

Previously Uninspected Facilities: Self-Inspection Instruction Guide

Advanced Energy (AE) will provide overall administration of the Duke Energy (Duke) inspection program for Previously Uninspected Facilities (PUF). Previously uninspected facilities are defined as solar PV facilities 1 MW and greater that began commercial operation before Duke implemented the commissioning inspection and testing program in 2017. The primary goal of the inspection program is to ensure compliance with the North Carolina Interconnection Procedures (NCIP) as well as to maintain the safety, power quality and reliability of the electrical distribution grid. Requirements of the inspection program are defined in the pro forma Memorandum of Agreement Regarding Procedure to Implement Periodic Medium Voltage Construction Safety and Reliability Inspection Requirements under NCIP Sections 6.5.2 and 6.5.3 (MOA).

Major requirements of the PUF inspection program include the following:

- Medium Voltage (MV) AC Inspection (MV Inspection)
- Inverter and interconnection device settings verification
- Submittal of updated single line diagram (SLD) based on existing site equipment
- Verification of point of interconnection (POI) right-of-way (ROW) access maintenance
- Cease-to-energize testing++

Interconnection Customers may elect the Self-Administered Compliance Program Option or elect for AE to complete the inspection under the Duke-Approved Third Party Administered Inspection Program Option. This document outlines the AE process for the Self-Administered Compliance Program Option.

Interconnection Customers have the following deadlines from the date of MOA execution to complete the initial MV Inspection:

- 18 months for Generating Facilities with a commercial operation date on or before August 31, 2015
- 3 years for Generating Facilities with a commercial operation date after August 31, 2015

Self-Administered Compliance Program Overview

- 1) The interconnection customer will develop a self-administered compliance program plan within 90 days of signing the MOA and provide it to Duke for review and acceptance.
- 2) While the MOA allows for inspections and testing to occur on separate days, Advanced Energy recommends that customers schedule both the inspection and test on the same day.
- 3) The interconnection customer will complete the following activities:
 - a) Perform initial MV inspection
 - b) Collect nameplate data for all inverters and transformers
 - c) Inspect and verify the applicable inverter and interconnection device settings
 - d) Verify the ROW access to Duke POI equipment is being properly maintained
 - e) Perform cease-to-energize testing
 - f) Collect most up to date SLD and verify accuracy on site
- 4) The interconnection customer will request a Duke Energy instrumentation and controls (I&C) technician to assist during the cease-to-energize testing.
 - a) To schedule an I&C Technician for Cease to Energize Testing, Email periodicinspections@advancedenergy.org at least 10 days in advance.
 - b) Requests for I&C technicians should include the following
 - i) Site Name

- ii) Address or GPS coordinates as applicable
 - iii) Test day and time
 - iv) Recloser ID (if available)
 - v) Site contact name and phone number
- 5) Within 30 calendar days of the MV inspection, the customer will remediate deficiencies identified during inspection or propose a reasonable alternative timeline in which to complete such remediation subject to agreement by Duke.
- 6) The interconnection customer will submit a report from a professional engineer or other qualified person.
- a) A [report template](#) can be found at <https://www.advancedenergy.org/previoursly-uninspected-facilities-program>. Reports shall be uploaded to Advanced Energy's SharePoint site ([instructions can be found here](#)). Once the customer has uploaded all the necessary documentation to the SharePoint site, the customer will provide email notification including timeline for remediation of any extended timeline corrections beyond 30 calendar days from the inspection to periodicinspections@advancedenergy.org.
 - b) Advanced Energy will begin reviewing documentation once all uploads to the SharePoint site have been completed. Uploads should include the following:
 - (1) Inspection Report
 - (2) Completed [DER Functional Settings Sheet](#)
 - (3) Completed [Initial Inspection and Facility Verification Report](#)
 - (4) Updated SLD for the site
 - c) After receiving notification from the customer, Advanced Energy will provide written feedback within ten calendar days addressing whether any proposed remediation timeline and plan is acceptable.
 - d) Advanced Energy will then review all documents uploaded to the SharePoint site and notify the interconnection customer if all documents are in compliance. Advanced Energy will seek to return feedback within 30 days of receiving submission, but the timeline will depend on number of submissions received.

