

**PUBLIC UTILITIES COMMISSION**

505 VAN NESS AVENUE  
SAN FRANCISCO, CA 94102-3298



June 23, 2023

Joshua Kretz  
Solar PV & Energy Storage Production Manager II  
44810 Kaiser Road  
Desert Center, CA 92239

**SUBJECT: Generation Audit of Desert Sunlight – Audit Number GA2023-12DS**

Dear Mr. Kretz:

On behalf of the Generation Section, Electric Safety and Reliability Branch (ESRB) of the California Public Utilities Commission (CPUC), Calvin Choi and Stephen Hur of ESRB staff conducted a generation audit of Desert Sunlight from May 15, 2023, through May 19, 2023.

During the audit, ESRB observed plant operations, inspected equipment, reviewed data, interviewed plant staff, and identified violations of General Order (GO) 167-B. A copy of the audit findings itemizing the violations is enclosed. Please advise me by email no later than July 21, 2023, by electronic copy, of all corrective measures taken by Desert Sunlight to remedy and prevent the recurrence of such violations. Your response should include a Corrective Action Plan with a description and completion date of each action and measure completed. For any violations not corrected, please provide the projected completion dates to correct the violations and to achieve full compliance with GO 167-B.

Please submit your response to Stephen Hur at [stephen.hur@cpuc.ca.gov](mailto:stephen.hur@cpuc.ca.gov). Please note that although Desert Sunlight has been given 30 days to respond, it has a continuing obligation to comply with all applicable GO 167-B requirements; therefore, the response period does not alter this continuing duty.

If you wish to make a claim of confidentiality covering any of the information in the report, you may submit a confidentiality request pursuant to Section 15.4 of GO 167-B, using the heading "General Order 167-B Confidentiality Claim". The request should be sent to Stephen Hur with a copy to me and the GO 167-B inbox [GO167@cpuc.ca.gov](mailto:GO167@cpuc.ca.gov) by July 7, 2023.

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

Attachment: CPUC Generation Audit Findings

Cc: Lee Palmer, Director, Safety and Enforcement Division, CPUC  
Nika Kjetsli, Program Manager, ESRB, CPUC  
Calvin Choi, Senior Utilities Engineer (Specialist), ESRB, CPUC  
Stephen Hur, Utilities Engineer, ESRB, CPUC

## I. Findings Requiring Corrective Action

### **Finding 1: ESRB staff observed faded High Voltage signs on the inverters and faded Arc Flash stickers and identification stickers on combiner boxes.**

**GO 167-B, Appendix E, Operation Standards (OS) 1: Safety** states in part:

*“The protection of life and limb for the work force is paramount. GAOs have a comprehensive safety program in place at each site...”*

**GO 167-B, Appendix D, Maintenance Standards (MS) 11: Plant Status and Configuration** states:

*“Station activities are effectively managed so plant status and configuration are maintained to support safe, reliable and efficient operation.”*

ESRB staff observed faded High Voltage signs on the inverter facilities. ESRB staff also observed faded Arc Flash stickers and identification stickers on the combiner boxes. These ID signs are important for the quick identification of equipment, and they help hasten repairs or maintenance being completed. The safety signs help inform employees, contractors, and visitors who may be unfamiliar with the equipment and its inherent dangers. All eligible signs must be replaced to display pertinent hazard information complying with NFPA-70 E and relevant OSHA regulations.



Figure 1: Faded High Voltage Sign on inverter facility door.



Figure 2: Faded signs/labels on the combiner boxes

**Finding 2: ESRB staff observed multiple oil leaks on critical high voltage electrical equipment.**

**GO 167-B, Appendix D, MS 4: Problem Resolution and Continuing Improvement** states:

*“The company values and fosters an environment of continuous improvement and timely and effective problem resolution.”*

**GO 167-B, Appendix D, MS 9: Conduct of Maintenance** states:

*“Maintenance is conducted in an effective and efficient manner, so equipment performance and material condition effectively support reliable plant operation.”*

**GO 167-B, Appendix D, MS 11: Plant Status and Configuration** states:

*“Station activities are effectively managed so plant status and configuration are maintained to support safe, reliable and efficient operation.”*

ESRB staff observed oil leaks on the transformers next to Inverter B8-09 and B18-06. Staff also observed oil leaks in the substation from GSU1 at the radiator valve and flange, as well as GSU2 near the bottom of the transformer and from the LTC drain valve. The plant must investigate the leakage to identify causes and evaluate any possible operational and structural anomaly of equipment for corrective actions ensuring safety and reliability of the critical assets and personnel.



