

Exhibit LL

Exhibit LL-1



Distribution Switching Procedures

SUMMARY

This utility procedure, including the switching and informational job aids associated with this procedure, provides methods and procedures to perform safe and reliable distribution switching.

Level of Use: Informational Use

TARGET AUDIENCE

Personnel who perform and direct distribution field switching.

SAFETY

Failure to follow proper distribution field switching procedures may result in employee injuries, public safety exposure, or damage to facilities. Consistent execution of this procedure promotes proper work practices and helps ensure compliance with Pacific Gas and Electric Company (Company) safety standards, including but not limited to those described in [SAFE-1001S, "PG&E Injury & Illness Prevention Plan \(IIPP\)"](#) and the [Code of Safe Practices \(CSP\)](#).

BEFORE YOU START

CONDUCT a jobsite tailboard briefing, identifying all known or possible hazards, per [TD-2024P-01, "Electric Tailboard Briefings."](#)

PERFORM an infrared safety inspection, as required, per [TD-2404P-01, "Working Near Underground Electric Distribution Cables and Field Repair of Electric Distribution Line Equipment."](#)

Additional arc-flash hazard face protection is required for all subsurface and pad-mounted distribution switching, including the following tasks:

- Installing/removing fuses.
- Operating transformer secondary breakers.
- Operating Load Break elbows while energized

SEE utility procedure [TD-2509P-01, "Electric Transmission and Distribution Arc-Flash Hazard \(AFH\) Control Procedure"](#) for arc-flash protection requirements.

Pre-Switching Review:

Employees MUST PERFORM the following review before initiating switching activities:

- CONFIRM that they are trained, qualified, and fit (both mentally and physically) to execute the switching tasks.



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BEFORE YOU START (continued)

- UNDERSTAND the rules that apply before performing the work.
- UNDERSTAND the purpose and expected results of each switching operation (e.g. picking up load, breaking parallels).
- ENSURE understanding and knowledge of the equipment they are assigned to operate.
- OBTAIN and REVIEW applicable job aids for the switching operations or task to be performed (SEE the job aids associated with this procedure).
- ENSURE that their level of engagement in the task is not compromised by fatigue or physical impairment.
- REVIEW the switching steps to confirm that the assigned switching activities can be performed safely and to achieve the stated purpose for the switching.
- RESOLVE any questions regarding the safety of operations, uncertainties, confusion, conflicts, inconsistencies, or doubts with the Control Center before switching (SEE the human performance [HP] error prevention tool, “Questioning Attitude,” in [Appendix A](#) on Page 48).
- IDENTIFY all critical steps and open or close operations. ENSURE understanding of the equipment to be operated. VERIFY that each critical step can safely achieve the intended result detailed in the instruction column of the switching log.
 - The critical information in the instruction section of the switching log states the intended result of the switching operation, such as energize, parallel, make/break loop, test, pick up load, dead-line operation, check open/closed ABC, de-energize/energize.

Review of Human Performance Tools:

SEE [Appendix A, “Human Performance Error Prevention Tools.”](#)

- USE HP error prevention tools when performing the switching activities described throughout this procedure.
- REVIEW, UNDERSTAND, and IMPLEMENT applicable HP error prevention tools while preparing for and performing distribution switching activities.



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PROCEDURE STEPS

1 General Switching Information

1.1 Performing Field Switching – Sequence of Switching Overview

1. APPLY all applicable HP error prevention tools (SEE [Appendix A, “Human Performance Error Prevention Tools”](#)).
2. RECEIVE approval to perform switching operations from the Control Center.
3. PERFORM placekeeping (SEE [Section 3.4, “Placekeeping.”](#) on Page 11).
4. BE fully engaged in the switching activity.
5. UNDERSTAND the switching operations to be performed.



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1.1 (continued)

6. READ the operation to be performed.
7. IDENTIFY the correct device number, per the switching operation.
8. VERIFY that the switch/apparatus is correct, per the switching log.
9. VERIFY the switch/apparatus is in proper operating condition (e.g., fully opened, fully closed, load breaking features engaged, appropriate oil levels). SEE [Section 9.2 "Checking Visible Contacts"](#) on Page 29 and [Section 12.2](#) on Page 40.
10. ANTICIPATE the expected results.
11. PERFORM the switching operation using the approved work method and/or tool.
12. VERIFY the switching operation is complete, as written.
13. VERIFY the anticipated results (SEE [Section 9.2 "Checking Visible Contacts"](#)).
IF results are not as expected,
THEN STOP and CONTACT the Control Center.
14. DOCUMENT the time each switching operation is completed.
15. REPORT the completion time for each switching operation to the Control Center.
 - Communication must include the switching log number, operation number, time the operation was completed.

1.2 Overcoming Distractions and Interruptions

1. ELIMINATE all distractions and interruptions not related to the switching (telephone calls, conversation with fellow employees, lack of preparation, etc.) before and during switching operations.
2. IF distracted or interrupted **during a pre-switching review, preparation, or pre-job briefing (tailboard)**,
THEN COMPLETE the following tasks:
 - a. STOP. ELIMINATE the distraction.
 - b. IMPLEMENT the Two Minute Rule (SEE [Appendix A](#)); TAKE the time needed to develop an accurate understanding of the critical indicators, system/equipment condition, work environment, hazards, and personnel.



Distribution Switching Procedures

1.2 (continued)

- c. CONFIRM that the distraction will not impact resuming pre-switching activities.
 - d. VERIFY the last task completed.
 - e. IDENTIFY the next task to be performed and RESUME pre-switching activities.
- 3. IF distracted or interrupted **while switching**,
THEN COMPLETE the following tasks:
 - a. STOP. ELIMINATE the distraction.
 - b. IMPLEMENT the Two Minute Rule; TAKE the time needed to develop a situational awareness and an accurate understanding of the critical indicators, system/equipment condition, work environment, hazards, and personnel.
- 4. Before resuming the switching process, COMPLETE the following tasks:
 - a. CONFIRM that the distraction will not impact the continuation of switching.
 - b. VERIFY the last switching operation completed.
 - c. IDENTIFY the next switching operation to be performed.
 - d. CONFIRM that you are at the correct device to perform the next switching step.

2 Verbal Communications

- 2.1 USE a Company radio for all field switching operations, if possible.

NOTE

When a Company radio is not available, using a cell phone is an acceptable alternative.

2.2 Three-Way Communication

- 1. Three-way communication helps ensure a reliable transfer of information and understanding, with the goal of assuring the correct action (i.e., State, Repeat, and Confirm).
- 2. Always SPEAK in a clear, concise, and definitive manner using the phonetic alphabet, as appropriate (SEE [Appendix A](#)).



Distribution Switching Procedures

2.2 (continued)

3. The following is the three-way communication procedure:
 - a. The speaker STATES a message.
 - b. The listener REPEATS the message for verification of understanding.
 - c. The speaker CONFIRMS and ACKNOWLEDGES that the message repeated back from the listener is accurate and either CONFIRMS or RE-INSTRUCTS.
 - d. If corrected by the speaker, the person receiving the information (the listener) ACKNOWLEDGES the correct message.
 - e. The person who originally transmitted the information (the speaker) ACKNOWLEDGES that the information was repeated correctly.
4. The following are the minimum verbal communication requirements:
 - Always USE three-way communication during switching operations.
 - Always USE three-way communication when reporting field conditions to the Control Center.

2.3 Acknowledging an Unwritten Message or Order.

1. When receiving an unwritten message or order concerning switching, clearances, load changes, equipment status updates, or pertinent information, immediately PERFORM the following tasks:
 - a. RECORD the item directly on the switching tag or switching log.
 - b. REPEAT the information to the sender.
 - c. RECEIVE an acknowledgment.

NOTE

An order may be relayed only when it cannot be sent directly.

2. Each party receiving an unwritten message or order must REPEAT the relayed message or order back to the sender. SEE [TD-2700P-02, "Electric Distribution Centers and General Operation."](#) Section 3.



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2.4 Communicating Completed Switching Operations.

1. After performing switching operations, the switchman immediately COMMUNICATES the following:
 - a. Switching log number.
 - b. Operation(s) completed.
 - c. Completion time for each operation.

IF performing multiple operations and the completion times are different,
THEN, REPORT the exact time for each operation.

NOTE

The operator is not required to repeat back reported times.

3 Switching Logs for Distribution Field Switching

3.1 Using an Authorized Switching Log and Switching Tag.

1. The switching log (Form 62-3487 [Rev 3/01]) is the principal form used for switching programs. SEE [Figure 1](#) below.

PG&E		SWITCHING LOG				Switching Log Number: 20-	
Page: 1 OF 1		SOUTH DCC				PM # OPER #	
Purpose:							
OPER NUM	Station or Location	Operation	Apparatus Number	Instructions	Time Given	Executed By Person	Time Executed
1.							
2.							
3.							
4.							
5.							
6.							
7.							
8.							
9.							
10.							
11.							
12.							
13.							

Switching Prepared By: _____	Date: _____	Switching Checked By: _____	Date: _____	Switching Checked by: _____	Date: _____	Switching Directed By: _____	Date: _____

Figure 1. 62-3487 [Rev 3/01]



Distribution Switching Procedures

3.1 (continued)

2. PERFORM field switching using Company Form 62 4118-9-63, "Switching Tag," when a copy of the original switching log is not available. SEE [Figure 2](#) below.

Exhibit A 2: SWITCHING TAG

SWITCHING LOG NO. _____

SHEET NO. _____

P G AND E

SWITCHING CENTER _____

DATE _____

PURPOSE _____

OPER'N No.	STATION OR LOCATION	OPER- ATION	SWITCH No.	INSTRUCTIONS	TIME EXECUTED

SWITCHING PREPARED BY: _____

SWITCHING CHECKED BY: _____

DATE _____

DATE _____

62-4118-9-63

SWITCHING EXECUTED BY: _____

DATE _____

Figure 2. Form 62 4118-9-63, "Switching Tag" (not available on-line)



Distribution Switching Procedures

3.1 (continued)

3. Per the requirements of [Corporation Standard GOV-7101S, "Enterprise Records and Information Management Standard,"](#) switching logs used by field switchmen are not considered a record, they are considered reference copies and may be discarded once no longer needed.

3.2 Switching Log Documentation.

1. WRITE handwritten switching log entries on Form 62-3487 [Rev 3/01] or switching tag entries on Form 62-4118-9-63 legibly.

DO NOT ERASE, "WHITE-OUT" or USE liquid correction fluid on any portion of the switching log or switching tag.
2. Before performing switching operations, VERIFY the switching log number is printed or written in the space provided on each page of the switching log/tag.
3. Numbering Steps
 - Sequentially NUMBER each step required to complete the switching program.
 - LIST only one operation per line.
 - DO NOT LEAVE blank lines between separate operations in the switching log.
 - FILL OUT the switching log starting with Operation 1 and CONTINUE through to the final step.
4. Numbering Pages
 - NUMBER the switching log pages consecutively.
 - INDICATE the total number of pages (e.g., 1 of 1; 2 of 6).

3.3 Corrections and Additions to Switching Logs/Tags (in the field)

1. Corrections
 - a. IF correcting a single space (e.g., operation number, equipment number, or instruction),

THEN LINE OUT, CORRECT, and DATE the individual item. WRITE the date as close as possible to the correction. SEE [Figure 3](#) on Page 10 and [Figure 4](#) on Page 11 for examples of single omission and multiple sequential omissions.
 - b. IF adding information to an existing space,

THEN INSERT the addition, and DATE as close as possible to the addition.



Distribution Switching Procedures

3.3 (continued)

- c. IF making corrections to "Instructions," "Time Given," and "Executed By Person" spaces,

THEN MAKE corrections as follows:

- (1) ENTER the word "omit" in the "Time Executed" space.
- (2) CONTINUE the line through the "Time Reported" space.
- (3) DATE each omission next to the word "omit." SEE [Figure 3](#) below and [Figure 4](#) on Page 11 for examples of single omission and multiple sequential omissions.

Exhibit C: SWITCHING LOG					Switching Log Number: 19-10315				
Correction – Multiple Sequential Omissions									
OPER NUM	Station or Location	Operation	Apparatus Number	Instructions	Time Given	Executed By Person	Time Executed	Time Reported	
16	FIELD	CHK	1709	OPEN LOCKED & T/MOL	0740		0741	0745	
16	↓	PLACE	1702	SCADA ON LOCAL & T/CAUT	↓	↓	0742	↓	
17	↓	READ	8833	VOLTS – A– B– C–			OMIT MD 04/05/19		
18	↓	C/OUT	1702	RCL RLY & T/CAUT	0740		0742	0745	
19	↓	OPEN	1702	CO&T/CAUT DE-ENER	↓	↓	↓	↓	
20	↓	CHK	1702	OPEN AT SEMA	↓	↓	↓	↓	
21	↓	OPEN	1717	CO&T/MOL DE-ENER	↓	↓	0743	↓	
22	↓	CHK	5355	OPEN LOCKED & T/MOL	0745		0759	0800	
23	FIELD/CREW	---	---	REPORTS ON TYLER 1105 BET: 1749, 1709, 1717, & 5355 USING GROUNDS PTF	---		0800	---	
24	FIELD/CREW	---	---	REPORTS OFF TYLER 1105 BET: 1749, 1709, 1717, & 5355 WITH ALL GROUNDS REMOVED PTF	---	↓	1100	---	
25	FIELD/CREW	---	---	CLEARANCE HOLDER CONFIRMS HAS VISUALLY INSPECTED THE CLEARED AREA FOR WORKERS, GROUNDS, AND EQUIPMENT IN THE CLEAR, AND EQUIPMENT IS BEING RETURNED IN THE SAME STATE AS RECEIVED.	---	↓	↓	---	
26	FIELD	CHK	5355	OPEN LOCKED & RT	1507		1508	1508	
Switching Prepared By:		Date:		Switching Checked By:		Date:		Switching Directed By: Date:	
		04-02-19				04-03-19			
						04-04-19			
								04-05-19	

Figure 3. Single Omission



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3.3 (continued)

Exhibit C: SWITCHING LOG				Switching Log Number: 19-10315					
Correction – Multiple Sequential Omissions									
Page 1 OF 3		NORTH DCC							
Purpose: TO CLEAR A SECTION OF THE RED BLUFF 1103									
OPER NUM	Station or Location	Operation	Apparatus Number	Instructions	Time Given	Executed By Person	Time Executed	Time Reported	
1	FIELD	CHK	1704	CLOSED	0700		0703	0705	
2	↓	C/OUT	1704	GRD RLY & T/CAUT	↓	↓	↓	↓	
3	↓	CHK	1702	CLOSED	0705		0708	0710	
4	↓	C/OUT	1702	GRD RLY & T/CAUT	↓	↓	↓	↓	
5	↓	CLO	2629 2627 BC 04/03/19	C/CLO ON LOOP	0713		0715	0718	
6	↓	OPEN	1749	CO&T MOL SEP LOOP	0720		0725	0728	
7	↓	CHK	1704	CLOSED	0730		0732	0735	
8	↓	RT & C/IN	1704	GRD RLY	↓	↓	↓	↓	
9	↓	CHK	1709	OPEN & T/MOL			OMIT ND 04/05/19		
10	↓	PLACE	1702	SCADA ON LOCAL & T/CAUT					
11	↓	READ	8833	VOLTS A- B- C-			OMIT A/N 04/02/19		
12	↓	PLACE	8833	ON NEUT					
13	↓	READ	8833	VOLTAGE & CHK PWR OK					
14	↓	TAKE	C238	OFFLINE PSJA					
Switching Prepared By: [REDACTED]		Date: 04-02-19		Switching Checked By: [REDACTED]		Date: 04-03-19		Switching Checked by: [REDACTED] Date: 04-04-19	
								Switching Directed By: [REDACTED] Date: 04-05-19	

Figure 4. Multiple Sequential Omission

2. Additions

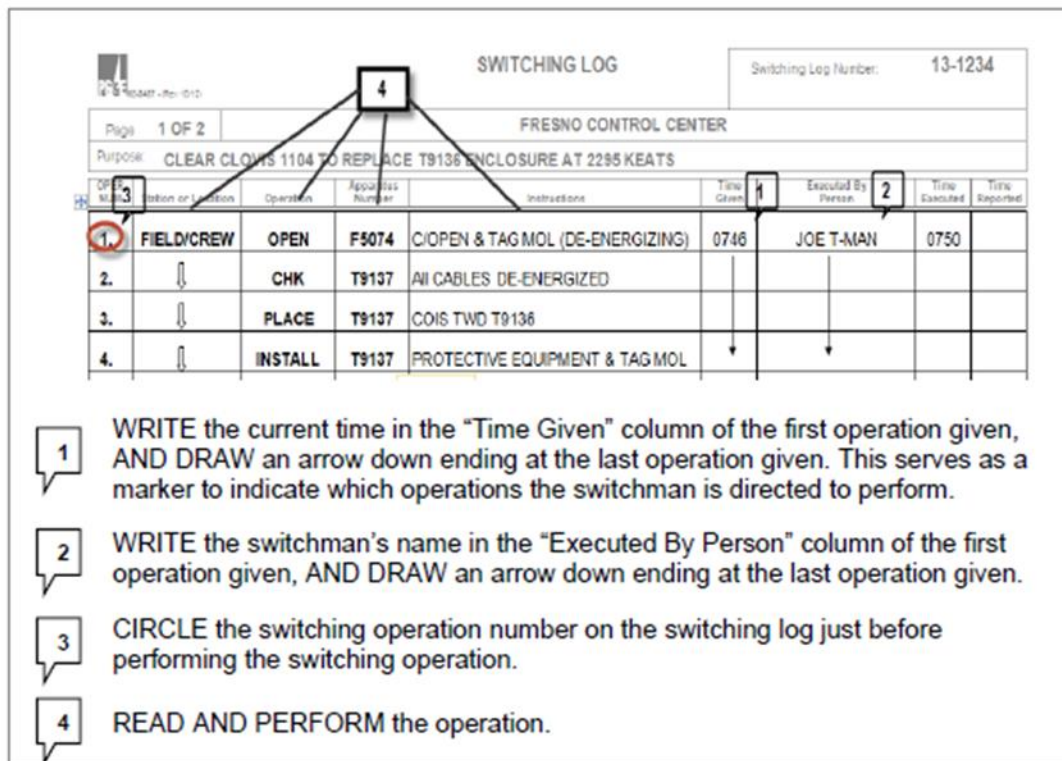
- To add a step, INSERT the step between operation numbers and label it with a sequential number and letter (e.g., 1a).

3.4 Placekeeping

- Figures 5 and 6 on Page 12, and Figure 7 on Page 13, along with their corresponding descriptions, are examples of the placekeeping tasks that must be performed during switching.

