

PUBLIC UTILITIES COMMISSION

505 VAN NESS AVENUE
SAN FRANCISCO, CA 94102-3298



October 23, 2019

TA2019-847

Lise Jordan, Sr. Director
Regulatory Compliance and Quality Assurance
Pacific Gas and Electric Company (PG&E)
77 Beale Street
San Francisco, CA 94105

SUBJECT: Transmission Audit of PG&E's Table Mountain Division

Dear Ms. Jordan:

On behalf of the Electric Safety and Reliability Branch (ESRB) of the California Public Utilities Commission (CPUC), Rickey Tse, Ivan Garcia, Chris Lee, Anwar Safvi, and Charles Mee of my staff conducted an electric transmission audit of PG&E's Table Mountain Division from May 20, 2019 through May 24, 2019. The audit included a review of PG&E's procedures, records, and field inspections of its transmission facilities.

As a result of the audit, ESRB staff identified violations of one or more General Orders (GOs). A copy of the audit findings itemizing the violations is enclosed. Please provide a response no later than November 20, 2019, by electronic or hardcopy of all corrective actions and preventive measures taken or planned by PG&E to correct the identified violations and prevent the recurrence of such violations. The response should include the date of each remedial action and preventive measure completed within 30 days. For any outstanding items not addressed within 30 days, please provide the projected completion dates of all actions for all violations outlined in Sections I, III & IV of the enclosed Audit Findings.

If you have any questions concerning this audit, please contact Ivan Garcia at (916) 928-5875 or ivan.garcia@cpuc.ca.gov.

Sincerely,

A handwritten signature in blue ink, appearing to read "Banu Acimis".

Banu Acimis, P.E.
Program and Project Supervisor
Electric Safety and Reliability Branch
Safety and Enforcement Division
California Public Utilities Commission

Enclosure: CPUC Audit Findings

Cc: Lee Palmer, Director, Safety and Enforcement Division, CPUC
Charlotte TerKeurst, Program Manager, ESRB, CPUC
Rickey Tse, Senior Utilities Engineer (Supervisor), ESRB, SED, CPUC

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Charles Mee, Senior Utilities Engineer (Specialist), ESRB, SED, CPUC
Ivan Garcia, Utilities Engineer, ESRB, SED, CPUC
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Anwar Safvi, Utilities Engineer, ESRB, SED, CPUC
Dave Phan, Transmission and Distribution Compliance Specialist, PG&E
Anne Beech, Director, Regulatory Compliance & Investigation, PG&E

AUDIT FINDINGS

I. Records Review

During the audit, ESRB staff reviewed the following records:

- PG&E's "Electric Transmission Preventive Maintenance Manual", TD-1001M, Revision 1 through 4
- PG&E Transmission Patrol and Inspection Procedures
- PG&E Vegetation Management Quality Assurance Standard and Procedures
- PG&E Transmission Vegetation Management and Integrated Procedures, Standards, and Bulletins
- PG&E's number of overhead and underground structure count and miles for the Table Mountain Division
- PG&E's listing of all circuits within Tier 2 and Tier 3 High Fire Hazard areas for the Table Mountain Division
- A summary of PG&E's detailed inspections and patrols conducted in the Table Mountain Division from January 1, 2009 to May 15, 2019
- PG&E's procedures for assigning priority levels to conditions identified as a result of patrols, inspections, and other means
- PG&E's list of open work orders created between January 1, 2016 and May 10, 2019 for the Table Mountain Division
- PG&E's list of completed work orders that were completed between January 1, 2016 and May 10, 2019 for the Table Mountain Division
- PG&E's list of work orders that were cancelled between January 1, 2016 and May 10, 2019 for the Table Mountain Division
- PG&E's policy and procedures for infrared patrols of transmission lines
- Infrared testing results from circuits in the Table Mountain Division
- PG&E's Light Detection and Ranging ("LiDAR") vegetation management records in 2018 and 2019 for the Table Mountain Division
- PG&E's pole intrusive test records for the Table Mountain Division
- PG&E Insulator Wash Procedures 2017-2019 for the Table Mountain Division
- PG&E Vegetation Management Records from January 2017 through March 2019 for the Table Mountain Division
- PG&E's policies and procedures for structure, intrusive and foundation test on transmission facilities
- A spreadsheet summary of PG&E's non-routine, infrared, and emergency patrols on transmission lines for the Table Mountain Division between January 1, 2018 and May 5, 2019
- A summary of PG&E vegetation management related certifications and academic degrees held by employees or contractors of PG&E's vegetation management department for the Table Mountain Division in 2017
- PG&E data concerning a vegetation fire from the PG&E 2018 Fire Incident Data Collection Report in the Table Mountain Division