Figure 3 & 4: Pinhole Oil Leaks from Transformers next to Inverter B8-09 and B18-06.



Figure 5 & 6: Oils Leaks on Transformer GSU1 in substation.



Figure 7 & 8: Oils Leaks on Transformer GSU2 in substation.

**Finding 3: ESRB staff observed a lower comparable Sulfur Hexafluoride (SF6) level on capacitor bank breaker.**

**GO 167-B, Appendix D, MS 4: Problem Resolution and Continuing Improvement states:**

*“The GAO values and fosters an environment of continuous improvement and timely and effective problem resolution.”*

**GO 167-B, Appendix D, MS 9: Conduct of Maintenance states:**

*“Maintenance is conducted in an effective and efficient manner, so equipment performance and material condition effectively support reliable plant operation.”*

ESRB staff observed that the C phase SF6 pressure gauge for DSSC22 capacitor bank breaker had a lower level compared to the other phases. This lower level may indicate an SF6 leak from the C phase breaker and/or a faulty pressure gauge. The plant must investigate and take actions to ensure the integrity of the breakers.

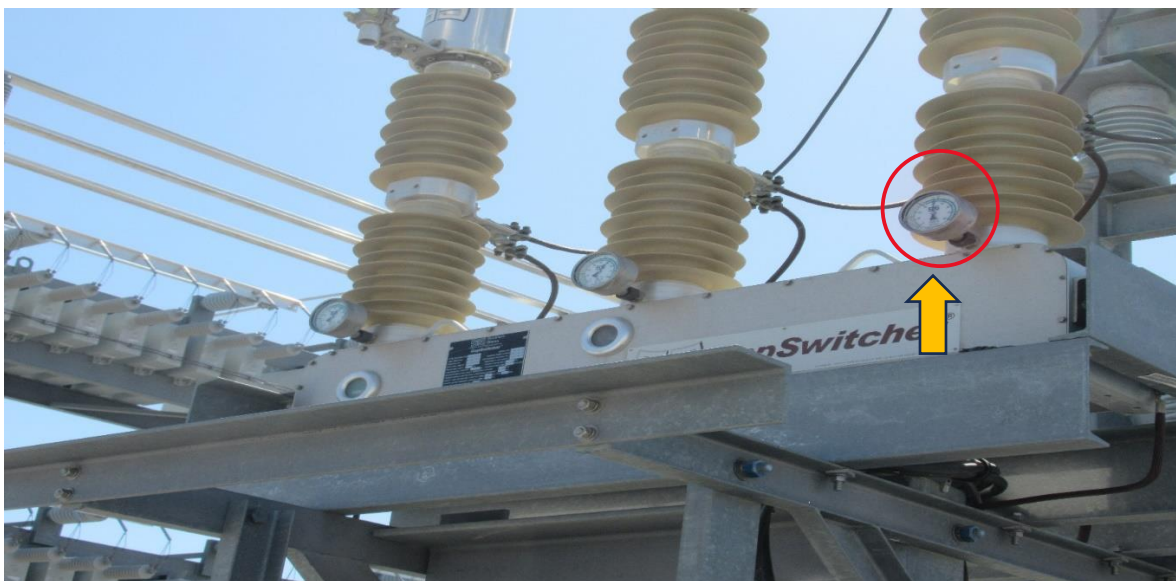


Figure 9: SF6 Pressure Gauges for DSSC22 Capacitor Bank.

**Finding 4: ESRB staff observed multiple solar panel arrays had loose cables.**

**GO 167-B, Appendix D, MS 9: Conduct of Maintenance** states:

*“Maintenance is conducted in an effective and efficient manner, so equipment performance and materiel condition effectively support reliable plant operation.”*

**GO 167-B, Appendix D, MS13: Equipment Performance and Materiel Condition**, states:

*“Equipment performance and materiel condition support reliable plant operation. This is achieved using a strategy that includes methods to anticipate, prevent, identify, and promptly resolve equipment performance problems and degradation.”*

ESRB staff observed multiple solar panels with loose cables touching the ground, particularly in Block 1 and Block 3 arrays. The unsecured cables and straps are susceptible to be damaged and can result in other hazards. The Plant must ensure all the cables are properly secured.

