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

January 21, 2022 SA2021-915

Mr. Daniel Honeyfield
Manager, T&D Maintenance Planning
SMUD
4401 Bradshaw Rd
Sacramento, CA 95827

SUBJECT: Substation Audit of Sacramento Municipal Utility District (SMUD)

Dear Mr. Honeyfield:

On behalf of the Electric Safety and Reliability Branch (ESRB) of the California Public Utilities Commission (CPUC), Samuel Mandell, Dmitriy Lysak, and Emiliano Solorio of my staff conducted a substation audit of SMUD's substations from November 15 through November 19, 2021. The audit included a review of SMUD's substation procedures and maintenance records, in addition to field inspections of SMUD's substations.

As a result of the audit, my staff identified violations of General Order 174. A copy of the audit findings itemizing the violations is enclosed. Please provide a response no later than February 18, 2022, via electronic transmittal of all corrective actions and preventive measures taken by SMUD to correct the identified violations and prevent the recurrence of such violations.

If you have any questions concerning this audit, please contact Samuel Mandell at (916) 928-2279 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 Audit Findings

Cc: Lee Palmer, Director, Safety and Enforcement Division, CPUC
Nika Kjensli, Program Manager, ESRB, SED, CPUC
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CPUC SUBSTATION AUDIT FINDINGS
Sacramento Municipal Utility District
November 15 - 19, 2021

I. Records Review

During the substation audit, Electric Safety and Reliability Branch (ESRB) reviewed the following standards, procedures, and records for Sacramento Municipal Utility District (SMUD):

- List of all assigned SMUD substations
- Map showing all assigned SMUD substations
- Single-line diagrams of ESRB selected substations
- Equipment lists for ESRB selected substations
- List of the previous 5 years substation inspections
- SMUD's Substation Electrician Procedure Manual Revision 0
- SMUD's Distribution Visual Inspection Prioritization Revision 7
- SMUD's Distribution Substation Visual Inspection Plan Revision 5
- List of all open/pending, completed, cancelled, and late work orders
- Last two visual inspection checklists for ESRB selected substations
- Infrared Testing records for ESRB selected substations in the last 24 months
- Most recent oil sample test results for ESRB selected substations
- Last electric test results for ESRB selected substations
- SMUD's inspector training policy

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. SMUD Distribution Substation Visual Inspection Prioritization, establishes SMUD's Priority and Response Times as follows:

Table 1. Due Dates Per Priority Code

Priority	Response Time
Urgent	<3 Months
Non-Urgent	<12 Months
Monitoring	Subsequent Inspection Until Resolved
No Action Required	N/A

Based on Table 1 above, ESRB noted 37 notifications that were closed after their past due dates. Therefore, SMUD did not perform maintenance in accordance with accepted good practices. See Table 2 below for the past-due notifications.

Table 2. Overdue Notifications

Notification	Priority	Date Identified	SMUD Due Date	Completion Date	Days Late
11118826	Routine - < 3 Month	07/12/2021	10/12/2021	10/13/2021	1
11099986	Routine - < 3 Month	01/25/2018	04/24/2018	04/25/2018	1
11118684	Routine - < 3 Month	07/19/2021	10/19/2021	10/21/2021	2
11100015	Routine - < 3 Month	01/31/2018	04/30/2018	05/02/2018	2
11114020	Routine - < 3 Month	08/21/2020	10/09/2020	10/12/2020	3
11107526	Routine - < 3 Month	11/30/2018	02/21/2019	02/25/2019	4
11107529	Routine - < 3 Month	11/30/2018	02/20/2019	02/25/2019	5
11099984	Routine - < 3 Month	01/25/2018	04/24/2018	04/30/2018	6
11107569	Routine - < 3 Month	12/03/2018	03/03/2019	03/11/2019	8
11091253	Routine - < 3 Month	01/26/2017	04/25/2017	05/03/2017	8
11091406	Routine - < 3 Month	02/21/2017	05/10/2017	05/18/2017	8
11107679	Routine - < 3 Month	12/12/2018	03/07/2019	03/15/2019	8

