

Electric Distribution Maintenance Requirements for Miscellaneous Overhead and Underground Equipment

SUMMARY

This utility procedure classifies maintenance tasks for miscellaneous electric overhead (OH) and underground (UG) equipment, including capacitor banks, fault indicators, interrupters, reclosers, voltage regulators, Supervisory Control and Data Acquisition (SCADA) and Primary Distribution Alarm and Control (PDAC) controls, sectionalizers, streetlights, and sump pumps. It requires that preventive maintenance activities be conducted in accordance with applicable Pacific Gas and Electric Company (Company), manufacturer, and engineering requirements.

Level of Use: Informational use

TARGET AUDIENCE

- Maintenance and construction (M&C) superintendents
- Transmission/substation maintenance and construction (T/S M&C) superintendents
- Restoration managers
- Compliance managers, supervisors and analysts
- Compliance inspectors
- Troublemens

SAFETY

This utility procedure complies with [Utility Standard SAFE-1001S, "Safety and Health Program Standard"](#) and the [Code of Safe Practices](#).

BEFORE YOU START

NA

Electric Distribution Maintenance Requirements for Miscellaneous Overhead and Underground Equipment

TABLE OF CONTENTS

SUBSECTION	TITLE	PAGE
1	General Information	2
2	Inspection and Testing Intervals and Included Procedures	3
3	Reporting	3
4	Requirements when Placing Equipment Off Line	3
5	Requirements when Placing Equipment On Line	3
6	Requirements for Equipment Needing Repair	4
7	Requirements for Off-Line Equipment	5
8	Requirements for Equipment That Cannot be Accessed or Located	5
9	Procedures for Nonstandard Equipment	5
10	Deferring Maintenance	6
11	Miscellaneous Equipment Sheets	6

PROCEDURE STEPS

1 General Information

- 1.1 This document contains requirements and procedures for testing, inspecting, and maintaining certain electric OH and UG equipment. These procedures were developed as key elements in a preventive maintenance program and are based on manufacturers' recommendations, industry standards, and past service history.

- 1.2 For more information about the process and the roles of each department, REFER to the following job aids:
 - [TD-2305M-JA02, "Overhead Inspection"](#)
 - [TD-2305M-JA03, "Underground Inspection"](#)
 - [TD-2305M-JA08, "High Voltage Sign Requirements"](#)
 - [TD-2305M-JA09, "Assessing Underground Primary Enclosure Covers"](#)
 - [TD-2305M-JA12, "Overhead Clearance Evaluation"](#)
 - [JA_100399, "Photo Capture Process – Field"](#)

Electric Distribution Maintenance Requirements for Miscellaneous Overhead and Underground Equipment

2 Inspection and Testing Intervals and Included Procedures

- 2.1 [Table 1](#) on Page 7 summarizes the specific intervals for inspecting and testing the equipment covered in this document. Diagnostic tests and inspections are performed together at the same time intervals.
- 2.2 [Section 11](#), “Miscellaneous Equipment Sheets” on Page 6, lists the detailed procedures included in [Attachment 1, “Equipment Sheets for Miscellaneous OH and UG Equipment.”](#)

3 Reporting

- 3.1 The qualified Company representative (QCR) performing the diagnostic testing and inspection must DOCUMENT the results on the appropriate test reports, in the following manner:

- WRITE all documentation entries in non-erasable ink.
- IF equipment, including equipment not requiring a test report, has been identified as damaged, inoperative, or in an abnormal condition,

THEN COMPLETE an electric corrective (EC) notification in SAP AND REPORT inoperative equipment conditions to the appropriate control center operator, who must ENTER the equipment in the Integrated Logging Information System (ILIS).

- 3.2 The Restoration Dispatch Manager must PERFORM the following tasks:

- ENSURE timely completion of the inspection records in the Field Automation System (FAS) by Restoration Troublemens.
- RETAIN records of the completion of line recloser, capacitors, voltage regulators, and SCADA equipment tests in FAS for access through SAP and Business Objects.
- SUBMIT records listing all cannot get ins (CGIs) and untestable results at the end of each quarter to the restoration managers and the distribution engineering manager.

- 3.3 The restoration managers must ENSURE accuracy of the inspection records.

4 Requirements when Placing Equipment Off Line

No testing is required when the only action being performed is to take equipment off line.

