PUBLIC UTILITIES COMMISSION
505 VAN NESS AVENUE
SAN FRANCISCO, CA 94102-3298

November 4, 2022 SA2022-1007

Vincent Tanguay, Senior Director
Electric Compliance, Electric Engineering
Pacific Gas & Electric Company (PG&E)
300 Lakeside Dr., Oakland 94612

SUBJECT: Substation Audit of PG&E's Table Mountain Headquarters (HQ)

Dear Mr. Tanguay:

On behalf of the Electric Safety and Reliability Branch (ESRB) of the California Public Utilities Commission (CPUC), Samuel Mandell and Stephen Lee of ESRB staff conducted an electric transmission audit of PG&E's Table Mountain HQ from September 12, 2022, through September 16, 2022. During the audit, ESRB staff conducted field inspection of PG&E's substation facilities and equipment and reviewed pertinent documents and records.

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 December 2, 2022, 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. 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 Sections II & IV of the enclosed Audit Findings.

If you have any questions concerning this audit, please contact Samuel Mandell at (916) 217-8294 or samuel.mandell@cpuc.ca.gov.

Sincerely,

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

Enclosure: CPUC Electric Substation Audit Findings

Cc: Lee Palmer, Director, Safety and Enforcement Division, CPUC
Nika Kjensli, Program Manager, ESRB, SED, CPUC
Nathan Sarina, Senior Utilities Engineer (Supervisor), ESRB, SED, CPUC
Rickey Tse, Senior Utilities Engineer (Supervisor), ESRB, SED, CPUC
Samuel Mandell, Utilities Engineer, ESRB, SED, CPUC
Stephen Lee, Senior Utilities Engineer (Specialist), ESRB, SED, CPUC

CPUC SUBSTATION AUDIT FINDINGS
PG&E- Table Mountain Headquarters (HQ)
September 12 – 16, 2022

I. Records Review

During the substation audit, Electric Safety and Reliability Branch (ESRB) reviewed the following standards, procedures, and records for PG&E's (Pacific Gas and Electric) Table Mountain HQ:

- Lists and locations of all assigned PG&E substations
- Map showing all assigned PG&E substations
- Single-line diagrams of substations
- Last two routine substation inspection checklists
- PG&E Counter Results Policies and Procedures
- PG&E Substation Inspection Practices and Procedures
- PG&E Substation Inspection Implementation Plan, TD-3322B-026
- PG&E Substation Maintenance and Construction (SM&C) Manual
- PG&E Infrared Testing Policies and Procedures
- PG&E Oil Testing Policies and Procedures
- PG&E Electrical Testing & Maintenance Policies and Procedures
- PG&E Battery Testing Policies and Procedures
- PG&E Substation Fire Protection Systems and Equipment – Inspection, Test, and Maintenance of Fire Protection Systems and Equipment at Substations: TD-3320P-07
- Inspector Training Policies
- Equipment List
- Visual Inspection List for all Selected Substations
- A list of Corrective and Maintenance Work Notifications from the last five years.
- Transformer Bank Overload Records from the last five years
- Infrared Testing records for selected substations in the last 24 months
- Last four oil test results for selected substations
- Last four electric test results for selected substations
- Training records for all substation inspection and maintenance personnel in the last five years.
- A list of Other Inspections
- Results of any PG&E Substation Internal Audit performed in the last five years

II. Records Violations

ESRB observed the following violations during the records review portion of the audit:

General Order (GO) 174, Rule 12, General states in part:

> *"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. PG&E Substation Equipment Maintenance Requirements, Utility Standard: TD-3322S[1], establishes PG&E's Basic Finish Date and Past Due dates as follows:

Table 1. Due Dates Per Priority Code

Priority Code	Basic Finish Date	Past Due Date
A	Within 30 days	1st day of the month following the month in which the basic finish date occurs
B	Within 90 days	1st day of the 2nd month following the month in which the basic finish date occurs
E	Within 365 days	1st day of the year following the year in which the basic finish date occurs
F	Greater than 365 days	None*

*Schedule Priority F when it is operationally efficient to perform the work

Based on Table 1 above, ESRB noted 73 corrective work notifications and 16 preventative work notifications that were not completed by their required due dates. Therefore, PG&E did not perform maintenance in accordance with accepted good practices described in Utility Standard TD-3322S. See Tables 2 and 3 below for a breakdown of the past-due notifications.

Table 2. Past Due Notifications[2]

Priority Code	Total Late Notifications	Late Corrective Open/Closed	Late Preventative Open/closed	Total Late Cancelled Notifications[3]
B	13	11	0	2
E	76	40	11	25
Total	**89**	**51**	**11**	**27**

[1] PG&E Utility Standard TD-3322S, October 2, 2020, Revision 7.
[2] As of July 22, 2022
[3] Inclusive of the late corrective and preventative notifications

Table 3: Most Overdue Notifications

Priority Codes	Most Overdue Notification	Completed Field Date	Out of Compliance Date	Days Overdue
B	117406252	05/01/2020	10/01/2019	213
E	117105505	09/24/2021	01/01/2020	632

III. Field Inspection

During the field inspection, ESRB inspected the following substations:

Substation	City
Clark Rd	Paradise
Esquon	Durham
Butte	Chico
Chico A	Chico
Sycamore Creek	Chico
Nord	Chico
Anita	Chico
East Quincy	Quincy
Gansner	Quincy
Big Meadows	Greenville
Chester	Chester
Pike City	Camptonville
Columbia Hill	Sweetland
Narrows	Smartville
Browns Valley	Browns Valley
Oroville	Oroville
Peachton	Gridley

IV. Field Inspection – Violations List

ESRB observed the following violations during the field inspection:

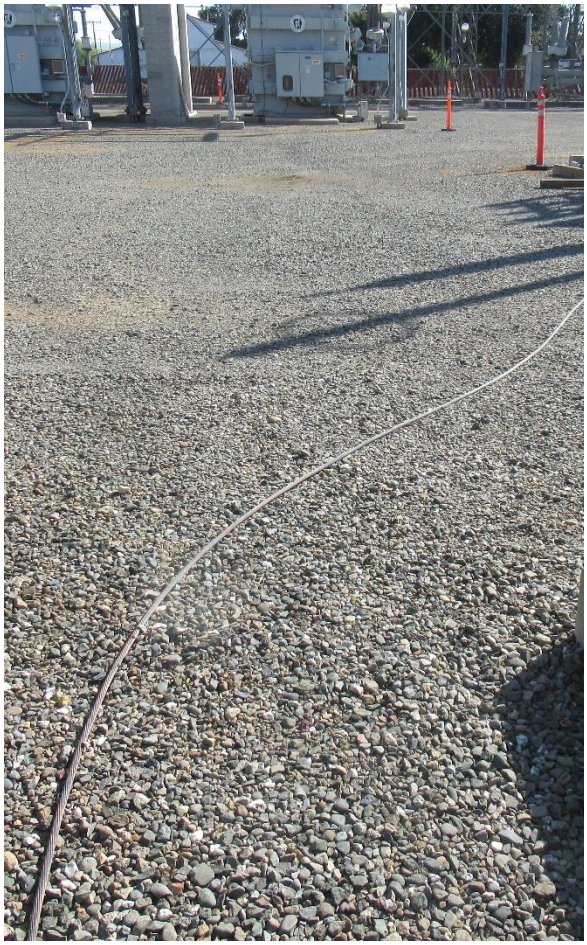
GO 174, Rule 12, General states in part:

> *"…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. Butte Substation

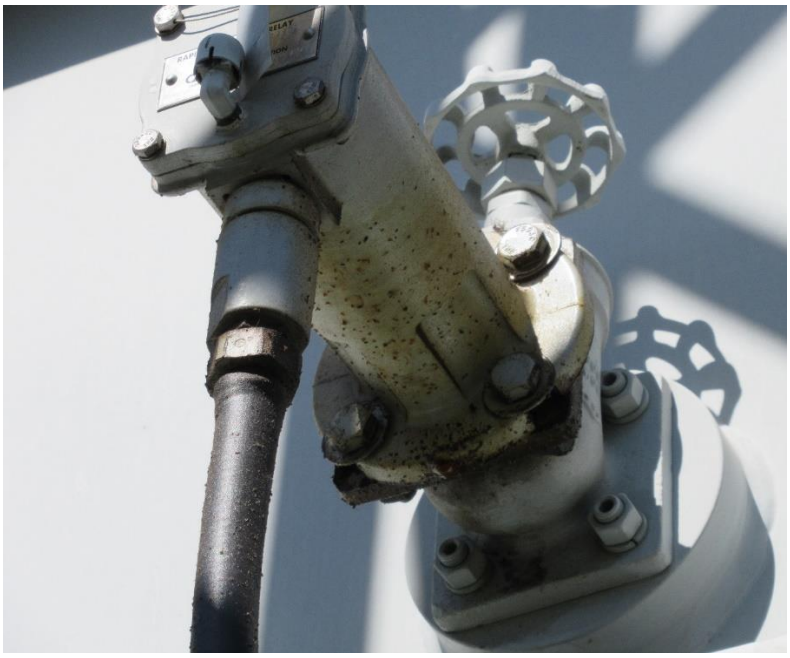
1.1. Birds nest in tertiary of Transformer Bank 1. PG&E has notification Line Corrective (LC) 124409741 to address the issue.

1.2. A ground wire is above ground connected to a temporarily stored transformer and poses a trip hazard. PG&E placed cones around the wire to address the issue.



2. Chico A Substation

2.1. Leak on the Bank 2 Transformer B-Phase main tank sudden pressure device. PG&E created LC 124496651 in the field.



2.2. Birds nest in the Bank 1 potential disconnect switches. PG&E created LC 124496655 in the field.

3. Sycamore Creek Substation

3.1. Winding temperature gauges on Transformer Bank 3 are illegible. PG&E created LC 124498881 in the field.

3.2. Oil leak on Transformer Bank 2 temperature probes. PG&E has LC 124486583 to address the issue.

3.3. Illegible temperature gauge on Transformer Bank 1. PG&E created LC 124498849 in the field.

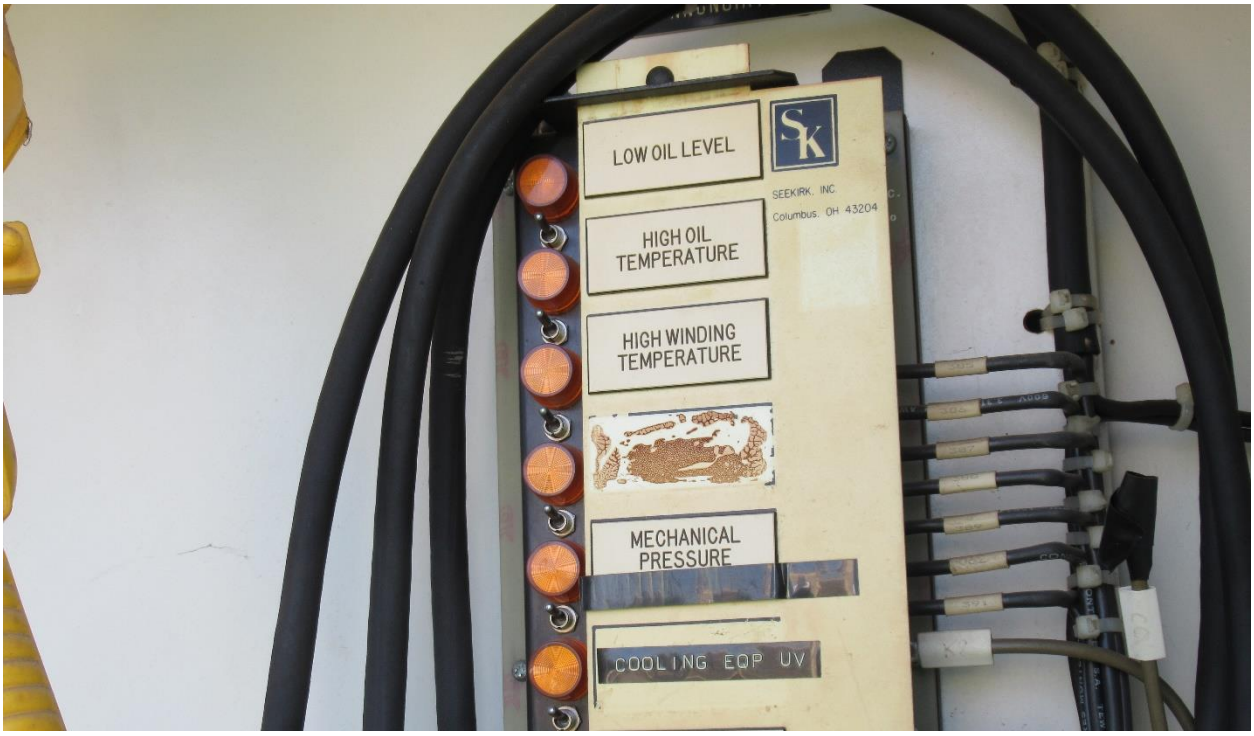
3.4.Cracked window on Circuit Breaker CB1111. PG&E created LC 124498880 in the field.

