an existing system, list inverter and panel equipment.</i>	
Inverter(s) (quantity, manufacturer and size)	
Panel(s) (quantity, manufacturer and size)	
Comments	



## 8. Energy Storage Equipment *(If applicable)*

Intended Use and Operation		
<p>Please provide a sequence of operations explaining how the system will operate under normal and off-grid conditions (<i>explain how the battery will disconnect and reconnect to the grid</i>). Please provide the type of switching and indicate if it is self contained or utilizes separate components, reference specific equipment on the one-line diagram. If your system rated kW out flow to the grid is restricted by control logic (outflow kW is less than inverter total capacity), then indicate the worst case out-flow capacity.</p>		
<i>(add separate sheet if necessary)</i>		
What is the maximum charging demand when utilizing power from the Oncor grid?	<b>kW</b>	
	<b>Yes</b>	<b>No</b>
Does the battery storage system have dedicated inverter(s) where the DC source for the inverter(s) is <i>only</i> batteries?		
<b>If No:</b>	Please describe the other equipment providing DC power to the inverter: <i>(example – PV panels and batteries; then go to Shared Inverter Information table)</i>	
<b>If Yes:</b>	Please proceed to <i>Dedicated Inverter and Battery Table Information Section</i>	
	<b>Yes</b>	<b>No</b>
Is the intended use of the battery storage and inverter system for off-grid use only?		
Will the energy storage system NOT be charged from the electric grid?		
<b>If Yes:</b>	Your system is totally off grid for charging and discharging. <i>Oncor does not require any additional information.</i>	

Dedicated Inverter Information <i>(Inverters with only batteries for DC source)</i>							
	Qty	Manufacturer	Model Number	Power Rating (W)	Voltage	Single or Three Phase	UL-1741 Certified <i>(Yes or No)</i>
1							
2							
3							

<b>Shared Inverter Information</b> <i>(DC coupled inverters with multiple sources)</i>							
	Qty	Manufacturer	Model Number	Power Rating (W)	Voltage	Single or Three Phase	UL-1741 Certified <i>(Yes or No)</i>
1							
2							
3							

<b>Battery Information</b>						
	Qty	Manufacturer	Model Number	Capacity (Ah)	Total Capacity (Ah)	Certification <i>(UL-1741, etc.)</i>
Battery Bank(s)						
Voltage						V
Maximum Continuous Power Rating						kW
Battery Technology <i>(Li+, NiCaD, NiMH, etc.)</i>						
Additional Information						

## 9. Wind Equipment *(If applicable)*

Inverter Information							
	Qty	Manufacturer	Model Number	Power Rating (W)	Voltage	Single or Three Phase	UL-1741 Certified <i>(Yes or No)</i>
1							
2							
3							

Turbine Information				
	Qty	Manufacturer	Model Number	Capacity (W)
1				
2				
3				

Existing Wind Equipment	
<i>If adding to an existing system, list inverter and panel equipment.</i>	
Inverter(s) <i>(quantity, manufacturer and size)</i>	
Turbine(s) <i>(quantity, manufacturer and size)</i>	
Comments	

## 10. Relay Information (Required if total capacity is greater than 1,000 kW)

### Part A – Sensing Points & Equipment Selection

Requirements for relaying are strictly functional and Oncor does not specify equipment manufacturers.

#### Sensing at the PCC

What is the approximate distance from the PCC to the Customer’s sensing equipment?  
(Provide a rough general estimate in feet)

#### Sensing Point and Clearing Time for Generation System Paralleling

The requirements for sensing (PTs & CTs) shall be met at the Point of Common Coupling (PCC). While tripping of the Customer’s main breaker is desired, other tripping alternatives to ensure generation ceases to energize the Oncor system can be requested (if designed and found unobjectionable to Oncor). Please indicate the tripping circuits on the relay functional diagram. Clearing time is the time between the start of the abnormal condition and the generation ceasing to energize the utility system. If you know your breaker operation times, then please shift the relay settings to allow for total clearing time.

**For example:** If your total clearing time is 10 cycles and breaker operation time is 4 cycles, then your relay setting would be 6 cycles.

