Region 2 Enforcement & Compliance Assurance Division
Air Compliance Branch

CAA Inspection Report

Inspection Date:	8/21/2023
Facility Name:	San Juan Steam Power Plant
Facility Address:	Mercado Central Avenue, Zona Portuaria Road PR-28, Puerto Nuevo, San Juan
ICIS-Air ID #:	PR0000007212700028
Facility Contact:	Bianca Lewis Santiago, Director HSEQ, 787-209-0646, <blewis@genera-pr.com>
EPA Lead Inspector:	Ralph Lonergan, 212-637-3516, <Lonergan.ralph@epa.gov>
	Julian Velez, 212-637-3464, <velez.julian@epa.gov>
	Gloria Diaz-Galarza, 787-977-5882, <diaz-galarza.gloria@epa.gov>
	Alex Rivera, 787-977-5845, <Rivera.Alex@epa.gov>
EPA Asst. Inspector:	Bryan Lange, 919-622-2374, <bryan.lange@erg.com>
State Inspector(s):	N/A
Other Inspector(s):	N/A

Summary of Observations

I. Opening Meeting

On August 21, 2023, EPA inspectors Ralph Lonergan, Julian Velez, Gloria Diaz-Galarza, Alex Rivera, and Bryan Lange (hereafter referred to as the inspection team) conducted an on-site inspection at San Juan Steam Power Plant. Following that introduction, Mr. Lonergan explained that under the compliance monitoring plan, Clean Air Act ("CAA") inspections are conducted at major facilities every 2-years. These inspections are separate from the CAA Section 114 request for information letter ("114 RFI") issued by EPA on May 17, 2023.

Monday (8/21/23) began with a corporate overview by Genera staff followed by an inspection to assess the compliance of the San Juan Steam Power Plant. Tuesday (8/22/23) through Thursday (8/24/23) four additional Genera sites were inspected (i.e., Palo Seco, Cambalache, Aguirre, Costa Sur) by the inspection team.

A. Corporate Overview

Ms. Katiuska Bolaños Lugo and Ms. Bianca Lewis Santiago provided a Genera PR, LLC (Genera) corporate overview. Ms. Bolaños explained that on July 1, 2023, Genera PR, LLC (Genera) began operation and maintenance of all fossil fired power plants.

Puerto Rico Electric Power Authority (PREPA) is the owner of all power plant assets. LUMA is responsible for transmissions and deployment. Ms. Bolaños explained that statements made by former PREPA employees are non-binding because those persons no longer represent PREPA. Questions about events and activities that occurred before July 1, 2023, should be directed to PREPA.

Inspector Lange asked about the smaller peaking unit[1] turbines located at Vega Baja and Aguirre that in 2021 were operated by hydro-gas. Ms. Bolaños explained that hydroelectric is still owned by PREPA and the gas turbines are now operated by Genera. There are currently 18 of these smaller turbines units, a Request for Proposal (RFP) is open to replace 11 of them. Genera is the administer of substitutions and replacements of current assets (e.g., small turbines).

A 10-year contract with the Puerto Rico Energy Bureau was signed, that contract includes a condition that requires Genera to submit a decommission schedule for approval. Implementation of the decommission plan should begin in year six. The Bureau's plans are outlined in the Integrated Resource Plan (IRP). The IRP has a 3-year review cycle, and the last version was approved on August 24, 2020. A new draft of IRP (including a revised decommission schedule) will be submitted in March 2024. It should be noted that the IRP includes renewal power generation targets. Decommission schedules could be impacted by the limited progress with construction and operation of renewal power generation.

Genera is also responsible for fuel management (i.e., logistics, purchase, delivery). A version of the fuel optimization plan will be submitted September 5, 2023, to the Energy Bureau and the plan will be subject to public review. The current draft includes plans to replace Electricity Generating Unit (EGU) components that will improve fuel efficiency.

There is a corporate fuel quality laboratory that verifies the fuel contents (e.g., sulfur) defined in the bill of lading paperwork.

B. Corporate Environmental Activities

Ms. Lewis-Santiago indicated there is a corporate desire to address historical problems performance testing and continuous emission monitoring systems (CEMS). Specifically, over a 2-day period in early August 2023, Teledyne visited each site to assess monitoring systems. Teledyne's initial assessment concluded that San Juan CEMS were satisfactory, Palo Seco and Costa Sur are deficient. Genera is expecting a proposal to repair or replace exiting CEMS. This should improve monitoring system reliability and simply data processing. There is a potential that some of the incurred repair costs will be federally reimbursed.

Ms. Lewis-Santiago explained that Genera will use software (i.e., 360) to track corporate compliance obligations and each location will have an environmental compliance specialist.

