

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, sump pumps, and batteries. It requires that preventive maintenance activities be conducted in accordance with applicable PG&E, manufacturer, and engineering requirements.

Level of Use: Informational Use

TARGET AUDIENCE

- Maintenance and construction (M&C) superintendents
- Restoration supervisors
- M&C compliance supervisors and analysts
- Maintenance inspectors
- Troublemens
- Electric dispatch and scheduling supervisors
- Electric distribution planning engineers
- Electric distribution operations engineers
- Distribution line technician

SAFETY

NA

BEFORE YOU START

NA

Electric Distribution Maintenance Requirements for Miscellaneous Overhead and Underground Equipment

TABLE OF CONTENTS

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

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 performed by 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"](#)

Electric Distribution Maintenance Requirements for Miscellaneous Overhead and Underground Equipment

2 Procedures and Intervals for Inspection and Testing

- 2.1 PERFORM diagnostic tests AND inspections at the same time as the [Appendix A, "Miscellaneous Equipment Testing Intervals."](#)

NOTE

[Appendix A](#) summarizes the inspection and testing intervals for the equipment discussed in this document.

- 2.2 SEE the list of the detailed procedures in [Section 11](#).

NOTE

The list of detailed procedures in [Section 11](#) are 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, as follows:
1. IF the equipment, including equipment not requiring a test report, is 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.
- 3.2 The control center operator must ENTER the equipment in the Integrated Logging Information System (ILIS).
- 3.3 The restoration dispatch supervisor must PERFORM the following tasks:
1. ENSURE timely completion of the inspection records in the Field Automation System (FAS) by restoration troublemen.
 2. RETAIN completed inspection records for the following equipment in the FAS to ensure access through SAP and [Business Objects](#):
 - Line reclosers
 - Capacitors
 - Voltage regulators
 - SCADA equipment

Electric Distribution Maintenance Requirements for Miscellaneous Overhead and Underground Equipment

3.3 (continued)

3. At the end of each quarter, SUBMIT the following records to the restoration managers and the distribution engineering manager:
 - Records listing all Cannot Get Ins (CGIs)
 - Un-testable results

3.4 The restoration-supervisor must ENSURE accuracy of the inspection records.

4 Placing Equipment Off-line

- 4.1 IF the only action required is to TAKE equipment Off-line,
THEN no testing is REQUIRED.

5 Placing Equipment On-Line

- 5.1 PERFORM an operational test when placing the equipment covered in this document in service.
- 5.2 IF the equipment was on the Critical Operating Equipment (COE) list AND is being placed back in service after repairs or replacement,
THEN a test report is not required UNTIL the equipment's next test/inspection cycle.

NOTE

SEE [Section 6](#) for steps required for equipment that requires repair.

SEE [Section 7](#) for steps required for equipment that is off-line.

6 Equipment Needing Repair

6.1 For equipment on the COE list:

1. During inspection, IF equipment on the COE list IS IDENTIFIED as requiring repairs,
THEN the inspector must PERFORM the following steps:
 - a. ENTER the COE PIN number in **Field Order Completion Comments** in the **COE Pin #** column.
 - b. COMPLETE the field order using FAS Completion Code **S349-Untestable** as follows:
 - (1) ENTER comments in the **Field Order Completion Comments** field.
 - (2) Complete the field order in FAS.

Electric Distribution Maintenance Requirements for Miscellaneous Overhead and Underground Equipment

6.2 For equipment not on the COE list:

1. During inspection, IF equipment not on the COE list is identified as needing repairs,
THEN the inspector must **PERFORM** the following actions in SAP:
 - a. **REQUEST** the distribution control center operator to assign a COE numbered pin to mark the location on maps.
 - b. **DOCUMENT** the COE pin number in Field Order Completion Comments in the COE Pin # column.
 - c. **COMPLETE** the field order using FAS Completion Code **S349-Untestable** as follows:
 - (1) **ENTER** comments in the **Field Order Completion Comments** field.
 - (2) Complete the field order in FAS.
 - d. **WHEN** repairs are completed **AND** the equipment is placed back in service,
THEN **PERFORM** an operational test.

NOTE

A test report is not required UNTIL the equipment's next test/inspection cycle.