### Part B – Required Relaying Elements & Setting Guidelines

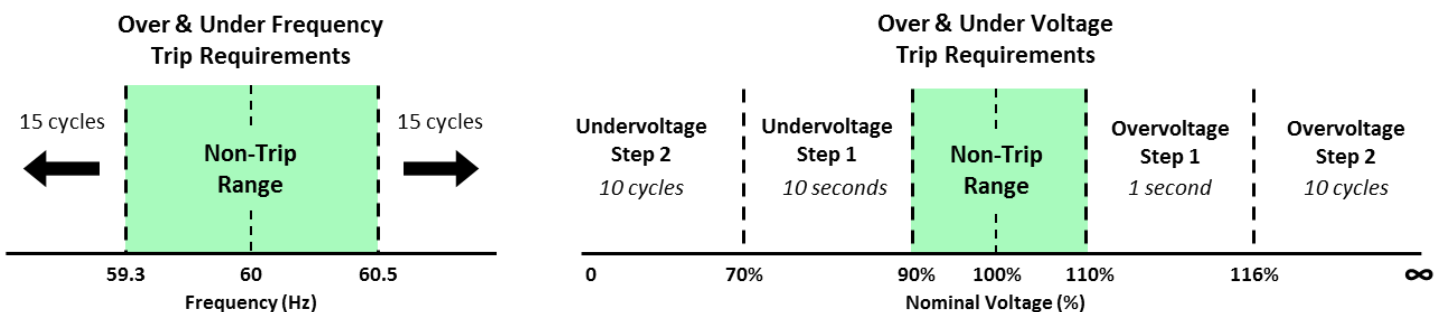
#### Voltage Clearing Time – Minimum required

	Step 1		Step 2	
	Pick-Up	Total Clearing	Pick-Up	Total Clearing
Under-voltage (27)	90%	10 seconds	70%	10 cycles
Over-voltage (59)	110 %	1 second	116%	10 cycles

*\* Per-phase sensing is required*

#### Frequency Clearing Time – Minimum required

	Pick-Up	Total Clearing
Under-frequency (81U)	59.3 Hz	15 cycles
Over-frequency (81O)	60.5 Hz	15 cycles



**Part C – Proposed Relay Settings**

Proposed Relay Settings			
<p>Oncor requests preliminary relay settings for review. This process is to help ensure the relay you purchase (with associated sensing equipment) will be able to be set to accommodate the required protective relay settings. In some cases, the required setting might be based on the assumption that only one generator will run when multiple generators are planned for operation (<i>worst case scenario</i>). This requirement can lead to settings lower than the capability of the relay and sensing equipment selected. Please feel free to contact Oncor to discuss the design criteria for relay settings.</p>			
		Yes	No
Are you planning on submitting relay settings with this application?			
If No:	Are you aware that settings developed after the short circuit study by Oncor could result in settings below the capability of your relay and sensing equipment?		
If No:	Please provide an estimated date when you plan on submitting preliminary settings to Oncor. (Contact Oncor for feeder impedance information if necessary)		

Please be aware that final relay test report results will be expected to be within certain accuracy. If test report results are outside 5% deviation (over the agreed upon settings – timing and pick-up), they will not be accepted.

Preliminary Relay Settings				
Relay Settings			Per Phase Sensing	
Element	Pick-Up	Total Clearing	Yes	No
27 – Step 1				
27 – Step 2				
59 – Step 1				
59 – Step 2				
81O				
81U				
	Pick-Up (kW)	Total Clearing		
32 – Phase A				
32 – Phase B				
32 – Phase C				
Directional Ground Over-Current or Ground Overvoltage				
67N				
59N				

**Part D – Relay Functional Diagrams**

Oncor requests relay functional diagrams to accompany this application. Example diagrams are included at the end of this application.

Relay Functional Diagram Checklist – Does the diagram show...	Yes	No
The Point of Common Coupling (PCC)		

The delivery voltage at the PCC		
The metering point		
The incoming utility feeders ( <i>Feeder 1, Feeder 2, etc.</i> )		
High and low side voltages ( <i>Transformers, VT's, etc.</i> )		
A coordinating isolation device at the PCC		
VT configuration symbols ( <i>Wye, delta, corner delta, etc.</i> )		
Sensing equipment ratios and quantity		
Required relaying elements ( <i>27/59, 810/U, 67N or 59N, 32</i> )		
Relay manufacturer and model number		
Tripping circuit scheme ( <i>Dotted lines to breaker, etc.</i> )		
Generator neutral resistor/reactor, if applicable ( $\Omega$ )		
Generator kW and voltage		
Transformer high and low side voltages, impedance (%), and kVA		
Transformer neutral resistor/reactor, if applicable ( $\Omega$ )		
Normal breaker position ( <i>N/O or N/C</i> )		
Kirk Key interlocks ( <i>If applicable</i> )		
Breaker labels ( <i>i.e. UM-1 or GM-2 utility, etc.</i> )		