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3.4 (continued)



SWITCHING LOG Switching Log Number: 13-1234

Page: 1 OF 2 FRESNO CONTROL CENTER

Purpose: CLEAR CLOVIS 1104 TO REPLACE T9136 ENCLOSURE AT 2295 KEATS

Operation Number	Location or Location	Operation	Apparatus Number	Instructions	Time Given	Executed By Person	Time Executed	Time Reported
1.	FIELD/CREW	OPEN	F5074	C/OPEN & TAG MOL (DE-ENERGIZING)	0746	JOE T-MAN	0750	
2.	↓	CHK	T9137	ALL CABLES DE-ENERGIZED				
3.	↓	PLACE	T9137	COIS TWD T9136				
4.	↓	INSTALL	T9137	PROTECTIVE EQUIPMENT & TAG MOL				

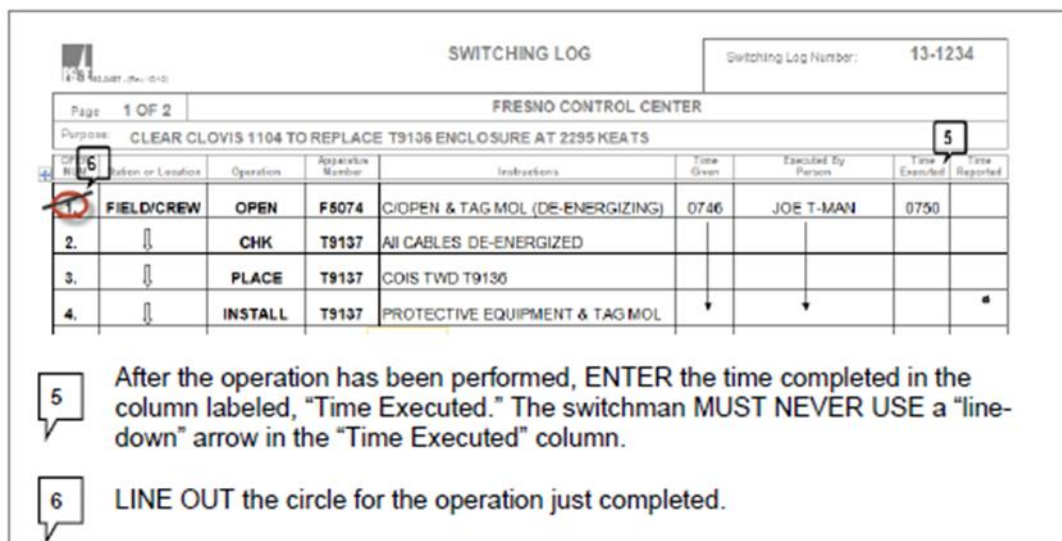
1 WRITE the current time in the "Time Given" column of the first operation given, AND DRAW an arrow down ending at the last operation given. This serves as a marker to indicate which operations the switchman is directed to perform.

2 WRITE the switchman's name in the "Executed By Person" column of the first operation given, AND DRAW an arrow down ending at the last operation given.

3 CIRCLE the switching operation number on the switching log just before performing the switching operation.

4 READ AND PERFORM the operation.

Figure 5. Placekeeping on a Switching Log – Example 1



SWITCHING LOG Switching Log Number: 13-1234

Page: 1 OF 2 FRESNO CONTROL CENTER

Purpose: CLEAR CLOVIS 1104 TO REPLACE T9136 ENCLOSURE AT 2295 KEATS

Operation Number	Location or Location	Operation	Apparatus Number	Instructions	Time Given	Executed By Person	Time Executed	Time Reported
1.	FIELD/CREW	OPEN	F5074	C/OPEN & TAG MOL (DE-ENERGIZING)	0746	JOE T-MAN	0750	
2.	↓	CHK	T9137	ALL CABLES DE-ENERGIZED				
3.	↓	PLACE	T9137	COIS TWD T9136				
4.	↓	INSTALL	T9137	PROTECTIVE EQUIPMENT & TAG MOL				

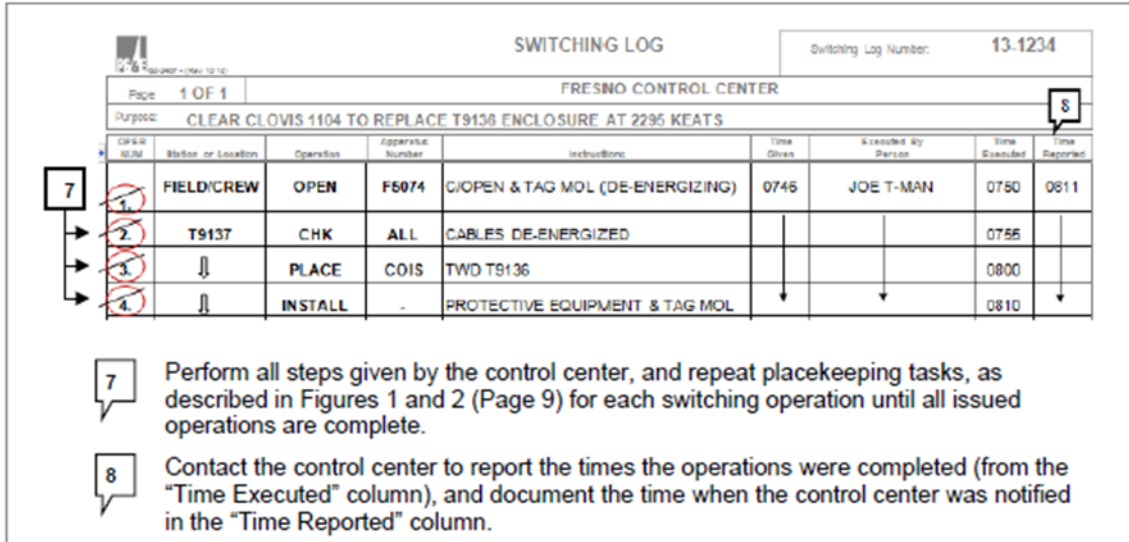
5 After the operation has been performed, ENTER the time completed in the column labeled, "Time Executed." The switchman MUST NEVER USE a "line-down" arrow in the "Time Executed" column.

6 LINE OUT the circle for the operation just completed.

Figure 6. Placekeeping on a Switching Log – Example 2

Distribution Switching Procedures

3.4 (continued)



SWITCHING LOG Switching Log Number: 13-1234

Page 1 OF 1 FRESNO CONTROL CENTER

Purpose: CLEAR CLOVIS 1104 TO REPLACE T9136 ENCLOSURE AT 2295 KEATS

OP&R ID#	Station or Location	Operation	Apparatus Number	Instructions	Time Given	Executed By Person	Time Executed	Time Reported
1	FIELD CREW	OPEN	F5074	C/OPEN & TAG MOL (DE-ENERGIZING)	0745	JOE T-MAN	0750	0811
2	T9137	CHK	ALL	CABLES DE-ENERGIZED			0755	
3	↓	PLACE	COIS	TWD T9136			0800	
4	↓	INSTALL	-	PROTECTIVE EQUIPMENT & TAG MOL			0810	

7 Perform all steps given by the control center, and repeat placekeeping tasks, as described in Figures 1 and 2 (Page 9) for each switching operation until all issued operations are complete.

8 Contact the control center to report the times the operations were completed (from the "Time Executed" column), and document the time when the control center was notified in the "Time Reported" column.

Figure 7. Placekeeping on a Switching Log – Example 3

4 Using Switching Job Aids (SJA)

SJAs are available in electronic form in the [Technical Information Library \(TIL\)](#). SJAs can also be accessed via a hyperlink to the TIL on the [DOT Webpage](#).

4.1 Incorporating an SJA within the switching log:

- Reduces the number of steps that need to be written and checked.
- Ensures the steps used in the field to complete the required task (as instructed in the SJA) are accomplished uniformly throughout the system.

NOTE

Control Center operators may also give verbal instructions to perform switching; for example, "per switching job aid."

4.2 When using an SJA, the instruction field on the switching log always includes one of the following to indicate that an approved switching job aid will be used:

- Per switching job aid
- Per SJA
- PSJA



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- 4.3 The switchman PERFORMS the following steps:
1. CONFIRM the number of the device to be operated AND the task to be performed.
 2. SELECT the appropriate job aid and VERIFY that it is current.
 3. REVIEW the required operations.
- 4.4 IF the switchman has questions about the switching, or is not certain that the SJA provides sufficient information to complete the activity safely,
- THEN the switchman CONTACTS the operator and RESOLVES any issues before proceeding.
- 4.5 IF the switchman does not have questions about the switching,
- THEN the switchman PERFORMS the operations directed in the SJA and REPORTS to the Control Center when the SJA is complete.
- 4.6 ENSURE that the report includes any devices that have had MOL tags installed or removed.
- 4.7 Examples of switching instructions that include an SJA are shown in [Table 1](#) below:

Table 1. Sample Text for SJAs Used in a Switching Log

Operation	Apparatus Number	Instructions
BYPASS	LR 1234	Per SJA
REPLACE	9999	Fuses on subsurface fuse switch, per SJA
TAKE	C521	Off-line Per SJA
SETUP	11137	SCADA-mate switch clearance limit Per SJA

- 4.8 SJAs assume that all equipment is equipped with Supervisory Control and Data Acquisition (SCADA).
- IF SCADA is not installed,
- THEN, the switchman IGNORES the SCADA operations.



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5 Equipment Tags for Field Use

5.1 Tagging

1. FILL OUT tags legibly and completely. Employees can reproduce electronic copies of official tags, but they must NOT ALTER the content AND/OR placement of pertinent information.

IF instructions are printed on the reverse side of the official tag,

THEN it is not required that they be printed on the reverse side of the electronic copy; however, always FOLLOW the tag instructions.

2. REPORT incomplete, illegible, or altered tags to the Control Center.
3. REPLACE illegible tags with new tags that contain identical information as the original tags and NOTIFY the Control Center.
4. USE all-weather tags in locations exposed to weather.

NOTE

Handwritten entries on master Man-on-Line (MOL) tags and **tags placed on equipment** must be legible and written in indelible (non-erasable) ink.

5. For tag placement options on electric distribution line equipment controls, REFER to [Section 5.5, "Alternate Tagging Options for Electric Distribution Line Equipment Controls"](#) on page 22.

5.2 Corrections, Omissions, and Additions. SEE [TD-2700P-07, "Tags"](#), Section 3.

1. DATE and INITIAL each correction, omission, and addition to MOL tags, Non-Test tags, and Caution tags as close to the change as possible, without obscuring the writing on the tag.
2. DO NOT ERASE, "WHITE OUT" or USE liquid correction fluid on any portion of a tag.

5.3 Tag Types

1. INFORMATION Tags. SEE [TD-2700P-07, "Tags"](#), Section 23.
 - a. ATTACH Information tags (SEE [Figure 8](#) on Page 16) to controls, switches, or equipment where it is necessary to pass on additional information.

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5.3 (continued)

- b. FILL OUT and INSERT Information tags in the clear pouch of the Yellow & Green Safety Pole Wraps when required. SEE [TD-2042P-01, "Safety Pole Wraps"](#) for addition information.

Information tags are not intended for long-term use or as substitutes for MOL, Caution, or other tags. To identify permanent conditions or information, USE permanent labels.

- (1) FILL OUT the Information tag completely.
- (2) PLACE the Information tag on the designated device.



Figure 8. Information Tag (Ordering code 03-0339)

2. NON-TEST Tags. SEE [TD-2700P-07, "Tags"](#), [Attachment 1, "Graphics"](#).
 - a. Non-Test tags are used to indicate a non-test is in effect on a circuit when, due to work or other special situation, a circuit should not be re-energized until it has been determined that the crew working on the line or equipment is in the clear, following an outage of the circuit.
 - b. [Figure 9](#) on Page 17 illustrates the older version of the Non-Test tag which, once depleted, will no longer be available to order. [Figure 10](#) on Page 17 illustrates the current Non-Test tag.
 - (1) FILL OUT the Non-Test tag completely.
 - (2) ATTACH the tag to the switch control handle, and CUT OUT the automatic circuit reclosing device during the period that the non-test is in effect.

Distribution Switching Procedures

5.3 (continued)



<p style="text-align: right;">62-1224 REV. 11-72</p> <p> WARNING</p> <p>NON-TEST TAG</p> <p>LIVE LINE CREW WORKING ON CIRCUIT</p> <p>If switch trips, do not reclose until permission is obtained from the Switching Center.</p> <p>SWITCHING CENTER <u>NORTH DCC</u></p> <p>STATION <u>SYCAMORE</u> CIRCUIT <u>1110</u></p> <p>Person in charge of Crew <u>-----</u></p> <p>Location of Crew <u>-----</u></p> <p>Tag attached by  At <u>1300</u> On <u>01-15-19</u></p> <p>Tag removed by <u>-----</u> At <u>-----</u> On <u>-----</u></p> <p style="text-align: center;">(over)</p>	<p style="text-align: center;">○</p> <p style="text-align: center;">INSTRUCTIONS</p> <p>Refer to General Operating Instructions, Section 10 and Standard Practice 403-3.</p> <p>The placing and removal of tags and the cutting out and in of automatic circuit reclosing devices shall be done under the direction of the switching center having jurisdiction.</p> <p>This tag is to be used to indicate a non-test is in effect on a circuit when due to work or some special reason a circuit should not be re-energized until it has been determined that the crew working on the line or equipment is in the clear following an outage of the circuit.</p> <p>Attach the tag to the switch control handle and cut out the automatic circuit reclosing device during the period the non-test is in effect.</p>
--	--

Figure 9. Non-Test Tag, Older Version (can be used until the supply is exhausted/depleted.)

<p style="text-align: center;"> ○</p> <p style="text-align: center;">WARNING</p> <p style="text-align: center;">Non-Test Tag</p> <p>Crew Working on Energized Circuit If switch trips, do not reclose until permission is obtained from the Electric Control Center</p> <p>_____ Control Center</p> <p>Tag Attached To _____</p> <p>Switching Log No. _____</p> <p>Time _____</p> <p>Date _____</p> <p style="font-size: small;">PG&E 5-102-074</p>	<p style="text-align: center;"> ○</p> <p style="text-align: center;">WARNING</p> <p style="text-align: center;">Non-Test Tag</p> <p>Crew Working on Energized Circuit If switch trips, do not reclose until permission is obtained from the Electric Control Center</p> <p style="text-align: center;">Instructions</p> <p style="font-size: x-small;">This tag is to be used to indicate a Non-Test is in effect on a circuit when, due to some special reason, a circuit should not be re-energized until it has been determined that the crew working on the circuit has released the Non-Test. Attach the tag to the switch control handle and cut out the automatic circuit reclosing device during the period the Non-Test is in effect. The placing and removing of tags and the cutting in and out of automatic circuit reclosing devices shall be done under the direction of the control center having jurisdiction.</p>
--	--

Figure 10. Non-Test Tag (Ordering Code 621355)

3. CAUTION Tag. SEE [TD-2700P-07, "Tags"](#), Section 11, and [Attachment 1, "Graphics."](#)
 - a. USE Caution tags to mark equipment that must not be operated or changed, except on specific instructions from the Control Center with jurisdiction or the person indicated on the tag.

Distribution Switching Procedures

5.3 (continued)

- [Figure 11](#) below illustrates the older version of the Caution tag which, once depleted, will no longer be available to order.
- [Figure 12](#) below illustrates the current Caution tag.

b. FILL OUT Caution tags completely. SEE [Figure 12](#) below.

c. ENTER a time in the required field if placing the tag is not associated with a switching log.

IF no time is required,

THEN ENTER “NA” or a dash (—) in the “Time” field, and ENTER the switching log number in the “Reason” field.

d. PLACE a Caution tag on each device to be tagged.

Figure 11. CAUTION Tag, Older Version (use only until the supply is depleted)

ENTER the following information in the space labeled:

From: ENTER the name of the electric control center or person installing the tag.

Phone: ENTER the phone number of the electric control center or person installing the tag.

Tag attached to: RECORD the equipment to which the tag is attached.

Reason: LIST the reason for attaching the tag or switching log number.

Date: RECORD the date the tag was filled out.

Time: RECORD the time the tag was filled out.

Figure 12. CAUTION Tag, Current Version (Ordering Code 621357)

Distribution Switching Procedures

5.3 (continued)

4. ASSESSMENT Information Tag

- a. NEVER USE the Assessment Information tag shown in [Figure 13](#) in place of the CAUTION tag shown in [Figure 12](#) on Page 18.
- b. USE the Assessment Information tag ONLY during storms or major incidents to identify work locations in the field that have already been assessed. This helps to prevent the re-assessment of locations and duplication of job packets.
 - (1) FILL OUT and INSERT the Assessment Information tag in the clear pouch of the Yellow or Green Safety Pole Wrap. SEE [TD-2042P-01, "Safety Pole Wraps"](#) for additional information.
 - (2) INCLUDE the Outage Information System (OIS) number and other pertinent data requested on the tag.
 - (3) ORDER Assessment Information tags (SEE [Figure 13](#) below) through MRO Integrated Solutions (MROIS): 2813752.



Figure 13. Assessment Information Tag, MROIS Code: 2813752



Distribution Switching Procedures

5.3 (continued)

5. MAN-ON-LINE Tag. SEE [TD-2700P-07, "Tags" Attachment 1, "Graphics"](#)
 - a. MOL tags are used to mark clearance limits, DO NOT REMOVE the tag until the clearance holder(s) has reported clear.
 - b. Clearance limits may not be worked on, operated, or removed.
 - c. The device **must not** be closed or changed, except on specific instructions from the Control Center with jurisdiction of the switching log.
 - d. FILL OUT the MOL tag completely. SEE [Figure 14](#) below and [Figure 15](#) on page 21.
 - [Figure 14](#) below illustrates the older version of the MOL tag which, once depleted, will no longer be available to order.
 - [Figure 15](#) on Page 21 illustrates the current MOL tag.
 - e. ATTACH the MOL tag to the control, operating mechanism, or protective equipment of each clearance limit. SEE [Section 5.4 "Tagging Clearance Limits"](#) on page 21.

NOTE

A shared clearance limit (the common point between two adjoining clearances) must have a properly filled-out MOL tag for each clearance.

<div style="text-align: center;"> <p>EQUIPMENT OR LINE</p> <p>CLEARANCE</p> <p>MAN ON LINE</p> </div> <p>THIS TAG MUST NOT BE REMOVED OR THIS SWITCH, GATE OR VALVE MUST NOT BE OPERATED WITHOUT APPROVAL OF <u>NORTH DCC</u></p> <p>ATTACHED BY <u>[REDACTED]</u></p> <p>SWITCHING LOG NO. <u>19-0023568</u></p> <p>DATE <u>02-15-19</u> (OVER)</p>	<div style="text-align: center;"> <p>03-0329-6/90</p> <p>INSTRUCTIONS</p> </div> <p>A Man On Line Tag must be attached to the control or operating mechanism of all switches or valves that control the supply of electricity, gas steam or water to the line or apparatus before men are permitted to work on such lines or apparatus and must not be removed or the switch or valve operated until all men have reported clear of the line or apparatus.</p> <p>If such switches or valves are not operated by a control handle or operating mechanism, the tag must be attached to an adjacent location in clear view of the position from which the switch or valve is operated.</p> <p>All information on this tag when issued by a station attendant must also be entered in the station log along with a complete record of the switching involving the clearance.</p>
---	--

Figure 14. Equipment or Line MOL Tag (Can be used until the supply is depleted.)

Distribution Switching Procedures

5.3 (continued)



 <p>⚠ DANGER Do Not Operate Equipment or Line Clearance MAN ON LINE This tag must not be removed and this Switch, Gate or Valve must not be operated without approval of _____ Phone _____ Attached to _____ Switching Log No. _____ Date _____ (over)</p>	 <p>⚠ DANGER Do Not Operate Equipment or Line Clearance MAN ON LINE This tag must not be removed and this Switch, Gate or Valve must not be operated without approval <small>Instructions: A new field MOL tag must be attached to the control or operating mechanism of switches, gates or valves that require the safety of equipment, line, switch or valve to the line to operate before personnel are permitted to work on switch, gate or valve and must not be removed and the switch, gate or valve operated until all personnel have reported clear of the line or equipment. If such switches, gates or valves are not equipped with a control handle or operating mechanism, the tag must be attached to an adjacent location in clear view of the position from which the switch, gate or valve is operated. The location on the tag must also be marked in the switching log along with a complete record of the switching involving the equipment. (11/15/20)</small> 621356-401</p>	<p>ENTER the following information in the space labeled:</p> <p>Of: ENTER the name of the electric control center.</p> <p>Phone: ENTER the telephone number of the electric control center.</p> <p>Attached to: ENTER the number of the switch, gate, or valve to which the tag is attached.</p> <p>Switching Log No.: RECORD the "Switching Log" number associated with this clearance.</p> <p>Date: RECORD the date the tag was filled out.</p>
--	---	--

Figure 15. Field MOL Tag (Ordering code 621356.)

5.4 Tagging Clearance Limits

For clearance limits, CHECK that the clearance limit is open, and then PLACE a properly completed MOL tag and lock at the clearance limits, if applicable.

