

PUBLIC UTILITIES COMMISSION

505 VAN NESS AVENUE
SAN FRANCISCO, CA 94102-3298



July 19, 2011

EA2011-009

Ms. Eleanor Joyce Pefferman
EO SR&S Sustainable Reliability
Pacific Gas and Electric Company
245 Market St, N14
San Francisco, CA 94105

Subject: PG&E Sonoma Division Electric Audit

Dear Ms. Pefferman:

On behalf of the Utilities Safety and Reliability Branch (USRB) of the California Public Utilities Commission, Ryan Yamamoto and I conducted an electric audit of PG&E's Sonoma Division from June 13-17, 2011. The audit included a review of the division's records for the period January 2008 through June 2011.

During the audit, we identified violations of one or more General Orders. I have enclosed a copy of our audit summary itemizing those violations. By August 18, 2011, PG&E must send me a response to this letter detailing its plans to address those violations and when PG&E expects to complete them. You may email an electronic copy of the response to kh2@cpuc.ca.gov or send a hard copy to:

Attn: Kenneth How
California Public Utilities Commission
505 Van Ness Avenue
San Francisco, CA 94102-3298

Should you have any questions concerning this letter I can be reached at by phone at (415) 703-2875 or by email at kh2@cpuc.ca.gov.

Sincerely,

A handwritten signature in blue ink that reads "Kenneth K. How".

Kenneth K. How
Utilities Safety and Reliability Branch
Consumer Protection and Safety Division
California Public Utilities Commission

Enclosures: Audit Summary

CC: Ryan Yamamoto, Utilities Engineer, CPUC USRB
Alok Kumar, Senior Utilities Engineer, CPUC USRB
Raymond Fugere, Program and Project Supervisor, CPUC USRB
Curtis Todd Ryan, Supervisor, PG&E Gas & Electric System Support

AUDIT SUMMARY

I. Record Violations

This section summarizes the General Order (GO) violations that we found during our review of PG&E Sonoma Division maintenance records.

A. GO 165 Inspection Record Violations

1. Late GO 165 Inspections

GO 165 Section IV: Standards for Inspection, Record-keeping, and Reporting states in part:

Each utility subject to this General Order shall conduct inspections of its distribution facilities, as necessary, to assure reliable, high-quality, and safe operation, but in no case may the period between inspections (measured in years) exceed the time specified in the attached table.

PG&E must inspect their facilities per the cycles outlined in GO 165. PG&E tracks these inspections by highlighting inspected facilities on inspection maps per PG&E's Electric Distribution Preventive Maintenance (EDPM) Manual. Facilities not highlighted within a GO 165 cycle indicate that PG&E has either not inspected those facilities on time or had failed to follow the inspection procedures outlined in its EDPM Manual.

The following inspection maps had facilities not highlighted within a GO 165 inspection cycle:

Record	Explanation of Violation
Overhead Inspection Map KK2806 Completed 5/11/10	Customer owned poles that were found during a 2005 inspection were not mapped onto the 2010 map and were not highlighted. Pole on eastern edge of the inspection map was also not highlighted.
Overhead Inspection Map KK2823 Completed 6/25/10	Pole near Arlen Dr. highlighted in 2005 but not in 2010.
Overhead Inspection Map OO35 Completed 3/31/10	A pole near the northern side of the map was not highlighted in 2005 or 2010.

Underground Inspection Map II2722 Completed 4/5/10	Enclosure near Corporate Ctr Pkway and Sebastapol Rd highlighted in 2005 but not in 2010.
Overhead Inspection Map HH2301 Completed 10/8/10	Pole near northwest side of map highlighted in 2005 but not in 2010. Guy stub pole on Woodside Dr highlighted in 2005 but not in 2010.
Overhead Inspection Map HH2716 Completed 12/16/10	Pole near Brandee and Kerry Ln. highlighted in 2005 but not in 2010.

2. Missing GO 165 Inspection Records

GO 165 Section IV: Standards for Inspection, Record-keeping, and Reporting states in part:

The company shall maintain records of inspection activities which shall be made available to parties or pursuant to Commission rules upon 30 days notice.

Under GO 165 Section IV, PG&E must keep and be able to produce records of its inspection activities. The following table lists inspection records that PG&E could not produce during our audit.