- A list of PG&E’s circuits that are subject to the Public Safety Power Shutoff (PSPS) for the Table Mountain Division
- PG&E’s Amended 2019 Wildfire Safety Plan from February 6, 2019

ESRB staff observed the following violation during the records review portion of the audit:

1. GO 95, Rule 31.1, Design, Construction and Maintenance states in part:

“Electrical supply and communication systems shall be designed, constructed, and maintained for their intended use, regard being given to the conditions under which they are to be operated, to enable the furnishing of safe, proper, and adequate service.

For all particulars not specified in these rules, design, construction, and maintenance should be done in accordance with accepted good practice for the given local conditions known at the time by those responsible for the design, construction, or maintenance of communication or supply lines and equipment.”

ESRB staff reviewed work orders from Bates PGE-CPUC-DATA-0000000975 that were completed between January 1, 2016 and May 10, 2019 for the Table Mountain Division. PG&E’s Electric Transmission Preventive Maintenance Manual (ETPM), Revision 4, effective November 20, 2018, Table 5 below defines the priority codes and associated time frames for the response/repair action.

Table 5. Priority Codes

Priority Code	Priority Description
A	The condition is urgent and requires immediate response and continued action until the condition is repaired or no longer presents a potential hazard. SAP due date will be 30 days to allow time for post-construction processes and notification close-out.
B	Corrective action is required within 3 months from the date the condition is identified. The condition must be reported to the transmission line supervisor as soon as practical.
E	Corrective action is required within 12 months from the date the condition is identified.
F	Corrective action is recommended within 24 months from the date the condition is identified, (due beyond 12 months, not to exceed 24 months). Requires Director approval.

ESRB found a total of 904 work orders in PGE-CPUC-DATA-0000000975 that were completed late from their respective due dates per Table 5, Priority Codes specified in PG&E’s ETPM, Revision 4. This includes some work orders that were listed as Priority 4 and 5 which are the old priority codes that were in used back in 2005 and 2007. Priority 4 and 5 work orders required corrective action within 12 and 24 months, respectively. Table 1 below is a breakdown of the 904 work orders completed late for each priority. It also shows the percentage breakdown of the total work orders completed for the period.

Table 1. Number and percentage of work orders completed late by priority codes

Priority Codes	Work Orders Completed Late	Total Work Orders Completed	Percentage of Work Orders Completed Late
4	1	1	100%
5	5	5	100%
A	5	270	1.85%
B	121	1507	8.03%
E	413	3842	10.75%
F	359	674	53.26%
Grand Total	904	6299	14.35%

These work orders that were completed late represent 14.35% of the total work orders completed for the period. For Priority F, the percentage is as high as 53% (more than half of Priority F work orders were completed late). Additionally, for Priority 4 and 5, all work orders were completed late.

Of the 904 work orders completed late, two work orders were completed as many as 2,693 days past their assigned due dates, or approximately 7 ½ years late. And the work orders prioritized under the old coding system were obviously most overdue and were completed as many as 3,447 days or about 9 ½ years late. Table 2 below identifies the most overdue work orders for each priority.