11112270	Routine - < 3 Month	10/30/2019	01/21/2020	01/30/2020	9
11108489	Routine - < 3 Month	03/19/2019	06/14/2019	06/26/2019	12
11103932	Routine - < 3 Month	08/21/2018	11/15/2018	11/27/2018	12
11099133	Routine - < 3 Month	09/25/2017	12/20/2017	01/04/2018	15
11091677	Routine - < 3 Month	04/17/2017	07/10/2017	07/25/2017	15
11091912	Routine - < 3 Month	05/23/2017	09/19/2017	10/05/2017	16
11112275	Routine - < 3 Month	10/23/2019	01/22/2020	02/10/2020	19
11107739	Routine - < 3 Month	12/21/2018	03/21/2019	04/11/2019	21
11112172	Routine - < 3 Month	10/03/2019	01/03/2020	01/27/2020	24
11108470	Routine - < 3 Month	03/15/2019	06/13/2019	07/25/2019	42
11107434	Routine - < 3 Month	11/15/2018	02/05/2019	04/01/2019	55
11095516	Routine - < 3 Month	08/29/2017	11/22/2017	02/28/2018	98
11108309	Routine - < 3 Month	02/27/2019	05/27/2019	09/03/2019	99
11099087	Routine - < 3 Month	09/25/2017	12/20/2017	05/16/2018	147
11108677	Routine - < 12 Month	05/01/2019	04/19/2020	04/20/2020	1
11112514	Routine - < 12 Month	11/27/2019	11/20/2020	11/25/2020	5
11107272	Routine - < 12 Month	11/01/2018	10/18/2019	11/08/2019	21
11091219	Routine - < 12 Month	02/06/2017	01/19/2018	03/29/2018	69
11099839	Monitoring	01/03/2018	04/02/2018	04/13/2018	11
11096121	Monitoring	03/05/2019	06/05/2019	06/19/2019	14
11083054	Monitoring	05/17/2017	06/20/2018	07/13/2018	23
11108305	Monitoring	02/27/2019	05/17/2019	06/17/2019	31
11100369	Monitoring	04/10/2018	07/05/2018	10/01/2018	88
11100370	Monitoring	04/10/2018	07/05/2018	05/31/2019	330
11100379	Monitoring	04/12/2018	07/11/2018	10/17/2019	463

2. SMUD generated two urgent notifications during Infrared (IR) inspections that were not completed within the allotted 3-month response time. See Table 3 for the late IR follow-up.

Table 3. Late IR Inspection Follow-up

Notification	Priority	Date Identified	Expected Completion	Comments
11106828	Urgent	01/06/2021	4/7/2021	A crew is scheduled to start the work on January 5, 2022
11106830	Urgent	01/06/2021	4/7/2021	A crew is scheduled to start the work on January 7, 2022

III. Field Inspection

During the field inspection, ESRB inspected the following substations:

SUBSTATION	City
Power Line - Elkhorn	Sacramento
El Centro - Arena	Sacramento
North Market - Sports	Sacramento
Cargo- Northgate	Sacramento
Truxel	Sacramento
Tenaya - Northgate	Sacramento
El Camino	Sacramento
Frienza - Albastross	Sacramento
Northrop	Sacramento
Campus Commons	Sacramento
Country Club Center 2	Sacramento
Bell - Cottage	Sacramento
Butano- Cottage	Sacramento
Fruit Ridge - South Land Park	Sacramento
Havenside - Canal	Sacramento
Meadowview - Freeport	Sacramento
Requa - Fawn	Sacramento
Power Inn - Elise	Sacramento
Don Julio - Elkhorn	Sacramento
Don Julio - Lorac Vista	Antelope
Auburn - Van Maren	Citrus Heights
Kalamazoo - San Juan	Citrus Heights
Sunrise - Antelope	Citrus Heights
Sunrise Center	Citrus Heights
Bradshaw - Grant Line	Elk Grove
Bruceville - Poppy Ridge	Elk Grove
Laguna Springs - Sirocco	Elk Grove
Galt	Galt
Live Oak – UPRR	Galt
Twin Cities	Galt

IV. Field Inspection – Violations List

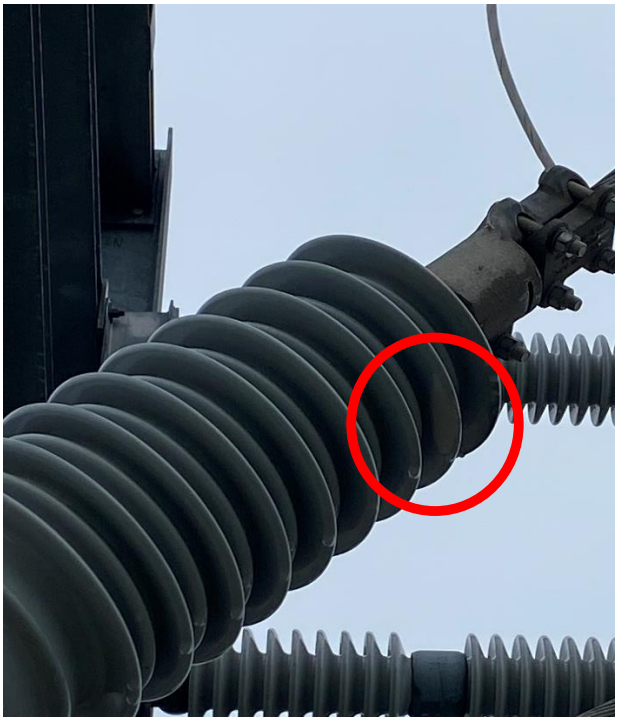
ESRB observed the following violations during the field inspection:

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. Powerline – Elkhorn Substation

1.1) Chipped insulator on C phase of Breaker 7710.