Record	Explanation of Violation
Overhead Inspection Map MM3022 Completed 9/23/10	Missing Inspection Map
Overhead Inspection Map NN36 Completed 10/4/05	Missing Inspection Map

B. Equipment Test and Inspection Record Violations

1. Suspect Capacitor Banks Returned to Service

GO 95 Rule 31.1 Design, Construction and Maintenance [of overhead systems] and GO 128 Rule 17.1 Design, Construction and Maintenance [of underground systems] state in part:

For all particulars not specified in these rules, design, construction, and maintenance should be done in accordance with accepted good practice

Section 5 of PG&E's Rev. 06/2010 Capacitor Bank Test Report Form requires that "capacitor banks with load currents outside the ranges shown [on included load chart] must be taken offline immediately" and that "the condition must be documented in the 'Comments' section of this form and on an EC Notification". We consider the completion of the test form to be part of PG&E's "accepted good practice" per GO 95 Rule 31.1 and GO 128 Rule 17.

The below capacitors were operating outside the ranges shown on the load chart, but the inspector did not note any abnormal conditions in the comments section nor on an EC notification. Some suspect capacitors were subsequently returned to service without any corrective action. Since PG&E did not identify these suspect capacitors per PG&E maintenance procedures, they were not maintained in accordance with PG&E's "accepted good practice" per GO 95 Rule 31.1 and GO 128 Rule 17.1.

Record	Explanation of Violation
Capacitor Test Report Operating #: 504 Year 2011	All three phase online load currents measured at values above acceptable range. Tester appears to have been looking at load chart for a 900 kVAR capacitor instead of a 600 kVAR as indicated in equipment info. Unit left online. No abnormal conditions noted in comments section or on an EC notification.
Capacitor Test Report Operating #: 572 Year 2011	All three phase online load currents measured at values below acceptable range. Unit taken offline, but no abnormal conditions noted in comments section or on an EC notification.
Capacitor Test Report Operating #: 904 Year 2011	All three phase online load currents measured at values below acceptable range. Unit left online. No abnormal conditions noted in comments section or on an EC notification.

2. Incomplete Capacitor Tests Marked as Complete

GO 95 Rule 31.1 Design, Construction and Maintenance [of overhead systems] and GO 128 Rule 17.1 Design, Construction and Maintenance [of underground systems] state in part:

For all particulars not specified in these rules, design, construction, and maintenance should be done in accordance with accepted good practice

PG&E Utility Procedure TD2302P-05 requires maintenance staff to test switched capacitor banks with the switches in both the open and closed positions. We consider the procedures in TD2302P-05 to be part of PG&E's "accepted good practice" per GO 95 Rule 31.1 and GO 128 Rule 17.

While reviewing PG&E's capacitor test records, we found that PG&E did not always perform on-line tests on its switched capacitors when inspectors found high voltages across them. These tests would be considered incomplete per TD2302P-05. These capacitors should either be revisited and retested when conditions are conducive to testing or put on a deferment list per TD2302P-05. If PG&E does not complete these maintenance tests per its standards, the capacitors are not maintained in accordance with PG&E's "accepted good practice" per GO 95 Rule 31.1 and GO 128 Rule 17.1.

Below is a sample of switched capacitors we found that did not receive online tests due to high voltage conditions.

Record	Explanation of Violation
Capacitor Test Report Operating #: 518 Year 2011	Did not receive online test due to high voltage conditions.
Capacitor Test Report Operating #: 614 Year 2011	Did not receive online test due to high voltage conditions.
Capacitor Test Report Operating #: 686 Year 2011	Did not receive online test due to high voltage conditions.
Capacitor Test Report Operating #: 868 Year 2011	Did not receive online test due to high voltage conditions.
Capacitor Test Report Operating #: 4406 Year 2011	Did not receive online test due to high voltage conditions.
Capacitor Test Report Operating #: 4490 Year 2011	Did not receive online test due to high voltage conditions.

Capacitor Test Report Operating #: 4536 Year 2011	Did not receive online test due to high voltage conditions.
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3. Corrective Actions Not Recorded on Equipment Test Forms

GO 95 Rule 31.1 Design, Construction and Maintenance [of overhead lines] and GO 128 Rule 17.1 Design, Construction and Maintenance [of underground systems] state in part:

For all particulars not specified in these rules, design, construction, and maintenance should be done in accordance with accepted good practice

Section 7 of PG&E’s Rev. 06/2010 Capacitor Bank Test Report form requires an ERR Pin number if the tester identifies abnormal conditions on a capacitor. Section 9 of the form also requires an EC notification number for identified abnormal conditions. PG&E’s recloser test form requires similar procedures. We consider the completion of these forms to be part of PG&E’s “accepted good practice” per GO 95 Rule 31.1 and GO 128 Rule 17.

