



**Region 2 Caribbean Environmental Protection Division
Multimedia Permits and Compliance Branch**

CAA Inspection Report

Inspection Date: 8/20/2024

Facility Name: AES Puerto Rico Cogeneration Plant (AES Puerto Rico, LP)

Facility Address: Road #3 km. 142 Bo. Jobos Guayama, PR 00784

ICIS-Air ID #: PR0000007205700056

EPA Lead Inspector: Alex Rivera, EPA Air Inspector, 787-977-5845, rivera.alex@epa.gov

EPA Asst. Inspector: Gloria Diaz-Galarza, EPA Air Inspector, 787-977-5882

Facility Contact: Felipe Bruneau, Environmental Lead, 787-866-8117 ext. 2266, felipe.bruneau@aes.com

State Inspector(s): None.

Other Inspector(s): Elizabeth Hubbard, ERG Inspector, 919-468-7894

Other Attendee(s): Jorge Cañellas, ERG

This report is a summary of observations and information gathered from the facility at the time of the inspection. The information provided does not constitute a final decision on compliance with Clean Air Act ("CAA") regulations or applicable permits, nor is it meant to be a comprehensive summary of all activities and processes conducted at the facility.

Summary of Onsite Observations

A. Opening Conference

The representatives of the United States Environmental Protection Agency (EPA), Alex Rivera and Gloria Diaz-Galarza, and Elizabeth Hubbard and Jorge Cañellas from Eastern Research Group, Inc. (ERG), arrived at the AES Puerto Rico Cogeneration Plant located at Road #3 km. 142 Bo. Jobos in Guayama, PR ("AESPR," or "the facility") at approximately 10:00 am. The EPA and ERG representatives ("the inspectors") were met upon arrival by Felipe Bruneau, Environmental Lead. At approximately 10:10 am, Mr. Bruneau led the inspectors to a conference room where they were joined by Elias Sostre, Plant Manager, and Luis R. Cruz, Environmental Coordinator ("the facility representatives"). The inspectors presented their identification credentials and provided an overview and scope of the inspection.

The inspectors asked the facility representatives to describe the facility's operations and history. The facility representatives informed the inspectors that the facility has around 110 employees and 600 contractors and generally operates 24 hours per day, 7 days per week. Office employees generally work 8 hours per day Monday through Friday, while operations and maintenance workers rotate day and night shifts. According to the facility representatives, construction of the facility began in 1999, and the facility began operating on November 28, 2002. In 2011, the facility added a zero liquid discharge system. The facility representatives told

the inspectors that coal is the main fuel source used at the facility, while limestone is used for sulfur control. Coal and limestone are the main solid materials handled at the facility.

The facility representatives shared a presentation with the inspectors describing the facility's operations in more detail. According to the presentation, the facility includes a 500-megawatt (MW) coal power plant, a 24-MW solar plant, 12 MW of energy storage, and a 20-MW black start unit. The facility is responsible for producing around 25 percent of the electricity for Puerto Rico. The coal power plant includes two circulating fluidized bed (CFB) boilers, each with a capacity of 255 MW. Coal is fed to the CFB boilers from eight coal silos, and supplied air facilitates combustion and keeps the particulates fluidized. AESPR was the first zero liquid discharge industrial facility in Puerto Rico and has a contract with Puerto Rico Aqueduct and Sewer Authority for recycled water used for cooling; the facility uses around five million gallons of water per day. Coal is delivered via cargo ships, and the facility receives around 36 ships each year, each of which delivers 40 to 45 tons of coal from Colombia. The ash from the process is 20 percent bed ash and 80 percent fly ash and is used to produce manufactured aggregate (Agremax) which is sent to landfills in the United States. All conveyors at the facility are enclosed to prevent fugitive dust emissions, and an electrostatic precipitator (ESP) is used to control particulate matter (PM) emissions. Sulfur oxide emissions are controlled through use of limestone and lime injection and circulating dry scrubbers (CDS). A selective non-catalytic reduction system (SNCR) is used to control nitrogen oxide emissions by injecting urea into the upper section of the furnace.