Inspector Lonergan asked if Genera would consider Mercury and Air Toxics Standards (MATS) compliance with periodic particulate matter (PM) testing instead of PM CEMS. Mr. Lonergan also asked if Genera would consider installing PM CEMS at Aguirre. Ms. Lewis-Santiago explained that Genera's preference is the CEMS compliance option and that at this time PM CEMS are not under consideration at Aguirre. Ms. Lewis-Santiago also mentioned that decommission could result in relocation of monitoring equipment.

On August 14, 2023, Genera met with Tetra Tech to inquire about environmental performance testing. Genera is also exploring the re-introduction of a corporate environmental testing group that would reduce reliance on

[1] An electric generating unit within a plant operated to meet maximum (peak) demand or to fill emergency requirements.

contract testing companies. Testing will occur for online units when the contract issues are resolved. EPA will be notified of that testing.

II. Facility Overview

The San Juan Steam Power Plant (SJSPP) is located on the north coast of Puerto Rico in San Juan. The facility began operation in 1950. Today the facility employs 140 employees and consists of six units: four boilers (7 and 8, 9 and 10) and two turbines (5 and 6). Adjacent to SJPP property is a Liquefied natural gas (LNG) terminal facility owned by New Fortress Energy.

Mr. Victor L. Ortiz Perez described the operational units. On Monday (8/21/23), units SJCC5, SJCC6, and SJ9 were operational for baseload.

A. Boilers

The original equipment manufacturer (OEM) of units SJ7 and SJ8 are Babcock & Wilcox. They are frontal fired, each has 9 burners, and can burn three fuels, propane, bunker C, and diesel. Propane is only used for startup.

The OEM of units SJ9 and SJ10 was Combustion Engineering; they are tangential fired, each have 20 burners, and a capacity of 100 MW.

The steam turbine generator was manufactured by General Electric and the Distributed Control System (DCS) was manufactured by Foxboro.

SJ7 was in an environmental outage; it is expected to come online at the end of September 2023. Boiler environmental outages occurs every 18-months and the downtime is approximately 6-weeks. SJ8 and SJ10 are not available. SJ10 went offline about 6-years, there was a failure in the low-pressure stage of the turbine. Unit 8 is out of service due to a problem with the boiler. Genera has no plans to put those units back online.

The soot blowing occurs three times per 24-hour period or every 8-hours. The soot blowing cycle, for SJ7 and SJ8, each take about 2-hours. The sequence progresses through the air heaters, superheater, gas furnace, back-pass, then the air heaters again. The soot blowing uses the system steam. The number of soot blowers varies with OEM designs. For example, one blower might reach across the entire unit others might only reach halfway.

B. Combined Cycle Turbines

The San Juan Steam Power Plant also operates two turbines, SJCC5 and SJCC6 that fire natural gas and No. 2 fuel oil. There is no natural gas storage on-site. The natural gas is received directly from the adjacent New Fortress LNG terminal. Units SJCC5 and SJCC6 have a capacity of 210 MW, they could produce more power if the ambient air temperature conditions were favorable. Units SJCC5 and SJCC6 always use the Heat Recovery Steam Generator (HRSG), the steam turbine is not always used but it increases efficiency.

SJCC5 is equipped with both an OxCat and Selective Catalytic Reduction (SCR); both SJCC5 and SJCC6 have steam injection. The SCR was commissioned at the end of 2021, its expected life is 10-years. Genera has a maintenance contract with Environics, to periodically analyze a shipped sample of the honeycomb SCR media. The pH and pressure drop are continuously monitored, and that information is relayed to the control room. The OxCat is a grid of nozzles that injects 90 percent ammonia upstream of the SCR. The ammonia slip is not monitored, but staff indicted that Genera is considering installing an ammonia monitor to optimize injection and reduce ammonia costs. Further, slipped ammonia can lead to fouling and reduced heat transfer efficiency.

Environmental outages are not performed on units SJCC5 and SJCC6, but the units are turned off for maintenance. The maintenance schedule is done according to the hours of service (i.e., combustion inspection is annually, turbine inspection every 2-years, major inspection where the unit is disassembled).

C. Emergency Engines

Each power block has an emergency generator.

- SJCC5 and SJCC6 turbines have a 2.5 MW capacity black start,
- SJ9 and SJ10 boilers have a 0.5 MW black start engine, and
- SJ7 and SJ8 boilers have a 0.35 MW black start engine.

The mechanical shop has a 0.35 MW emergency generator, an unused the warehouse and a fire-pump.

D. US Army Corps of Engineers (USACE)

There are gas fired turbines on-site that are not owned by PREPA and are not operated by Genera. Collectively these units generate 200 MW of temporary power for the island and are intended to maintain power while repairs are being made to PREPA EGU assets. The units are expected to provide power until March 15, 2024. They may be relocated on the island.

