

PUBLIC UTILITIES COMMISSION

505 VAN NESS AVENUE
SAN FRANCISCO, CA 94102-3298



November 17, 2020

SA2020-854

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

SUBJECT: Field Inspection Findings – PG&E’s San Carlos Headquarters Substation Audit

Dear Ms. Jordan:

On behalf of the Electric Safety and Reliability Branch (ESRB) of the California Public Utilities Commission (CPUC), Raymond Cho and Ogeonye Enyinwa of ESRB conducted field inspections of PG&E’s substation facilities and equipment in the San Carlos Headquarters area from October 12, 2020 through October 15, 2020.

As a result of the field inspections, ESRB staff identified violations of General Order (GO) 174. A copy of the audit findings itemizing the violations and follow-up questions is enclosed. Please provide a response no later than December 15, 2020 by electronic copy of all corrective actions and preventive measures taken by PG&E to correct the identified violations and prevent the recurrence of such violations and a response to the additional questions under Section III. The response should indicate the date of each remedial action and preventive measure completed. For any outstanding items not addressed, please provide the projected completion dates of all corrective actions for the violations outlined in Section II of the enclosed Field Audit Findings.

If you have any questions concerning this audit, please contact Raymond Cho at (415) 703-2236 or raymond.cho@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 Field Audit Findings

Cc: Lee Palmer, Director, Safety and Enforcement Division, CPUC
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**CPUC FIELD AUDIT FINDINGS OF
PG&E SAN CARLOS SUBSTATION HEADQUARTERS
OCTOBER 12 - 15, 2020**

I. Field Inspection

During the field inspection, ESRB inspected the following substations:

Substation	City
Bay Meadows	San Mateo
Belmont	Belmont
Burlingame	Burlingame
Cooley Landing	Palo Alto
Emerald Lake	Emerald Lake
Glenwood	Menlo Park
Half Moon Bay	Half Moon Bay
Hillsdale	San Mateo
Jefferson	Redwood City
Menlo	Menlo Park
Redwood City	Redwood City
San Carlos	San Carlos
San Mateo	San Mateo
Watershed	Redwood City
Woodside	Woodside

II. Field Inspection – Violations List

ESRB observed the following violations during the field inspection:

GO 174, Rule 12, General states in part:

“...Substations shall be designed, constructed and maintained for their intended use, regard being given to the conditions under which they are to be operated, to promote the safety of workers and the public and enable adequacy of service.

Design, construction, and maintenance should be performed in accordance with accepted good practices for the given local conditions known at the time by those responsible.”

1. Bay Meadow Substation

- 1.1. Potential oil leaks on the radiator for Transformer Bank #1.
- 1.2. A high insulator/bushing oil level on Transformer Bank #4.
- 1.3. Housekeeping issues: Equipment parts left lying around at Transformer Bank #2.
(Figures 1 and 2)



Figure 1: Parts left around Transformer Bank #2.



Figure 2: Parts left under Transformer Bank #2.

1.4. The National Fire Protection Association (NFPA) 704 Diamond on one of the control room entrances was faded and no longer legible. (Figure 3)



Figure 3: Faded NFPA diamond.

2. Burlingame Substation

- 2.1. Two lights required replacement in the station's battery room.
- 2.2. An abandoned ground wire and underground conduit were protruding out of the ground near Regulator #401.

2.3. Potential oil weeps at the radiator flanges of 3-phase transformer Banks #1, #2, and #3. (Figure 4)



Figure 4: Example of oil weep at flange of one of the Transformer Banks.

2.4. Atmospheric corrosion at the base of a conduit by the C-Phase Regulator #401. (Figure 5)



Figure 5: Atmospheric corrosion on the conduit supporting Regulator #401.

3. **Hillsdale Substation**

3.1. An abandoned ground wire protruding from the ground near distribution Circuit Breaker #405. (Figure 6)



Figure 6: Abandoned ground wire protruding from the ground near Circuit Breaker #405.

4. **Jefferson Substation**

- 4.1. The desiccant for Shunt Reactor #1 required replacement.
- 4.2. Potential oil leaks at the radiator drain plugs for Transformer Bank #2.
- 4.3. In the control room, an alarm on the relay for Circuit Breaker #82 identified the need for a battery replacement.
- 4.4. Contamination on the insulators/bushings at or near the following locations:
 - 60kV bus #2 potential transformer
 - Transmission Circuit Breaker #62
 - Transmission Circuit Breaker #12 and potential transformer
 - Transmission Circuit Breaker #22 and potential transformer

5. **Redwood City Substation**

- 5.1. Audible noises heard from the Section D bus at the 12kV secondary (potential partial discharge/corona).
- 5.2. A junction box near Circuit Breaker #24 identified as a trip hazard. (Figure 7)



Figure 7: Junction box near Circuit Breaker #24.

6. San Carlos Substation

6.1. Potential oil leak at the lid of Regulator #403. (Figure 8)



Figure 8: Potential oil leak on Regulator #403.

6.2. An insulator disk/bushing on pole #2 of distribution Circuit Breaker #1101 was chipped/damaged. (Figure 9)



Figure 9: Chipped/ damaged insulator disk/bushing on Circuit Breaker #1101.

6.3. Two insulators/bushings on Circuit Breaker #1103 were missing portions of animal guard wrapping.

6.4. Tripping hazard: The lowering jack near Circuit Breaker #1101. (Figure 10)



Figure 10: Lowering jack on the ground near Circuit Breaker #1101.

7. Glenwood Substation

Vegetation Management issues identified: Tree's branches overhung into Glenwood Substation from adjacent property and were a potential risk to PG&E's substation electric facilities.

8. Woodside Substation

Potential oil leak on the radiator of Transformer Bank #2.

III. Additional Follow-up Question

Hillsdale Substation

In response to ESRB's post-audit data request #1, Question 1, for the last two oil test results for Hillsdale Substation Transformer Bank #1, PG&E provided dissolved gas analyses and insulating fluid evaluations for all three phases. The insulating fluid evaluations for Transformer Bank #1 noted warnings for moisture, interfacial tension and acid number. The comments section of the insulating fluid evaluations also noted "NTFY M&P Eng and Specialist"¹ which ESRB interprets to mean to notify a maintenance and planning engineer and specialist.

Does PG&E have a plan to address these issues and if so, how does PG&E plan to mitigate the issues identified for each phase of Hillsdale Substation's Transformer Bank #1? Provide any supporting work orders for planned work.

¹ San Carlos Post Audit Data Request 1 DRU-3060, Attachment: Hillsdale Bank 1 Oil Test Results_CONF, pp. 2,4, 6.