5 Requirements when Placing Equipment On Line

PERFORM an operational test whenever equipment covered in this document is placed in service. However, a test report is not required until the equipment’s next test/inspection cycle, unless the equipment has been on the Critical Operating Equipment (COE) list and is being placed back in service after repairs or replacement. SEE [Section 6](#) on Page 4 and [Section 7](#) on Page 5.

Electric Distribution Maintenance Requirements for Miscellaneous Overhead and Underground Equipment

6 Requirements for Equipment Needing Repair

6.1 Equipment on the COE List

Routine scheduled testing is not required for equipment already on the COE list in the calendar year of the scheduled test.

6.2 Equipment not yet on the COE List

1. IF, during an inspection, equipment is found to need repairs and is not yet on the COE list,

THEN the inspector must TAKE the following actions:

- a. ASK the control center operator to assign a COE numbered pin to mark the location on maps.
- b. CREATE an S6 notification, OR PROVIDE the information to the control center operator so the operator can create the S6 notification.
- c. COMPLETE the following fields in the mobile inspection application for the specific equipment:
 - 1) SELECT the checkbox labeled "Test could not be completed. Provide explanation in Comments section above."
 - 2) ENTER the COE pin number in the boxes provided to obtain the S6 notification number if not already obtained from the control center operator.
 - 3) ENTER the inspector's local area network identification (LAN ID) AND the date in the boxes provided.
- d. After being notified by the inspector that the equipment needs repairs, the compliance supervisor must INDICATE on the master spreadsheet (in the applicable notebook) that the equipment is now on the COE list.
- e. Once repairs have been completed, an operational test is required at the time the equipment is placed back in service. However, a test report is not required until the equipment's next test/inspection cycle.

7 Requirements for Off-Line Equipment

IF, at the time of a scheduled inspection or test, the equipment is off line per instructions from the distribution operations engineer, the distribution planning engineer, or the control center operator,

THEN a test report is not required. The compliance supervisor must DOCUMENT on the master spreadsheet that the equipment is off line per instructions from the control center operator, distribution operations engineer, or distribution planning engineer.

Electric Distribution Maintenance Requirements for Miscellaneous Overhead and Underground Equipment

8 Requirements for Equipment That Cannot be Accessed or Located

IF equipment cannot be located in the place indicated on the associated circuit map OR IF it cannot be accessed safely to perform a required test or inspection,

THEN the QCR must TAKE the following actions:

1. CHECK the appropriate box on the test report form to indicate that test or inspection could not be completed.
2. SUBMIT the test report to the local compliance group.
3. For access issues, SUBMIT an EC notification.

9 Procedures for Nonstandard Equipment

9.1 Only equipment that has been reviewed and approved for installation or pilot test by the appropriate electric distribution standards engineers may be purchased and installed.

9.2 IF nonstandard equipment is installed, or if unapproved equipment was installed previously,

THEN the director responsible for area operations, maintenance, and construction (M&C) is responsible for ensuring that inspection and maintenance procedures are written consistent with the manufacturer's recommendations and Company practices.

1. SEND copies of these inspection and maintenance procedures, approved by the area M&C director, to the directors responsible for electric transmission and distribution (T&D) engineering and electric distribution maintenance.
2. MAINTAIN nonstandard equipment on the same cycle as similar standard equipment unless deferred in accordance with [Utility Standard TD-2302S, "Electric Distribution Maintenance Requirements for Overhead and Underground Equipment."](#)

10 Deferring Maintenance

For deferment procedures, SEE Section 2 of [Utility Standard TD-2302S](#).

Electric Distribution Maintenance Requirements for Miscellaneous Overhead and Underground Equipment

11 Miscellaneous Equipment Sheets

[Attachment 1, "Equipment Sheets for Miscellaneous OH and UG Equipment,"](#) contains equipment sheets for the equipment listed in [Table 1](#) on Page 7. The equipment sheets provide a description of the equipment and its function(s), safety precautions, installation procedures, inspection and testing intervals and procedures, preventive maintenance tasks, and references for more information.