**Part E – Relay Operation**

Relay Tripping Logic		
	<b>Yes</b>	<b>No</b>
Will the Oncor interconnection relay <u>tripping logic</u> be enabled at all times? (relay needs to be in steady state operation during paralleling)		
<b>If No:</b>	Please explain reasoning for why the <u>trip logic</u> relaying is not enabled at all times:	
	What causes the <u>tripping logic</u> to become enabled? Oncor requires that the <u>trip logic</u> activate the tripping elements at least two seconds before the paralleling event begins to ensure relay steady state operation. Please include the <u>scheme, sequence of events, and/or include logic variables in your description.</u>	
<b>If No:</b>	If the Oncor interconnection protective relay is not enabled at all times, then Oncor requests information on the contact state to enable the relay. Oncor requests that the N/O (normally open) state activate the relaying elements and the N/C (normally closed) state disable the relaying elements.	
	<b>Yes</b>	<b>No</b>
	Does the N/O state activate the relay?	
Do you plan on changing setting groups to enable the Oncor protective relaying functions?		

**Part F – Relay Testing**

**Relay Testing Agent Commissioning Logic**

If the Oncor interconnection relay tripping logic is not enabled at all times then please explain the proposed scheme (or isolated test) to allow the relay testing agent the ability to verify the relay was in steady state operation.

**Part G – Event Capture**

Relay Data Loggers – Event Capture	Yes	No
Does your relay have a pre-event and post-event data logger (event capture)?		
If yes, do you plan on enabling this function?		

**Relay Testing, Relay Test Reports and Relay Tester Comments**

Part of the interconnection process required for approval of your system is submitting relay test reports to Oncor. Oncor requires that a certified testing agent test your system. Testing of protection systems shall include procedures to functionally test all protective elements of the system (including relay/breaker trip timing) up to and including tripping of the generator(s) and/or interconnection device. Your breaker failure scheme should also be tested. An example form of a Relay Test Report is included at the end of this application.

- **Reverse Power (32)** – Oncor requests these elements be tested per phase at 1/3 of the agreed three phase kW amount.
- **Under-Voltage (27) and Over-Voltage (59)** – Relay test reports should indicate results for per phase testing.

Test Report – Agreed Upon Settings versus Actual Results – Expected Accuracy

To minimize having to test customer owned protective relaying several times, you should instruct your testing agent to adjust settings if your results vary by more than 5%. *(For example, if you expect your total clearing time is expected to be 10 cycles and the test report shows 10.9 cycles, then this exceeds 5%. Testing agent could adjust the setting to a lower value to hit the target 5% expected result or contact Oncor.)*

Oncor requests *testing agent proposed comments* be submitted with preliminary settings. Following are some generic comments. Comments should be customized for each project.

<b>Relay Testing Agent Requested Comments</b> - <i>These comments should be customized to your project</i>	
	<b>Oncor asks the testing agent state in the comments section of the test report that the generator tripping device ___ ~ 52-UM (breaker or contactor) was operated and that the agent witnessed the devices operated as intended.</b>
	<b>For installations utilizing <u>tripping logic</u> which is enabled and disabled, Oncor requests that the testing agent state the relay was in full active service when paralleling occurred or occurs. The testing agent should be able to confirm the relay was active before and during paralleling and state this in the test report comments and that the N/O state activated the relay.</b>
	<b>Breaker Failure – Testing agent should comment and indicate breaker failure scheme was tested and operated as designed.</b>
	<b>Others as required.</b>

## **Exporting Information** *(skip for non-exporting applications)*

*The purpose of this section is to provide general information for facilities such as landfill gas exporting generation systems or other similar type larger based exporting systems. Certified systems (inverter based) should use the application for certified systems. Please feel free to contact Oncor for a preliminary screening study or to determine other requirements for exporting systems.*

<b>Metering</b>	
<b>Reference Source</b> ---ERCOT (Electric Reliability Council of Texas) <i><a href="http://www.ercot.com/services/rq/re/dgresource.html">http://www.ercot.com/services/rq/re/dgresource.html</a></i>	<b>Check One:</b>
<b>Do you request TDSP Oncor read meter data?</b> <i>Settlement Metering Option 1: TDSP Read Generation Meter</i>	
<b>Do you request EPS (ERCOT Polled Settlement) type metering?</b> <i>Settlement Metering Option 2: ERCOT Polled Settlement Meter</i>	

### **Metering Communications**

Generally for customers with expected demands or generation larger than 700 kW, a two wire land line will be required for metering. Monthly expenses and procurement will be the customer’s responsibility.