A number of capacitor and recloser test forms we reviewed were missing these numbers even after the tester marked them as necessary. It is unknown whether the abnormal equipment received corrective action. Without corrective action and corrective action numbers written on the form per PG&E maintenance procedures, the equipment is not being maintained in accordance with PG&E’s “accepted good practice” per GO 95 Rule 31.1 and GO 128 Rule 17.1.

Below is a list of equipment we found whose test forms indicated that they required ERR Pin numbers and/or EC Notification numbers but had none written down.

Record	Explanation of Violation
Capacitor Test Report Operating #: 476 Year 2011	Missing EC Notification # when marked that one was required.
Capacitor Test Report Operating #: 696 Year 2011	Missing EC Notification # when marked that one was required.
Capacitor Test Report Operating #: 806 Year 2011	Missing EC Notification # when marked that one was required.
Capacitor Test Report Operating #: 822 Year 2011	Missing EC Notification # when marked that one was required.

Capacitor Test Report Operating #: 846 Year 2011	Missing EC Notification # when marked that one was required.
Capacitor Test Report Operating #: 4484 Year 2011	Missing EC Notification # and ERR Pin # when marked that they were required.
Recloser Test Report Operating #: 406 Year 2011	Missing EC Notification # when marked that one was required.
Recloser Test Report Operating #: 560 Year 2011	Missing EC Notification # when marked that one was required.

4. Incomplete or Incorrectly Marked Capacitor Test Forms

GO 95 Rule 31.1 Design, Construction and Maintenance [of overhead lines] and GO 128 Rule 17.1 Design, Construction and Maintenance [of underground systems] state in part:

For all particulars not specified in these rules, design, construction, and maintenance should be done in accordance with accepted good practice

We consider the completion of PG&E's Rev. 06/2010 Capacitor Bank Test Report form to be part of PG&E's "accepted good practice" per GO 95 Rule 31.1 and GO 128 Rule 17.

We found a number of capacitor test forms that were incorrectly or incompletely marked. Incorrect test forms are incomplete per PG&E maintenance standards, resulting in equipment not being maintained in accordance with PG&E's "accepted good practice" per GO 95 Rule 31.1 and GO 128 Rule 17.1.

Below is a sample of capacitor test records we found that appear to be incompletely or incorrectly filled out.

Record	Explanation of Violation
Capacitor Test Report Operating #: 135 Year 2011	Section 3 - Status of fixed bank after test was not recorded
Capacitor Test Report Operating #: 157 Year 2011	Section 2 – Visual Inspection not marked as completed

Capacitor Test Report Operating #: 2132 Year 2011	Section 2 –Inspector erroneously checked that no visual inspection was completed and that the equipment was not in good condition
Capacitor Test Report Operating #: 4246 Year 2011	Section 2 – No check box marked next to “Equipment appears to be in good condition”

We also found 2011 capacitor test forms where the counter readings in Section 4 were not filled in without explanation why.

5. Late Equipment Tests

GO 95 Rule 31.1 Design, Construction and Maintenance [of overhead lines] and GO 128 Rule 17.1 Design, Construction and Maintenance [of underground systems] state in part:

For all particulars not specified in these rules, design, construction, and maintenance should be done in accordance with accepted good practice

PG&E Standard TD-2302S outlines PG&E equipment inspection and test cycles. We consider the procedures in TD2302S to be part of PG&E’s “accepted good practice” per GO 95 Rule 31.1 and GO 128 Rule 17.

When asked for a list of equipment not inspected or maintained on time, PG&E responded by saying that capacitor bank 3268 was not inspected in 2010. Late equipment inspections are not compliant with PG&E standard TD2302-S, resulting in equipment not being maintained in accordance with PG&E’s “accepted good practice” per GO 95 Rule 31.1 and GO 128 Rule 17.1.