6.3 For equipment that failed testing:

1. IF equipment not on the COE list has failed testing **AND** is identified as needing repairs,
THEN troubleman must **PERFORM** the following steps:
 - a. **INSTRUCT** the distribution control center operator to assign a COE-numbered pin to mark the location on maps.
 - b. **ENTER** the COE pin number in **Field Order Completion Comments** in the **COE Pin #** column.
 - c. **COMPLETE** the field order using FAS Completion Code **S359-Failed Test** as follows:
 - (1) **ENTER** comments in the **Field Order Completion Comments** field.
 - (2) **COMPLETE** the field order in FAS.

Electric Distribution Maintenance Requirements for Miscellaneous Overhead and Underground Equipment

7 Off-Line Equipment

7.1 At the time of a scheduled inspection or test,

IF the equipment is off-line per instructions from the distribution operations engineer, the distribution planning engineer, or the control center operator,

THEN the troubleman must PERFORM the following steps:

1. INSTRUCT the distribution control center operator to assign a COE-numbered pin to mark the location on maps.
2. ENTER the COE pin number in **Field Order Completion Comments** in the **COE Pin #** column.
3. COMPLETE the field order using FAS Completion Code **S349-Untestable** as follows:
 - a. ENTER comments in the **Field Order Completion Comments** field.
 - b. COMPLETE the field order in FAS.
4. On a weekly basis, electric dispatch & scheduling personnel PROVIDE a list of untestable equipment to distribution engineering personnel to validate equipment that was reported offline in the field.
5. IF equipment can be brought back online per distribution engineering personnel,
THEN a list is provided to electric dispatch leadership personnel.

8 Equipment That Cannot be Accessed or Located

8.1 IF equipment cannot be located based on the address/location provided in the FAS field order on the associated circuit map,

OR it cannot be accessed safely to perform a required test or inspection,

THEN the QCR must PERFORM the following steps:

1. COMPLETE the field order using one of the Can't Get In (CGI) FAS completion codes listed below:
 - a. **0920-No Access**

After entering the code, SELECT the appropriate reason from the dropdown list (e.g., dog, locked gate, customer denied access, traffic control, muddy conditions, construction, safety issues).

Electric Distribution Maintenance Requirements for Miscellaneous Overhead and Underground Equipment

8.1.1 (continued)

b. **0930-CGI Other**

After entering the code, SELECT the appropriate reason from the dropdown list (e.g., can't locate, environmental limitations).

c. **0980-Cancel Order-duplicate orders**

2. ENTER comments in the **Field Order Completion Comments** field.

- 8.2 IF access issues are encountered,

THEN SUBMIT an EC notification.

9 Managing Nonstandard Equipment

- 9.1 Electric distribution standards engineers must REVIEW AND APPROVE equipment for installation or pilot before it is purchased and installed.

1. IF nonstandard equipment is installed (without approval by distribution standards engineers),

OR if unapproved equipment was previously installed,

THEN the area maintenance and construction (M&C) director ENSURES that inspection and maintenance procedures comply with manufacturer recommendations and PG&E practices.
2. SEND copies of the inspection and maintenance procedures, approved by the area M&C director, to the following organizations:
 - a. Directors responsible for electric transmission and distribution (T&D) engineering.
 - b. Electric distribution maintenance.

- 9.2 UNLESS testing is deferred in accordance with [Utility Standard TD-2302S, "Electric Distribution Maintenance Requirements for Overhead and Underground Equipment."](#)

MAINTAIN nonstandard equipment on the same testing cycle as similar standard equipment.

10 Deferring Maintenance

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

Electric Distribution Maintenance Requirements for Miscellaneous Overhead and Underground Equipment

11 Miscellaneous Equipment Sheets

11.1 SEE the equipment sheets provided in [Attachment 1](#) for the following information about the equipment listed in [Appendix A](#):

- Description of the equipment and its function
- Safety precautions
- Installation, inspection, and testing procedures
- Preventive maintenance tasks
- References for additional information.

