

## PUBLIC UTILITIES COMMISSION

505 VAN NESS AVENUE  
SAN FRANCISCO, CA 94102-3298



March 27, 2023

Weikko Wirta  
Director, Plant Operations  
AES Legacy Units  
690 North Studebaker Road  
Long Beach, CA 90803

**SUBJECT: Generation Audit of AES Alamos, Long Beach Legacy Units – Audit Number GA2023-03ALBL**

Dear Mr. Wirta:

On behalf of the Generation Section, Electric Safety and Reliability Branch (ESRB) of the California Public Utilities Commission (CPUC), Calvin Choi of ESRB staff conducted a generation audit of Alamos Legacy Units from February 13, 2023, through February 16, 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 April 28, 2023, by electronic copy, of all corrective measures taken by Alamos Long Beach Legacy Units 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 Calvin Choi at [Calvin.Choi@cpuc.ca.gov](mailto:Calvin.Choi@cpuc.ca.gov). Please note that although Alamos Legacy 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 Calvin Choi with a copy to me and the GO 167-B inbox [GO167@cpuc.ca.gov](mailto:GO167@cpuc.ca.gov) by April 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

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Nika K̆jensli, Program Manager, ESRB, CPUC  
Calvin Choi, Senior Utilities Engineer (Specialist), ESRB, CPUC  
Saimon Islam, Senior Utilities Engineer (Specialist), ESRB, CPUC

## I. Findings Requiring Corrective Action

### Finding 1: ESRB staff observed standing water in one area of the Plant because of clogged drain.

GO 167-B, Appendix D, Maintenance Standards (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 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 a large pool of standing water due to a clogged drain near the Unit 4 Selective Catalytic Reduction fans. ESRB recommended for Plant staff to unclog the drain as soon as possible. Standing water can result in hazards that include slipping hazards.



Figure 1: Standing water because of clogged drain

**Finding 2: ESRB staff observed leakage from pipes and other equipment in different areas of the Plant.**

**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 a leak from the Unit 4 chemical mixing tank overflow pump, steam leaks near sealed steam regulator PS-49 and main stop valve east. Staff also observed oil leaking from a High Energy Pipe (HEP) support on Unit 5 Level 3 and the Unit 5 Lube Oil Feed Pump North. There was also an air leak from Unit 3 level 5 primary and secondary control solenoid and the Unit 5 level 3 air supply for the nitrogen oxide system.



Figure 2



Figure 3

**Finding 3: ESRB staff observed damaged insulation across the Plant.**

**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 damaged insulation on the main steam line for Unit 5 at level 6, as well as on the Unit 3 3-C Boiler Circulation Pump. Damaged insulation can result in accelerated heat gain or loss and can result in corrosion under insulation.



Figure 4



Figure 5

**Finding 4: ESRB staff observed damaged National Fire Protection Association (NFPA) Fire diamond signs on ammonia tanks. Missing NFPA (Fire diamond) signs and self-closing mechanism on warehouse flammable storage cabinets.**

GO 167-B, Appendix E, Operation Standards (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 damaged NFPA sign (the fire diamond) on the ammonia storage tanks for Unit 3 and 4. Also, the flammable storage cabinets were missing the fire diamond with appropriate rating numbers and a self-closing mechanism. The numbers are important to provide information related to hazards.



Figure 6: Damaged NFPA sign (fire diamond)



Figure 7 & 8: NFPA Fire diamonds missing on the flammable storage cabinets

**Finding 5: ESRB observed examples of poor housekeeping.**

**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 E, 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 some debris that was not cleaned up near equipment at Unit 5 5S burner. This can result in tripping hazards.



Figure 9

**Finding 6: ESRB staff observed severely rusted fire blanket holder.**

**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.”*

ESRB staff observed a fire blanket holder that was severely rusted on the bottom and could not hold the fire blanket at Unit 4 Level 6. A rusted holder will not properly protect the fire blanket from deterioration from the environment.



Figure 10



**Finding 7: ESRB staff observed a valve handle that was not attached to accompanying valve.**

**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 E, 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 a valve handle on the ground that was not attached a valve near Unit 4 Deaerator Aux Steam Regulator. The detached handle prevents the valve from being operated properly and quickly.



Figure 11

**Finding 8: ESRB observed witnessed defective pressure gauge.**

**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.”*

ESRB staff observed a defective pressure gauge that was missing a glass cover. Defective pressure gauges can result in erroneous pressure readings.



Figure 12

**Finding 9: ESRB staff observed a Post Indicator Valves (PIVs) with missing position indicator.**

**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 E, 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 Post Indicator Valves (PIVs) 5B that was missing a position indicator. The PIV is a valve used to control the water supply to the fire sprinkler system. The PIV has a display that shows whether water is being pumped into the system (“OPEN”) or not (“CLOSED”).



Figure 13: PIV missing position indicator

**Finding 10: The Plant is not keeping pace with the replacement of deteriorating signs. The Plant is also missing signs in some places.**

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...”*

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 deteriorating signs and labels, including “High Voltage” signs and “Confined Space” signs. These signs help inform employees, contractors, and visitors who may be unfamiliar with the equipment and its inherent dangers.