C. Late Corrective Actions

GO 95 Rule 31.1 Design, Construction and Maintenance [of overhead lines] and GO 128 Rule 17.1 Design, Construction and Maintenance [of underground systems] state in part:

For all particulars not specified in these rules, design, construction, and maintenance should be done in accordance with accepted good practice

PG&E’s EDPM manual outlines PG&E’s methodology for prioritizing (with end dates) corrective actions for issues it finds on its electric system. We consider the procedures in PG&E’s EDPM manual to be part of PG&E’s “accepted good practice” per GO 95 Rule 31.1

and GO 128 Rule 17. Thus, past due corrective actions that violate the guidelines in that manual are also violations of GOs 95 and/or 128.

In a pre-audit data request to PG&E, we requested a list of all corrective actions in the audit period that PG&E Sonoma Division had completed late or that were late and still pending. There were 92 corrective actions on that list that PG&E had completed late and 7 late corrective actions that were still pending. These late corrective actions are violations of GOs 95 and/or 128.

During our records review, we also found that EC Notification #101916381 was marked as complete when it was not actually complete at the time of our audit. It was written, in part, for a map change at location 22 on PG&E's 2005 overhead inspection map MM3513. This notification is also late and is a violation of GO 95

II. Field Violations

This section lists the GO 95 and 128 violations that we identified during our field inspections of PG&E facilities. For the field work, we chose locations that PG&E inspected for GO violations per its maintenance program recent to our audit date.

A.	Location:	Pole at 21684 8 th St E, Sonoma, CA (MM3516 Loc 1)
	Pole No.:	N/A
	Previous Visit by Utility:	Overhead Inspection Map MM3516 Completed 5/30/10
	Date Visited by CPUC:	6/15/11
Explanation of Violation(s):		
<p><u>Buried Guy Anchor</u></p> <p>GO 95 Rule 31.1:</p> <p style="text-align: center;"><i>Electrical supply and communication systems shall be designed, constructed, and maintained for their intended use.</i></p> <p>PG&E Document 022221 indicates that the connection between anchor rods and down guys should be kept above grade to prevent corrosion. The connection was below grade at this location.</p>		

B.	Location:	Pole at 21707 8 th St E, Sonoma, CA (MM3516 Loc 8)
	Pole No.:	N/A
	Previous Visit by Utility:	Overhead Inspection Map MM3516 Completed 5/30/10
	Date Visited by CPUC:	6/15/11
Explanation of Violation(s):		
<p><u>Slack Anchor Guy</u></p> <p>GO 95 Rule 56.2:</p> <p style="text-align: center;"><i>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</i></p> <p>The anchor guy was slack at this location.</p>		

C.	Location:	Pole at 456 2 nd St, Sonoma, CA
	Pole No.:	N/A
	Previous Visit by Utility:	New Residential Svc Installation PM 30829612 Bending Moment Calc Completed 6/23/10
	Date Visited by CPUC:	6/15/11
Explanation of Violation(s):		
<p><u>Inaccurate Safety Factor Calculation</u></p> <p>GO 95 Rule 44.1 Outlines the minimum safety factor requirements for poles. To ensure that those safety factors are met, PG&E must perform accurate safety factor calculations on its poles that take into account all attachments.</p> <p>A streetlight mounted on the pole was not included in the pole's safety factor calculation. See section III.A for further discussion of this violation.</p>		

D.	Location:	Pole at 19400 Wyatt Rd, Sonoma, CA
	Pole No.:	N/A
	Previous Visit by Utility:	Pole Replacement PM 30829450 Bending Moment Calc Completed 2/12/11
	Date Visited by CPUC:	6/15/11
Explanation of Violation(s):		
<p><u>Inaccurate Safety Factor Calculation</u></p> <p>GO 95 Rule 44.1 Outlines the minimum safety factor requirements for poles. To ensure that those safety factors are met, PG&E must perform accurate safety factor calculations on its poles that take into account all attachments.</p> <p>A streetlight mounted on the pole was not included in the pole's safety factor calculation. Secondary services on this pole were also not included. See section III.A for further discussion of this violation.</p>		

E.	Location:	Pole at 202 Hill Blvd, Petaluma, CA
	Pole No.:	N/A
	Previous Visit by Utility:	Overhead Patrol Map NN2915 Completed 9/28/10
	Date Visited by CPUC:	6/16/11
	Explanation of Violation(s):	
	<p data-bbox="240 558 565 594"><u>Broken Ground Molding</u></p> <p data-bbox="248 632 509 667">GO 95 Rule 51.6 B:</p> <p data-bbox="321 705 1339 814"><i>That portion of the ground wires attached on the face or back of wood crossarms or on the surface of wood poles and structures shall be covered by a suitable protective covering</i></p> <p data-bbox="240 852 768 888">Ground molding was broken at this pole.</p>	