The inspectors asked whether the Title V permit issued November 15, 2011 and the PSD permit issued August 10, 2004 are still the facility's most recent permits. Mr. Cruz said yes and noted that the facility requested a permit renewal for its Title V permit prior to expiration but has not yet received an updated permit. He told the inspectors that he believes the facility has a permit shield for the 2011 Title V permit.

The inspectors noted the facility had submitted several notices of excess emissions from the boilers so far in 2024 and inquired about the primary causes of excess emissions from the boilers. The facility representatives informed the inspectors they are working on investigating the main causes of excess emissions, but there seem to be several causes. In the week prior to the inspection, the facility submitted a notification to EPA that they had to reduce their capacity at the request of LUMA Energy (current manager and operator of the Puerto Rico Electric Power Authority's electric grid) due to power outages caused by Tropical Storm Ernesto. The facility representatives explained that running on lower capacity leads to excess PM emissions.

The inspectors noted that several of the excess emissions reports appeared to be tied to malfunctions of the CDS and asked the facility representatives to describe the operation of the CDS and potential causes of malfunctions. The facility representatives explained that the CDS is used for control of sulfur emissions; flue gases from the CFB boilers are fed to the CDS at approximately 300 degrees Fahrenheit (°F) and are lowered to 160°F using water nozzles that feed water at 140 gallons per minute. The facility representatives told the inspectors that the CDS pumps which supply water to the CDS sometimes trip which causes a reduced supply of water to the CDS and increased opacity emissions. Additionally, the CDS water contains a chemical used to control mercury emissions which can be very corrosive to the pumps; the facility representatives explained that since introducing this chemical, the pumps corrode far more quickly, and pumps that previously lasted a few years now must be replaced every two to three months. The facility representatives noted that they had begun a project in late 2023 to address corrosion to the pumps to reduce malfunctions. They also increased the stock of backup pumps they keep in their warehouse from two to five so that they have extra pumps on hand in case the CDS pumps fail.

The inspectors noted that the facility's Title V permit indicates its boilers are subject to 40 CFR Part 60 Subpart Da – Standards of Performance for Electric Utility Steam Generating Units (NSPS Subpart Da). The inspectors asked how the facility ensures compliance with the applicable emission standards. The facility representatives

told the inspectors that they primarily measure emissions with a continuous emission monitoring system (CEMS) and that they have emission controls that the operators consistently monitor to ensure they are meeting the required operating parameters. The facility is also subject to 40 CFR Part 63 Subpart UUUUU – National Emission Standards for Hazardous Air Pollutants for Coal- and Oil-Fired Electric Utility Steam Generating Units (EGUs), also known as the Mercury and Air Toxics Standards (MATS). The facility representatives indicated that the facility uses sorbent traps to comply with the MATS; the sorbent traps are exchanged twice a week and sent to a lab for analysis. Additionally, the facility has real-time mercury monitors and conducts quarterly performance tests and Relative Accuracy Test Audits (RATA). The facility representatives explained that the real time mercury monitors are used to monitor and maintain the mercury emission rate well below the permissible limit so that operators have time to make the necessary operational adjustments and prevent a mercury emissions exceedance.

The inspectors asked when the most recent performance tests were conducted on the CEMS and continuous opacity monitoring system (COMS) at the facility. The facility representatives responded that the most recent CEMS performance tests were conducted in June 2024 and informed the inspectors that the next tests would be conducted in September 2024.