3.5. Counter on CB1104 has worn out numbers. PG&E has LC 124471316 to address the issue.

4. Nord Substation

4.1. Transformer Bank 2 has an oil leak from a hose coupling. PG&E has LC 124320662.

4.2. Transformer Bank 2 Alarm panel Local Enunciator Gas Accumulator label fell off the panel.



4.3.Birds nest in Bank 2 radiator. PG&E has LC 124469662 to address the issue.

4.4. Birds nest in Bank 1 radiator. PG&E has LC 124469661 to address the issue.

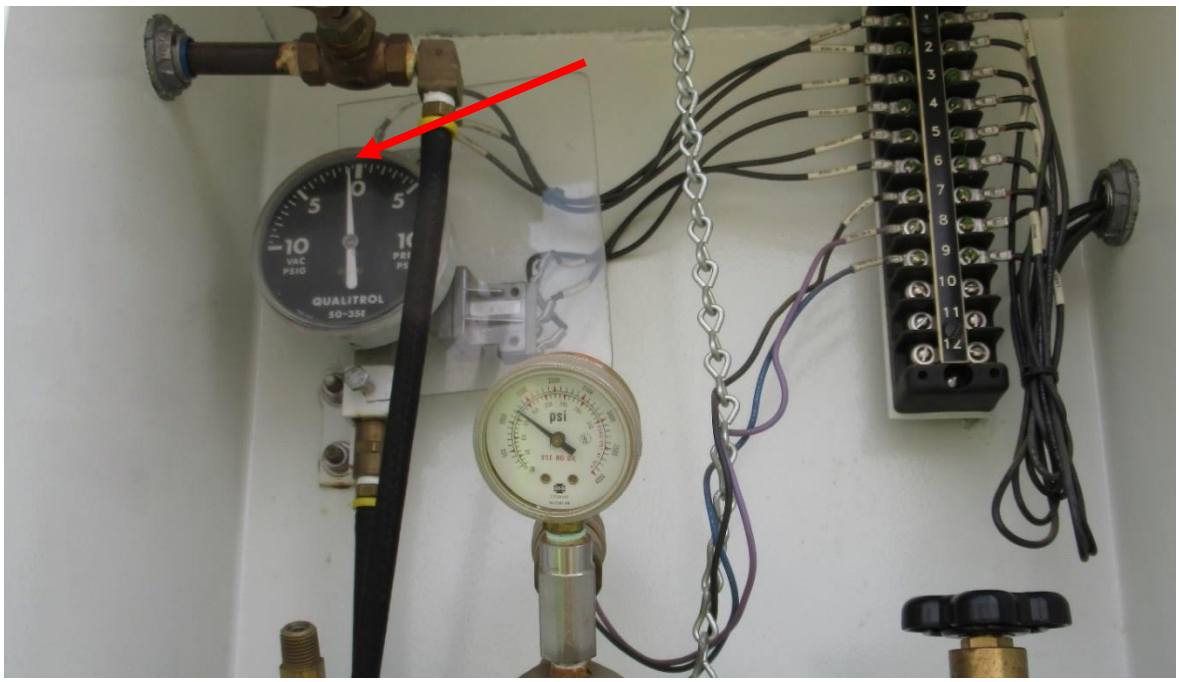
5. Anita Substation

Temperature gauge on Transformer Bank 1 in not functional, shows temperature below 0° C. PG&E has LC 124366150 to address the issue.