### **Reverse Power Relaying**

In most cases, a 32 element with per-phase sensing is required for exporting.

### **Transfer Trip**

Depending on facility and Oncor parameters, transfer trip between the Oncor substation and customer generation facilities may be required. Please feel free to contact Oncor for additional information. If transfer trip is required then:

- 1) Your one-line diagram should include the circuitry for the transfer trip scheme,
- 2) Should include type of communication circuit proposed,

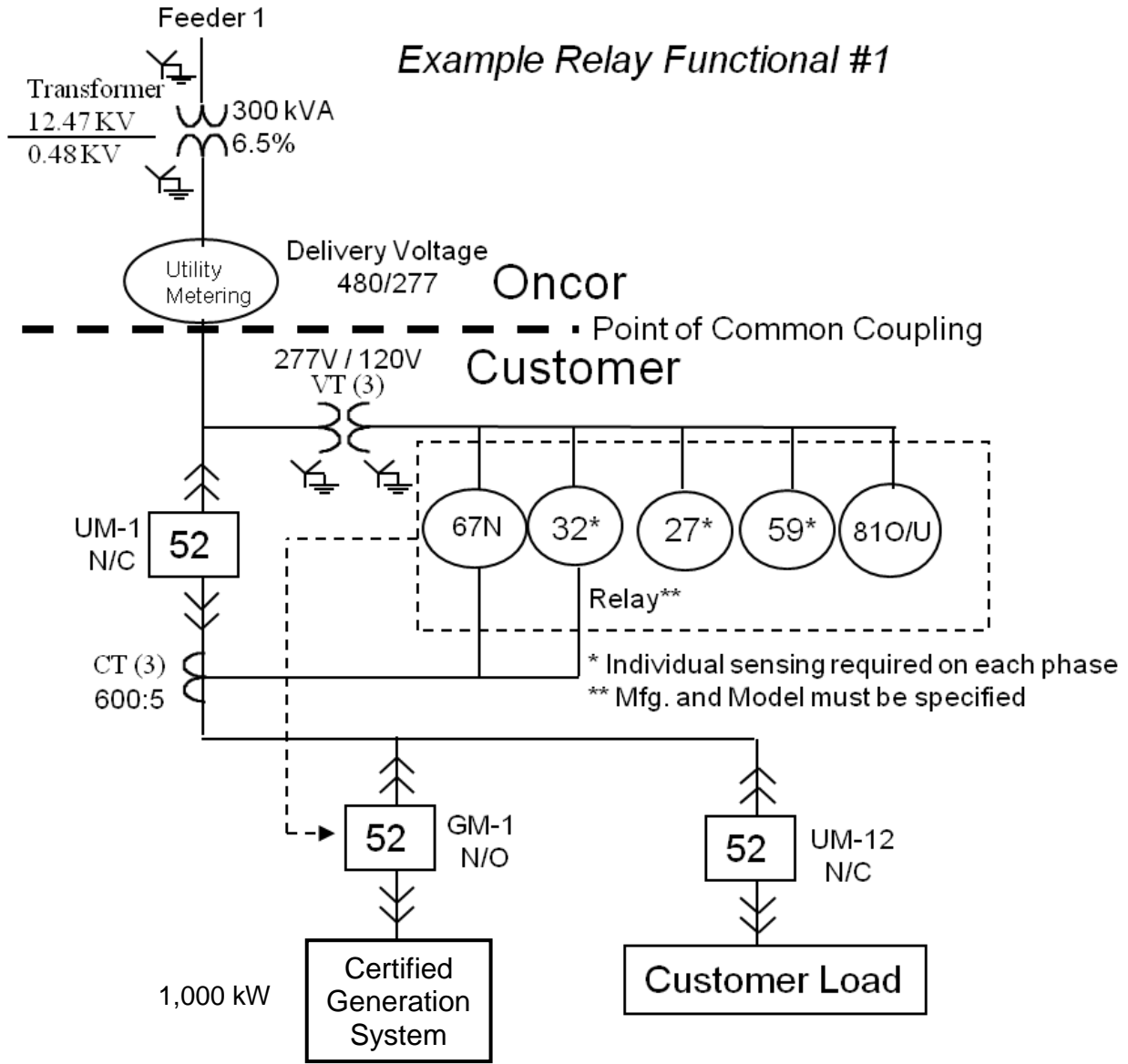


Please be aware should you utilize phone data circuits, wire-line isolation devices could be required to protect from high voltage surges at the Oncor substation. In this case it is the customer's responsibility to request ground potential rise measurements at the Oncor substation if required by your communication provider. If you are utilizing fiber communications, then you will need to contact local providers for leased circuit information or secure an Oncor Pole License Agreement to utilize Oncor facilities for pole contacts. Oncor specialists are available to discuss this process. Contact Oncor for further information.