1. Tagging Combination Fused and Solid-Blade Cutouts: [TD-2700P-07, "Tags"](#), Section 22.

When used in combination, fused and solid-blade cutouts are considered separate clearance limits and must be tagged accordingly. The switching log must contain separate operating instructions to perform the following tasks:

- Tag fused cutouts MOL.
 - Tag solid-blade cutouts MOL.
2. Tagging Overhead Line Disconnects, Jumpers, or Cutouts. SEE [TD-2700P-07, "Tags"](#) Section 13.
 - a. MARK cutouts, line openers, and jumpers that are located on wood poles and are not operated from the ground-level by hanging the appropriate tag from a nail, approximately 8 feet (ft.) above ground level.
 - b. PLACE the MOL tag on the side of the pole from which the device number can be read most easily or on the side of the pole ordinarily climbed.
 - c. On non-wood poles, ATTACH the MOL tag to a step or to another readily visible location on the pole.
 3. Tagging Field Switches with a Handle. SEE [TD-2700P-07, "Tags"](#) section 5.
 - a. PLACE the MOL tag on the operating handle.



Distribution Switching Procedures

5.4 (continued)

4. Tagging Field Switches with No Handle. SEE [TD-2700P-07, "Tags"](#), section 14.

MARK field switches with no handle by either of the following methods:

- a. PLACE the tag on the side of the pole from which the switch number can be read most easily or on the side of the pole ordinarily climbed.
 - On wood poles, HANG the appropriate tag from a nail, approximately 8 ft. above ground-level.
 - On non-wood poles, ATTACH the tag to a step or to another readily visible location on the pole.
 - b. INSTALL a Marshall tagging device in the upper hook of the toggle-style mechanism with a tag attached.
5. Tagging live-front underground equipment. SEE [TD-2700P-07, "Tags"](#), section 15.
 - a. ATTACH MOL tag(s) to the interphase barrier(s). REFER to [TD-2303P-01, "Operating Procedures for Primary Underground Separable Terminations"](#).
 6. Tagging dead-front underground equipment, (Load-Break & Dead-Break). [TD-2700P-07, "Tags"](#), Section 15.
 - a. ATTACH MOL tag(s) to the test-plug elbows. REFER to [TD-2303P-01](#).

5.5 Alternate Tagging Options for Electric Distribution Line Equipment Controls

For some equipment controls, placing tags on toggles switches (which is currently required) may lead to the toggle position being inadvertently changed. This may be caused by strong winds or when the door to the control is closed.

1. The following alternate tag placement options (in order of preference) should be utilized for equipment controls only. SEE [Figure 16](#) on Page 23.
 - a. **Option 1:** PLACE tag on toggle switch (unless there is a possibility of the switch being inadvertently moved).
 - b. **Option 2:** PLACE tag inside of the control cabinet.
 - Tags may be attached to the front panel of the control using existing internal bracketry, binder clip or manufacturer's installed tagging clips.

Distribution Switching Procedures

5.5 (continued)

- c. **Option 3:** ATTACH tag to external latches or locks.
- When tag must be placed outside of the control cabinet, take measures to ensure the information on the tag will not deteriorate due to weather.
 - ENSURE all-weather tags are used in locations exposed to weather.

NOTE

All tags must remain visible when installing multiple tags on/in the same fixture.

2. [Figure 16](#) below provides a visual of alternate tagging option locations for equipment controls.

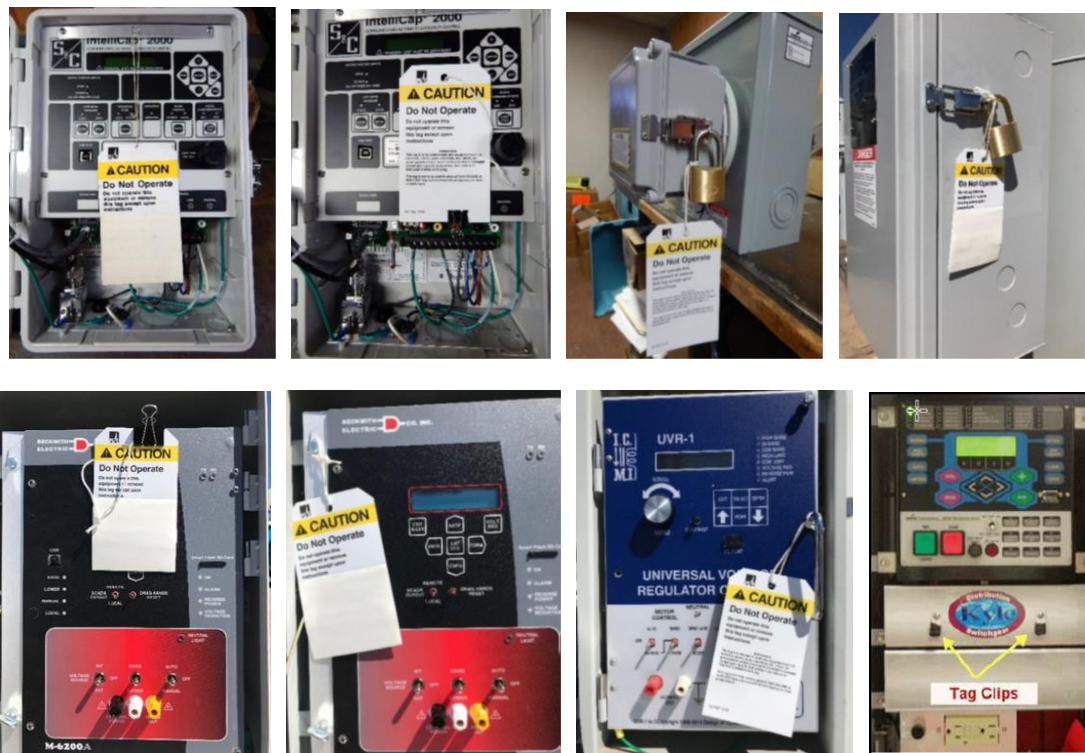


Figure 16. Alternate Tagging Options for Equipment Controls

Distribution Switching Procedures

6 Ensuring Safe Operation Within Designated Ratings

- 6.1 Before opening or closing any switching device, **PERFORM** a thorough visual inspection of the entire unit.



WARNING

DO NOT REOPEN any switching device that is closed into a fault until the circuit's protective devices have opened and de-energized the line.

Except for line reclosers, interrupters, and fuses, Company switching devices do not have fault-interrupting capability. Any attempt to open these devices while fault current is flowing may cause serious injury or equipment damage.

1. IF any of the parts are suspected to be deteriorated or deformed,
THEN DO NOT OPERATE the device.
- 6.2 Loadbreak Capability
1. The loadbreak capability of a device is its ability to interrupt load current. This capability varies greatly, depending on the type of load (e.g. dropping load, separating a loop or parallel).
 2. Switching devices must never be operated beyond their rating. For device ratings, REFER to the following documents:
 - [072160, "Ratings for Underground Switching Devices"](#)
 - [072161, "Ratings for Overhead Switching Devices"](#)
 3. Before opening any device, TAKE one of the following actions to ensure that the amperage on the line does not exceed the load-break rating of the device being operated:
 - TAKE a SCADA load reading.
 - READ the load with a clamp-on ammeter.
 - READ the applicable substation meter.
 - CHECK a Feeder Calculation (FDRCAL) printout. (FDRCAL is an application that calculates feeder and device loading.)
 - CALCULATE the maximum load amperage by totaling the capacities of all the transformers on the line segment being de-energized.



Distribution Switching Procedures

6.2 (continued)

4. When opening any switching device with load-break capability, **PERFORM** the operation without hesitation.
5. **OPEN** the device in a fast, steady, and complete motion to reduce deterioration of the contacts.

IF the arc does not extinguish when an overhead disconnect device is opened fully,
THEN **CLOSE** the device immediately.

6.3 Switching Devices – Class Ratings and Fault-Closing Capability

1. Employees who prepare, direct, or execute switching must understand the physical characteristics and capabilities of each switching device.
2. Switching devices are divided into four class ratings: Class I, Class II, Class III, and Class IV.
 - a. Class I switching devices have fault-close rating capabilities and can be operated to perform the following:
 - Energize and de-energize lines and equipment.
 - Parallel and loop switching.
 - Test lines and equipment that may be faulted, up to the fault-close capability rating of the device.
 - b. Class II switching devices do not have fault-close ratings and can be operated to perform the following:
 - De-energize lines and equipment.
 - Energize lines and equipment that are known to be in a fault-free condition.

NOTE

Lines and equipment are considered to be in a fault-free condition if they have been:

- De-energized by a predetermined switching operation procedure, **and**
- There has been no work performed on the lines or equipment or other changes made (while de-energized) that could cause them to need repair.



Distribution Switching Procedures

6.3 (continued)

- c. Class III switching devices (**load-break separable terminations**) have a one-time fault-close rating intended for the switchman's safety. REFER to [TD-2303P-01, "Operating Procedures for Primary Underground Separable Terminations."](#)

- (1) The number of times load-break elbows can be operated depends on the amount of the current being interrupted.
- (2) Load-break separable terminations can be used to energize new, repaired, or replaced facilities, but must never be used to energize cables and equipment that are known to be in a faulted condition.

IF any of the following conditions exist:

- A load-break separable termination is closed into a fault.
- Any small fire or flash is observed at the end of the load-break bushing insert.
- A load-break elbow is found to have a broken tip on the probe.
- Any other noticeable damage to the ablative material.

THEN INSTALL a Caution tag on the elbow until all the components can be replaced, as described in [TD-2303P-01](#).

- (3) Load-break separable terminations may be used to perform the following tasks:
 - Make or break loads up to 200 amperes (A).
 - Make and break loop currents up to 200 A.
 - Energize facilities that were de-energized for sectionalizing only.
 - Energize new, repaired, or replaced line or equipment (excluding capacitor banks) where load will not exceed 200 A, and the following condition is required:

To operate load-break separable terminations on an energized circuit under any circumstances, the source side protection must be fused or the next upstream protective device must be a fault interrupter (non-reclosing), line recloser, or circuit breaker with the reclosing relay cut out. For the purpose of this document, sectionalizers are not considered protective devices.



Distribution Switching Procedures

6.3 (continued)

- (4) DO NOT USE load-break separable terminations to perform any of the following tasks:
 - Close into or attempt to energize cable or equipment known or suspected to be faulted.
 - Make or break parallel currents.
 - Make or break loop currents that exceed 200 A.
 - Operate any energized equipment for which the available fault duty exceeds 10,000 A.
 - Energize or de-energize facilities where ferroresonance is a concern, without first taking steps to avoid resonance buildup. SEE [051105, "Prevention of Ferroresonance in Distribution Transformer Installations"](#).
 - Energize or de-energize capacitor banks without first taking the capacitor bank off-line. Load-break elbows cannot successfully interrupt capacitor currents.
- d. Class IV switching devices do not have fault-close ratings and must only be used to energize lines and/or equipment known to be in good condition.
 - (1) A Class IV switching device can be used to energize new and/or repaired overhead lines and equipment (excluding capacitor banks), provided the line and/or equipment have been either:
 - Patrolled by a qualified electrical worker and determined to be in good condition before energizing, **or**
 - Closed on a de-energized line and tested with a Class I device.
 - (2) Class IV switching devices must never be used to energize the following:
 - Lines or equipment that were automatically de-energized by a protective device for the purpose of testing.
 - New, repaired, or replaced underground facilities.
 - (3) Underground facilities cannot be visually patrolled to verify that they are in good condition. They must be energized using a Class I or Class III switching device.



Distribution Switching Procedures

7 Jobsite Preparation Before Performing Switching

- 7.1 ENSURE that environmental and/or hazardous conditions are identified, controlled, and resolved, whenever possible.
1. COMMUNICATE any unresolved environmental issues to other switchmen, crew members, and supervisor, as needed.
- 7.2 ORGANIZE the materials and tools needed to perform the switching, including any applicable job aids.
1. ENSURE that all tools are readily available to minimize distractions and interruptions during the switching process.
- 7.3 OBTAIN writing materials (clipboards and pens).
- 7.4 CONSIDER taking the following steps:
- KEEP a spare writing instrument.
 - CARRY a piece of clear plastic to cover the switching log during inclement weather.
 - Completely FILL OUT tags required for switching.
 - PLACE the switching log operation number on each tag for easy reference during switching.
- 7.5 CONDUCT a tailboard/self-tailboard briefing, as applicable. SEE [TD-2024P-01, "Electric Tailboard Briefings."](#)
- 7.6 The switchman must ENSURE understanding of the line configuration and equipment to be operated.
- 7.7 IDENTIFY any persons who may be working near the lines or equipment to be operated, and NOTIFY them of potential impacts that may result from switching.
1. VERIFY that all personnel are "in the clear."
- 7.8 CONFIRM the location and condition of the equipment assigned in the switching log.
1. NOTIFY the Control Center of any conditions that may adversely affect the planned switching.
- 7.9 VERIFY that the device to be operated is equipped to perform the task safely (drop load, separate parallel, loop, etc.). SEE [Section 6, "Ensuring Safe Operation Within Designated Ratings."](#)



Distribution Switching Procedures

8 Obtaining Approval and Sequence of Operations

8.1 OBTAIN approval to perform switching using “Three Way Communication” per [Section 2.2](#) on Page 5.

1. CONTACT the Control Center to obtain approval and instructions for switching.
2. REPEAT BACK the instructions issued by the Control Center.
3. RECEIVE acknowledgment from the Control Center that the instructions are correct.

8.2 Proper Sequence of Switching Operations

1. The switchman must EXECUTE the operations in the order given by the Control Center operator.
2. The following switching operations must not be issued or performed “upon arrival:”
 - Making and breaking loops and parallels.
 - Energizing or de-energizing.

9 Field Switching Requirements

9.1 Locking Switches and Apparatus

1. SECURE field switches/apparatus in the open or closed position with an approved locking device, when applicable.

EXCEPTIONS :

- The operating handle of Inertia Hook Stick operated air switches are not accessible to the public and do not require a locking device to be installed.
- The operating device of subway/subsurface/pad-mounted switches that are behind bolted lids, below manhole covers, or locked compartment doors are not accessible to the public and do not require a locking device to be installed.

9.2 Checking Visible Contacts

1. Before opening, VISUALLY CONFIRM that all contacts are fully closed and all load-break attachments, if present, are fully engaged and appear to be in proper working condition.
2. After opening any device, VISUALLY CONFIRM that the device is fully open and all load-break attachments, if present, have fully separated and are in proper working condition.

Distribution Switching Procedures

9.2 (continued)

3. Before closing, VISUALLY CONFIRM that there are no obstructions that would prevent the device from fully closing.
4. After closing any device, CHECK that all contacts are fully closed and latched, and CHECK that load break attachments are completely engaged, if present.

9.3 Checking Non-Visible Contacts

1. CONFIRM that equipment is open or closed by observing the semaphore position and indicating lights (if available), or by checking the position indicator, if the equipment does not have visible contacts.

9.4 Field Operation of Disconnects or Switches on Remote Controlled Equipment

1. ENSURE that the equipment is on local control before operating manual disconnects or switches associated with remotely controlled equipment.

9.5 Pole-Mounted Controls



WARNING

Vehicle tires are conductive; standing on a vehicle while performing electrical work greatly increases the step and touch potential. Standing on equipment not designed for this purpose poses a risk of falling.

1. DO NOT STAND on vehicles while performing overhead work.
2. DO NOT USE ladders when it is raining or in wet conditions where rivulets of water may form on the rungs or rails. Even fiberglass ladders do not provide an adequate insulated working surface when they are visibly wet.
3. To access pole-mounted controls for local operation, PERFORM one of the following:
 - STAND on a Company-approved fiberglass ladder.
 - CLIMB the pole in accordance with approved pole climbing procedures.
 - USE an approved insulated aerial lift device.

10 Re-Fusing Overhead Distribution Fused Radial and Tap Lines (SEE [Appendix B](#) on Page 53)

Section 10 applies to overhead fused radial and tap lines only. PERFORM all other testing and sectionalizing of circuits following the requirements in [TD-2700P-11, "Testing and Sectionalizing Distribution Equipment"](#)



Distribution Switching Procedures

- 10.1 IF local conditions make it possible to evaluate the outage completely and determine independently that it is safe to re-fuse and test,

THEN switchmen, using their training, experience, and good judgment, may RE-FUSE and CLOSE the fuses one time to test and restore service without contacting the Control Center in advance.

Under these circumstances, the switchman MUST:

1. USE the Field Automation System/Mobile Application (FAS/MA) to report that they are onsite, and they will make required reports as described in the Electric Outage Dispatch Process.
2. USE FAS/MA to verify the blown fuses are the ones identified on the Outage Information System (OIS)/FAS outage order.

IF there is no OIS/FAS outage order for this trouble,

THEN REPORT the outage to the Control Center and REQUEST instructions.

3. VERIFY that the outage is on an overhead fused radial or tap line.

IF primary underground equipment is present in the faulted line segment OR if a generator is attached to the primary,

THEN CONTACT the Control Center for troubleshooting directions.

NOTE

The patrol must take into consideration all the relevant conditions that exist at the time, (e.g., fire index, hazards, clearances). For detailed information about replacing fuses in hazardous fire areas, SEE [TD-1464S, "Preventing and Mitigating Fires While Performing PG&E Work"](#), [TD-1464P-01, "Fire Index Patrol and Non-Reclose Procedure"](#) and [PSPS-1000P-01, "Public Power Safety Shut-off for Electric Transmission and Distribution"](#)

4. Thoroughly PATROL the line and ENSURE that the line is safe to test/energize.

IF an extended patrol will delay restoration,

THEN CONTACT the Control Center to report conditions and receive instructions.



Distribution Switching Procedures

10.1 (continued)

NOTE

Switchmen are not authorized to open primary devices to isolate trouble without first contacting the Control Center, except if single phasing is present or as stated in [TD-2700P-10 "Electric System Emergency Response Protocol"](#), Section 1 to protect life or property during emergencies.

IF single phasing is present (for example, a single 12-kilovolt [kV] fuse blown on a three-phase, three-wire circuit),

THEN OPEN the remaining fuses and/or TAKE other steps to mitigate the impact of this condition before performing a patrol.

5. NOTIFY the Control Center having jurisdiction of the time the remaining fuses were opened to stop single phasing before leaving this case of trouble.
6. VERIFY that closing the fuses will not energize up to a clearance limit.
7. REPLACE blown fuse(s), and CLOSE one time for a test.
8. CALL the Control Center, and VERIFY the required fuse size under either of the following circumstances:
 - The cause of the trouble is unknown, and overload is suspected.
 - The correct fuse size is in question.
9. CONTACT the Control Center and REPORT the results of the test.
 - a. For a good test, REPORT the following information:
 - The time power was restored.
 - The number of fuses replaced.
 - The size/type of fuse(s) installed.
 - The time the fuses were opened to stop single-phasing.

IF the cause of the trouble is unknown or if the correct fuse size is in question, after power is restored,

THEN the switchman must read and report the load.

Distribution Switching Procedures

10.1 (continued)

b. For a bad test, REPORT the following information:

- The time the fuses were closed.
- The results of the test. (i.e., Closed NG).

Coordinate a troubleshooting plan with the Control Center.

11 Operating Pad-Mounted Heavy (PMH) Switching Devices

11.1 Overview

1. Single pole operation to de-energize/drop load is **ONLY** allowed when using the approved PMH Remote Operating Tool/S&C FLEXIPULL. SEE Figures [17](#), [18](#), [19](#), and [20](#) below.



Figure 17. PMH Remote Operating Tool, Folded



Figure 18. PMH Remote Operating Tool, Unfolded



Figure 19. PMH Remote Operating Tool, Installed



Figure 20. Fuse Opened with PMH Remote Operating Tool

2. The PMH remote operating tool ensures employee safety in the event of an arc flash during switching operations. The use of this tool allows a Crew/T-man to operate a PMH single pole device to de-energize/drop load without being directly in the danger zone if a failure occurs (e.g., arc flash).