6. Gansner Substation

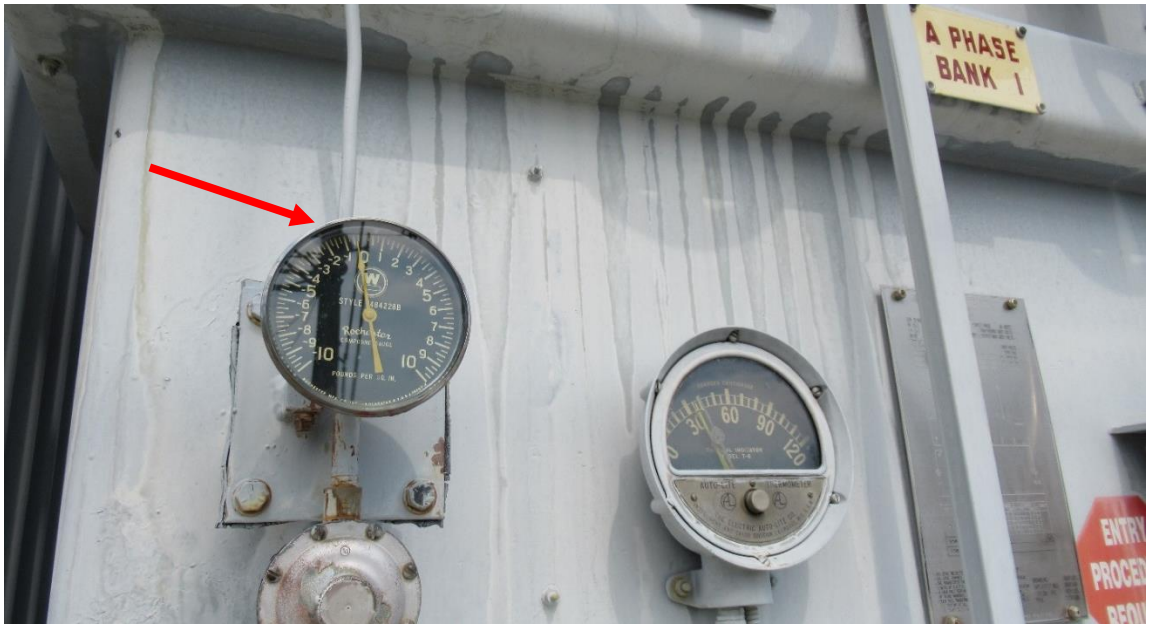
6.1. Expired eye wash in the control house. PG&E has LC124499956 to address the issue.

6.2. Negative pressure on transformer. PG&E corrected the condition in the field.



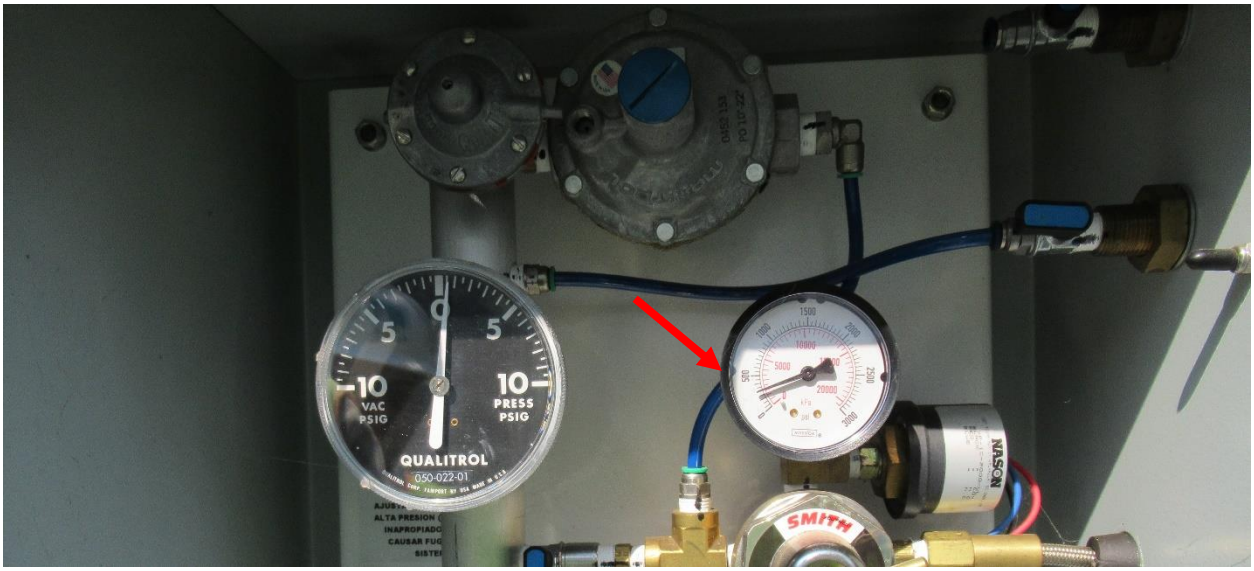
7. Big Meadows Substation

Negative pressure on Transformer Bank 1 A Phase. PG&E created LC 124505518 in the field.



8. Pike City Substation

Low pressure (less than 500 psi) in the nitrogen bottle for Transformer Bank 1 spare phase. PG&E has LC 124511478 to address the issue.



9. Columbia Hill Substation

Expired solution in the eye wash station. PG&E has LC 124511534 to address the issue.

10. Browns Valley Substation

10.1. Jacket splitting on SO Cable. PG&E has LC 124412156 to address the issue.

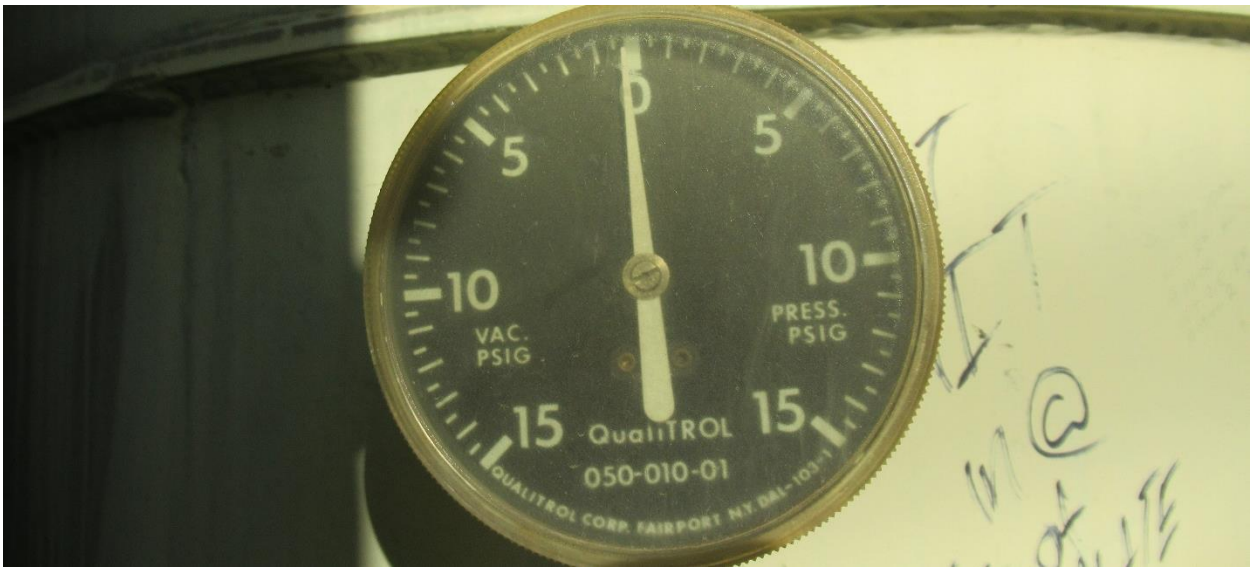
10.2. Damaged nitrogen gauge on Transformer Bank 1 C-phase. PG&E has LC 124412154 to address the issue.