Table 2. Work orders most overdue per priority and number of days past due

Priority Codes	Most Overdue Work Orders (WO #s)	Number of Days past Assigned Due Dates
4	102374211	3,128
5	101785384	3,447
A	106593206 & 106593205	632
B	106919001	1,086
E	106997432	1,262
F	111940598 & 111940652	2,693

Work order #102374211 was identified on May 22, 2007 to replace a cross arm and given a required completion end date of May 22, 2008. The work was not completed until December 14, 2016.

Work order #101785384 was identified on July 7, 2005 to replace a vibration damper and given a required completion end date of July 7, 2007. The work was not completed until December 13, 2016.

Work orders #111940598 and #111940652 were both identified on June 26, 2007 to replace transmission poles. They were given a required completion end date of June 26, 2009. However, the required work was not completed until November 9, 2016.

II. Field Inspection

During the field inspection, ESRB staff inspected the following facilities:

Location	Structure Number	Circuit
1	0/8	Butte-Chico #1, 60 kV
2	0/9	Butte-Chico #1, 60 kV
3	0/10	Butte-Chico #1, 60 kV
4	0/11	Butte-Chico #1, 60 kV
5	0/12	Butte-Chico #1, 60 kV
6	0/13	Butte-Chico #1, 60 kV
7	0/14	Butte-Chico #1, 60 kV
8	0/15	Butte-Chico #1, 60 kV
9	0/16	Butte-Chico #1, 60 kV
10	0/17	Butte-Chico #1, 60 kV
11	0/18	Butte-Chico #1, 60 kV
12	0/16	Butte-Chico #2, 60 kV
13	Pole 17	Inside Chico A Substation
14	12/207	Centerville-Table Mountain 60 kV
15	12/006	Centerville-Table Mountain 60 kV
16	12/005	Centerville-Table Mountain 60 kV
17	13/095	Rock Creek – Poe, 230 kV
18	16/134	Cresta – Rio Oso, 230 kV
19	15/102	Rock Creek – Poe, 230 kV
20	29/238	Cresta –Rio Oso, 230 kV
21	29/235	Cresta – Rio Oso, 230 kV
22	29/234	Cresta – Rio Oso, 230 kV
23	30/199	Poe – Rio Oso, 230 kV
24	A6-70A	Palermo-Oroville #2, 60 kV
25	A5-69	Palermo-Oroville #2, 60 kV
26	A5-68	Palermo-Oroville #2, 60 kV
27	A6-70	Palermo-Oroville #2, 60 kV
28	A6-71	Palermo-Oroville #2, 60 kV
29	A6-72	Palermo-Oroville #2, 60 kV
30	11-102	Woodleaf-Palermo, 115 kV
31	12/120	Woodleaf-Palermo, 115 kV
32	12/118	Woodleaf-Palermo, 115 kV
33	12/117	Woodleaf-Palermo, 115 kV
34	17/173	Woodleaf-Palermo, 115 kV
35	18-187	Woodleaf-Palermo, 115 kV
36	19-201	Woodleaf-Palermo, 115 kV
37	77/315 #1	Round Mountain – Table

Location	Structure Number	Circuit
		Mountain #1, 500 kV
38	77/315 #2	Round Mountain – Table Mountain #2, 500 kV
39	13/264	Colgate-Palermo, 60 kV
40	13/263	Colgate-Palermo, 60 kV
41	13/262	Colgate-Palermo, 60 kV
42	11/226	Colgate-Palermo, 60 kV
43	5/103 A	Colgate-Palermo, 60 kV
44	5/103 B	Colgate-Palermo, 60 kV
45	5/103 C	Colgate-Palermo, 60 kV
46	5/104 T	Colgate-Palermo, 60 kV

III. Field Inspection Violations –Violations List

ESRB staff observed the following violations during the field inspection:

1. GO 95, Rule 56.9 Guy Marker (Guy Guard) states:

“A substantial marker of suitable material, including but not limited to metal or plastic, not less than 8 feet in length, shall be securely attached to all anchor guys. Where more than one guy is attached to an anchor rod, only the outermost guy is required to have a marker.”