Distribution Switching Procedures

11.1 (continued)

3. For installation instructions, REFER to Job Aid [TD-2908P-01-JA12, "Installing and Operating PMH Remote Operating Tool."](#)

11.2 PPE Requirements

1. The single layer FR (SLFR) protection level, with safety glasses and hard hat, is considered sufficient when using the PMH remote operating tool for single-pole operations to de-energize/drop load.
 - No additional face protection is required, per [TD-2509P-01, "Electric Transmission and Distribution Arc-Flash Hazard Control Procedure."](#)
2. When performing single-pole switching operations on energized PMH style switch gear **WITHOUT** the PMH remote operating tool (e.g. closing single pole device, opening properly bypassed single pole device, or when removing/installing single pole fuse or solid blade), SEE [TD-2509P-01, "Electric Transmission and Distribution Arc-Flash Hazard Control Procedure"](#) for additional PPE requirements.
3. Class II rubber gloves must be worn when using a crank-handle mechanism to operate gang-operated, pad-mounted switches.

11.3 Operating PMH Switch Gear



WARNING

CONSIDER all terminals energized. NEVER LEAVE an energized compartment unattended if any compartment door is open.

If fuses are in the open position, they must be removed prior to closing the compartment door.

1. Restrictions



CAUTION

Using the battery-operated impact tool to open PMH door latch and over-torquing of the mechanism can result in failure to the latch.

- a. DO NOT USE a battery-operated impact tool to open a PMH door latch.
- b. There are no restrictions on the operation of a single-pole device when it is de-energized.



Distribution Switching Procedures

11.3 (continued)

- c. A grapppler tool attached to a 1-¼ inch hot stick must be used when removing or installing a single pole device – fuse or solid blade.
 - d. A 1-¼ inch hot stick with a grapppler tool or shotgun (Grip-All stick) are the approved live-line tools to **close** a single pole device.
 - e. The PMH remote operating tool is **required to open** a single-pole device to de-energize/drop load.
 - f. Separating circuit loops with a single-pole device is allowed when using the PMH remote operating tool.
 - g. Closing a Single Pole device to make circuit loops is allowed.
 - h. Breaking or making parallels with a single pole device is **NOT** allowed.
2. When removing or installing fuse(s)/solid blade(s) with the bottom side of the switch energized:
 - A grapppler tool **must be used**.
 - INSTALL lower barrier (e.g., rubber blanket) prior to fuse(s)/solid blade(s) installation or removal.
3. A **properly bypassed** single-pole device (e.g., PMH 41, 42) may be opened while energized using one of the following tools:
 - The PMH remote operating tool.
 - A 1-¼ inch hot stick with a grapppler tool.
 - Shotgun (Grip-All stick).



Distribution Switching Procedures

11.4 Switching Logs

1. Switching Log Entries for PMH Planned Work

- a. IF field personnel will be directed to perform a single pole operation of pad-mounted heavy (PMH) switch gear to de-energize/drop load,

THEN, the Distribution Operator will write "PMH" on each page in the "Purpose" field after the statement describing the switching log intent (SEE [Figure 21](#) below) and write "PMH" in the "Station or Location" field of a switching log step (SEE [Figure 22](#) below).


 SWITCHING LOG		Switching Log Number: 15-0001234
Page 1 OF 1	ELECTRIC DISTRIBUTION CONTROL CENTER	
Purpose: CLEAR A SECTION OF THE PLEASANT GROVE 1102-PMH		

Figure 21. Switching Log Sample of PMH in "Purpose" Field

OPER NUM	Station or Location	Operation	Apparatus Number	Instructions
1.	FIELD/PMH	OPEN	1234	DE-ENER (or D/LD)

Figure 22. Switching Log Sample of PMH in "Station or Location"

- b. The Distribution Operator will not write "PMH" reminders in switching logs for any reason other than the situation described in [Step 11.4.1a](#) above.
2. The Application for Work (AFW) must include in the "Crew Special Setups" section: "PMH Remote Operating Tool will be used."

11.5 Styles of PMH Switch Gear and Operating Restrictions

1. [Table 2](#) (beginning on page 37) provides brief descriptions of each style of PMH switch gear and their operating restrictions. The PMH Job Aids associated with this procedure provide a detailed description and operating procedures for each style of PMH switch gear.



Distribution Switching Procedures

11.5 (continued)

Table 2. Operating Restrictions for Various Styles of PMH Switch Gear

PMH 3 – Equipped with a Gang Operated switch, no fuses.		
Device Features	What <u>CAN</u> be performed	What <u>CAN'T</u> be performed
Gang Operated Switch	No Operating Restrictions	No Operating Restrictions
PMH 4 – Equipped with single pole fuses and has no bypass capabilities.		
Device Features	What <u>CAN</u> be performed	What <u>CAN'T</u> be performed
Single Pole Fuse device(s), No Bypass capabilities	<p>Close Single Pole Fuse Device to energize, test, or make a loop.</p> <p>Open a Single Pole Fuse Device to de-energize/drop load or separate a loop ONLY when using PMH remote operating tool.</p>	<p>Open a Single Pole Fuse Device to separate a parallel.</p> <p>Close a Single Pole Fuse Device to make a parallel.</p>
PMH 5 – Equipped with single pole fuses and a Gang Operated switch.		
Device Features	What <u>CAN</u> be performed	What <u>CAN'T</u> be performed
One Gang Operated Switch and three Single Pole Fuse devices	<p>Use the Gang Operated Switch to energize/de-energize (pick-up/drop load), test, or make/break a circuit loop or parallel.</p> <p>Close the Single Pole Fuse device to energize, test, or make a loop.</p> <p>Open a Single Pole Fuse Device to de-energize/drop load or separate a loop ONLY when using PMH remote operating tool.</p>	<p>Open a Single Pole Fuse Device to separate a parallel.</p> <p>Close a Single Pole Fuse Device to make a parallel.</p>
PMH 6 – Equipped with single pole fuses and two Gang Operated switches.		
Device Features	What <u>CAN</u> be performed	What <u>CAN'T</u> be performed
Two Gang Operated Switches and three Single Pole Fuse Devices	<p>Use the Gang Operated Switch(s) to energize/de-energize (pick-up/drop load), test, or make/break a circuit loop or parallel.</p> <p>Close the Single Pole Fuse device to energize, test, or make a loop.</p> <p>Open a Single Pole Fuse Device to de-energize/drop load or separate a loop ONLY when using PMH remote operating tool.</p>	<p>Open a Single Pole Fuse Device to separate a parallel.</p> <p>Close a Single Pole Fuse Device to make a parallel.</p>



Distribution Switching Procedures

11.5 (continued)

Table 2. Operating Restrictions for Various Styles of PMH Switch Gear, continued

PMH 9 – Equipped with single pole fuses and two Gang Operated switches.		
Device Features	What <u>CAN</u> be performed	What <u>CAN'T</u> be performed
Two Gang Operated Switches and six Single Pole Fuse Devices	<p>Use the Gang Operated Switch(s) to energize/de-energize (pick-up/drop load) or make/break a circuit loop or parallel.</p> <p>Close the Single Pole Fuse device to energize, test, or make a loop.</p> <p>Open a Single Pole Fuse Device to de-energize/drop load or separate a loop ONLY when using PMH remote operating tool.</p>	<p>Open a Single Pole Fuse Device to separate a parallel.</p> <p>Close a Single Pole Fuse Device to make a parallel.</p>
PMH 11 – Equipped with single pole fuses and three Gang Operated switches.		
Device Feature	What <u>CAN</u> be performed	What <u>CAN'T</u> be performed
Three Gang Operated Switches and Three Single Pole Fuse Devices	<p>Use the Gang Operated Switch(s) to energize/de-energize (pick-up/drop load) or make/break a circuit loop or parallel.</p> <p>Close the Single Pole Fuse device to energize, test, or make a loop.</p> <p>Open a Single Pole Fuse Device to de-energize/drop load or separate a loop ONLY when using PMH remote operating tool.</p>	<p>Open a Single Pole Fuse Device to separate a parallel.</p> <p>Close a Single Pole Fuse Device to make a parallel.</p>
PMH 41 – Equipped with one fuse and one solid blade (SB) bypass.		
Device Features	What <u>CAN</u> be performed	What <u>CAN'T</u> be performed
One Single Pole Fuse Device and One Single Pole Bypass Solid Blade Device	<p>Close the Single Pole SB Bypass device to change fuse size or to bypass fuse for circuit loop switching.</p> <p>Close the Single Pole Fuse device to energize, test, or make a loop.</p> <p>Open a Single Pole Fuse Device or Single Pole SB to de-energize/drop load or separate a loop ONLY when using PMH remote operating tool.</p>	<p>Open the Single Pole Fuse or Single Pole SB Bypass Device to separate a parallel.</p> <p>Close the Single Pole Fuse or Single Pole SB Bypass Device to make a parallel.</p> <p>Close Solid Blade to test.</p>



Distribution Switching Procedures

11.5 (continued)

Table 2. Operating Restrictions for Various Styles of PMH Switch Gear, continued

PMH 42 – Equipped with two fuses and two solid blade (SB) bypasses.		
Device Features	What <u>CAN</u> be performed	What <u>CAN'T</u> be performed
Two Single Pole Fuses and Two Single Pole Solid Blade Bypass Devices	<p>Close Single Pole SB Bypass device(s) to change fuse size or to bypass fuse(s) for circuit loop switching</p> <p>Close the Single Pole Fuse device(s) to energize, test, or make a loop.</p> <p>Open the Single Pole Fuse Device(s) or Single Pole SB to de-energize/drop load or separate a loop ONLY when using PMH remote operating tool.</p>	<p>Open the Single Pole Fuse(s) or Single Pole SB Bypass Device to separate a parallel.</p> <p>Close the Single Pole Fuse(s) or Single Pole SB Bypass Device to make a parallel.</p> <p>Close Solid Blade to test.</p>
PMH 43 – Equipped with single pole fuses and a Gang Operated fuse bypass switch.		
Device Features	What <u>CAN</u> be performed	What <u>CAN'T</u> be performed
One Gang Operated Fuse Bypass Switch and three Single Pole Fuse Devices	<p>Utilize the Gang Operated Fuse Bypass Switch to:</p> <ul style="list-style-type: none"> De-energize the load (fused) side of the PMH (Close bypass, Open fuses, Open bypass). Separate a circuit loop or parallel (Close bypass, Open fuses, Open bypass) <p>Close the Single Pole Fuse device(s) to energize, test, or make a loop.</p> <p>Open the Single Pole Fuse Device(s) to de-energize/drop load or separate a loop ONLY when using PMH remote operating tool.</p>	<p>Open the Single Pole Fuse(s) to separate a parallel.</p> <p>Close the Single Pole Fuse(s) to make a parallel.</p>

11.6 Ordering Information

- Order through **SAP** as a Coded Material.
 - PMH Remote Operating Tool/FLEXIPULL and Carrying Case: M206521.
 - PMH Remote Operating Tool/FLEXIPULL Carrying Case only: M206522.



Distribution Switching Procedures

12 Requirements for Operating Sub-Surface and Pad-Mounted Oil-Filled Equipment

12.1 CONSIDER the use of a non-test.

12.2 Before operating, INSPECT the physical condition of the switch and associated connections.

1. CHECK the enclosure and the tank of the switch for any sign of oil leaking.

a. CHECK for deteriorating laminated steel.

b. CHECK for any sign of a swollen tank.

IF there is any evidence of deterioration or signs of a swollen tank,
THEN, DO NOT OPERATE.

2. CHECK oil level indicator.

- IF there is no oil level indicator,

THEN carefully INSPECT the exterior for evidence of leakage.

- IF there is any evidence of oil leakage,

THEN DO NOT OPERATE.

- OTHERWISE, IF there is no evidence of oil leakage,

THEN PROCEED with switching.

12.3 During switching operations, AVOID leaning directly over the top of the equipment.

12.4 CONSIDER the use of toggle style live line tool (Hot Stick).



Distribution Switching Procedures

13 Requirements for Operating Load-Break Oil Rotary (LBOR) Switches without Oil-Level Indicating Sight Glasses

13.1 Restrictions

1. DO NOT OPERATE LBORs without sight glasses, unless by use of the remote operator or when de-energized. SEE [Job Aid TD-2908P-01-JA280, "Trayer Remote Operator for Load Break Oil Rotary \(LBOR\) Switches."](#) for installation and operating instructions.
 - This remote operator can be used to operate LBORs with or without sight glasses.
 - It can also be used to operate any other subsurface rotary top-operable switch, e.g., underground commercial distribution (UCD) transformer.
2. When operating LBORs without sight glasses, PERFORM a "before" and "after" infrared camera reading to determine temperature change after operating the switch, which may indicate low level arcing in the tank. SEE [Section 13.3](#) on Page 42.

13.2 Pre-operation Requirements

1. Before the operation of an oil-filled primary device, carefully INSPECT the device and PERFORM a work area sight inspection to include the enclosure, and the area near the device for any indication of leaking oil. TAKE NOTICE of any of the following:
 - Aroma from the enclosure of mineral oil.
 - Noticeable smell, similar to burned cables or connectors.
 - Presence of oil in the enclosure, such as oily dirt, stains, or an oil sheen on standing water.
 - Substantial rust or corrosion on the exterior of the device, with the possible presence of holes and seeping oil.



WARNING

If an oil leak is found while conducting the work area sight inspection **the switch must not be operated.**

2. IF an oil leak is found while conducting the work area sight inspection, THEN PERFORM the following actions:
 - a. CONTACT the Distribution Control Center and the person in charge (PIC).
 - b. TAG the device non-operational.



Distribution Switching Procedures

13.3 Operation

1. SET UP barricades, as required.
2. IF the LBOR does not have a sight glass,

THEN PERFORM the following steps:

- a. USE an approved IR camera to take a measurement of the temperature of the LBOR, as described in [TD-2022P-01, "Infrared \(IR\) Inspection of Electric Distribution Facilities," Section 3.1](#) and NOTE this value/image.
 - (1) SELECT a spot on the lid of the LBOR near the operating handle as a reference point.
 - (2) ENSURE the temperature does not exceed the accepted values listed in [Table 3](#) below.

Table 3. Maximum Allowable Temperatures of LBORs

Reading	Time Elapsed (min)	Max Temperature
Pre-operation	< 0	185°F (85°C)
1 st after Operation	2	Pre-operation Temp + 45°F (25°C) OR Maximum of 185°F (85°C)
2 nd after Operation	5	Pre-operation Temp + 45°F (25°C) OR Maximum of 185°F (85°C)

- b. USE the Remote Operator, as described in [Job Aid TD-2908P-01-JA280, "Trayer Remote Operator for Load Break Oil Rotary \(LBOR\) Switches,"](#) to operate the switch.
- c. LISTEN for any audible signs of arcing.

IF any signs of arcing are detected,

THEN DE-ENERGIZE switch immediately – remotely or via a fault interrupting device (such as the station breaker or recloser), if possible and STAND CLEAR.

OTHERWISE, IF no audible signs of arcing are heard,

THEN KEEP the area clear and TAKE **two** additional measurements using the IR camera to compare the temperature of the same LBOR reference point from the same angle to the previously taken reading, as shown in the [Table 3](#) above.



Distribution Switching Procedures

13.3 (continued)

- (1) IF for any of the three readings the temperature is exceeded,
THEN PERFORM the following actions:
 - STOP the procedure.
 - MAKE the area safe.
 - NOTIFY the Control Center that the switch should be de-energized.
- (2) IF after 5 minutes, the temperature is beneath the maximums,
THEN the operation is complete.

END of Instructions

DEFINITIONS

Air switch attachments: Air switches may be equipped with various types and combinations of attachments to increase their current-interrupting capabilities and to reduce burning their main contacts, including:

- Quick-breaks and arcing horns: Increase the contact parting speed for faster current interruption or transfer the final break to an area other than the main contacts.
- Hooded quick-breaks: Are attached to distribution air switches and consist of a combination of whiskers enclosed in an arc-quenching hood.
- Enclosed Interrupters: Used to break load current in an enclosed medium, including S&C Omni-Rupter, Cooper Reliabreak, and S&C SCADA-Mate interrupters.

Automated switches: Any line-switching device that does not require personnel to be present to operate it. Some automated switches are monitored and operated remotely by system operators at the Control Center. Automated switches include SCADA- and Primary Distribution Alarm and Control (PDAC)-controlled devices, such as reclosers, sectionalizers, and interrupters containing stored energy operators (SEOs) or motor switch operators (MSOs) that provide the power to move switch contacts.

Class I switching devices: Devices that can be closed safely to test lines and equipment that may be faulted. Some Class I switching devices are equipped with make and latch capabilities. Fused cutouts and overhead switches require manual closure. Always close these devices quickly and with complete follow through.



Distribution Switching Procedures

DEFINITIONS (continued)

Class II switching devices: Devices that have no fault-close capability ratings. Must be used only to energize lines and equipment known to be in a fault-free condition.

NOTE

A circuit or portion of a circuit is considered to be in a fault-free condition if it has been de-energized previously by a predetermined switching procedure and there has been no work performed on it or other changes made while it was de-energized.

Class III switching devices: Devices that have a one-time fault-close rating. May be used to energize new, repaired, or replaced facilities, but must never be used to energize cables and equipment known to be in a faulted condition. If a fault closure occurs, the device is damaged and cannot be used again. In this case, the elbow, pin, and insert must be replaced.

Class IV switching devices: Devices (e.g. load pick-up jumpers) that have no fault-close rating. Must never be used to energize lines and/or equipment de-energized automatically by a protective device. Use these switching devices only to energize lines and/or equipment in good condition.

Critical Step: A switching step to open or close a device (routinely operated in excess of 600 volts [V], phase-to-phase), whether energized or de-energized. These steps, if performed improperly, can cause irreversible consequences by placing personnel at risk, potentially damaging equipment, or significantly impacting the safe and reliable operation of the electric system.

Field Automation System/Mobile Application (FAS/MA): A computer-based program that dispatches work to the field.

Fused tap or fused radial: A section of primary circuit protected by fuses with no alternate feed and only one source.

Radial: A section of primary circuit that may have multiple numbered sectionalizing devices or multiple hard taps, only one source, and no alternate feed.

Tap line: A section of primary circuit that begins at a sectionalizing point (switch, fuse, jumpers, line openers, etc.) and has no other sectionalizing points to the end of the line. A tap line has only one source with no alternate feed.

IMPLEMENTATION RESPONSIBILITIES

The superintendents/managers in charge of the following personnel must communicate this procedure with all affected employees:

- Maintenance and construction (M&C)
- Restoration
- Engineering and operations (E&O)



Distribution Switching Procedures

GOVERNING DOCUMENT

NA

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:

[Code of Safe Practices \(CSP\)](#)

Company Forms:

- Form 62-3487, "Switching Log" (SEE TD-2700P-04, Attachment 1, Page 5, Exhibit A 1)
- Form 64-4118-9-63, "Switching Tag" (SEE TD-2700P-04, Attachment 1, Page 6, Exhibit A 2)

Numbered Documents:

- [051105, "Prevention of Ferroresonance in Distribution Transformer Installations"](#)
- [072160, "Ratings for Underground Switching Devices"](#)
- [072161, "Ratings for Overhead Switching Devices"](#)

Utility Procedures:

- [PSPS-1000P-01, "Public Power Safety Shut-off for Electric Transmission and Distribution"](#)
- [TD-1464P-01, "Fire Index Patrol and Non-Reclose Procedure"](#)



Distribution Switching Procedures

REFERENCE DOCUMENTS (continued)

- [TD-2042P-01, "Safety Pole Wraps"](#)
- [TD-2303P-01, "Operating Procedures for Primary Underground Separable Terminations"](#)
- [TD-2509P-01, "Electric Transmission and Distribution Arc-Flash Hazard Control Procedure"](#)
- [TD-2700P-02, "Electric Distribution Centers and General Operation"](#)
- [TD-2700P-03, "Clearances and Non-Tests"](#)
- [TD-2700P-04, "Processing Applications for Work and Switching Logs"](#)
- [TD-2700P-06, "Distribution Switching"](#)
- [TD-2700P-07, "Tags"](#)
 - [Attachment 1, "Graphics"](#)
- [TD-2700P-10 "Electric System Emergency Response Protocol"](#)
- [TD-2700P-11, "Testing and Sectionalizing Distribution Equipment"](#)
- [TD-3320P-01, Electric T&D Confined Space Work Procedures](#)

Utility Standards:

- [SAFE-1001S, "PG&E Injury & Illness Prevention Plan \(IIPP\)"](#)
- [TD-1464S, "Preventing and Mitigating Fires While Performing PG&E Work"](#)
- [TD-2700S, "Electric Distribution General Operating, Clearance, and Non-Test Instructions"](#)

[Electric Distribution Field Switching Manual](#) (TD-2908M)

[DOT Webpage](#)

Supplemental References:

- [TD-2022P-01, "Infrared \(IR\) Inspection of Electric Distribution Facilities"](#)
- [TD-2888B-110, "Thermal Imaging Devices for Infrequent Users"](#)
- [TD-2024P-01, "Electric Tailboard Briefings"](#)



Distribution Switching Procedures

REFERENCE DOCUMENTS (continued)

- [TD-2404P-01, "Working Near Underground Electric Distribution Cables and Field Repair of Electric Distribution Line Equipment"](#)

APPENDICES

[Appendix A, "Human Performance Error Prevention Tools"](#)

[Appendix B, "Re-Fusing Overhead Distribution Fused Radial and Tap Lines"](#)

ATTACHMENTS

NA

DOCUMENT REVISION

Utility Procedure TD-2908P-01, "Distribution Switching Procedures," Rev. 3, dated 02/15/2017.