1.2) Warning stickers faded and peeling throughout substation

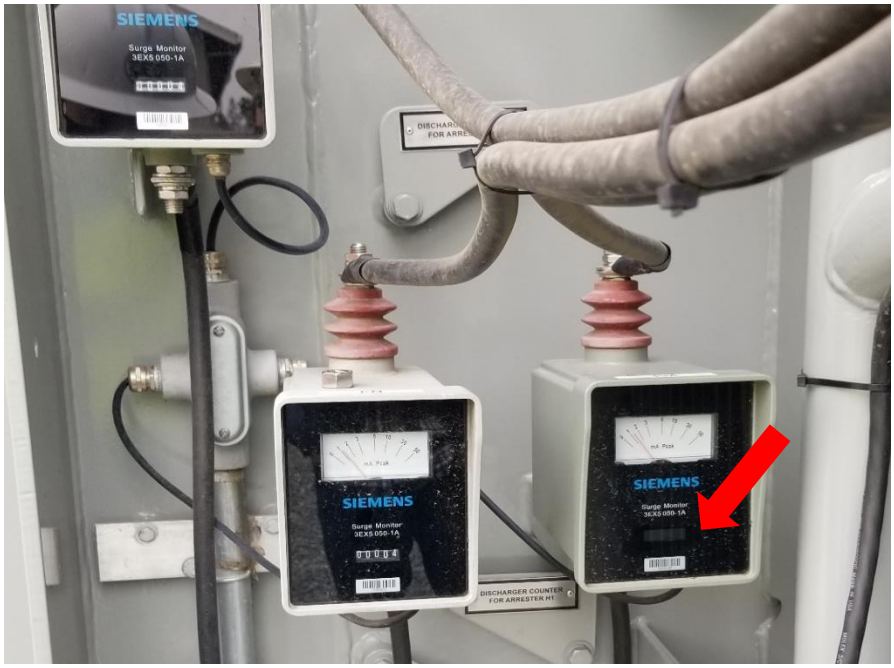
2. North Market – Sports Substation

2.1) Center phase bushing on Transformer Bank 2 is damaged

2.2) Birds nest in Transformer Bank 1 radiator.

3. Truxel Substation

The Surge Monitor counter is illegible.



4. El Camino Substation

4.1) Chipped insulator on Transformer Bank 1.

4.2) Chipped insulator on Transformer Bank 2.

5. Frienza – Albatross Substation

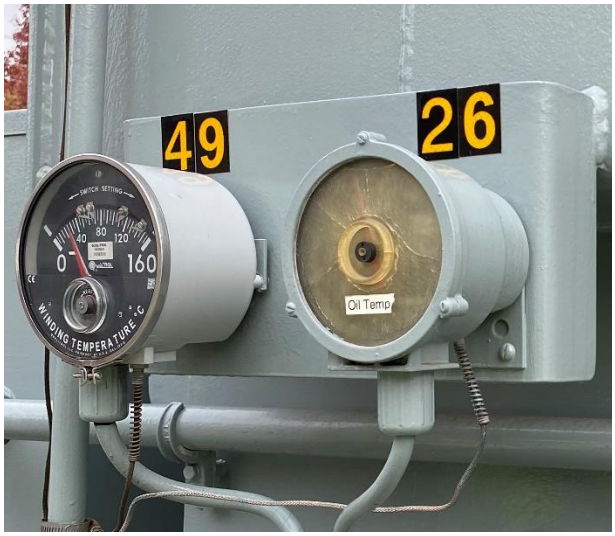
Warning stickers on Transformer Bank 1 are faded and peeling.

6. Country Club Center 2 Substation

Missing light cover on Feeder 401 in the control house.

7. Northrop Substation

The oil temperature gauge on Transformer Bank 2 is damaged and illegible.



8. Fruitridge – South Land Park Substation

Transformer Bank 1 has no secondary containment.