10.3. Damaged nitrogen gauge on Transformer Bank 1 A-phase. PG&E has LC 124412154 to address the issue.

11. Oroville Substation

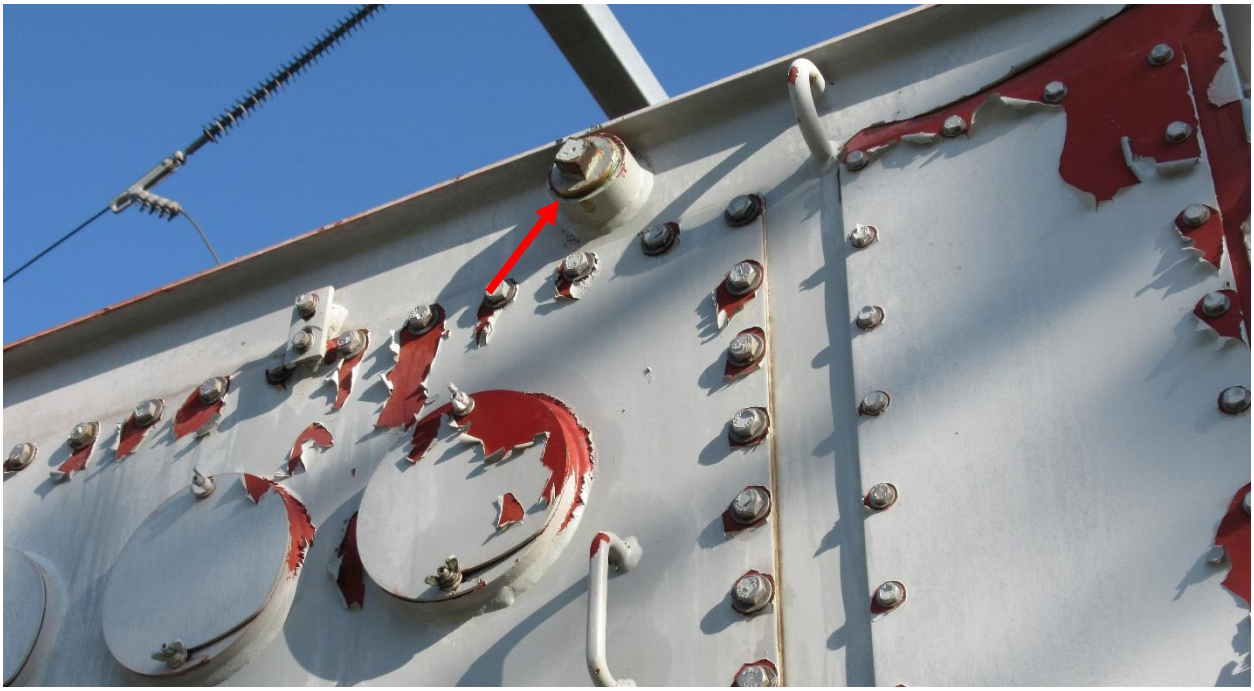
11.1. The eye wash solution in the control house is expired. PG&E has LC 122343458 to address the issue.