The following bulletins are available "For Reference Only" (FRO):

- TD-2908B-002, "Ratings Information for Overhead and Underground Distribution Switching Equipment," Rev. 2, dated 01/15/2013
- TD-2908B-005, "Operating Procedures for Pad Mounted Heavy (PMH) Switch Gear" Rev 1, dated 06/30/2016
- TD-2908B-008, "Load-Break Oil Rotary (LBOR) Switch Operating Procedure," dated 08/15/2018
- TD-2908B-009, "Alternate Tagging Options for Electric Distribution Line Equipment Controls", dated 11/15/2018

DOCUMENT APPROVER

_____, Manager

DOCUMENT OWNER

_____, Manager

DOCUMENT CONTACT

_____, Distribution Specialist

_____, Distribution Specialist

_____, Distribution Specialist



Distribution Switching Procedures

REVISION NOTES

Where?	What Changed?
Before You Start	Added instructions for jobsite tailboard briefing, infrared safety inspection, and additional arc-flash hazard face protection.
Section 2.4	Step 1, "Note" removed reference to critical step to align with TD-2700P-06.
Section 3	Added new Section 3, "Switching Logs for Distribution Field Switching." It includes guidance for using approved switching log and switching tag, added new figures. Aligns with TD-2700P-04. Previous section 3, "Placekeeping" was revised and relocated to Section 3.4
Section 4	Added new Section 4, "Using Switching Job aids" – this information was formally located in Section 1.3
Section 4.7 - Table 1	Removed the critical step information from Table 1 to align with TD-2700P-04
Section 5.1	Updated "Tagging" section to incorporate the information formally in TD-2908B-009 and to align with recent changes to TD-2700P-07.
Section 5.3	Added new section "Tag Types" and re-organized content. Removed reference to nail the tag to each pole.
Section 5.4	Added additional content regarding tagging specific types of equipment.
Section 5.5	Incorporated the information from Utility Bulletin TD-2908B-009 into Section 5.5, "Alternate Tagging Options for Electric Distribution Line Equipment Controls" and added Figure providing illustrations of alternate tagging options on OH equipment controls.
Section 6.3	Updated content for Class III devices.
Section 8.1	Removed the requirement that critical steps contained in SJA's be written in the switching log, and reported using 3-way communication to align with last revision of TD-2700P-04.
Section 8.2	Step 2, removed reference to critical step.
Section 10	Reorganized section content for clarity and flow.
Section 11	Incorporated content from TD-2908B-005, "Operating Procedures for Pad Mounted Heavy (PMH) Switch Gear."
Section 13	Updated to reflect changes communicated in Utility Bulletin TD-2908B-008, "Load-Break Oil Rotary (LBOR) Switch Operating Procedure."
Compliance Requirement / Regulatory Commitment	Added Records and Information Management instructions.
Reference Documents	Added additional Fire and PSPS procedure references.

Distribution Switching Procedures

Appendix A, Human Performance Error Prevention Tools

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Two Minute Rule

The key objective of this tool is to improve a person(s) situational awareness when first arriving at the jobsite, or when conditions or job scope has changed. A carefully performed two-minute rule review will take as much time as needed to help a person(s) to develop an accurate understanding of critical indicators and the work environment.


Situational Awareness

Situational awareness is the accuracy of a person(s)' current knowledge and understanding of the task at hand and related working conditions compared to actual conditions at a given time. Situational awareness demands that the individual(s) clearly understand the job requirements, the equipment conditions, and the work environment before acting.

Questioning Attitude

A questioning attitude fosters situational awareness, promotes a preference for facts over assumption and opinion, and encourages thought about safety before action is taken. Without sufficient facts or verification, the performer or an observer stops the activity to address unexpected work situations that could lead to either a serious mistake or a significant event. Ask why? What if?


Three Steps to a Questioning Attitude



- 1. Knowledge and Understanding**

What are we doing? Why are we doing it? What can affect it? Previous problems?	Who are the players? What are their roles? What is my part? What could go wrong?
---	---
- 2. Observing and Listening**

Look for Danger Signs in others: <ul style="list-style-type: none"> • Not engaged • Overconfident • Impatient 	Look for Danger Signs in yourself: <ul style="list-style-type: none"> • Confusion • Nagging Doubts • Uncertainty 	Listen for Danger Words: <ul style="list-style-type: none"> • "Probably" • "I Think..." • "I'm not sure..."
---	--	---
- 3. Verifying and Resolving**

If you identify a Danger Sign or Words, ask questions!	
Is the basis for your decision a fact or an assumption?	
Questions must be resolved and verified by facts.	

Your Questioning Attitude will help to identify Assumptions and verify Facts



Distribution Switching Procedures

Appendix A, Human Performance Error Prevention Tools

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STOP When Unsure

When confronted with confusion or uncertainty, a person is in unfamiliar territory. Given that the chance for error is particularly high in such situations, the best course of action, when unsure, is to STOP and GET HELP from other people.

Self-Checking (STAR)

(STOP, THINK, ACT, REVIEW) – Self-checking helps the performer focus attention on the appropriate component, think about the intended actions, understand the expected outcome before action is taken, and verify the results after the action. When used rigorously, self-checking boosts attention and thinking just before physical actions are performed.

Tailboards and Task Preview

Prepares workers to perform the job right, the first time. A tailboard involves having a conversation among all participants about what is to be accomplished and what is to be avoided regarding a specific task before performing it:

- Identify tasks
- Identify and address hazards

IDENTIFY AND ADDRESS related safety precautions.

Steps to Perform a Task Preview are S.A.F.E.R.

1. **SUMMARIZE** the critical steps.
2. **ANTICIPATE** errors for each critical step and relevant error precursors.
3. **FORESEE** probable worst-case consequences should an error occur during each critical step.
4. **EVALUATE** controls or contingencies at each critical step to prevent, catch and recover from errors, and to reduce their consequences.
5. **REVIEW** previous experience and lessons learned relevant to the specific task and critical steps.

Three-Way Communication

Three-way communication promotes a reliable transfer of information and understanding, with the goal of helping to assure the correct action, State, Repeat, Confirm. When using Three-Way communication as a speaker, ENUNCIATE. The listener will restate or paraphrase his understanding of the message and repeat it back to the speaker for verification. The speaker acknowledges that what you heard and restated is correct.

- The speaker states a message.
- The listener repeats back the message for verification of understanding.
- The speaker confirms and acknowledges what you heard is correct.

Distribution Switching Procedures

Appendix A, Human Performance Error Prevention Tools

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Phonetic Alphabet: USE the phonetic alphabet for communicating alphanumeric information.

PHONETIC ALPHABET	
Alpha	November
Bravo	Oscar
Charlie	Papa
Delta	Quebec
Echo	Romeo
Foxtrot	Sierra
Golf	Tango
Hotel	Uniform
India	Victor
Juliet	Whiskey
Kilo	X-ray
Lima	Yankee
Mike	Zulu

Procedure Use and Adherence

Understanding the overall purpose and strategy of approved procedures promotes a safe, reliable outcome. Adhering to approved procedures helps to dispel doubt and provides clarification regarding questions in the execution of various tasks and duties.

Placekeeping

Placekeeping is used when performing switching operations. SEE [Section 3.4, "Placekeeping."](#) on Page 11, for detailed information.

How to Do Placekeeping:

1. WRITE current time in Time Given column of switching log.
2. WRITE switchman's name in the Executed By Person column of switching log.
3. CIRCLE switching operation number to be performed.
4. When switching operation is completed, ENTER time and slash through the circle.

Distribution Switching Procedures

Appendix A, Human Performance Error Prevention Tools

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Safe Switching Triangle (SEE [Figure 1](#) below)

The safe switching triangle is a simplified way to remember what to do before operating a switch or apparatus.

1. READ the operations on the switching log or Standard Switching Program.
2. FIND the correct switch or apparatus.
3. Once again, VALIDATE the switch or apparatus is correct, per the switching log or Standard Switching Program.

Upon completion of these tasks ([Steps 1 through 3](#) above), PERFORM the switching operation.

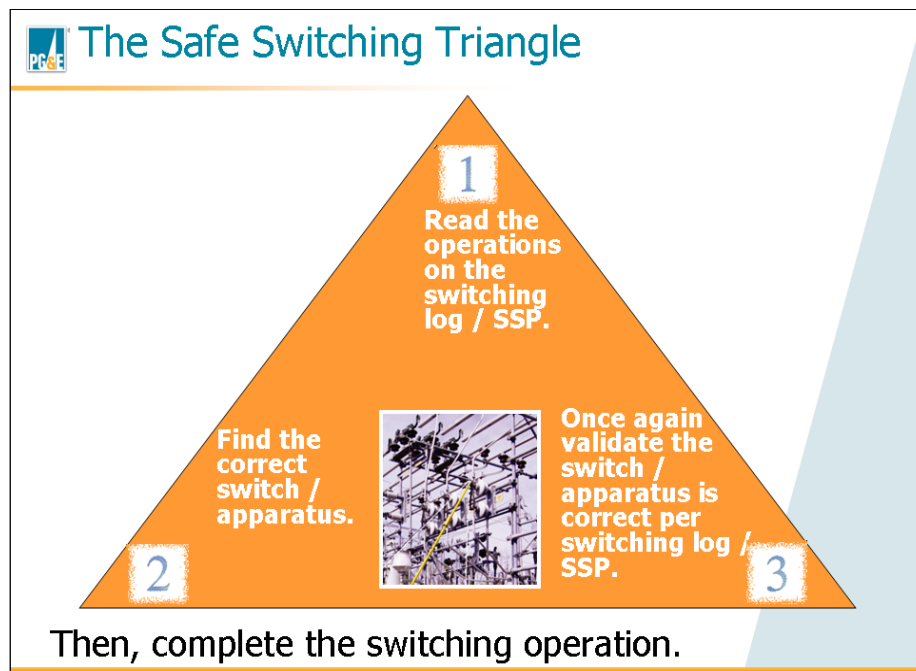


Figure 1 – Safe Switching Triangle

Distribution Switching Procedures

Appendix B, Re-Fusing Overhead Distribution Fused Radial and Tap Lines

Page 1 of 2

A. Examples

EXAMINE [Figure 1](#) below. The diagram indicates six work locations on two circuits by case number. The corresponding case numbers in the chart following the diagram specify the appropriate action to take for each case.

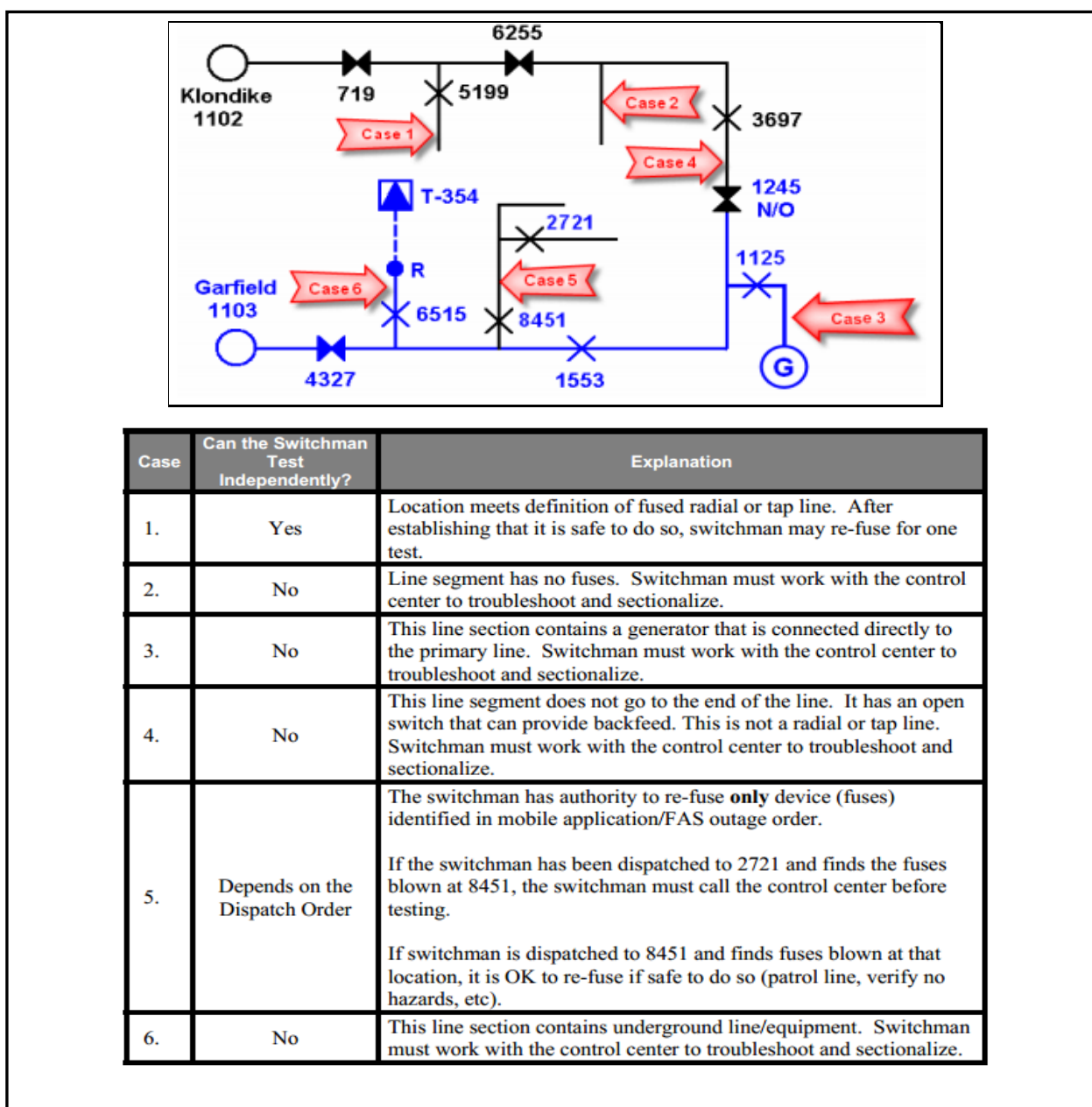


Figure 1. Re-Fusing Overhead Distribution Fused Radial and Tap Lines – Examples

Distribution Switching Procedures

Appendix B, Re-Fusing Overhead Distribution Fused Radial and Tap Lines

Page 2 of 2

B. Definitions:

The following definitions apply when performing the procedures in this appendix:

- **Overhead fused tap or fused radial:** A section of overhead primary circuit protected by fuses with no alternate feed. Overhead fused tap or fused radials have only one source.
- **Overhead tap line:** A section of overhead primary circuit that begins at a sectionalizing point (switch, fuse, jumpers, line openers, etc.) and has no other sectionalizing points to the end of the line. Overhead tap lines have only one source with no alternate feed.
- **Overhead radial:** A section of overhead primary circuit that may have multiple numbered sectionalizing devices or multiple hard taps. Overhead radials have only one source with no alternate feed.

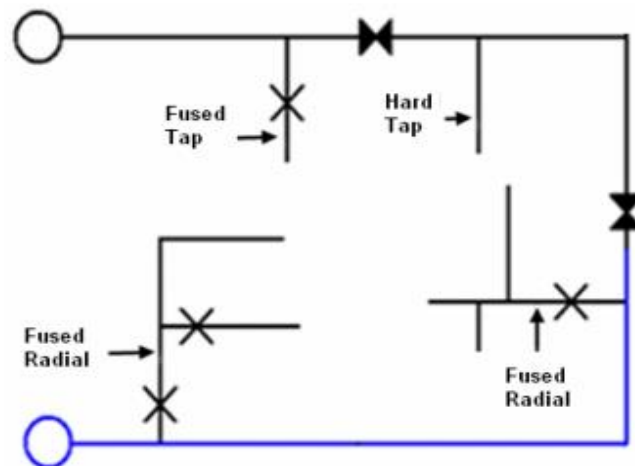


Figure 2. Overhead Radial and Tap Lines – Examples

Exhibit LL-2



Electric Distribution General Operating, Clearance, and Non-Test Instructions

SUMMARY

This utility standard establishes Pacific Gas and Electric Company (Company) responsibilities, distribution operating requirements, and instructions for authorized, qualified personnel involved in the operation, maintenance, and construction of its electric distribution system.

TARGET AUDIENCE

The instructions in this standard apply to authorized and qualified personnel who operate or work on or near Company-owned distribution electric lines and associated equipment.

TABLE OF CONTENTS

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REQUIREMENTS

1 General Operation

1.1 Operating the Distribution System

1. Electric distribution system operators are responsible for operating the electric distribution system for their assigned area of responsibility (AOR) as indicted in the jurisdiction letters.

1.2 Operating the Transmission and Generation Systems

1. The California Independent System Operator (CAISO) has the overall responsibility for managing the operation of the electric grid for about 80% of California, which encompasses all the investor-owned utilities territories and some municipal utility service areas. CAISO is the designated Balancing Authority for all participants.
2. System dispatch personnel, under the direction of CAISO, monitor and operate the Company's electric transmission system, serve as the single point of contact, and coordinate emergency responses with CAISO. See [Utility Standard TD-1400S, "Electric Transmission Operations,"](#) for system dispatch responsibilities.
3. Electric transmission operators are responsible for operating the electric transmission system for their assigned AOR under the direction of system dispatch personnel.



Electric Distribution General Operating, Clearance, and Non-Test Instructions

1.2 (continued)

4. Energy procurement coordinators monitor qualified facilities that operate the Company's generation system (under the direction of CAISO) and monitor and operate outside agencies' generation systems. They serve as the single point of contact and coordinate emergency responses with CAISO.

2 Distribution Electric Control Centers

2.1 Function of Distribution Control Centers

1. Distribution control centers (DCCs) must meet the following requirements:
 - a. Must be staffed 24 hours a day, 7 days a week (an exception is when the AOR is transferred to another AOR jurisdiction or control center).
 - b. The staff must be competent personnel trained for normal and emergency situations and qualified to:
 - (1) Operate and maintain safety of the Company's electric system.
 - (2) Respond to load shedding during normal or emergency conditions and adjust generation as necessary.
 - c. Jurisdictional responsibility for monitoring and directing all construction, maintenance, and operational activity on distribution power lines and substations is delegated to distribution system operators at control centers, per the Jurisdiction Letters.

