

PUBLIC UTILITIES COMMISSION

505 VAN NESS AVENUE
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January 20, 2022

GA2021-12ISG

Brian P. Sherriff
Engineering Manager - Ivanpah Solar Thermal
100302 Yates Well Road
HCR1 Box 280
Nipton, CA 92364

SUBJECT: Audit of Ivanpah Solar Generating Station

Mr. Sherriff,

On behalf of Electric Safety and Reliability Branch (ESRB) of the California Public Utilities Commission (CPUC), Richard Le and Calvin Choi conducted a powerplant audit of the Ivanpah Solar Generating Station from December 6, 2021 to December 10, 2021.

During the audit, my staff 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 no later than February 21, 2022, by electronic or hard copy, of all corrective measures taken by Ivanpah Solar Generating Station 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.

If you have any questions concerning this audit, you can contact Richard Le at Richard.Le@cpuc.ca.gov or (213) 999-9053.

Sincerely,

A handwritten signature in blue ink that reads "Fadi Daye".

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

Attachment: Findings

Cc: Lee Palmer, Director, Safety and Enforcement Division, CPUC
Nika Kjensli, Program Manager, ESRB, CPUC
Majed Ibrahim, Senior Utilities Engineer, ESRB, CPUC
Richard Le, Utilities Engineer, ESRB, CPUC
Calvin Choi, Utilities Engineer, ESRB, CPUC

I. Findings Requiring Corrective Action

Finding No. 1: ESRB Inspectors witnessed a broken door handle on a DCS Cabinet in Unit 3.

GO 167-B, Appendix D, Maintenance Standard 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 witnessed a broken door handle on a DCS Cabinet in Unit 3, preventing it from shutting and locking properly.



Broken handle preventing door from closing properly.

Finding No. 2: ERSB Inspectors witnessed several areas with damaged insulation.

GO 167-B, Appendix D, Maintenance Standard 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.

ERSB staff witnessed several areas with damaged insulation. Damaged insulation not only destroys the insulative capacity but also contributes to increased corrosion.



Damaged insulation



Damaged insulation



Damaged insulation



Damaged insulation



Damaged insulation



Damaged insulation



Damaged insulation



Damaged insulation

Finding No. 3: ERSB Inspectors found examples of poor housekeeping.

GO 167-B, Appendix D, Maintenance Standard 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 E, Operation Standard 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 a tube laying in the middle of a walkway. This causes a tripping hazard for plant staff and contractors. The staff also observed debris accumulation in different areas, including debris near the ammonia loading station and an unused pipe obstructing an eye wash station. The plant should ensure that its staff keep areas free of debris.



Tube laying in the middle of a walkway



Debris left near the ammonia loading station

Finding No. 4: The Plant is not keeping pace with sign damage and deterioration.

GO 167-B, Appendix D, Maintenance Standard 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 a faded danger sign in the hazardous waste storage area. ESRB staff also observed numerous damaged labels on plant equipment. Damaged warning signs prevent plant staff and contractors from recognizing dangers. These signs are important for the safety of the employees, and they make them aware of the surroundings and any potential safety hazards.



Faded Danger sign in the hazardous waste storage area



Damaged label



Damaged label



Damaged label



Damaged label



Damaged label

Finding No. 4: A container in the hazardous waste area did not have secondary containment.

GO 167-B, Appendix E, Operation Standard 10: Environmental Regulatory Requirements states:

Environmental regulatory compliance is paramount in the operation of the generating asset. Each regulatory event is identified, reported and appropriate action taken to prevent recurrence.

40 CFR § 264.193 - Containment and detection of releases states in part:

In order to prevent the release of hazardous waste or hazardous constituents to the environment, secondary containment that meets the requirements of this section must be provided

ESRB staff observed a container of liquid in the hazardous waste area without secondary containment. Should this container leak, the liquid would be uncontained and could pose a hazard to the environment.



A container of liquid in the hazardous waste area without secondary containment.

II. Documents Reviewed

ESRB Staff reviewed the following records and documents:

Safety

1. Orientation Program for Visitors and Contractors**
2. Evacuation Procedure
3. Evacuation Map & Plant Layout
4. Evacuation Drill Report & Critique
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
12. Fire Sprinkler Test Report (last 3 years)
13. Insurance Report / Loss Prevention / Risk Survey (last 3 years)
14. Lockout / Tagout Procedure
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. All Training Records

Contractor Management

20. Certifications for Welders, Forklift & Crane Operators
21. Latest list of Qualified Contractors
22. Contractor Selection / Qualification Procedure
23. Contractor Certification Records
24. Contractor Monitoring Program

Regulatory Compliance

25. Air Permit
26. Water Permit
27. Spill Prevention Control Plan (SPCC)
28. CalARP Risk Management Plan

Operations and Maintenance (O&M)

29. Daily Round Sheets & Checklists
30. Logbook**
31. List of Open/Backlogged Work Orders**
32. List of Closed/Retired Work Orders**
33. Work Order Management Procedure**
34. Computerized Maintenance Management System**
35. All Equipment Failure RCA's

36. Feedwater grab-sample test sample record
37. Water Chemistry Manuals
38. Maintenance & Inspection Procedures
39. SCADA system
40. Maintenance and Inspection Records for Solar Inverters
41. Maintenance and Inspection Records for Switchgear/breaker/relays
42. Maintenance & Inspection Records for Electrical System
43. Maintenance and Inspection Records for Main Transformer(s)
44. Maintenance & Inspection Records for Switchyard & Transmission Equipment
45. Spare Parts Inventory List
46. Instrument Calibration Procedures and Records
47. Calibration Procedures and Records
48. Internal Audit Procedures and all Records

Turbine

49. Borescope Inspection Reports
50. Maintenance & Inspection Procedures (or Related Documents)
51. NDE Reports
52. Overspeed Trip Test Records
53. Bearing Lube Oil Analysis
54. DC Lube Oil Pump Test Record
55. Emergency Stop Valve Sample Test Record on Main Steam Line

Generator

56. Bearing Lube Oil Analysis

Cathodic Protection

57. Procedures and Inspection Records

HEP

58. Pipe Hangers/Support Calibration Records

Boilers

59. Inspection Procedures and Records