The customer must adhere at minimum to the timelines outlined in the MOA for each part of the inspection program. More details for each part of the program are provided below.

MV Inspection Details

Purpose

The purpose of the MV inspection is to inspect the MV AC equipment from the secondary side of the MV transformers to the point of interconnection to ensure compliance with applicable industry codes and standards. The applicable industry codes and standards are the versions of the following code and standards in effect at the time the interconnection agreement was executed or at the time of any subsequent material modification to the generating facility.

- National Electrical Safety Code (NESC)
- National Electrical Code (NEC)

During the MV site inspection, customer will also confirm right-of-way access for Duke POI facilities is being properly maintained.

Scope

The scope of the MV inspection includes verification of compliance with applicable industry codes and standards. The MV inspection includes but is not limited to inspecting the following:

- MV AC construction
- Transformers
- Customer-owned primary meter
- Customer-owned recloser (as applicable)
- Point of interconnection auxiliary transformer and associated disconnect switch or panelboard (as applicable)
- Inrush mitigation system (as applicable)
- Power plant control system (as applicable)
- Inverter nameplates (verification of UL 1741 and IEEE 1547 compliance)
- ROW access for Duke POI facilities
- Security fence and access gates
- Vegetation management at overhead lines and fences

The scope of the MV inspection also includes verification that ROW access for Duke POI facilities is being properly maintained in a manner consistent with Duke specifications applicable to Duke facilities and rights of way. The customer's inspection report will provide written documentation detailing Interconnection Customer's preventive maintenance plan for ROW access for which Interconnection Customer has legal control for Duke POI facilities.

Requirements

Requirements of the MV inspection include:

- Facility must be fully operational
- MV inspection shall be completed within 18 months after execution of the MOA for Generating Facilities with a commercial operation date on or before August 31, 2015, or 3 years for Generating Facilities with a commercial operation date after August 31, 2015
- Inverter nameplate data and transformer nameplate and tap setting data must be collected and provided on the [Initial Inspection and Facility Verification Report](#)

Inverter and Interconnection Device Settings Verification

Purpose

The purpose is to verify compliance of the applicable inverter and interconnection device settings to those specified in the NC IA and [DER Functional Settings Guidance Document](#).

Scope

The scope includes:

- Inverter settings
- Customer owned recloser, protective relay or interconnection device settings

Requirements

The requirements of the inverter and interconnection device settings verification include:

- Facility must be fully operational
- Inverter and interconnection device settings verification shall be performed no later than 90 days after the MV inspection
- Settings shall be reviewed and adjusted as necessary in the verification process
- All settings must be verified and provided for each inverter on the [DER Functional Settings Sheet](#)

Cease-to-Energize Testing (Anti-Islanding Testing)

Purpose

The purpose of cease-to-energize testing is to ensure that the facility will cease to energize the POI during three-phase and single-phase open conditions.

Scope

The scope of the cease-to-energize testing includes tests of the site's inverters and protective equipment to ensure that it performs as described in the [Duke Cease-to-Energize Test Approach](#)

Requirements

The requirements of the cease-to-energize testing include:

- Facility must be fully operational and capable of generating rated power under favorable weather conditions
- The inverter and interconnection device functional settings have been verified as correct before the test
- Weather conditions must permit the site to generate 20 percent of rated AC current in order to conduct the tests
- The PV facility must cease-to-energize within 2 seconds of three-phase and single-phase opens at the POI
- When normal utility voltage is restored, the facility must restart predictably and consistently at the expected time based on the required inverter restart delay setting of 300 seconds.
- Cease-to-energize testing shall be performed no later than 90 days after the MV inspection or the completion of corrections after the MV inspection

Periodic Self Inspection

Once each facility completes the initial inspection it shall conform to periodic inspections to ensure the facility continues to meet applicable industry codes and standards, as well as requirements for maintenance and right-of-way access. Customers shall perform onsite MV inspections, document reviews, as well as cease-to-energize testing at a period of not less than once every 5 years.

Advanced Energy Contact Information

periodicinspections@advancedenergy.org

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- First Issuance

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- Update to inverter settings requirements