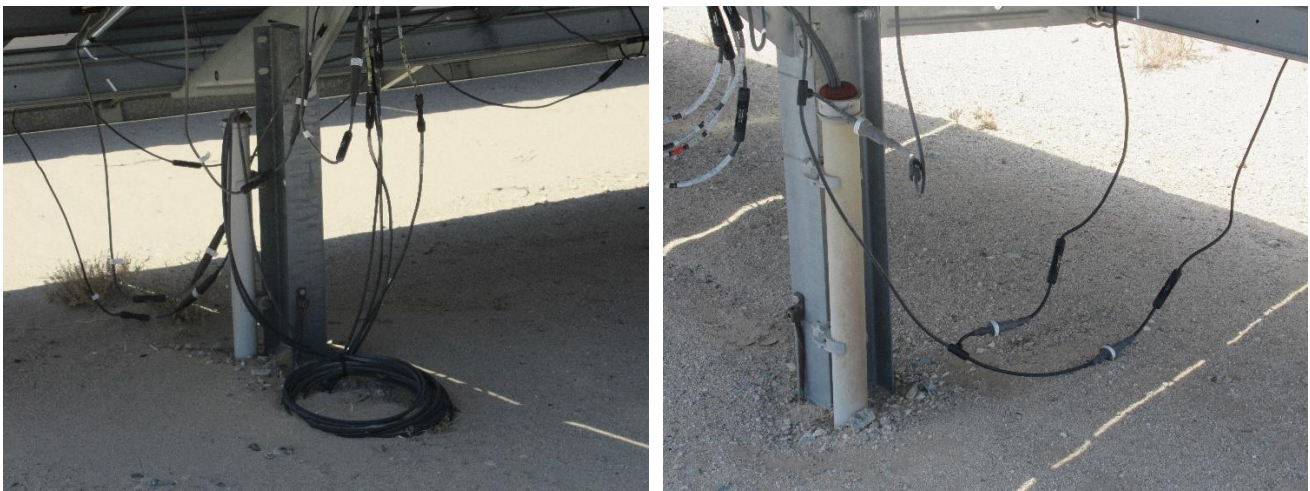


Figure 10 & 11: Loose cables touching the ground in Blocks 1 and 3 arrays.

**Finding 5: ESRB staff observed unsecured cabinets on pad-mounted electric switches.**

**GO 167-B, Appendix E, OS 1: Safety** states in part:

*“The protection of life and limb for the work force is paramount. GAOs have a comprehensive safety program in place at each site. The company behavior ensures that personnel at all levels of the organization consider safety as the overriding priority. This is manifested in decisions and actions based on this priority.”*

**GO 167-B, Appendix D, OS 8: Plant Status and Configuration** states:

*“Station activities are effectively managed so plant status and configuration are maintained to support safe, reliable and efficient operation.”*

ESRB staff observed that the cabinet doors for the pad-mounted electric switches 07-PVCS and 18-PVCS were not properly secured. The doors did not have locks on them and while they did have Penta bolts, the Penta bolts were not properly screwed into the door. Unsecured doors may allow unauthorized personnel access to equipment. All high voltage cabinets of the plant must be inspected and properly secured.



Figure 12: 07- PVCS Switch Cabinet



Figure 13: 18-PVCS Switch Cabinet

**Finding 6: ESRB staff observed a failed cooling system in a plant inverter facility.**

**GO 167-B, Appendix E, OS 4: Problem Resolution and Continuing Improvement** states:

*“The GAO values and fosters an environment of continuous improvement and timely and effective problem resolution.”*

**GO 167-B, Appendix D, OS 8: Plant Status and Configuration** states:

*“Station activities are effectively managed so plant status and configuration are maintained to support safe, reliable and efficient operation.”*

ESRB staff observed that the belts for the inlet supply fans in Inverter B2-30 were broken or missing. The cooling systems are critical components for the inverters which expose to extreme heat condition surrounding the plant especially in hot summer season. The failed cooling system indicates a lack of maintenance activities for the vital and heat sensitive equipment. The plant management must establish routine inspection programs and verify the completion of maintenance activities to ensure intended functionality of the equipment.