The inspectors noted that the facility's current filterable PM emission limit under the MATS is 0.03 pounds per million British thermal units (lb/MMBtu), but amendments to the MATS will require the facility to meet a filterable PM emission limit of 0.01 lb/MMBtu by July 2027. The amended rule will also require the facility to meet requirements for PM CEMS by July 2027. Additionally, Puerto Rico Energy Public Policy Act 17-2019 will prohibit coal-based electricity generation after December 31, 2027, and this will require the plant to close at that time. The inspectors asked how the facility plans to comply with the updated MATS requirements given it will be closing shortly after the updated limit takes effect. The facility representatives indicated that AESPR is preparing to comply and is planning to conduct studies to determine if it will need to make changes to the units prior to 2027.

The inspectors noted that the most recent quarterly testing report they had access to was from January 2024 and asked whether the facility had performed any tests more recently. The facility representatives indicated that a performance test was performed in July 2024 and agreed to share the performance test report with the inspectors once it is available.

The inspectors asked how frequently the facility conducts boiler tune-ups and when the most recent tune-ups occurred. The facility representatives explained that they perform annual maintenance on the boilers which include fine tuning, cleaning, and instrument calibration. The facility representatives said they could provide a log of boiler maintenance activities and the maintenance schedule.

The inspectors also requested copies of the following records. They informed the facility representatives that they would follow up with an email listing the requested documents and a link where they could upload electronic copies of the records:

- Written documentation of the facility's plan to improve CDS operation
- Permit shield for the facility's Title V permit
- Black start engine construction permit
- Title V 2023 annual compliance certification
- Boiler operating hours for the past two years
- CEMS and COMS downtime for the past two years
- Quarterly performance test records from June 2024
- Most recent RATA report

- Semiannual compliance reports for 2023 and 2024
- Quarterly opacity exceedance reports for the past two years
- Boiler maintenance records for the past two years, including maintenance performed to meet tune-up requirements
- Urea injection rate records for the past two years
- Heat input records for the past two years
- Startup and shutdown records for the past two years
- Visible emissions observations for coal and limestone handling operations and limestone dryer for the past two years
- Method 9 certifications for the observers who performed any Method 9 readings over the past two years
- Limestone dryer operating hours for the past two years
- Limestone dryer and limestone handling baghouse pressure drop measurements for the past two years

At approximately 12:10 pm, the inspectors took a lunch break. They returned to the facility at approximately 1:30 pm and met again in the conference room where the facility representatives provided a safety orientation.

B. Facility Walkthrough

At approximately 2:10 pm, Mr. Bruneau and Willy Santiago, Plant Operations Manager, led the inspectors on a tour of the facility. The inspectors explained that during the facility tour, they would capture digital images of the facility's processes and emission points using a digital point and shoot camera that is not intrinsically safe. They informed the facility representatives that they would let them know prior to taking each photo. They explained that the facility would have the opportunity to claim any of the photos as confidential business information (CBI), if needed. The facility representatives did not express any concerns with the inspectors capturing photos. The list of digital images taken during the facility tour are included in Appendix A.

The group visited the boilers, the boiler operator control room, the CEMS room, the urea storage area, the black start engine, and the diesel-powered fire water pump. From the structure where the boilers are located, they also observed the coal pile and ash pile. See photos DSC01374 through DSC01395.

In the boiler operator control room, Mr. Santiago explained that average emission numbers are used for compliance purposes, but the operators have access to instantaneous emission measurements and make operational changes based on those numbers. He showed the inspectors where these instantaneous readings are displayed on screens in the control room.

The inspectors noted that an alarm on the Unit 2 monitoring screen was blinking red for opacity and inquired as to why. The operators in the control room explained they were getting a high sulfur dioxide reading, so they had increased the lime injection rate to lower sulfur dioxide, but that resulted in increased opacity. They explained that their response to an opacity alarm depends on the reason, as it could be caused by the CDS or EPS malfunctioning, or it could be a false CEMS reading.

From the boiler area, the inspectors observed dust blowing off the top of the ash pile and asked how the facility control fugitive dust from the pile. Mr. Bruneau told the inspectors that sprinklers are used to spray water on the pile to minimize dust.