11.2. Negative nitrogen pressure in Transformer Bank 3. PG&E has LC 124517848 to address the issue.

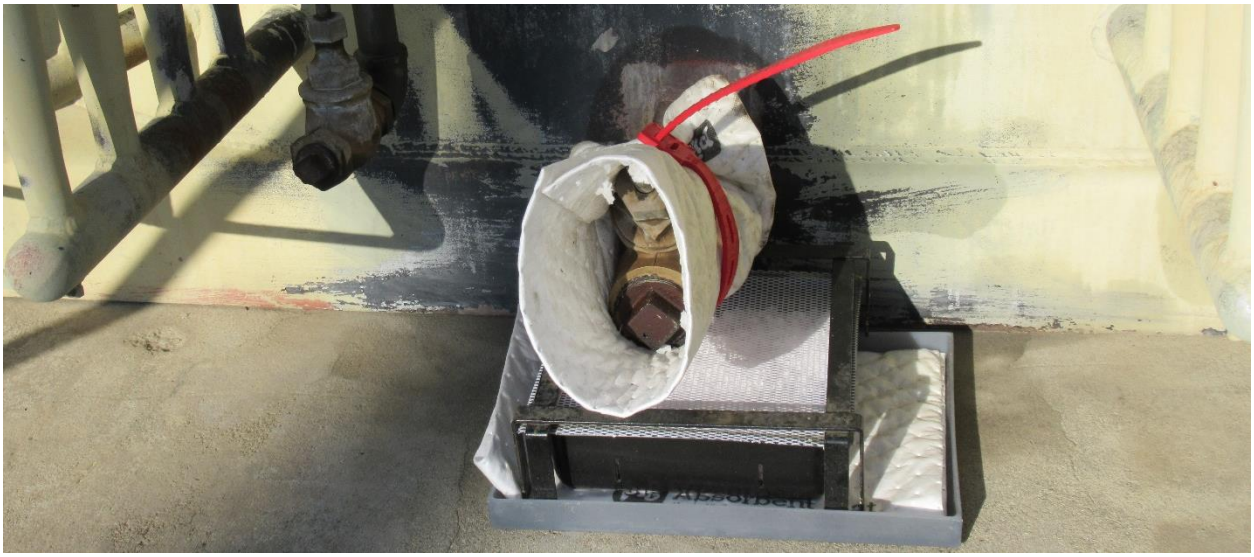


11.3. Oil leak from Transformer Bank 2 radiator flange. PG&E has LC 120527369 to address the issue.

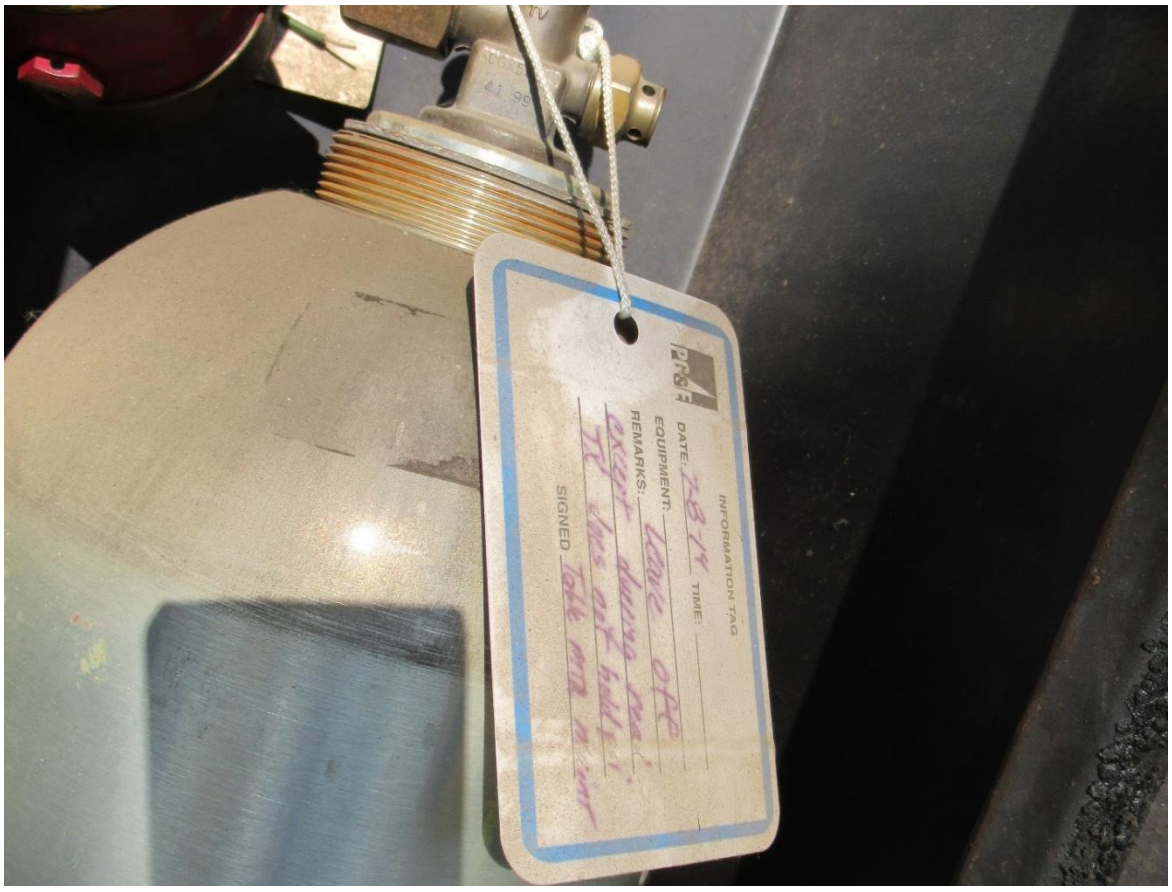
11.4. Oil leak from Transformer Bank 2 LTC drain plug. PG&E has LC 120527367 to address the issue.



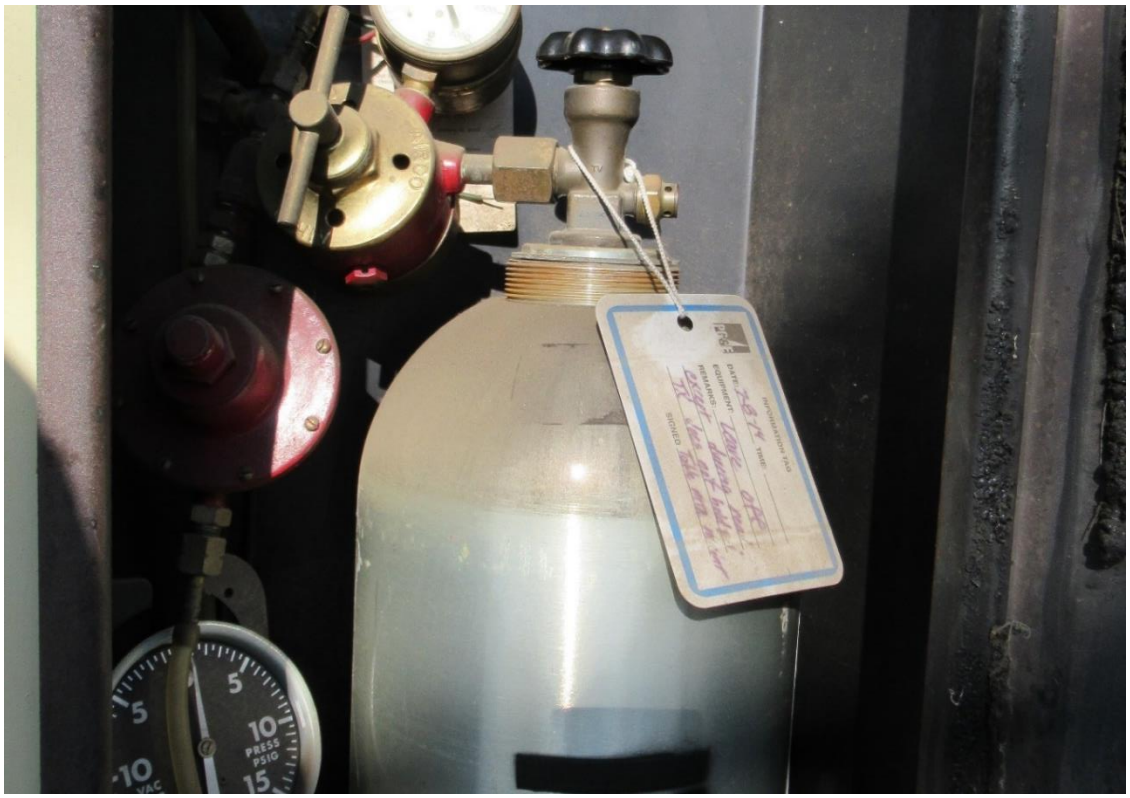
11.5. Oil leak from the Transformer Bank 1 Spare Phase main drain valve. PG&E has LC124336466 to address the issue.