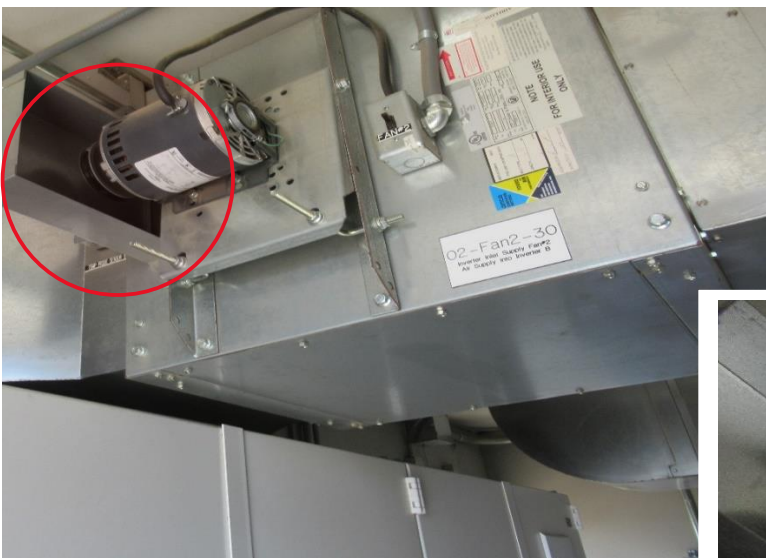


Figure 14: Damaged Belt on Inverter Cooling Fan



**Finding 7: ESRB staff observed several damaged items around the Plant.**

**GO 167-B, Appendix D, MS 1: Safety** states in part:

*“The protection of life and limb for the work force is paramount. The company behavior ensures that individuals at all levels of the organization consider safety as the overriding priority.”*

**GO 167-B, Appendix D, MS 4: Problem Resolution and Continuing Improvement** states:

*“The company values and fosters an environment of continuous improvement and timely and effective problem resolution.”*

**GO 167-B, Appendix D, MS 11: Plant Status and Configuration** states:

*“Station activities are effectively managed so plant status and configuration are maintained to support safe, reliable and efficient operation.”*

ESRB staff observed several damaged items around the plant. The plant management must establish comprehensive inspection programs to identify damage, malfunction on the balance of plant and verify execution of routine maintenance activities to eliminate unnoticed latent problems and equipment failure.



Figure 15: Inverter B10 02.  
The door auto closing mechanism was broken. This may have inverters exposed to dust, vermin and rainwater and result in the system failure and damage.

Figure 16: Inverter B12 07.  
Emergency Shut-off Button cover was missing. This may cause inadvertent system shutdown and damage.



**Finding 8: The Plant emergency action plan requires to be corrected.**

**General Order (GO) 167-B, Appendix E, OS 1: Safety** states:

*“The protection of life and limb for the work force is paramount. GAOs have a comprehensive safety program in place at each site. The company behavior ensures that personnel at all levels of the organization consider safety as the overriding priority. This is manifested in decisions and actions based on this priority. The work environment and the policies and procedures foster such a safety culture, and the attitudes and behaviors of personnel are consistent with the policies and procedures.”*

**GO 167-B, Appendix E, OS 20: Preparedness for On-Site and Off-Site Emergencies** states in part:

*“The GAO plans for, prepares for, and responds to reasonably anticipated emergencies on and off the plant site, primarily to protect plant personnel and the public, and secondarily to minimize damage to maintain the reliability and availability of the plant. Among other things, the GAO: [...]*

*C. Ensures provision of emergency information and materials to personnel.”*

SMS 237 Emergency Action Plan corrected and updated designated muster areas for emergency evacuation after ESRB audit. The plant needs to provide ESRB with evidence of signage for the new muster points. The muster point signage should be posted in a clear position and glow-in-the dark to show up even in the event of a power outage or fire.

## **II. Observation**

The following observation was noted on the critical equipment impacting Desert Sunlight. Concerns related to the operation and maintenance of this equipment still exist, and ESRB recommends the observation be addressed.

**Observation 1: Atmospheric Corrosion was observed on pad-mounted transformers.**

ESRB observed atmospheric corrosion on multiple pad-mounted transformers specifically on radiators and their oil pipes. Plant-wide inspection and examination are recommended to identify corroded transformers and develop action plans to prevent further progress on the high voltage critical equipment.