The pole 0/16 on the Butte-Chico #2, 60 kV circuit has a broken guy marker.

2. GO 95, Rule 31.1, Design, Construction and Maintenance states in part:

“Electrical supply and communications systems shall be designed, constructed, and maintained for their intended use, regard being given to the conditions under which they are to be operated, to enable the furnishing of safe, proper, and adequate service.

For all particulars not specified in these rules, design, construction, and maintenance should be done in accordance with accepted good practice for the given local conditions known at the time by those responsible for the design, construction, or maintenance of communication or supply lines and equipment.”

- 2.1 The pole 12/207 on the Centerville-Table Mountain 60 kV circuit had an anchor guy buried in the ground.
- 2.2 The tower 29/238 on the Cresta-Rio Oso 230 kV circuit had all four concrete footings buried in the ground.
- 2.3 The wooden pole 5/104T on the Colgate-Palermo 60 kV circuit had an exposed three-foot hole next to it where the previous pole existed.

3. GO 95, Rule 61.6, Marking and Guarding states in part:

“All towers shall be equipped with signs designed to warn the public of the danger of climbing same. Additionally, such signs shall include a graphic depiction of the dangers of falling or electrocution associated with climbing the towers. Such signs shall be placed and arranged so that they may be read from the four corners of the tower. Such signs shall be neither less than 8 feet nor more than 20 feet above the ground except where the lowest horizontal member of the tower is more than 20 feet above the ground in which case the sign shall be not more than 30 feet above the ground.”

- 3.1 The tower 29/238 on the Cresta-Rio Oso 230 kV circuit is missing a danger/high voltage sign on one side of the tower face.
- 3.2 The tower 30/199 on the Poe-Rio Oso 230 kV circuit is missing a danger/high voltage sign on one side of the tower face.

4. GO 95, Rule 51.6, Marking and Guarding, High Voltage Marking states in part:

“Poles which support line conductors of more than 750 volts shall be marked with high voltage signs. This marking shall consist of a single sign showing the words “HIGH VOLTAGE”, or pair of signs showing the words “HIGH” and “VOLTAGE”, not more than six (6) inches in height with letters not less than 3 inches in height. Such signs shall be of weather and corrosion-resisting material, solid or with letters cut out therefrom and clearly legible.”

The leaning wood pole 12/120 on the Woodleaf-Palermo 115 kV circuit is missing high voltage signs.

5. GO 95, Rule 56.2, Overhead Guys, Anchor Guys and Span Wires, Use states in part:

“Guys shall be attached to structures, as nearly as practicable, at the center of load. They shall be maintained taut and of such strength as to meet the safety factors of Rule 44.”

The down guy of wood pole 5/103B on the Colgate-Palermo 60 kV circuit is not taut.

IV. Field Inspection – Documented Violations List

ESRB staff observed the following violations during the field inspection that were documented by PG&E in its last inspection. These violations are still pending corrective action.

1. GO 95, Rule 31.1, Design, Construction and Maintenance states in part:

“Electrical supply and communications systems shall be designed, constructed, and maintained for their intended use, regard being given to the conditions under which they are to be operated, to enable the furnishing of safe, proper, and adequate service.

For all particulars not specified in these rules, design, construction, and maintenance should be done in accordance with accepted good practice for the given local conditions known at the time by those responsible for the design, construction, or maintenance of communication or supply lines and equipment.”

- 1.1 The wood pole A5/68 on the Palermo-Oroville #2 60 kV circuit was over-stressed with shell rot and woodpecker damage.

- 1.2 The leaning wood pole 12/120 on the Woodleaf-Palermo 115 kV circuit has shell rot and woodpecker damage.
- 1.3 The leaning wood pole 12/117 on the Woodleaf-Palermo 115 kV circuit has pole top and woodpecker damage.