F.	Location:	Pole at 4355 Hall Rd, Santa Rosa, CA
	Pole No.:	N/A
	Previous Visit by Utility:	Overhead Inspection Map II2619 Completed 1/25/11
	Date Visited by CPUC:	6/16/11
Explanation of Violation(s):		
<p data-bbox="240 491 695 527"><u>Anchor Guy Contacting Secondary</u></p> <p data-bbox="240 564 1295 636">GO 95 Table 2 Case 19 D requires a 3 in clearance between 0-750 volt conductors and guys.</p> <p data-bbox="240 674 1081 709">At this location, a secondary conductor was touching a guy cable.</p>		
<p data-bbox="240 758 797 793"><u>Tree Grounding Sectionalized Anchor Guy</u></p> <p data-bbox="240 831 464 867">GO 95 Rule 56.6</p> <p data-bbox="321 905 1338 1119"><i>All portions of guys within both a vertical distance of 8 feet from the level of supply conductors of less than 35,500 volts and a radial distance of 6 feet from the surface of wood poles or structures shall not be grounded, through anchors or otherwise. Where necessary to avoid the grounding of such portions, guys shall be sectionalized by means of insulators installed at locations as specified in Rule 56.7.</i></p> <p data-bbox="240 1161 1414 1232">Tree branches contacting a guy at this location were potentially grounding the sectionalized portion of that guy.</p>		

G.	Location:	PM Transformer at 1841 Bella Vista, Santa Rosa, CA (HH2822 Loc 1)
	Enclosure No.:	T-7388
	Previous Visit by Utility:	Underground Inspection Map HH2822 Completed 3/10/11
	Date Visited by CPUC:	6/17/11
Explanation of Violation(s):		
<p><u>Improper Work Space Clearances</u></p> <p>GO 128 Rule 17.1:</p> <p><i>For all particulars not specified in these rules, design, construction, and maintenance should be done in accordance with accepted good practice</i></p> <p>PG&E Standard 051122 requires a 3' horizontal working space clearance around the inoperable sides of padmounted equipment. At this location, shrubs of a greater size than allowed in 051122 were growing against two of the three inoperable sides of the padmount.</p>		

H.	Location:	PM Transformer at 1832 Pallasade, Santa Rosa, CA (HH2822 Loc 2)
	Enclosure No.:	T-7389
	Previous Visit by Utility:	Underground Inspection Map HH2822 Completed 3/10/11
	Date Visited by CPUC:	6/17/11
Explanation of Violation(s):		
<p><u>Improper Work Space Clearances</u></p> <p>GO 128 Rule 17.1:</p> <p><i>For all particulars not specified in these rules, design, construction, and maintenance should be done in accordance with accepted good practice</i></p> <p>PG&E Standard 051122 requires a 3' horizontal working space clearance around the inoperable sides of and an 8' clearance in front of padmounted equipment. At this location, shrubs of a greater size than allowed in 051122 were growing against one of the three inoperable sides of the padmount. There was also a fire hydrant located less than 8' in front of the operable side of the padmount.</p>		

III. Programmatic Violations

This section discusses GO violations stemming from issues raised during the review of PG&E's maintenance procedures and from observation of PG&E's implementation of those procedures. These violations may be systemic in nature and might not be specific to the Sonoma Division.

A. PG&E Does Not Take Into Account All Working Stresses in Safety Factor Calculations

GO 95 Rule 44 outlines the minimum safety factor requirements for poles. To ensure that those safety factors are met, PG&E must perform accurate safety factor calculations on its poles and take into account all working stresses including those from attachments.

While in the field we found poles (see sections II.C, II.D) with safety factor calculations that did not include all facilities, namely streetlights and service drops. PG&E standard 015203 has instructions for estimating the wind loading created by streetlights, suggesting that they should be included in the loading calculations. Standard 015203 also indicates that moments created by secondary services should be "considered" and follows with instructions on how to estimate them. However, during our review of PG&E's loading calculations, we could not find any records showing that PG&E considered or estimated service moments. PG&E must indicate that they have taken into account all facilities, including streetlights and services, when performing safety factor calculations to show that those calculations are within the requirements of GO 95 Rule 44.