The USACE is directed by Federal Emergency Management Agency (FEMA) and USACE is responsible for the permitting. Like, the San Juan Steam Power Plant they receive natural gas from New Fortress.

III. Plant Tour

A facility tour was conducted to better understand the operations and to confirm the information provided by the facility. ERG took photos of selected emission units and operational records (e.g., logbooks, checklists).

A. Boiler Control Room

Only one boiler (i.e., SJ9) was operational on August 21, 2023. The inspection team visited the boiler control room and observed the following parameters:

- Control screen No.1 showed 72 MW of generated power and the measured opacity in each of the two stack was 2.4 and 2.6 percent.
- Control screen No.2 showed the 26 soot blowing locations; soot blowing was not occurring when the inspection team was in the control room.
- Control screen No.3 showed 4 levels of burners, 17 of which were lit when the inspection team was in the control room.

B. Boiler CEMS Building

The SJ9 and SJ10 power block shares a CEMS building. The inspection team reviewed the maintenance logbook which indicated daily completion of the operation checklist. The checklist showed a collection of parameters including air pressure and CO span assessments. Compressed gas paperwork showed that calibration gases had not expired. The inspectors checked the CEMS rack and noted the model and serial number. The CEMS readout showed opacity in each of the two stack was 2.1 and 2.4 percent. The measured particulate matter (PM) was 5.1 and 5.5.[2]

[2] The 2021 inspection report indicate that the PM CEMS is displayed as backscatter percent and a conversion to a concentration requires other variables (e.g., relative humidity, oxygen, and the AP42 F-factor).

C. Observation Point

The inspection team climbed stairs to an observation point on the boiler SJ9 scaffolding. Visible from that location was the New Fortress LNG ship, on-land LNG storage tanks, and truck loadout racks. Also visible was the USACE turbines and other two San Juan power blocks (i.e., SJCC5 and SJCC6, SJ9 and SJ10).

D. Fire Pump and Boiler Black Start

The fire pump (Model: 6AF15B) had a maximum rating of 147.5 BHP, the lifetime hours could not be confirmed. There was no display.

The SJ9 and SJ10 power block black start engine had 721.5 lifetime hours. Electronic recordkeeping tracking sheet, provided by Genera staff, matched this counter. It was evident that the engines filters were changed when it was last operated on December 13, 2022. The handwritten operation record seemed to be missing from that tracking sheet; the last entry of 717.9 hours was recorded January 21, 2022.

E. Turbine Control Room, PM CEMS Data Center, Turbine CEMS Building

Turbines SJCC5 and SJCC6 were both operational on August 21, 2023. Control screens showed that 156.4 and 157.5 MW of power, respectively, were being generated (1-hour average). Six-minute opacity displays (i.e., control room and CEMS building analog display) read 1.39 and 2.23 percent. Control screens also showed the ammonia flow-rate and power generated by the steam turbine.

Adjacent to the turbine control room was the PM CEMs data center. Digital records for SJ9 showed 24-hour concentrations for a 20-day period in August 2023 were 0.031 lb/MMBtu and concentrations were labeled as excessive. Historical concentrations were also reviewed and all 24-hour concentrations in June 2023 were labeled invalid.

The inspection team reviewed the turbine CEMS building maintenance logbook. The logbook indicated daily completion that operation checklist. The checklist showed a collection of parameters including air pressure and CO span assessments. Compressed gas paperwork showed that calibration gasses had not expired.

F. Turbine Black Start

The turbines SJCC5 and SJCC6 each had a black start engine. Markings on the equipment indicated 108.6 and 92.6 lifetime hours. Electronic recordkeeping tracking sheet confirmed that these engines did not have a visible hour tracker.

IV. Closing Meeting

After the conclusion of the inspection, Mr. Lonergan expressed gratitude for all the assistance provided during the inspection. There was a single area of concern, neither the fire pump nor the turbine black start engines had visible hour of operation trackers. Further, electronic recordkeeping tracking sheet corroborated these observations and showed that three of the ten (10) onsite emergency generators lack a visible hour display.

The inspection team concluded the closing meeting on August 21, 2023, at around 3:30 PM.

Lead Inspector's Name: *for* Ralph Lonergan

X JULIAN VELEZ SANCHEZ

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Date: 2023.10.18 11:58:21 -04'00'

Lead Inspector

Assisting Inspector's Name: Julian Velez

X JULIAN VELEZ SANCHEZ

Digitally signed by JULIAN VELEZ SANCHEZ
Date: 2023.10.18 11:58:49 -04'00'

Assisting Inspector

Supervisor's Name: Joseph Cardile

X Cardile, Joseph

Digitally signed by Cardile, Joseph
Date: 2023.10.19 16:08:11 -04'00'

Supervisor