NOTE

The following is a list of the equipment sheets included in [Attachment 1](#):

- **Capacitor banks** (SCADA/Non-SCADA)
- **Fault indicators** (underground)
- **Interrupter, underground** (subsurface, pad-mounted, and vault)
- **Recloser, overhead** (with electronic and microprocessor controllers for hydraulic oil-filled and vacuum bottle apparatuses)
- **Voltage regulators** (overhead and pad-mounted)
- **SCADA/PDAC equipment**
- **Sectionalizer switches, overhead** (with electronic and microprocessor controllers for open-air and vacuum-bottle apparatuses)
- **Sump pump (manhole)**
- **Batteries**

END of Instructions

Electric Distribution Maintenance Requirements for Miscellaneous Overhead and Underground Equipment

DEFINITIONS

NA

IMPLEMENTATION RESPONSIBILITIES

NA

GOVERNING DOCUMENT

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

COMPLIANCE REQUIREMENT / REGULATORY COMMITMENT

Records and Information Management

Information or records generated by this procedure must be managed in accordance with the Enterprise Records and Information (ERIM) program policy, standards, and Enterprise Records Retention Schedule (ERRS). Refer to [GOV-7101S, "Enterprise Records and Information Management Standard,"](#) and related standards. Management of records includes, but is not limited to:

- Integrity
- Storage
- Retention and Disposition
- Classification and Protection

REFERENCE DOCUMENTS

Developmental References:

NA

Supplemental References:

[Code of Safe Practices](#)

Numbered Documents:

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

[015238, "Feeder Voltage Regulator Installations With Pole Bolted Inertia Non-Interrupting Bypass Disconnect, Hookstick Operated \(ND\) Switches"](#)

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

Electric Distribution Maintenance Requirements for Miscellaneous Overhead and Underground Equipment

Reference Documents (continued)

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

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

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

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

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

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

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

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

[Utility Procedure TD-2307P-01, "Inspecting Streetlight-Only Poles and Foundations"](#)

[Utility Standard SAFE-1001S "Injury & Illness Prevention Plan \(IIPP\) Standard"](#)

APPENDICES

[Appendix A, Miscellaneous Equipment Testing Intervals](#)

ATTACHMENTS

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

DOCUMENT RECISION

This document cancels and supersedes the following documents:

- Utility Procedure TD-2302P-05, "Electric Distribution Maintenance Requirements for Miscellaneous Overhead and Underground Equipment," Rev. 2, Dated 08/15/2017.
- Utility Bulletin TD-2302B-005, "Battery Replacement Schedule for Distribution Line Equipment," Rev. 0, issued 11/19/2015
- Guidance Tailboard for TD-2302B-005, Rev. 0, issued 11/19/2015

Electric Distribution Maintenance Requirements for Miscellaneous Overhead and Underground Equipment

DOCUMENT APPROVER

██████████, Manager, Distribution Standards

DOCUMENT OWNER

██████████ Manager, Distribution Standards

DOCUMENT CONTACT

██████████, Senior Electric Distribution Standards

REVISION NOTES

Where?	What Changed?
Pages 4 and 5	Added FAS codes.
Page 7	Revised Table 1 and footnotes.
Pages 1, 6 and 7	Removed streetlight information. Incorporated battery information from TD-2302B-005. Added 5MM Capacitor Bank Inspections.

Electric Distribution Maintenance Requirements for Miscellaneous Overhead and Underground Equipment

Appendix A, Miscellaneous Equipment Testing Intervals

	Facilities	Intervals ¹				Comments
		Annually	3 Years	5 Years	As Needed	
Miscellaneous	Capacitor Banks	I/T ²				
	Fault Indicators, UG		T			
	Interrupters, UG (Pad-mount / Subsurface, Vault)		I/T			Pre-commissioning required
	Reclosers, OH	I/T				Pre-commissioning required
	Voltage Regulators	I/T				
	SCADA / PDAC			T		
	200A Junctions		I			
	Sectionalizers, OH				I	Visual inspection from bucket truck every 10 years in costal and/or corrosive environments
	Sump Pumps, Manhole				I	Per local practice
	Batteries				T	Refer to Attachment 1, "Equipment Sheets for Miscellaneous OH and UG Equipment" for testing and replacement schedule

¹ Increased inspection / testing intervals subject to local engineering input

² T = Test, I = Inspect

³ Inspection in designated wildfire areas as designated by [Engineering Document 072148](#) must be done in accordance with [Utility Standard TD-2301S, "Patrols and Detailed/Intrusive Inspections of Electric Overhead and Underground Distribution Facilities."](#)

⁴ Distribution equipment located inside a substation follows the same inspection and testing cycle as equipment located outside a substation, using equipment sheets in the relevant procedure.