9. Havenside – Canal Substation

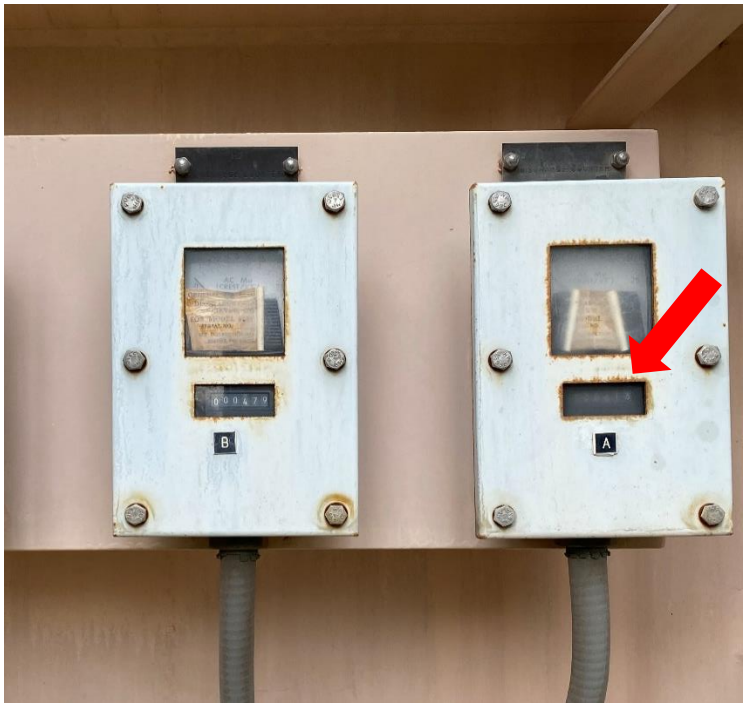
There is an auxiliary power cable laying on the ground creating a trip hazard near a 69 kV riser.

10. Meadowview – Freeport Substation

Chipped insulator on the A phase of Transformer Bank 2.

11. Don Julio – Lorac Vista Substation

The A phase discharge counter is illegible.

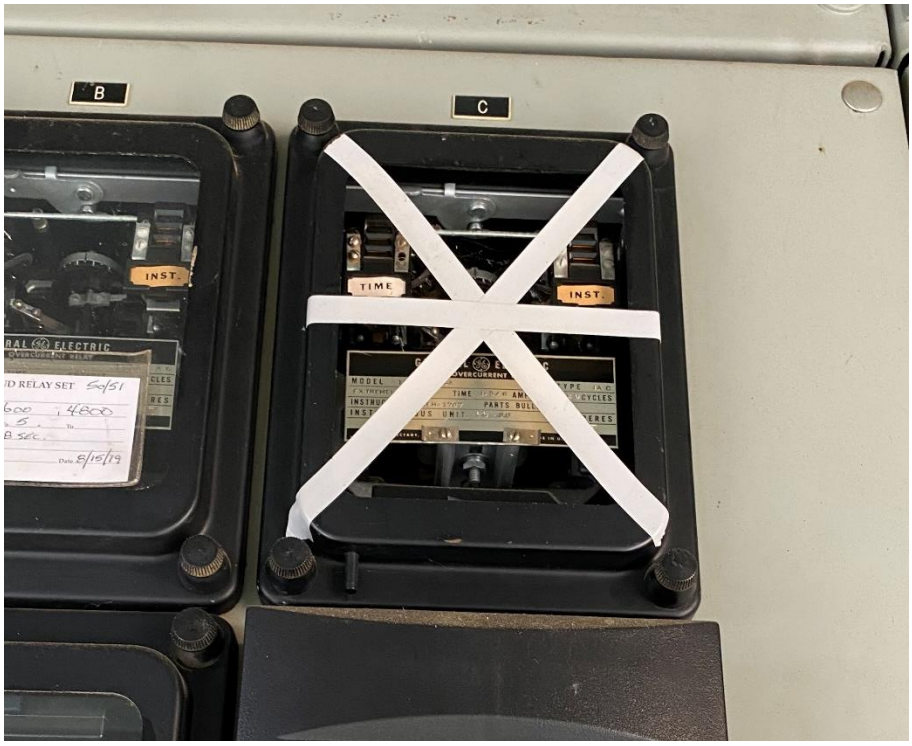


12. Don Julio – Elkhorn Substation

Transformer Bank 1 is weeping from rib near the top of the transformer.

13. Kalamazoo – San Juan Substation

Feeder 1201 C phase relay is missing its cover.



14. Galt Substation

Load tap changer digital position display was not working.

15. Twin Cities Substation

Oil weep on from Transformer Bank 1 LTC oil tank.

16. Laguna Springs – Sirocco

16.1) Batteries 7-14, 17, 20, 23, and 24 were filled above the max fill line.

16.2) The conduit for one of the surge counters was heavily corroded and exposing the wire within.

17. Bruceville - Poppy Ridge

There are pieces of broken insulators inside the transformer radiator fins.