

PUBLIC UTILITIES COMMISSION

505 VAN NESS AVENUE
SAN FRANCISCO, CA 94102-3298



July 6, 2023

Garry Rogers
Project Manager
Aquamarine Solar
24999 Laurel Ave
Stratford, CA 93266

SUBJECT: Generation Audit of Aquamarine Solar – Audit Number GA2023-06AMS

Dear Mr. Rogers:

On behalf of the Generation Section, Electric Safety and Reliability Branch (ESRB) of the California Public Utilities Commission (CPUC), Samuel Mandell and Stephen Hur of ESRB staff conducted a generation audit of Aquamarine Solar from May 01, 2023, through May 05, 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 August 3, 2023, by electronic copy, of all corrective measures taken by Aquamarine Solar 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 Samuel Mandell at Samuel.Mandell@cpuc.ca.gov. Please note that although Aquamarine Solar 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 Samuel Mandell with a copy to me and the GO 167-B inbox GO167@cpuc.ca.gov by July 20, 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

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

**CPUC AUDIT FINDINGS OF
AQUAMARINE SOLAR PARK
MAY 01 – MAY 05, 2023**

I. Findings

Finding 1: The Plant fails to maintain good housekeeping practices in its storage containers.

GO167-B, Appendix E, Operation Standards (OS) 3: Operations Management and Leadership
states in part:

*“D. Monitoring and Assessing
Operations management effectively monitors and assesses the performance of operations
activities in the following areas: 13. General Area Housekeeping”*

ESRB staff observed inconsistent storage practices where items are being allowed to accumulate on the floor in walkways, making portions of the storage facility inaccessible.



Figure 1: Poor housekeeping practices in storage container.



Figure 2: Empty packaging and left in storage container.

Finding 2: ESRB staff observed missing National Fire Protection Association (NFPA) Fire diamond signs on the exterior of the Operations Building and Flammable Materials Cabinet. The Cabinet also lacks self-closing ability.

GO 167-B, Appendix E, OS 10: Environmental Regulatory Requirements states in part:

“Environmental regulatory compliance is paramount in the operation of the generating asset.”

NFPA 1 (Uniform Fire Code) 60.1.2.23 (d) states:

“Doors shall be well fitted, self-closing, and equipped with a self-latching device.”

NFPA 704: 4.3 Location of Signs states:

“Signs shall be in locations approved by the authority having jurisdiction and as a minimum shall be posted at the following locations:

- 1) Two exterior walls or enclosures containing a means of access to a building or facility.*
- 2) Each access to a room or area.*
- 3) Each principal means of access to an exterior storage area.”*

ESRB staff observed a missing NFPA sign (the fire diamond) on the Operations Building, where the flammable material cabinet is stored. The cabinet itself is also missing the fire diamond and is not

self-closing. This sign is important to provide information related to hazards that emergency services would need to effectively deal with the emergency.



Figure 3: Missing NFPA sign (fire diamond) on Flammable Material Cabinet.



Figure 4: No self-closing on the Flammable Material Cabinet.

Finding 3: The Plant did not inspect the spare fire extinguishers.

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 D, Maintenance Standard (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 3: Maintenance Management and Leadership states:

“Maintenance managers establish high standards of performance and align the maintenance organization to effectively implement and control maintenance activities.”

GO 167-B, Appendix E, OS 13: Routine Inspections states in part:

“Routine inspections by plant personnel ensure that all areas and critical parameters of plant operations are continually monitored, equipment is operating normally, and that routine maintenance is being performed.”

National Fire Protection Agency (NFPA) 10, Section 7.2.1.2.1, 2022 Edition, states:

“Fire extinguishers and Class D extinguishing agents shall be inspected at least once per calendar month.”

The Plant does not perform monthly inspections on the spare fire extinguishers kept in storage. The fire extinguishers need to be included in the monthly inspections to ensure that they are in proper working condition.



Figure 5: Spare fire extinguishers not being inspected.

Finding 4: The Plant does not have signage for the emergency muster points.

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 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.”

ESRB staff observed that The Plant did not have any physical signs for the emergency muster points in the evacuation plan. In the event of an emergency the signage would allow for more accurate reporting of worker location and coordination with emergency responders.

Finding 5: ESRB staff observed overgrown vegetation in The Plant.

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

“The protection of life and limb for the workforce 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.”

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 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 overgrown vegetation in blocks 5.11 and 4.7 of the Plant. The vegetation was also in a dry and highly flammable state. Proper vegetation management is necessary to mitigate fire risk to ensure safety and maintain service.



Figure 6: Overgrown Vegetation in Block 5.11

Finding 6: ESRB Staff observed broken solar panel connectors.

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

“The protection of life and limb for the workforce 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 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 13 - 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.”

In Block 1.3 there were multiple rows of solar panels with broken connectors. The broken connectors are a safety hazard since the panels are electrified when the sun is shining.



Figure 7: Broken connector hanging off solar panel.

Finding 7: ESRB Staff observed unsecured conductors sagging to the ground.

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

“The protection of life and limb for the workforce 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 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 13 - 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.”

In Block 2.2, where sheep had recently grazed, there were multiple cable hangers that had been knocked to the ground. The conductors on the ground are no longer isolated and pose an electrical hazard.

Finding 8: ESRB Staff observed broken ground wires throughout the Plant.

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

“The protection of life and limb for the workforce 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.”

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Throughout the Plant the ground wires connecting the array trackers to the cable hangers are broken. The broken ground wires create an electrical safety hazard in the Plant and need to be addressed.



Figure 8: Example of broken ground observed throughout the Plant.

II. 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