Figure 14



Figure 15



Figure 16



Figure 17

**Finding 11: ESRB staff observed numerous burner control cabinets throughout the Plant that doesn't close and lock properly.**

**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, 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 multiple burner control cabinets that doesn't close and lock. Without the locks, the cabinets are not protected from the outside environment and can lead to tripping hazards.



Figure 18



Figure 19

**Finding 12: ESRB staff observed numerous unmarked High Energy Pipe (HEP) structures throughout the Plant.**

**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, 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 multiple unmarked HEP structures. Unmarked HEP structures do not allow Plant personnel to determine if the system is within proper operating range.



Figure 20



Figure 21



Figure 22



Figure 23

**Finding 13: Many pieces of test equipment were not recalibrated on time.**

**GO 167-B, Appendix E, OS 11: Operations Facilities, Tools and Equipment** states:

*“Facilities and equipment are adequate to effectively support operations activities.”*

ESRB staff observed that according to the records provided by the plant, there were many pieces of test equipment that were not recalibrated on time. Regular calibration of the test equipment is required to ensure accurate and reliable qualitative and quantitative results when in use.

**Finding 14: Inspection report for renewal of Certificate of Operations was not provided for 2022.**

**GO 167-B, Appendix D, MS 16: Regulatory Requirements** states:

*“Regulatory compliance is paramount in the operation of the generating asset. Each regulatory event is properly identified, reported and appropriate action taken to prevent recurrence.”*

ESRB staff observed that at the time of the audit, the Plant did not provide the 2022 inspection report from a contractor that is required for the renewal of the Plant’s Certificate of Operations. Plant staff has stated that the inspection was completed already, but the contractor that performed the inspection has not sent the report to the Plant yet. The Plant staff must provide the report once the contractor has sent it to them.

**Finding 15: Critical Piping Inspection report for Unit 3 was not provided for 2022.**

**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.”*

ESRB staff observed that at the time of the audit, the Plant did not provide the Critical Piping Inspection report for Unit 3 for 2022. CPI reports for Unit 4 and 5 conducted by a contractor in 2022 were provided to ESRB staff. The last CPI report conducted for Unit 3 was in 2020.

**Finding 16: Pipe Hangers/Support Inspections 2023 reports are to be sent when provided.**

**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.”*

ESRB staff observed that the Plant provided proposals from a contractor to perform high energy piping/support, restraint, and snubber inspections to Unit 3, 4, and 5 in 2023. Plant staff has stated that the inspections have been completed early 2023 and the report is pending. ESRB staff requests that the reports be provided when the contractor has sent said reports to the Plant.

## II. Documents Reviewed

ESRB Staff reviewed the following records and documents:

(\*\* documents were not provided during the time the audit was conducted\*\*)

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
	29	Water Permit
	30	Spill Prevention Control Plan (SPCC)
	31	CalARP Risk Management Plan (RMP)
O&M	32	Daily Round Sheets / Checklists
	33	Feedwater Grab-sample Test Records



	34	Water Chemistry Manual
	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)
Gas Turbine	41	Borescope Inspection Reports (last 2 years)
	42	Maintenance & Inspection Procedures (or Related Documents) (last 3 revisions, if applicable)
	43	Intercooler Inspection Reports
	44	Combustors Inspection (CI) Reports
	45	Hot Gas Path (HGI) Inspection Reports
	46	Bearing Lube Oil Analysis Reports
	47	DC Lube Oil Pump Test Records
Main Plant Compressor(s)	48	Inspection Procedures and Records
Document	49	P&IDs*
	50	Vendor Manuals*
Spare Parts	51	Spare Parts Inventory List
	52	Shelf-life Assessment Report
Management	53	Employee Performance Review Procedures and Verifications
	54	Organizational Chart
HRSG	55	Tube Analysis Report
	56	Chemical Clean Report
	57	Safety Valve Test Records
	58	Hot Spots / IR Inspection Reports
	59	Structural Integrity Assessment
HEP	60	FAC Inspection Procedure & Measurements
	61	Pipe Hangers / Support Calibration Records
Steam Turbine	62	NDE Reports
	63	Overspeed Trip Test Records
	64	Bearing Lube Oil Analysis Reports
	65	DC Lube Oil Pump Test Records
	66	Emergency Stop Valve Test Records on Main Steam Line
	67	Borescope Inspection Records
	68	Most recent Class A (major) STG inspection report
	69	STG inspection reports from May 2011 and March 2013
Generator	70	Bearing Lube Oil Analysis
	71	Maintenance & Inspection Procedures (or related documents)
	72	Polarization Test Records

Transformer	73	Hot Spots / IR Inspection Reports
	74	Oil Analysis Reports
Cathodic Protection	75	Procedures and Inspection Records
Air Cooled Condenser System	76	Cooling Fans & Motors Inspection Records
	77	Cooling Tower Structural Integrity Assessment
	78	Circulating Water Pumps Maintenance Records
Instrumentation	79	Instrument Calibration Procedures and Records
Test Equipment	80	Calibration Procedures and Records
Emission Control Equipment (SCR, Ammonia, NOx, CO)	81	Maintenance & Inspection Procedures and Records
Internal Audit	82	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.