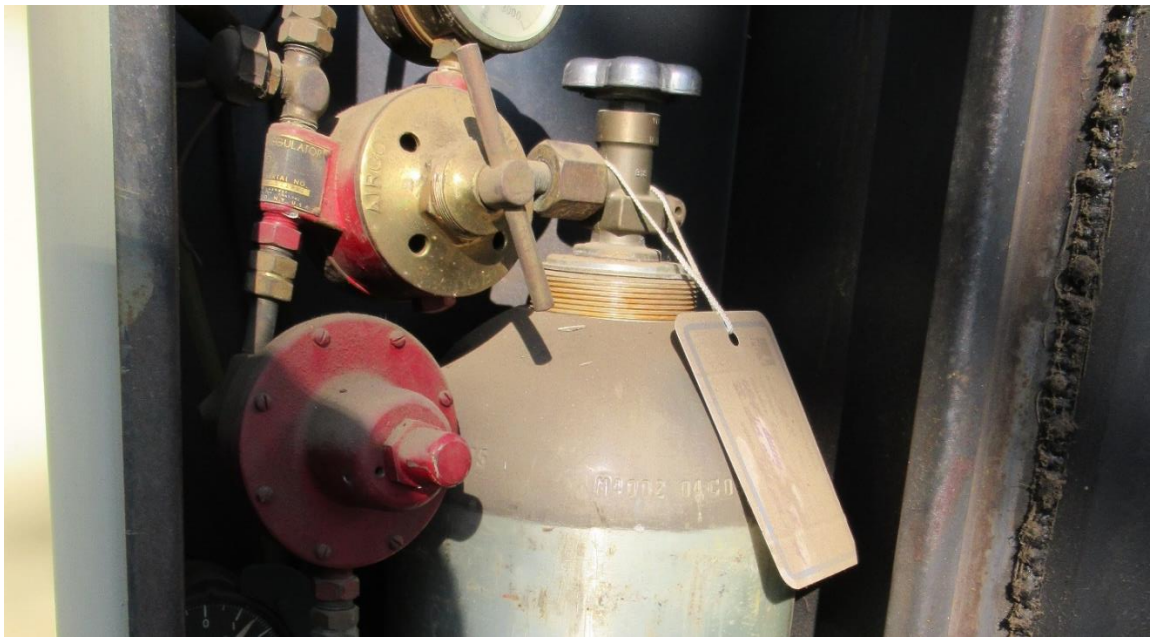
11.6. Leak in the nitrogen pressurization system in Transformer Bank 1 A-Phase. PG&E created LC 124517859 in the field.