The following is a list of the equipment sheets in this utility procedure:

- Capacitor Banks – Pad-Mounted or Overhead, Fixed or Switched
- Fault Indicators – Underground Manual-Reset and Automatic-Reset
- Interrupter, Underground – Subsurface, Pad-Mounted, and Vault-Type
- Recloser – Overhead Hydraulic; Electronic - Form 3A; and Microprocessor - Form 4C and Form 6
- Voltage Regulators, Overhead
- SCADA/PDAC Equipment
- Sectionalizers, Overhead – Hydraulic and Electronic
- Streetlights
- Sump Pump, Manhole

Electric Distribution Maintenance Requirements for Miscellaneous Overhead and Underground Equipment

Table 1. Miscellaneous Equipment Testing Intervals**

	Facilities	Intervals **				Comments
		Quarterly	Twice Yearly	Yearly	As Needed	
Miscellaneous	Capacitor banks, pad-mounted or overhead (OH) , fixed or switched			T/I		
	Fault indicators, UG or OH, manual-reset and automatic reset			I	T	Testing on a 3-year cycle.
	Interrupters, UG – subsurface, pad-mounted, and vault-type				T/I	Pre-installation testing. Visual inspection on a 3-year cycle.
	Reclosers, OH – hydraulic, electronic and microprocessor			T/I		
	Voltage regulators, OH			T		
	Supervisory Control and Data Acquisition (SCADA)/Primary Distribution Alarm and Control			T		
	Sectionalizers, OH – hydraulic and electronic					Inspect from bucket truck 10 years after being installed new or overhauled.
	Streetlights					5-year replacement cycle.
	Sump pumps, manhole			I		

I = Inspect
 T = Test

** = Increased inspection/testing intervals subject to local engineering input

END of Instructions

DEFINITIONS

NA

IMPLEMENTATION RESPONSIBILITIES

NA

Electric Distribution Maintenance Requirements for Miscellaneous Overhead and Underground Equipment

GOVERNING DOCUMENT

[Utility Standard TD-2302S, "Electric Distribution Maintenance Requirements for Overhead and Underground Equipment"](#)

COMPLIANCE REQUIREMENT / REGULATORY COMMITMENT

NA

REFERENCE DOCUMENTS

Developmental References:

NA

Supplemental References:

[Code of Safe Practices](#)

[Numbered Document 015237, "Regulator Platform Installation"](#)

[Numbered Document 015238, "Feeder Voltage Regulator Installations – Pole-Bolted"](#)

[Numbered Document 015239, "Distribution Voltage Regulators and Boosters"](#)

[Numbered Document 028425, "Capacitors for Distribution Lines"](#)

[Numbered Document 038005, "Automatic Sectionalizers for Overhead Distribution Lines"](#)

[Numbered Document 039586, "Application and Control of Capacitors on Distribution Lines"](#)

[Numbered Document 054438, "Installation of Wiring for Lighting and Auxiliary Equipment in Vaults and Manholes"](#)

[Numbered Document 061683, "Fault Indicators for Underground Application"](#)

[Numbered Document 064048, "Application and Installation of Overhead Fault Indicators"](#)

[Numbered Document 066199, "Installing Automatic Circuit Reclosers on Distribution Lines"](#)

[Numbered Document 066200, "Overhead Capacitor Bank Installations"](#)

[Utility Standard SAFE-1001S, "Safety and Health Program Standard"](#)

[Utility Standard TD-2309S, "Street and Outdoor Lighting"](#)

Electric Distribution Maintenance Requirements for Miscellaneous Overhead and Underground Equipment

APPENDICES

NA

ATTACHMENTS

[Attachment 1, "Equipment Sheets for Miscellaneous OH and UG Equipment"](#)

DOCUMENT REVISION

This document cancels and supersedes Utility Procedure TD-2302P-05, "Electric Distribution Maintenance Requirements for Miscellaneous Overhead and Underground Equipment," Rev. 1, issued 02/15/2017.

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Electric Distribution Maintenance Requirements for Miscellaneous Overhead and Underground Equipment

REVISION NOTES

Where?	What Changed?
Entire document	<p>3.1 – Clarified that the QCR performing the diagnostic testing should report the inoperative equipment condition to the control center operator.</p> <p>6.2.c - Replaced references to DART with references to the mobile inspection application.</p> <p>6.2.c - General edits to reflect mobile inspection application usage versus paper form.</p> <p>Removed manual notification process to compliance personnel of COE status equipment found during inspection.</p> <p>Removed reference to Compliance RMC.</p> <p>Section 7 - Clarified in that equipment may be offline due to instructions from the control center operator.</p> <p>Updated references to “OM&C” to “M&C.”</p>