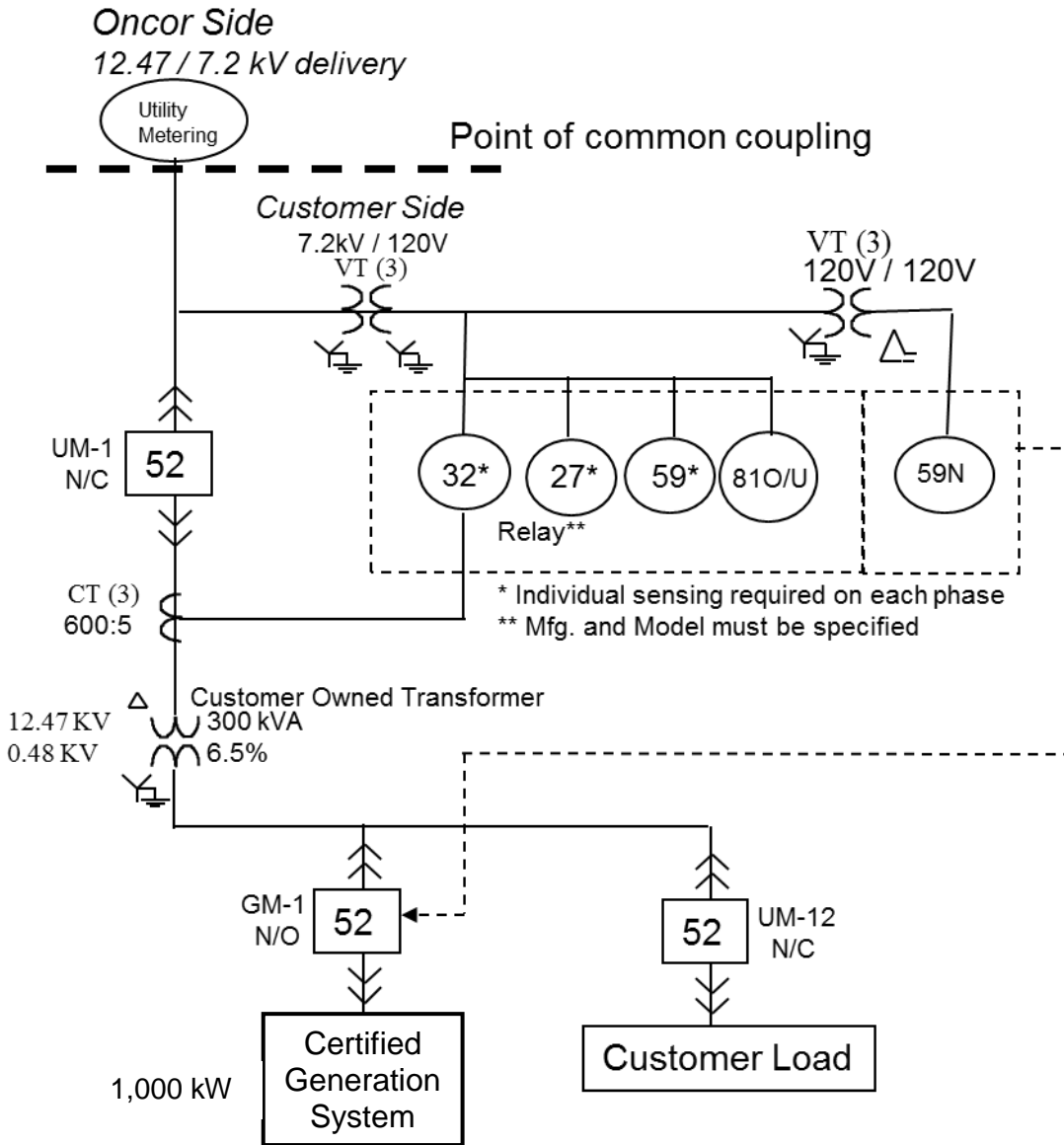
**Phone Company Data Circuits**

Oncor is currently utilizing what is called a point to point VG6 four wire analogue data circuit which is used in conjunction with tonal receiving equipment at the Oncor substation. Oncor has been made aware by AT&T that this circuit is planned to be obsolete in 2020. Contact Oncor for further information.

## Example Relay Functional Diagrams



## Example Relay Functional Diagrams *(Continued)*





## REQUIRED ADDITIONAL INFORMATION

This additional information is required for Certified Systems with single inverters with a capacity of  $\geq 500$  kW or multiple inverters with a combined capacity of  $\geq 1,000$  kW. While these inverter-based systems are still certified, the increase in capacity of the inverters requires commissioning and testing of settings to ensure interoperability with the Oncor system.

**Step 1:** Complete Panel and Inverter Data Sheet. A manufacturer specification sheet may be provided instead of the *Panel and Inverter Data Sheet*. Please also provide specification sheets for battery, wind, or other generation equipment if applicable.

**Step 2:** At commissioning, completion of Oncor Certified Inverter Commissioning - Testing worksheet will be required for final approval of system.

## Panel and Inverter Data Sheet

Provide a data sheet that has the following information or insert the data in the Tables below.

(STC – Standard Test Condition)

Solar Panel Data Information	
Current at Maximum Power Point – $I_{mpp}$	Amps
Voltage at Maximum Power Point – $V_{mpp}$	Volts
Short-Circuit Current in STC – $I_{sc}$	Amps
Open-Circuit Current in STC – $V_{oc}$	Volts
Short-Circuit Current Temperature Coefficient – $\alpha_{sc}$	Amp/°C
Open-Circuit Current Temperature Coefficient – $\beta_{sc}$	Volts/°C
Normal Operating Cell Temperature – NOCT	°C
Reference Ambient Temperature	°C
STC Temperature – $T_{stc}$	°C
STC Insulation – $G_{stc}$	W/m <sup>2</sup>

Solar Inverter Data Information	
Number of Series-Connected PV Cells – (Ns)	
Number of Parallel Strings – (Np)	
PV Panel Rated Power (Prate)	kW