2.2 Verbal Communication

1. Three-way communication is required and helps ensure a reliable transfer of information and understanding when exchanging operational information. Refer to [North American Electric Reliability Corporation \(NERC\) Reliability Standard COM-002-4, "Operating Personnel Communications Protocols."](#)
2. Operating personnel who issue and receive oral or written operating instructions must use the English language, unless agreed to otherwise, in compliance with NERC Reliability Standards [COM-002-4](#) and [COM-001-3, "Communications,"](#) Requirement (R4), which state the following:

"Unless agreed to otherwise, each Reliability Coordinator, Transmission Operator, and Balancing Authority shall use English as the language for all communications between and among operating personnel responsible for the real-time generation control and operation of the interconnected Bulk Electric System. Transmission Operators and Balancing Authorities may use an alternate language for internal operations."



Electric Distribution General Operating, Clearance, and Non-Test Instructions

2.3 Phonetic Alphabet

The phonetic alphabet adds clarity to the daily use of three-way communication. See [Utility Procedure TD-2700P-02, "Electric Distribution Centers and General Operation."](#)

2.4 Recording Time

Time must be recorded on a 24-hour clock basis.

2.5 Switching

1. Control center personnel direct switching operations.
2. Only qualified switchmen are permitted to perform switching operations. This includes outside agencies with written agreements and hiring hall personnel.
 - a. The above requirements (Items [2.5.1](#) and [2.5.2](#)) do not preclude emergency switching or actions provided for in [Utility Procedure TD-2700P-10, "Emergency Operations,"](#) Section 1, and [Utility Procedure TD-2700P-06, "Distribution Switching,"](#) Section 9.

2.6 Lockable Switches and Disconnects

Lockable switches or disconnects located in substations, switchyards, and the field must be padlocked in either the open or closed position.

2.7 Recording Presence at Staffed Substations, Unattended Substations, and Switchyards

1. Personnel or a representative of a group entering or departing a staffed substation must report the purpose of their visit to the onsite person in charge and sign in and out, using the visitor sign-in book.
2. Personnel or a representative of a group entering or departing an unattended station or switchyard must sign in and out, contact the control center as posted, and chronologically record significant activity, as stated in [Utility Procedure TD-3320P-18, "Substation Switching Procedure – Field Instructions,"](#) and [NERC Reliability Standard CIP-006-6, "Cyber Security – Physical Security of BES Cyber Systems."](#)
 - a. Unattended station log book entries must be clear, concise, and completed in non-erasable blue or black ink. The station logbook must have no lines skipped or left blank between entries.
 - b. Make corrections in station log books, as stated in [Utility Procedure TD-2700P-02,](#) Section 4.3, "Correcting Station Logs," and [Utility Procedure TD-3320P-18.](#)



Electric Distribution General Operating, Clearance, and Non-Test Instructions

2.7 (continued)

3. For further information, refer to the following documents:

- a. [Utility Standard TD-3463S, "Security Measures for Substation Facilities," Attachment 1, "Substation Security Measures"](#)
- b. [Utility Standard PG-1279S, "Operations Logs"](#)
- c. [Utility Procedure PG-1279P-01, "Instructions for Entering Operations Logs"](#)

3 Preparing, Directing, and Documenting Switching Logs

The following general principals establish consistent methods and procedures to ensure that Company employees conduct a comprehensive analysis when preparing, directing, and documenting switching logs.

3.1 Safety

1. The system operator's first priority is safety.
2. System operators must be prepared to take prompt action to protect personnel, the public, and property.

3.2 Efficiency

1. Design work to be efficient as well as safe.
2. Apply safety rules to create a workflow that both minimizes delays and gets the job done safely.

3.3 Continuity of Service

1. Proactively avoid service interruptions through the following methods:
 - a. Use alternate sources of power, when available.
 - b. Plan operations to prevent system vulnerability to single-point failures.
 - c. Consider contingency plans that respond to the most likely failures.

3.4 Communication

1. Share information among all concerned parties.



Electric Distribution General Operating, Clearance, and Non-Test Instructions

3.5 Documentation

1. Document all information received for the planned work and share it with those who need to know.
2. A complete and accurate written record is essential for the following reasons:
 - Provides a record of events.
 - Informs other operators and interested parties.
 - Eliminates confusion that can accompany oral messages.
 - Aids in the understanding of work and planning processes.

3.6 Clarity

1. Operators, switchmen, and other personnel involved in the switching process must understand their roles before they begin the work.
 - a. Provide the switching log to operators, switchmen, and other personnel to read, understand, and ask questions before switching begins.

3.7 Create an Appropriate Plan

1. A switching log is a detailed plan containing all the steps necessary to accomplish the work.
2. When creating a switching log, consider the following items:
 - a. System conditions – Writing a switching log that accurately anticipates system conditions requires research and may also require consultation with engineers, Grid Control Center (GCC) operators, or others.

NOTE

For transmission requirements, see [Utility Standard TD-1400S, "Electric Transmission Operations,"](#) and its associated procedures.

- b. Equipment ratings – Plan routine work so that equipment is operated within normal limits.
 - (1) DO NOT USE emergency ratings as part of routine operations. If higher ratings are required, request an engineering evaluation to determine if special or one-time ratings are appropriate for the work.



Electric Distribution General Operating, Clearance, and Non-Test Instructions

3.7 (continued)

- c. System checking – A switching log must include steps, as appropriate, to check the affected portion of the system before, during, and after switching to ensure acceptable conditions are maintained.

3.8 Switching Log Preparation, Direction, and Documentation Procedure

1. Electric distribution control centers must follow the procedures described in [Utility Procedure TD-2700P-04, "Processing Applications for Work and Switching Logs."](#)

4 Standards, Procedures, and Bulletins

4.1 Operating Procedures

1. Personnel who operate and work on or near Company-owned electric distribution lines, generators, and associated equipment must follow the operating procedures described in this standard and its associated procedures governed by this standard.

4.2 Standards, Procedures, Bulletins, etc.

1. Standards, procedures, bulletins, policies, instructions, etc. (issued by various departments related to electric distribution system operations) must be consistent with the electric distribution operating instructions in this standard and its associated procedures.

4.3 Interpreting Instructions and Procedures

1. Refer questions regarding the electric distribution operating instructions in this standard and the TD-2700 series utility procedures to electric distribution system operations support personnel. (Refer to [Document Contacts](#) on Page 18.)
2. Refer questions relating to telecommunications equipment and procedures (defined in [Utility Procedure TD-2700P-15, "Telecommunications and Technology Systems"](#)) to the Enterprise Network Operations Center (ENOC).

5 Record Retention and Disposal

- 5.1 Documents associated with this standard and its related procedures must be retained and disposed of according to the requirements of [Corporation Standard GOV-7101S, "Enterprise Records and Information Management Standard."](#)

END of Requirements



Electric Distribution General Operating, Clearance, and Non-Test Instructions

DEFINITIONS

Abnormal voltage: Voltage outside the minimum and maximum voltage limits, as identified in engineering standards.

Area of Responsibility (AOR): Geographical area of operating jurisdiction assigned to transmission and distribution operators. Operation of the electric distribution system is segmented into AORs 1 through 8 in the three Distribution Control Centers (DCCs) – North, Central, and South.

Attended station: A generation facility that is staffed and has jurisdiction over the equipment assigned to it (e.g., Humboldt Bay power plant).

Balancing Authority: The functional entity that integrates resource plans ahead of time, maintains generation-load-interchange-balance within a Balancing Authority area, and contributes to interconnection frequency in real time.

Bulk Electric System (BES): All transmission elements operated at 100 kilovolt (kV) or higher, as well as “Real Power” and “Reactive Power” resources connected at 100 kV or higher. Refer to the [NERC Glossary](#).

California Independent System Operator (CAISO): The designated balancing authority for all participants.

Center(s): The following are generation and electric centers referred to throughout this standard and its associated procedures:

- Transmission grid control center (GCC) – includes system dispatch and transmission system operators
- Distribution control center (DCC)
- Switching centers (Power Generation)
- Attended stations (Power Generation)

Clearance: Permission from the electric control center to work on lines or equipment once they are isolated from all sources of energy and tagged with properly filled out Man-on-Line (MOL) tags. Types of clearances include the following:

- Emergency/unplanned/unscheduled clearance – A clearance that does not meet the minimum lead-time requirements for processing and/or for notifying concerned parties.
- Routine/planned/scheduled clearance – A clearance that meets the minimum lead-time requirements for requesting work and notifying concerned parties.
- Safety clearance – A clearance that is established as described in the definition of a regular clearance and used in conjunction with other work performed to establish a safe working zone. Personnel cannot perform work under a safety clearance; however, the clearance holder must report on the safety clearance using grounds or using no grounds per tailboard form.



Electric Distribution General Operating, Clearance, and Non-Test Instructions

DEFINITIONS (continued)

Clearance holder: The qualified person who is reported on a clearance or holding their own tap-line clearance.

Clearance limit(s): A point or points used to isolate the requested work area or equipment from all sources of energy, gas, vapor, or liquid, and that have been tagged with a properly filled out MOL tag(s). Such limits include, but are not limited to switches, disconnects, open jumpers (e.g., double dead-ends or flying bells), separable connectors, and valves.

Control center: A staffed facility with jurisdiction over an assigned portion of the electric distribution or transmission system:

Distribution Control Center (DCC)

- North/Rocklin
- Central/Concord
- South/Fresno

Transmission Grid Control Center (GCC)

- Vacaville GCC
- Rocklin Back-Up GCC

Construction plan: A statement of the scope of the work (e.g., location, clearances, list of new equipment) to be performed and the ratings of new equipment to be installed.

Critical assets (NERC): Facilities, systems, and equipment which, if destroyed, degraded, or otherwise rendered unavailable, would affect the reliability or operability of the Bulk Electric System (BES).

Critical step: A switching step to open or close a device (routinely operated in excess of 600 volts [V], phase-to-phase), whether energized or de-energized. These critical steps, if performed improperly, can cause irreversible consequences by placing personnel at risk, potentially damaging equipment, or significantly impacting the safe and reliable operation of the electric system.

Customer at risk (CAR): When load is perceived to be at risk due to a single-source condition, whether that condition is due to routine or emergency activities.

Distribution: Primary voltage levels 44 kilovolts (kV) and below.

Distribution control center (DCC): A center where distribution system operator functions monitor and control the electric distribution system.



Electric Distribution General Operating, Clearance, and Non-Test Instructions

DEFINITIONS (continued)

Distribution Management System (DMS): An electronic display of the distribution control center jurisdiction(s). The distribution control center operators must ensure the electronic DMS display of their jurisdiction indicates current operating conditions at all times.

Energy Management System (EMS): Graphic display system that provides electric transmission status and controls for the operation of the electric transmission system.

Enterprise Network Operations Center (ENOC): Consists of three specialized groups which ensure that information and technology systems are operating as optimally as possible under all circumstances on a 24 x 7 x 365-day basis.

The following are the three specialized ENOC groups:

- Eyes on Glass – Includes monitoring and scheduling/alarms and alerts/initial outage management/notifications.
- Incident/Event Management – Includes running books/scheduling operations/monitoring and scheduling technical support/business rule management/coordination of incidents.
- Escalation and Clearance Management – Includes application/network management oversight/escalation support, (High impact) for incident/ maintenance/change control.

Fault location, isolation, and service restoration (FLISR): Self-healing feeder automation (FA) technology schemes designed to improve service reliability on the electric distribution system. PG&E uses software that interfaces with Supervisory Control and Data Acquisition (SCADA) devices. Automatic sectionalizing equipment detects and isolates the fault and may open and close multiple devices to energize customers within 5 minutes resulting in some customers experiencing a momentary (5 minutes or less) and some customers experiencing a sustained outage (greater than 5 minutes).

Field Automation System (FAS): Mobile application (MA) used by troublemen (T-men) and field personnel that integrates with the Outage Management Tool (OMT), SAP, and the DMS, allowing direct data communication with the distribution control center (DCC).

Fused tap or fused radial: A section of overhead or underground primary circuit protected by fuses, with no alternate feed and only one source. Opening the fuses de-energizes the section of a circuit to the end of the line.

Grid control center (GCC): A center where system dispatch and transmission system operator functions monitor and control the electric transmission system.

Integrated Logging Information System (ILIS): A chronological record of all operations and all significant information received and transmitted at a distribution center. The distribution operators (DOs) on duty must make entries directly into ILIS at the time they receive or transmit messages, orders, alarms, etc.



Electric Distribution General Operating, Clearance, and Non-Test Instructions

DEFINITIONS (continued)

Job walkdown: A meeting held before a construction project is approved. All disciplines with a stake in the construction and outcome of the project are represented. The meeting is an opportunity for stakeholders to have input to the proposed projects. The resulting decisions from the job walkdown represent each team member's commitment to the sponsor that the project can be completed as proposed.

Jurisdiction: Geographical boundaries and equipment demarcation points assigned to system operators as stated in the Jurisdiction Letters.

- Areas of Responsibility 1 through 8 assigned to North, Central, or South distribution control centers.
- Areas of Responsibility for transmission grid control centers (GCCs), per transmission Jurisdiction Letters.

Loops and parallels for distribution: For the purposes of this standard and its associated procedures, loops and parallels are defined as follows:

- "Looping" establishes a temporary closed circuit in any of the following circumstances:
 - Within a single circuit.
 - Between two circuits that are in parallel.
 - Closing the bypass on equipment such as a line regulator, line recloser, etc.
- "Paralleling" establishes a temporary connection between two circuits.

NOTE

Connecting a generator to the electric system is also known as a "parallel."

Name: When referring to a Company employee, at a minimum use the last name or full CORP LAN ID. Documentation and verbal communications must include the following information to positively identify the persons involved:

- For documentation purposes, the last name or CORP ID is required.
- For each verbal communication, the last name or radio call sign is initially required.

Non-test: A setup used when the person in charge of the work considers it advisable for the safety of personnel that equipment not be re-energized after a relay operation.



Electric Distribution General Operating, Clearance, and Non-Test Instructions

DEFINITIONS (continued)

Outages (distribution): Per [Utility Procedure TD-2200P-01, "Outage Reporting Details and Accuracy Verification Process."](#)

- Momentary outage – An outage event experienced by one or more customers that lasts 5 minutes or less.
- Sustained outage – An outage event experienced by one or more customers lasting greater than 5 minutes.
- Distribution transformer level and higher – Level of the open point, when customers are impacted by an outage starting with a distribution transformer. All reportable outages affecting customers at the distribution transformer level and higher must be entered in ILIS with complete and accurate details.
- Force out – An outage event of any duration where advance notice was not given to customers, due to an emergency or extenuating circumstance requiring a section of line or equipment to be deenergized.

Person, authorized: For the purpose of this standard and its associated procedures, an authorized person is an individual who is properly trained in the written procedures (and fully knowledgeable regarding hazardous energies specifically related to the equipment), but is not qualified to switch and/or perform work on or near electric lines and associated equipment.

Person, qualified: For the purposes of this standard and its associated procedures, a qualified person is an individual who is qualified to switch and/or perform work on or near electric lines and associated equipment and is properly trained on Company clearance procedures. Only qualified persons may be clearance holders or non-test holders.

Phonetic alphabet (international radiotelephony spelling alphabet): A spelling alphabet, radio alphabet, or telephone alphabet that contains a set of words used in place of the letters of the alphabet. Each word in the spelling alphabet typically replaces the letter with which it starts.

Polarizing: The alternating current (ac) voltage and current supply to relays with either directional or impedance elements.

Primary, backup, or second-level relays: Relays that protect the power system or equipment. In the event the primary relay fails or is removed from service, backup or secondary relays provide protection. Some schemes use the designations "Set A" and "Set B" relays in place of primary and backup, where either set can provide adequate equipment protection.

Radial: A section of overhead or underground primary circuit which may have multiple numbered sectionalizing devices and multiple hard taps but has only one feed source with no alternate feed.



Electric Distribution General Operating, Clearance, and Non-Test Instructions

DEFINITIONS (continued)

Relieving shift tailboard: A required verbal report to the oncoming operator of the activities and events that occurred on the previous shift. This includes, but is not limited to, any abnormal conditions, new equipment installations, revised or new operating procedures, outstanding clearances, switching in progress, or emergency orders in effect.

Significant facilities: Facilities with a potentially significant effect upon congestion revenue rights (CRRs), revenue adequacy when the outage impacts the normal energy transfer capability (congestion), or flow between points on the CAISO-controlled grid. Refer to [CAISO Operating Procedure 3210, "Transmission Outages."](#) and 3210B, "PG&E Equipment Significant to CRRs." *The hyperlink to 3210B is only available to authorized users.*

Signature: Handwritten, signed name (must include last name), handwritten initials (accompanying the typed name), or handwritten CORP ID.

NOTE

Computerized signatures are prohibited unless signatures are electronically signed in a way that meets all regulatory, legal, and PG&E security tracking requirements.

Special setup: An operations process that requires an analysis and/or a written response from operation engineering and/or system protection personnel.

Switching center: A staffed facility with jurisdiction over an assigned portion of the power generation system.

Switching log: A written list of steps with each operation numbered in sequence. The switching log provides specific operations for switching and serves as a written record of the operations performed.

Tap-line: A section of overhead or underground primary circuit that begins at a sectionalizing point (e.g., switch, fuse, jumpers, line openers), has no other sectionalizing points to the end of the line, and has only one source with no alternate feed.

Temporary device: A device that will not be in place permanently and must be identified by a number or descriptive location. Temporary devices must be indicated on the applicable circuit maps, Distribution Management System (DMS), and/or station single-line diagrams.

Test program: A comprehensive process requiring review, input, and execution by various individuals and departments to place new equipment in service.



Electric Distribution General Operating, Clearance, and Non-Test Instructions

DEFINITIONS (continued)

Three-way communication: A communication technique designed to ensure an accurate exchange of information between parties (including outside agencies), as follows (in compliance with [NERC Reliability Standard COM-002-4, "Operating Personnel Communications Protocols."](#))

1. The person transmitting the information states the information to be transferred.
2. The person receiving the information repeats the information transmitted.
3. The person who originally transmitted the information acknowledges that the information was repeated correctly and either confirms or re-instructs.
4. If corrected, the person receiving the information acknowledges the correct message.
5. The person that originally transmitted the information acknowledges that the information was repeated correctly.

Timelines: For the purposes of timelines for electric distribution and transmission scheduled clearances, apply the following descriptions:

- Work days are Monday through Friday (excluding holidays).
- Calendar days are consecutive days on the calendar, including weekends and holidays.
- 5 weeks equal 35 calendar days.

Unattended station log: A chronological record of all operations at an unattended station, including all significant information received and transmitted.

IMPLEMENTATION RESPONSIBILITIES

The director in charge of electric distribution system operations business applications is responsible for approving, revising, and distributing this standard.

The director in charge of electric distribution operations business applications authorizes the manager of distribution system operations business systems to update and reissue the distribution procedures associated with this standard.

The directors of electric distribution system operations, restoration and control, electric distribution line, maintenance and construction, and substations are responsible for ensuring their personnel are aware of and comply with this standard and its associated procedures.

Supervisors in charge of electric distribution system operations and the system operators are responsible for understanding and complying with this standard and the procedures governed by this standard.



Electric Distribution General Operating, Clearance, and Non-Test Instructions

IMPLEMENTATION RESPONSIBILITIES (continued)

Electric distribution personnel conduct quality reviews (QRs) that measure adherence to this standard and its associated procedures.

Electric operations distribution support personnel establish and monitor a measurement system and conduct quality audits (QAs) that measure adherence to this standard and its associated procedures.

Personnel involved in the operation, maintenance, and construction of the electric distribution system and associated Company equipment must comply with the instructions in this standard and its associated procedures.