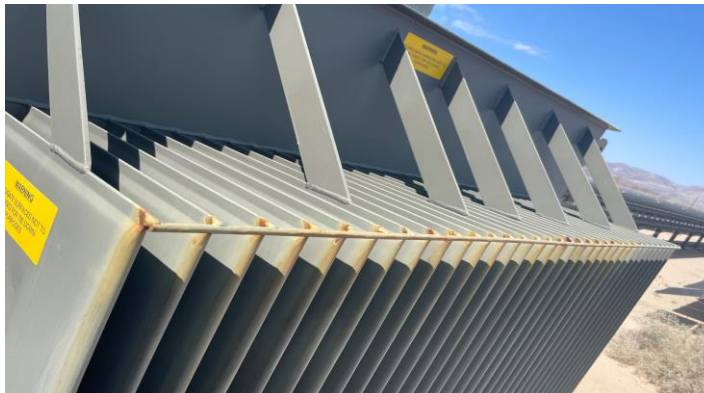


Figure 18: Rust on Inverter B12-07 Transformer.



### III. Documents Reviewed

Category	Reference #	CPUC-Requested Documents
Safety	1	Orientation Program for Visitors and Contractors**
	2	Evacuation Procedure
	3	Evacuation Map and Plant Layout
	4	Evacuation Drill Report & Critique (last 3 years)
	5	Hazmat Handling Procedure
	6	MSDS for All Hazardous Chemicals
	7	Injury & Illness Prevention Plan (IIPP) (last 3 years)
	8	OSHA Form 300 (Injury Log) in last 4 years
	9	OSHA Form 301 (Incident Report) in last 4 years
	10	List of all CPUC Reportable Incidents (last 5 years)
	11	Root Cause Analysis of all Reportable Incidents (if any)
	12	Fire Sprinklers Test Report (last 3 years)
	13	Insurance Report / Loss Prevention / Risk Survey (last 3 years)
	14	Lockout / Tagout Procedure (last 3 revisions, if applicable)
	15	Arc flash Analysis
	16	Confined Space Entry Procedure
	17	Plant Physical Security and Cyber Security Procedures and Records
	18	Fire Protection System Inspection Record
Training	19	Safety Training Records*
	20	Skill-related Training Records*
	21	Certifications for Welders, Forklift & Crane Operators*
	22	Hazmat Training and Record*
Contractor	23	Latest list of Qualified Contractors*
	24	Contractor Selection / Qualification Procedure
	25	Contractor Certification Records
	26	Contractor Monitoring Program
Regulatory	27	Daily CEMS Calibration Records
	28	Air Permit (if applicable)
	29	Water Permit (if applicable)
	30	Spill Prevention Control Plan (SPCC) (if applicable)
	31	CalARP Risk Management Plan (RMP)
O&M	32	Daily Round Sheets / Checklists
	35	Logbook**
	36	List of Open/Backlogged Work Orders*
	37	List of Closed/Retired Work Orders (last 4 quarters) *
	38	Work Order Management Procedure (last 3 revisions, if applicable)

	39	Computerized Maintenance Management System (Demonstration Onsite)**
	40	All Root Cause Analyses (if any)
	41	Maintenance & Inspection Procedures (or Related Documents) (last 3 revisions, if applicable)
	42	SCADA system
	43	Maintenance and Inspection Records for Solar Inverters
	44	Maintenance and Inspection Records for Solar Trackers
	45	Maintenance and Inspection Records for Solar Arrays/Collectors/Solar Field
	46	Maintenance and Inspection Records for Mounting System
	47	Maintenance and Inspection Records for Switchgear/breaker/relays
	48	Maintenance and Inspection Records for Electrical System
	49	Maintenance and Inspection Records for Main Transformer(s)
	50	Maintenance and Inspection Records for Switchyard & Transmission Equipment
	51	Maintenance and Inspection Records for other equipment
Document	52	P&IDs*
	53	Vendor Manuals*
	54	Solar Firm Equipment Design Data
	55	Procedure Compliance Policy
Spare Parts	56	Spare Parts Inventory List
	57	Shelf-life Assessment Report
Instrumentation	58	Instrument Calibration Procedures and Records
Test Equipment	59	Calibration Procedures and Records
Internal Audit	60	Internal Audit Procedures and all Records

\* Provide data in a searchable format such as a searchable PDF, Word Document, Excel Spreadsheet, etc.

\*\* These items may be provided on-site by the first day of the audit.