Generator Base	kW
Power Factor	%
Ambient Temperature	°C
Fault Contribution - Percent	%

From the product manufacturer, provide the available ramp rate for each inverter and the proposed ramp rate to be installed on the units.

Inverter Ramp Rate Data Information	
Available Ramp Rate	kW/sec or %/sec
Ramp Rate Settings	kW/sec or %/sec

## Oncor Certified Inverter Commissioning - Testing

*This document is required for applications with single inverters with a capacity of  $\geq 500$  kW or multiple inverters with a combined capacity of  $\geq 1,000$  kW.*

General Process steps are:

- Oncor receives completed application and secures Impact Study fee.
- Oncor prepares Service Study or Impact Study.
- Oncor secures funding for any required system impacts.
- Oncor prepares, submits and secures an Interconnection Agreement with customer.
- Oncor schedules and completes any required system changes.
- Oncor review and provides confirmation of non-objection to this Commissioning document.

Commissioning Agent Check List		Yes	No
Agent verified the placards have been installed in accordance with placarding guidelines <i>(and found non-objectionable by Oncor)</i>			
Agent has taken pictures of placards and submitted to dg@oncor.com			
Agent performed a shut-down test, which verified $\geq 300$ second restart delay.			
Have factory UL-1741 settings been enabled during <i>final in-service commissioning</i> ?			
<b>If No:</b>	<i>Please explain any adjustments:</i>		
		<b>Yes</b>	<b>No</b>
Did the Oncor Impact or Service Study require a minimum ramp rate or other system adjustments?			
<b>If Yes:</b>	<i>Please explain any adjustments and the results of on-site verification or testing:</i>		
<b>Additional Comments</b>			

**Commissioning Agent – Name, Title, & Qualifications:**

*(Example: George Solartown – Master Electrician)*

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

**Date:** \_\_\_\_\_

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

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

**Additional Information:** \_\_\_\_\_

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