Personnel are responsible for executing only the work for which they have been trained. When necessary, personnel must notify their supervisor of any additional training, equipment, or resources they need to perform their assigned duties and/or job assignments

GOVERNING DOCUMENT

NA

COMPLIANCE REQUIREMENT / REGULATORY COMMITMENT

[Electric Rule 2, "Description of Service"](#)

REFERENCE DOCUMENTS

Developmental References:

NA

Supplemental References:

[CAISO Tariffs & Protocols](#)

[CAISO Transmission Control Agreement](#)

[Code of Safe Practices](#)

[Corrective Action Program \(CAP\)](#)

[Corporation Standard GOV-7101S, "Enterprise Records and Information Management Standard"](#)

[Electric Planning Manual](#)

- [Section 6, "Voltage Regulation"](#)



Electric Distribution General Operating, Clearance, and Non-Test Instructions

REFERENCE DOCUMENTS (continued)

[Western Electricity Coordinating Council \(WECC\) Reliability Standards](#)

[NERC Reliability Standards:](#)

- CIP-006-6, "Cyber Security – Physical Security of BES Cyber Systems"
- COM-001-3, "Communications," R1, R3, R4, R5
- COM-002-4, "Operating Personnel Communications Protocols," R2, R1.1

[Numbered Document 027653 "Distribution System Voltage Regulation"](#)

[PG&E Distribution Interconnection Handbook](#)

[Substation Maintenance and Construction Manual \(TD-3322M\):](#)

- [Transformers](#), Section 9, "Inspecting, Testing, and Energizing Equipment After a Fault"
 - [Form TD-3322M-F-41, "Transformer/LTC/Regulator Visual Inspection After Fault Checklist"](#)
- [Voltage Regulators and LTCs](#), Section 8, "Preoperating Checks and Procedures for Operating Voltage-Regulating Devices"

Utility Bulletins:

- [TD-2010B-001, "Process for Critical Operating Equipment \(COE\) using SAP"](#)
- [TD-2400B-001, "Substation Load Information and Power Factor"](#)

Utility Procedures:

- [PG-1279P-01, "Instructions for Entering Operations Logs"](#)
- [TD-1013P-02, "Transfer Trip Schemes for Transmission and Distribution Generator Interconnections"](#)
- [TD-1400P-01, "Transmission Operating Procedures"](#)
 - [Attachment 1, "FERC Standards of Conduct – Order 717"](#)
- [TD-2700P-01, "Distribution Control Center Jurisdiction Letters"](#)
- [TD-2700P-02, "Electric Distribution Centers and General Operation"](#)
- [TD-2700P-03, "Clearances and Non-Tests"](#)



Electric Distribution General Operating, Clearance, and Non-Test Instructions

REFERENCE DOCUMENTS (continued)

Utility Procedure:

- [TD-2700P-04, "Processing Applications for Work and Switching Logs"](#)
- [TD-2700P-05, "Operating Procedures for Fault Location Isolation & Service Restoration \(FLISR\)"](#)
- [TD-2700P-06, "Distribution Switching"](#)
- [TD-2700P-07, "Tags"](#)
- [TD-2700P-08, "Reporting On and Off Procedures"](#)
- [TD-2700P-09, "Responding to Emergencies and Alarms"](#)
- [TD-2700P-10, "Emergency Operations"](#)
- [TD-2700P-11, "Testing and Sectionalizing Distribution Equipment"](#)
- [TD-2700P-12, "Relays and Protective Devices"](#)
- [TD-2700P-13, "Station Operation"](#)
- [TD-2700P-14, "Voltage and Line Operation"](#)
- [TD-2700P-15, "Telecommunications and Technology Systems"](#)
- [TD-2700P-16, "Distribution SCADA Alarm Display Screens and Configurations"](#)
- [TD-2700P-17, "Energizing Substation Transformers after a Fault"](#)
- [TD-2700P-18, "Standardized SCADA Navigation Screens For Distribution"](#)
- [TD-2700P-19, "Reporting and Releasing Information"](#)
- [TD-2700P-20, "Distribution Switching Requiring Engineer Review"](#)
- [TD-2700P-21, "Volt/Var Optimization"](#)
- [TD-2700P-22, "Electric Distribution ERR \(ILIS\) and SAP/COE Interface Procedure"](#)
- [TD-2908P-01, "Distribution Switching Procedures"](#)
- [TD-3320P-17, "Substation Switching Procedure"](#)



Electric Distribution General Operating, Clearance, and Non-Test Instructions

REFERENCE DOCUMENTS (continued)

Utility Procedures:

- [TD-3320P-18, "Substation Switching Procedure – Field Instructions"](#)
- [TD-3330P-01, "Job Walkdown"](#)
- [TD-3330P-06, "ESE Design Review Process"](#)
- [TD-3340P-10, "Relay and Protection Scheme Release Procedures"](#)

Utility Standards:

- [PG-1279S, "Operations Logs"](#)
- [SAFE-1001S, "Safety and Health Program Standard"](#)
- [S1418, "Notice to Customers, Planned Electric Service Interruption"](#)
- [TD-1400S, "Electric Transmission Operations"](#)
- [TD-1464S, "Fire Danger Precautions in Hazardous Fire Areas"](#)
- [TD-2200S, "Electric Customer Outage Reporting"](#)
- [TD-3463S, "Security Measures for Substation Facilities"](#)
 - [Attachment 1, "Substation Security Measures"](#)
- [TD-3468S "Mobile Substation Equipment – Maintenance and Construction"](#)

APPENDICES

NA

ATTACHMENTS

NA

DOCUMENT RECISION

This utility standard cancels and supersedes Utility Standard TD-2700S, "Electric Distribution General Operating, Clearance, and Non-Test Instructions," Rev. 0, dated 10/29/2014.

DOCUMENT APPROVER

██████████, Director Business Applications



Electric Distribution General Operating, Clearance, and Non-Test Instructions

DOCUMENT OWNER

██████████, Director Business Applications

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Electric Distribution General Operating, Clearance, and Non-Test Instructions

REVISION NOTES

Where?	What Changed?
Entire document	Updated links.
Section 1.1	Added reference to Utility Standard TD-1400S, "Electric Transmission Operations," for system dispatch responsibilities.
Section 2.5	Removed "System Dispatch, "switching centers" and "attended stations."
Section 3.1	Added section for Safety.
Definitions Section	<p>Added the following definitions:</p> <ul style="list-style-type: none"> • Area of Responsibility (AOR) • Balancing Authority • Bulk Electric System (BES) • Distribution Management System (DMS) • Energy Management System (EMS) • Fault location, isolation, and service restoration (FLISR) • Field Automation System (FAS) • Forced out (distribution) – added to "Outage (distribution)" definition • Integrated Logging Information System (ILIS) • Special setup • Test program <p>Removed the following definitions:</p> <ul style="list-style-type: none"> • Chronological log • System dispatcher <p>Updated the following definitions:</p> <ul style="list-style-type: none"> • Jurisdiction: Changed "Areas of control assigned to transmission system operators" to "Areas of Responsibility for Transmission Grid Control Center (GCC) as per transmission Jurisdiction Letters." • Outages (distribution): Added reference to Utility Standard TD-2200S, "Electric Customer Outage Reporting." • Momentary outage: Changed from "An outage event...that lasts less than 5 minutes" to "An outage event...that lasts 5 minutes or less" • Sustained outage: Changed from "An outage event ... lasting 5 minutes or longer" to "An outage event...greater than 5 minutes." • Distribution transformer level and higher: Added the following verbiage "All reportable outages affecting customers at the distribution transformer level and higher must be entered in ILIS with complete and accurate details."

Exhibit LL-3



Responding to Emergencies and Alarms

SUMMARY

This utility procedure establishes Pacific Gas and Electric Company (Company) responsibilities and distribution operating procedures for personnel involved in the operation, maintenance, and construction of its electric distribution system.

Level of Use: Informational Use

TARGET AUDIENCE

This procedure applies to qualified personnel who operate or work on or near Company-owned distribution electric lines and associated equipment.

SAFETY

Perform operating, switching, and restoration procedures safely and in accordance with [Utility Standard SAFE-1001S](#), "[PG&E Injury & Illness Prevention Plan \(IIPP\)](#)," and the [Code of Safe Practices](#).

Personal and public safety must never be compromised.

BEFORE YOU START

NA

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Responding to Emergencies and Alarms

PROCEDURE STEPS

1 Responding to Emergencies

- 1.1 Before acting, ANALYZE the situation. Operators must act only after understanding the nature and extent of the emergency and formulating a specific emergency plan.

To start an emergency switching log, PERFORM the following tasks:

1. SILENCE any alarms promptly.
2. **Immediately** begin to GATHER AND RECORD information.
3. DOCUMENT the emergency in required information systems.
4. COMMUNICATE, as required.
5. RESTORE, as required.

- 1.2 CONSIDER the situation by asking and answering the following questions:

1. Are there injuries or property damage?
2. Is there a hazard to people or property?
3. How does this problem affect the system?
4. What should the initial plan of action be?
5. Will assistance be required to handle the emergency?
6. What standard procedures apply in these circumstances?
7. What are the initial indications of trouble?
8. What initial reports/notifications must be made?
9. What subsequent reports/notifications must be made and when are they due?
10. What other information can be gathered in a timely fashion?

2 Responding to Fire and SCADA Alarms

2.1 Fire Alarms

1. Fire detection alarms indicating a fire require an acknowledgement and immediate action.



Responding to Emergencies and Alarms

2.1 (continued)

2. The system operator must **immediately** CALL 911, DISPATCH personnel to the substation, AND then PROCEED per [Utility Procedure TD-3320P-03, "Fire Entry Procedure for Indoor Substations,"](#) if applicable.

2.2 SCADA Alarms

1. IF alarms are received via supervisory control and data acquisition (SCADA),
THEN the system operator RESPONDS as appropriate for the circumstances and level of alarm.
2. NOTIFY the Grid Control Center (GCC) transmission system operator of events that could affect the transmission electric grid, per [Utility Procedure TD-1400P-07, "System Emergencies and Responding to Alarms,"](#) Section 7.
3. ACKNOWLEDGE SCADA alarms before completion of the trouble event or when not associated with an event before the end of the shift.

2.3 Responding to SCADA Alarms, Priorities 1 through 10

SEE [Attachment 2, "Integrated SCADA Alarm Summary Table,"](#) for more information on priority type audible, descriptions, and network SCADA alarms. SEE [Section 4, "Responding to Network SCADA Alarms,"](#) on Page 6 for information on network alarm descriptions.

As with any critical alarm, acknowledgement and analysis is required. The decision to dispatch personnel or only monitor the situation is based on the known concurrent activity and circumstances; however, SEE [Item 2.3.2.e.](#) on Page 4 for specific requirements for Fire System Malfunction alarm procedures.

1. Priority 10 – Critical: This priority level is specifically reserved for fire detection. **Immediate response and action** are REQUIRED.
 - a. The Priority 10 SCADA alarm indicates **fire alarm** with additional information to designate which substation or building is affected (SEE [Attachment 1, "Responding to SCADA Alarms – Exhibits and Examples,"](#) Exhibit B, "SCADA Generic Format").
 - b. The system operator PERFORMS the following tasks:
 - (1) **Immediately** CALL 911. NOTIFY emergency/fire department personnel **immediately** per local procedures when receiving a fire alarm.
 - (2) DISPATCH personnel to the substation.



Responding to Emergencies and Alarms

2.3 (continued)

- (3) PROCEED per [Utility Procedure TD-3320P-03, "Fire Entry Procedure for Indoor Substations"](#) and the [Distribution System Operations Manual](#) "Substation" section.
 - c. MONITOR fire alarms in a constantly attended location in accordance with the California Fire Code (CFC) and PG&E Enterprise Risk Management & Insurance Department/Property Loss Control guidelines.
 - d. SEE [Section 3.2, "Wireless Third-Party Monitoring,"](#) on Page 6 for specific information on substations monitored by a third party.
 - e. DISTRIBUTE the data from the fire alarm to San Francisco General Office (SF GO), Applied Technical Services (ATS) Historian, and the Central Distribution control center (CDCC).
2. Priority: P06 – P09 – Critical: These priority levels require **immediate analysis and action**. They are reserved for the following circumstances that indicate potential loss of equipment, path interruption, or customer outage such as, but not limited to:
 - a. Changes in circuit breaker, line recloser, or switch positions with wav. file alerts.
 - b. High-high/low-low analog alarms.
 - c. Cable pressure alarms.
 - d. Field devices, urgent network alarms.
 - e. Fire System Malfunction alarms.
 - (1) NOTIFY substation maintenance and construction personnel as soon as possible within 24 hours, per local regular and on-call procedures.
 - (2) For SCADA alarm log printout specifications for this alarm, SEE [Attachment 1, Exhibit B and SCADA Examples](#).

IF the alarm is not due to directed switching activity,

THEN the system operator must DOCUMENT the alarm in the chronological log or switching log.

3. Priority P04 – P05 - Critical: This level is comprised of all security alarms, other significant substation trouble indicators, communication, and field device alarms.
 - a. TAKE action as needed. Analysis is required.



Responding to Emergencies and Alarms

2.3 (continued)

- b. The decision to dispatch personnel or only monitor the situation is based on the known concurrent activity and circumstances. In some instances, close monitoring may be enough; in others, dispatching personnel may be required.
- 4. Priority 3 (P03) – Important: This level is designated for targets and must be **analyzed AND acknowledged**.
 - a. Analysis and acknowledgment are required.
 - b. Response is based on the alarm point and circumstances. Monitoring the conditions and analyzing the information is required.
- 5. Priority 2 (P02) – Non-Critical: May be useful while analyzing and event. This level includes, but is not limited to, status changes, confirmations, non-critical network secondary breaker operations, and self-check alarms. **TAKE action as needed.**
 - a. TAKE action as needed.
 - b. Response is based on analysis of the circumstances.
- 6. Priority 1 (P01) – Informational: Unnecessary for real-time operation, **no acknowledgment required. TAKE action as needed:**
 - a. These alarms are unnecessary for real-time operations.
 - b. These alarms do not require acknowledgement and need not be acted upon.

- 2.4 SCADA platforms that do not allow prioritizing or categorizing alarms on the alarm printout must be responded to as appropriate using the above guidelines.

3 Responding to Non-SCADA Alarms

3.1 Non-SCADA Alarms

- 1. Stations with alarms that indicate only line and station alarms that clear or hold must be acknowledged.
- 2. IF the alarm clears when acknowledged,
THEN DOCUMENT the alarm in the chronological log, DISPATCH personnel at the first opportunity during normal working hours, AND NOTIFY the on-call supervisor.
- 3. IF the alarm does **not** clear,
THEN DOCUMENT the alarm in the chronological log or switching log AND DISPATCH personnel to investigate or, after normal working hours, NOTIFY the on-call supervisor.



Responding to Emergencies and Alarms

3.1 (continued)

4. IF any information is received that indicates the possibility of a fire,

THEN **immediately** DISPATCH personnel to the location AND NOTIFY supervision, such as by a call from a third party. NOTIFY the fire department in accordance with [Section 2.3.1. b.](#) on Page 3.
5. NOTIFY GCC transmission personnel of events that could affect the transmission electric grid, per [Utility Procedure TD-1400P-01, "Transmission Operating Procedures."](#)

3.2 Wireless Third-Party Monitoring

1. In some cases, fire departments may require a wireless third-party monitoring system at indoor substations to receive/monitor the fire system alarms as a condition of the permit for the installation of the fire system.
2. IF there is a Fire Alarm or Fire System Malfunction Alarm,

THEN:
 - a. The wireless system notifies the third-party monitoring company.
 - b. The third party CALLS 911.
 - c. The third party then CALLS the appropriate control center.
 - d. The control center PROCEEDS per normal response to fire or fire system malfunction. SEE [Attachment 1, Exhibit A](#), for impacted substations.
3. LOG all communication AND notifications in the control center log.

4 Responding to Network SCADA Alarms

- 4.1 The electric distribution networks are designed to provide a highly reliable system for serving dense urban environments in San Francisco and Oakland. The network protectors (NPs) that connect the network transformers to the customers may open or close automatically depending on the direction of current flow or transformer loading.
- 4.2 The network systems operate differently than the distribution radial systems and have a unique priority network alarm table. SEE [Attachment 2, "Integrated SCADA Summary Table,"](#) for more information on priority types and descriptions.
 1. The Network SCADA alarms are set at priorities levels P01, P02, P04, or P07. Priority level critical alarms initiate an audible alert, and non-critical and informational alarms do not initiate an audible alert. These alarms are described as follows:



Responding to Emergencies and Alarms

4.1 (continued)

- a. Priority 7 – Critical and must have immediate analysis and action. These alarms are for urgent network conditions that require an immediate response; high-high load, transformer low-low oil, and transformer high-high temperature.
- b. Priority 4 – Critical and Analysis required. These alarms are for less urgent network conditions such as high load in the vault or network transformer load > 95% of the rating that require a response within 24 hours.
- c. Priority 2 – **Non-critical/Informational** and **do not require acknowledgment**. These alarms include control position (local/remote) and NP open/close status.
- d. Priority 1 – **Informational/no action required**. These include alarms such as SCADA battery test failure, water level > 1 foot (ft), and other status alarms associated with the NP and are monitored by maintenance personnel.
- e. Network transformer oil levels at 25% (Low Alarm) are monitored by engineers via Historian.
- f. Network transformer oil levels at 100% (High Alarm) are monitored by engineers via Historian. This may an indication of internal leaks.
- g. Maintenance personnel MONITOR high water levels ≥ 3 feet and low-level alarms AND TAKE appropriate action as required.
- h. Network transformer pressure ≥ 6 pounds per square inch (psi) (High Alarm) and less than ≤ 0 psi (Low Alarm) are monitored by engineers via Historian.
 - These alarms are unnecessary for real-time operations.
 - These alarms do not require acknowledgement and need not be acted upon by operators.

4.3 Overload Alarms

1. Overload alarms are set at 95% and 120% of the rating (the normal rating is 100% and emergency rating is 130%, and these alarms are set slightly lower to allow time for responding to the condition).
 - a. Priority 7 – Critical: High-High alarm for transformer load is set at 120% of the rating. The operator must **TAKE immediate action** AND RELIEVE load off the transformer (SEE [Items 4.3.2. a–d](#) below) on Page 8.
 - b. Priority 4 – Critical: High alarm for transformer load is set at 95% of the rating. The operator must CONTACT engineering personnel within 24 hours to manage the loading issue.



Responding to Emergencies and Alarms

4.3 (continued)

2. Actions to take include the items below, if determined feasible:

- a. Remotely CLOSE another NP to share load.
- b. Manually CLOSE another NP to share load.
- c. COORDINATE customer load curtailment.
- d. DROP load at a spot or grid network.

4.4 Equipment/Vault Abnormal Conditions Alarms

Transformer oil level is linearly ranged from “Low-Low” to “High,” based on historical operating limits with 25° C around mid-range.

1. Priority 7 – Critical: Low-Low Level Alarm is set at 0% of the total range, and the operator must **immediately** CONTACT engineering OR personnel onsite to investigate within 2 hours.
 - a. IF alarm does not clear and it is not feasible to investigate within 2 hours,
THEN the operator must CLEAR the circuit AND OPEN the NP.
2. Priority 1 – Informational: High Level Alarm is set at 100% of the total range. Maintenance personnel MONITOR these alarms.
 - a. This may be an indication of internal leaks between the transformer main tank to either the primary connection or the ground switch chambers.
3. Priority 1 – Informational: Low Level Alarm is set at 25% of the total range. These alarms are monitored by engineers via Historian.
4. Transformer Temperature
 - a. Priority 7 – Critical: High Temperature Alarm is set at 110° Celsius and the operator must **immediately** CONTACT engineering OR maintenance personnel onsite to investigate within 2 hours.
 - (1) IF the alarm does not clear and it is not feasible to investigate within 2 hours,
THEN the operator must CLEAR the circuit AND OPEN the NP.