11.7. Leak in the nitrogen pressurization system in Transformer Bank 1 B-Phase. PG&E created LC 124517855 in the field.

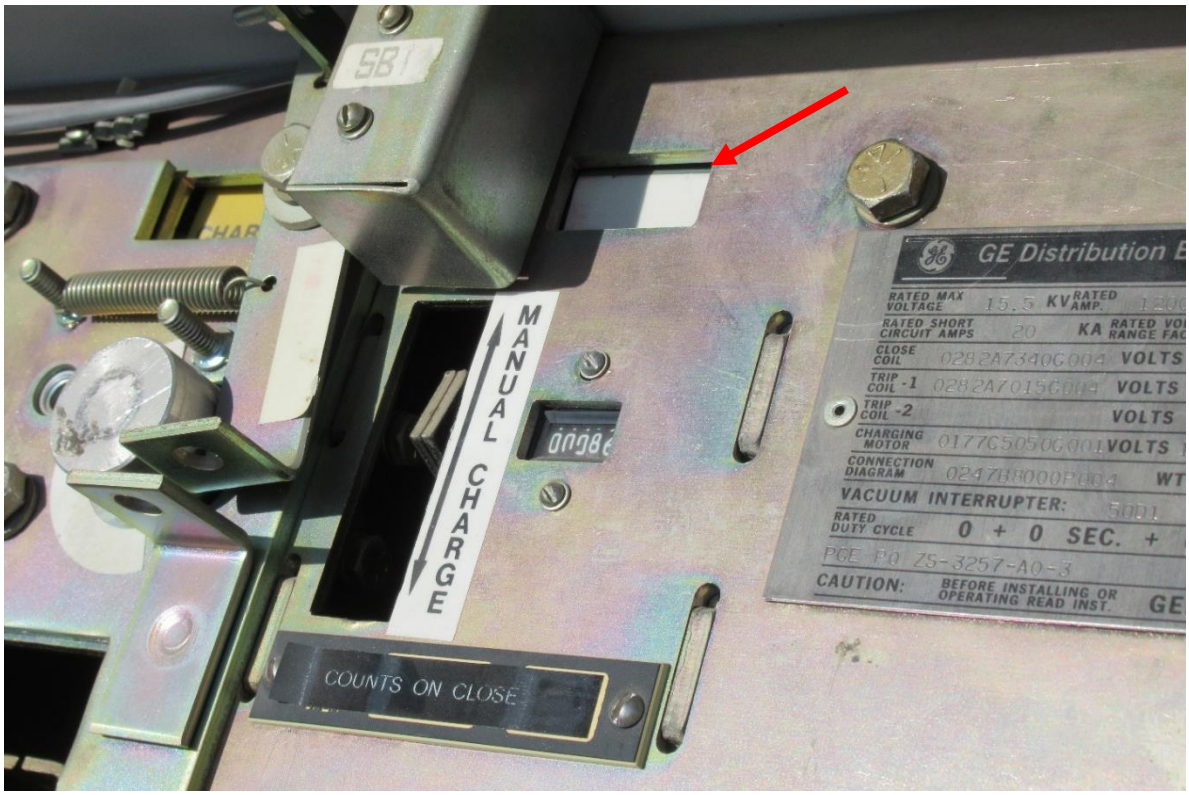


11.8. Leak in the nitrogen pressurization system in Transformer Bank 1 C-Phase. PG&E created LC 124517852 in the field.



11.9. Transformer Bank 1 C-Phase is missing its oil level gauge. PG&E created LC 124517883 in the field.

11.10. The closed indication semaphore on CB1101 is sun-bleached and illegible. PG&E has LC 122343162 to address the issue.



11.11. The concrete foundation for Regulators 3A and 3B is damaged. PG&E created LC124517704 in the field.

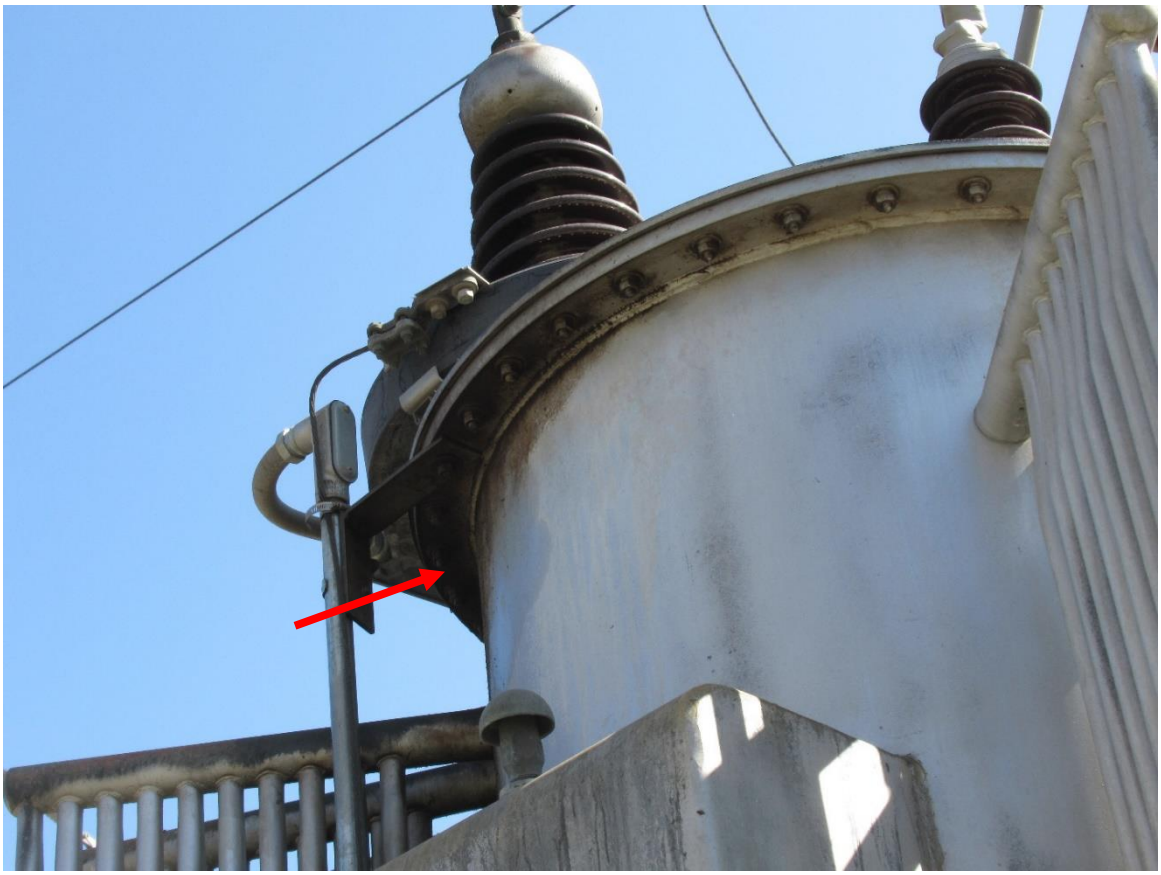
12. Peachton Substation

12.1. The fire extinguisher in the control house is expired. PG&E has LC 124459628 to address the issue.

12.2. There is a birds nest in the CB32 current transformer(CT). PG&E has LC 124459518 to address the issue.

12.3.There are birds nest in the CB22 CT. PG&E has LC 124459514 to address the issue.

12.4. Oil Leak from the Transformer Bank 1 B-Phase lid. PG&E has LC 124320456 to address the issue.



12.5. Transformer Bank 1 C-Phase has negative pressure.

12.6. Transformer Bank 1 C-Phase has negative pressure. PG&E has LC 124459401 to address the issue.

13. Issue Across Multiple Substations

In many of the substations that ESRB visited, the nitrogen tanks connected to the spare transformers were closed. The tanks are connected to automatic regulators and should be left in the open position to ensure that a positive pressure is maintained on the transformer.