Responding to Emergencies and Alarms

4.3 (continued)

5. Transformer Pressure
 - a. Priority 1 – Informational: Network transformers should normally be pressurized with nitrogen at 1–2 pounds per square inch (psi). Low and High Pressure alarms are set at 0 and 6 psi respectively. Engineers MONITOR these alarms via Historian.
6. Water Level in Vault
 - a. Water level alarms are set at 1 ft. and 3 ft.
 - (1) Priority 1 – Informational: Maintenance personnel MONITOR the 3-ft water level alarm AND TAKE appropriate action as required. When the 3-ft water level alarm is triggered, CONTACT the maintenance supervisor within 24 hours to arrange for the vault to be pumped.
 - (2) Priority 1 – Informational: Maintenance personnel MONITOR the 1-ft water level alarm AND TAKE appropriate action as required.
7. Vault Temperature
 - a. Priority 1 – Informational: Vault temperature alarm is set at 50° C. Engineers MONITOR vault temperature alarm via Historian AND TAKE appropriate action as required.
8. SCADA Battery Test Failure and AC Offline
 - a. Priority 1 – Informational: These are alarms for power to the individual SCADA monitored equipment in the field. Maintenance personnel MONITOR these alarms AND TAKE appropriate action as required.
9. Local/Remote, Network Protector Open/Close Status, and Other Status Alarms Associated with the NP and Relay
 - a. Priority 2 – Non-Critical: Local/remote and NP open/close status are informational, and no acknowledgment is required. Operators TAKE action as needed.
 - b. Priority 1 – Informational: There are numerous status alarms that are used for troubleshooting the NP and relay. Maintenance personnel MONITOR these alarms via Historian AND TAKE appropriate action as required.



Responding to Emergencies and Alarms

5 Responding to Sustained Outages

- 5.1 When there is a sustained outage, closely MONITOR all incoming data from SCADA, Outage Management Tool (OMT) hazard tags, emergency agency calls, employee reports, etc.
1. VERIFY with dispatch personnel that resources are dispatched as appropriate per dispatch protocol.
 2. SEE [Utility Procedure TD-2700P-17, "Energizing Substation Transformers after a Fault,"](#) Attachment 1, ["Response Procedures for Substation Outages \(Substation Blitz\),"](#) for substation dispatch requirements.
 3. DOCUMENT the outage in the Integrated Logging Information System (ILIS), AND BEGIN a switching log if appropriate.
 4. PROCEED with testing AND sectionalizing per [Utility Procedure TD-2700P-11, "Testing and Sectionalizing Distribution Equipment."](#)
- 5.2 CALL OUT additional operator(s) if conditions warrant.

END of Instructions

DEFINITIONS

See [Utility Standard TD-2700S, "Electric Distribution General Operating, Clearance, and Non-Test Instructions."](#)

IMPLEMENTATION RESPONSIBILITIES

The directors of electric distribution system operations, restoration and control, maintenance and construction, and substations are responsible for ensuring their personnel are aware of and comply with this procedure.

Electric distribution personnel conduct quality reviews (QRs) that measure adherence to this procedure.

Electric operations distribution support personnel establish and monitor a measurement system and conduct quality audits (QAs) that measure adherence to this procedure.

Personnel involved in the operation, maintenance, and construction of the electric distribution system and associated Company equipment must comply with the instructions in this procedure.

Personnel are responsible for executing only the work for which they have been trained. When necessary, personnel must notify their supervisor of any additional training, equipment, or resources they need to perform their assigned duties and/or job assignments.



Responding to Emergencies and Alarms

GOVERNING DOCUMENT

[Utility Standard TD-2700S, "Electric Distribution General Operating, Clearance, and Non-Test Instructions"](#)

[Utility Standard TD-2800S, "Distribution SCADA System Operations and Protocol"](#)

COMPLIANCE REQUIREMENT / REGULATORY COMMITMENT

See the Compliance Requirement/Regulatory Commitment section in [Utility Standard TD-2700S](#).

Records and Information Management:

The document owner, or designee, ensures any records generated by this procedure are maintained 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,"](#) 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](#)

[Distribution System Operations Manual](#) (TD-2700M)

Utility Procedures:

- [TD-1400P-07, "System Emergencies and Responding to Alarms"](#)
- [TD-2700P-11, "Testing and Sectionalizing Distribution Equipment"](#)
- [TD-2700P-17, "Energizing Substation Transformers after a Fault"](#)
 - [Attachment 1, "Response Procedures for Substation Outages \(Substation Blitz\)"](#)



Responding to Emergencies and Alarms

REFERENCE DOCUMENTS (continued)

- [TD-2800P-02, "Distribution SCADA Design Layouts and Screen Views"](#)
- [TD-3320P-03, "Fire Entry Procedure for Indoor Substations"](#)

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

APPENDICES

NA

ATTACHMENTS

[Attachment 1, "Responding to SCADA Alarms – Exhibits and Examples"](#)

[Attachment 2, "Integrated SCADA Alarm Summary Table"](#)

DOCUMENT REVISION

This utility procedure cancels and supersedes the following utility procedures:

- TD-2700P-09, "Responding to Emergencies and Alarms," Rev. 0, dated 10/29/2014.
- TD-2700P-16, "Distribution SCADA Alarm Display Screens and Configurations," Rev. 0, dated 10/21/2014.

DOCUMENT APPROVER

██████████, Senior Manager, Electric Business Systems

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██████████ Network Engineer

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Responding to Emergencies and Alarms

REVISION NOTES

Where/Rev. #?	What Changed?
Rev. 0:	
	Added 2.2.1 from Utility Procedure WP3320-03, Rev. 0, "Fire Entry Procedure for an Indoor Substation." Added Utility Procedure TD-1466P-02, "Transmission Operating Procedures," Section 6, "Notifications."
Rev. 1:	
Entire Document	Made minor edits to clarify instructions and to conform to Guidance Document Management (GDM) requirements.
Section 2.2.1	Added Section 2.2.1 from Utility Procedure TD-3320P-02, "Fire Entry Procedure for an Indoor Substation."
Section 2.2.2	Added Section 2.2.2 from Utility Procedure TD-1400P-07, "System Emergencies and Responding to Alarms," Section 7.
Section 2.3	Removed "(Non-Network Alarms)" from the body of the sentence.
Attachment 2	Added new Attachment 2, "Integrated SCADA Alarm Summary Table."

Exhibit LL-4



Electric System Emergency Response Protocol

SUMMARY

This utility procedure establishes the responsibilities and distribution operating procedures for personnel involved in operating, maintaining, and constructing PG&E's electric distribution system.

Level of Use: Informational Use

TARGET AUDIENCE

This procedure applies to qualified personnel who operate or work on or near PG&E-owned electric distribution lines and associated equipment.

SAFETY

Perform operating, switching, and restoration procedures safely and in accordance with [Utility Standard SAFE-1001S](#), "[PG&E Injury & Illness Prevention Plan \(IIPP\)](#)," and the [Code of Safe Practices](#).

Personal and public safety must never be compromised.

BEFORE YOU START

NA

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2	Emergency Plan.....	2
3	Restoring Load After an Undervoltage or Underfrequency Event	2
4	Load at Risk	2

PROCEDURE STEPS

1 Emergencies

- 1.1 The distribution operator (DO) or switchmen must REPORT in detail, as soon as the situation permits, any conditions that can cause danger to life and property, equipment damage, cascading outages, or extreme overloads.
- 1.2 In emergencies where communications are interrupted AND it is necessary to protect lives or property, switchmen may TAKE appropriate action without first obtaining approval from the control center, except as covered by specific orders.



Electric System Emergency Response Protocol

2 Emergency Plan

- 2.1 For system emergencies and responding to alarms, REFER to [Utility Procedure TD-1400P-07 Attachment 1, "Initiate Distribution SCADA Load Shedding."](#)
- 2.2 Distribution control center (DCC) personnel must MAINTAIN a current copy of the [Electrical System Restoration Guidelines \(ESRG\)](#), [Electrical Emergency Plan \(EEP\)](#), and the [Business Continuity Plan \(BCP\)](#).

NOTE

Only authorized users can access the [EEP](#).

- 2.3 DOs must BECOME familiar with the restoration procedures for their jurisdictions AND adjacent areas.
- 2.4 DCC personnel are provided with data identifying circuits and stations that can be interrupted with the least inconvenience to customers or essential public services.
- 2.5 System dispatch personnel WORK with DCC personnel AND transmission system operators to manage either PG&E's EEP or the local EEP.

3 Restoring Load After an Undervoltage or Underfrequency Event

- 3.1 System dispatch personnel DIRECT DCC personnel AND transmission operations centers to restore the requested load requirement, including location, as stated in [Utility Procedure TD-1400P-07, "System Emergencies and Responding to Alarms," Section 5, "Unplanned Outages/Trouble Events, Subsection 5.3, "Underfrequency Operations."](#)

4 Load at Risk

- 4.1 IF the transmission operation engineer CONFIRMS that work is placing load at risk, AND other transmission sources **cannot** be used to directly pick up load,

THEN REFER to [Utility Procedure TD-1400P-02, "Transmission Application for Work and Timelines," Section 13, "Transmission Outage Restoration Plans," Subsection 13.3, "Key Elements of the Restoration Plan,"](#) for details of the customer at risk notice.

- 1. The Grid Control Center (GCC) transmission system operator must NOTIFY the DCC operator that load is at risk as a result of a clearance on the transmission system.
- 2. The DCC operator PERFORMS the following actions:
 - a. PREPARE for the possibility of picking up dropped load using distribution ties to other substations, if required.



Electric System Emergency Response Protocol

4.1.2 (continued)

- b. REQUEST assistance from distribution engineering operations personnel to prepare a switching plan to pick up as much load as possible through the distribution, if required.
 - (1) CONSIDER a distribution load transfer switching plan if the cleared equipment cannot be restored quickly (within 30–60 minutes).
 - (2) CONSIDER that it may not be possible to pick up the entire load through distribution transfers when preparing emergency switching logs.

END of Instructions

DEFINITIONS

NA

IMPLEMENTATION RESPONSIBILITIES

The directors of electric distribution system operations, restoration and control, maintenance and construction (M&C), and substations are responsible for ensuring their personnel are aware of and comply with this procedure.

Electric distribution personnel conduct quality reviews (QRs) that measure adherence to this procedure.

Electric operations distribution support personnel establish and monitor a measurement system and conduct quality audits (QAs) that measure adherence to this procedure.

Personnel involved in the operation, maintenance, and construction of the electric distribution system and associated PG&E equipment must comply with the instructions in this procedure.

Personnel are responsible for executing only the work for which they have been trained. When necessary, personnel must notify their supervisors of any additional training, equipment, or resources they need to perform their assigned duties and/or job assignments.

GOVERNING DOCUMENT

[Utility Standard TD-2700S, "Electric Distribution General Operating, Clearance, and Non-Test Instructions"](#)



Electric System Emergency Response Protocol

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:

[Utility Procedure TD-1400P-07 Attachment 1, "Initiate Distribution SCADA Load Shedding"](#)

Supplemental References:

[Application for Work](#)

[Code of Safe Practices](#)

[Electric System Restoration Guidelines \(ESRG\)](#)

[Electrical Emergency Plan \(EEP\)](#)

Utility Procedures:

- [TD-1400P-01, "Transmission Operating Procedures"](#)
- [TD-1400P-02, "Transmission Application for Work and Timelines"](#)
- [TD-1400P-07, "System Emergencies and Responding to Alarms"](#)
- [TD-2700P-02, "Electric Distribution Centers and General Operation"](#)
- [TD-2700P-03, "Clearances and Non-Tests"](#)

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



Electric System Emergency Response Protocol

APPENDICES

NA

ATTACHMENTS

NA

DOCUMENT RECISION

This utility procedure cancels and supersedes the following documents:

- Utility Procedure TD-2700P-10, "Electric System Emergency Response Protocol," Rev. 1, dated 05/15/2020.
- Guidance Document Analysis (GDA) for TD-2700P-10, "Emergency Operations," published 10/29/2014.

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Electric System Emergency Response Protocol

REVISION NOTES

Where?	What Changed?
Reference Documents	Added TD-1400P-07 Attachment 1.
Section 2 "Emergency Plans"	Added section 2.1. with Hyperlink.
Document Approver	Changed to director.
Document Owner	Changed to director.
Document Contact	Changed to add [REDACTED] and deleted [REDACTED]. Changed [REDACTED] to Director.
Entire Document	Updated the template, style, and formatting.

Exhibit LL-5



UO CUSTOMER SERVICE POLICY

Statement of Policy

It is Utility Operations (UO) policy that every employee will provide responsive service to customers by:

- Performing work safely.
- Anticipating, listening to, understanding, and responding effectively to the diverse and changing needs of our customers.
- Continually improving the work processes that serve customers.
- Applying best practices methodology and making sound business decisions.
- Proactively providing customers with information when their service is or will be affected.

Overall Accountability

The senior vice president of Customer Service and Revenue is responsible for authorizing, issuing, and updating this policy and for monitoring compliance.

The senior manager of Customer Service and Revenue Support authorizes, issues, and updates rules, tariffs, standards, and exceptions to this policy.

Utility Operations officers are responsible for implementing this policy within their respective organizations.

UO CUSTOMER SERVICE POLICY

(CONTINUED)

Definitions

Authorized override allows a customer service representative (CSR) to negotiate customer requests and offer different options without breaking internal scheduling rules.

Best practices methodology is the selection and use of current industry practices that will yield, at an acceptable cost, the maximum utilization of assets and the desired level of quality, operating dependability, and service reliability.

Customer service is service that is valued by the customer, as measured by customer satisfaction surveys.

Processes are sets of interrelated activities that use specific inputs to produce specific outputs (products or services).

Process improvement is the improvement of processes with a focus on customer need, a systems view, data and measurement, and leadership.

Sound business decisions apply the best industry practices in order to balance product and service quality, safety, cost, customer satisfaction, and shareholder benefit.

Implementation

1. Customer Needs

Pacific Gas and Electric Company (the Utility) will make sound business decisions based upon meeting customer needs. The Utility will continue to use research to explicitly define customer needs.

2. Services Provided to Customers

The following represents the levels of services the Utility will provide to customers. The service levels that the Utility provides should be driven by customer demand or needs of the area. Specialized phone and field service will be provided to several different market or client segments, such as non-English speaking and major accounts customers.

a) Phone

Customers will be able to access service 24 hours/day and 365 days/year through the Utility's 1-800 numbers and automated Interactive Voice Response Units (IVRU).

b) Internet

Limited services are available for customer appointment scheduling through PGE.com ([Customer Service Online](#)).

UO CUSTOMER SERVICE POLICY

(CONTINUED)

c) Office

A full range of services will be provided in the Utility's Customer Services offices throughout its service territory. The days and hours of business for each Utility Customer Service office will effectively meet the needs of the local community.

d) Field

A standard list of field services will be offered to all customers throughout the service territory. (See Attachment 1, "Standard List of Field Services Offered.")

e) New Services and Enhancements

Systemwide application of new services or processes will be evaluated and considered based on customer need and cost to implement. Areas are encouraged to share best practices. After review and approval, the new service or enhancement will be added to the standard list of the Utility's field services and implemented throughout the service territory.

f) Timely Emergency Response

The Utility will immediately respond to customer requests when general safety requires investigating, repairing, or making safe the use of gas and electricity.

g) Regular Service

The Utility will respond to routine requests for service according to customer needs. Appointments for service will be offered from 8:00 a.m. to 8:00 p.m. Monday through Friday, and from 8:00 a.m. to 5:00 p.m. on Saturday. Sunday service will be available for emergency calls.

Saturday Service

Veteran's Day

Day After Thanksgiving

Sunday Service

New Year's Day

Martin Luther King Day

President's Day

Memorial Day

Fourth of July

Labor Day

Thanksgiving Day

Christmas Day

Exceptions may be made in limited service areas due to customer need and manpower availability.

h) Schedule

All day appointments are 8:00 a.m. to 8:00 p.m. (Monday through Friday). Appointments for service will be available upon customer request.

UO CUSTOMER SERVICE POLICY

(CONTINUED)

The appointment windows offered are as follows:

Monday through Friday:

- (AM) Morning 8:00 a.m. to 12 noon.
- (PM) Afternoon 1:00 p.m. to 5:00 p.m.
- (NM) Evening 5:00 p.m. to 8:00 p.m.

Saturday: *

- (AM) Morning 8:00 a.m. to 12 noon.
- (PM) Afternoon 1:00 p.m. to 5:00 p.m.

(* Saturday scheduling offered only where Saturday scheduling currently exists.)

3. Employee Responsibility

It is the responsibility of all Utility employees to deliver these services to customers as outlined in this policy. Through continued process improvement, the Utility will be safe, efficient, and effective in providing service. Employees will be trained in the appropriate job skills and empowered to fully use their skills and knowledge when providing service to customers.

4. How the Utility and Customers Will Work Together

Customers see one company when requesting and evaluating service, and they expect the Utility to deliver on the commitments made to them. It is the responsibility of every employee and work team to communicate, coordinate, and make information handoffs across functional lines to meet commitments made to customers.

5. Criteria of Customer Service

Internal process performance measures will be used to evaluate and improve service delivery processes. Benchmarking, within the utility industry and with other nonutility service providers, will be used to identify best service practices and establish performance targets.

UO CUSTOMER SERVICE POLICY

(CONTINUED)

Authorization for Issue/Update

Original signed by:





Senior Vice President, Customer Service and Revenue

Issued/Updated: **October 2004**

UO CUSTOMER SERVICE POLICY

(CONTINUED)

Attachment 1

STANDARD LIST OF FIELD SERVICES OFFERED

Timely Emergency Response

When safety requires, the Utility will immediately respond to customer requests for assistance to investigate, repair, and/or make safe the use of gas and electricity in the areas listed below. In addition, there may be other situations not listed where an immediate response service would be initiated.

- Asphyxiation, carbon monoxide poisoning, carbon monoxide alarm, or electric shock.
- Fire, explosion (that may involve gas and/or electric with house, appliances, etc.).
- Gas leaks or strong odor of gas.
- Arcing/bare wires.
- Wire down.
- Extreme high/low voltage (customer suspects damage to equipment).
- Customer cannot shut off appliance.
- Report of high gas pressure (appliance gas flame unusually high).
- Incidents involving or suspected of involving hazardous materials.
- Damage or suspected damage to Company property, such as: car/power pole accident, dig-in of gas or electric underground facilities.
- Gas pressure complaints.

Same Day Response

The Utility will meet customer needs and provide same day scheduled service (nonemergency) for the following:

- Restore service that has been shut off for nonpayment (only if payment is made by 5:00 p.m.).
- Restore service that has been shut off by the Company in error.
- The Company failed to keep a scheduled appointment.
- Minor gas leaks or odors that are ongoing.
- Electric outage/complete out/part out.
- Flickering lights/voltage complaints.
- Any unusual hardship exists (e.g., life support equipment impacted, a senior citizen with no heat during inclement weather [as outlined in [UO Standard C-S0005, "Extreme Weather Policy"](#) – less than 36 degrees or more than 96 degrees Fahrenheit], or a commercial, industrial, or agricultural (CIA) account

UO CUSTOMER SERVICE POLICY

(CONTINUED)

with nonoperative equipment that may create heavy financial loss to an operation).

UO CUSTOMER SERVICE POLICY

(CONTINUED)

Scheduled Response

The following services will be provided on a scheduled basis on a future day:

- Establish gas and/or electric service (turn on, change of party, etc.). Authorized override for the second (2nd) business day for turn on service where the gas and/or electric commodity must be physically established.
- Restore service that was shut off for nonpayment when payment is made and called in after 5:00 p.m. Authorized override for the following day.
- Discontinue gas and/or electric service (a shutoff due to an appliance being disconnected or moved, change of party or seasonal requests for shutoff, etc.).
- Fumigation shutoffs/turn ons. Authorized override for the second (2nd). business day.
- Set gas and/or electric meters.
- Meter work not associated with establishing or discontinuing service (testing, replacing, and/or removing gas and electric meters when necessary to ensure accuracy; investigating crossed meter complaints; repairing broken glass/replacing meter index, etc.).
- Energy Cost Inquiries (ECI) to investigate and resolve customer inquiries related to their energy usage and meter measurement/accuracy.
- Seasonal relights and seasonal requests for turn on service.
- Routine appliance adjustment (commercial, industrial, or residential).
- Nonoperating gas appliance(s) (residential).
- Inoperative equipment (commercial, industrial, agricultural).
- Radio and/or TV interference complaints.
- Ongoing voltage complaints.
- No heat.
- No hot water. Authorized override for the next business day.
- Notification of bare service wire.
- Streetlight problems (Company-owned or maintained).
- Tree trimming – wires not arcing.