In the CEMS room, the facility representatives explained that the CEMS for the CFB boilers calibrate daily at 8 am for Unit 1 and 8:30 am for Unit 2. The inspectors noted the carbon monoxide monitor readings for Units 1

and 2 had question marks next to the numerical measurements. The facility representatives explained that this means the monitors are due for maintenance based on their hours of operation.

The inspectors asked when the black start engine was installed, and the facility representatives responded that it had been installed approximately three years ago and they began using it about two years ago. The inspectors noted they would like to get a copy of the construction permit for the engine, and the facility representatives agreed.

At the diesel-powered fire water pump, the facility representatives informed the inspectors that the pump had not been operating for the past year due to an issue with the engine. They explained that a repair person had been out to assess the damage, but they had not been able to get the pump back into service yet.

C. Closing Conference

At approximately 3:30 pm, the group returned to the conference room for a closing conference. The inspectors thanked the facility representatives for their time and cooperation during the inspection. The inspectors went back through the documents that were requested during the opening conference and reiterated that they would be following up via email with the list of documents as well. The inspectors explained that EPA would provide AESPR with an inspection report in approximately 60 days. At approximately 4:10 pm, the inspectors departed from the facility.

Appendices

A. Digital Image Log

End of Report

Lead Inspector's Name: Alex Rivera

ALEX
RIVERA

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RIVERA
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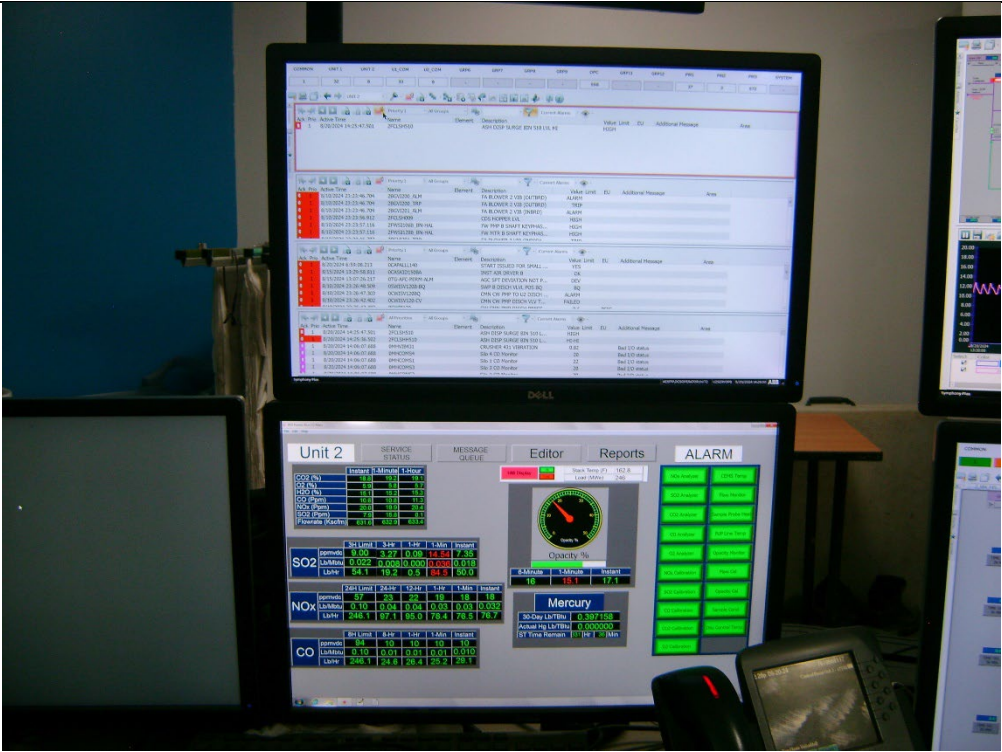
Supervisor's Name: Nancy Rodríguez

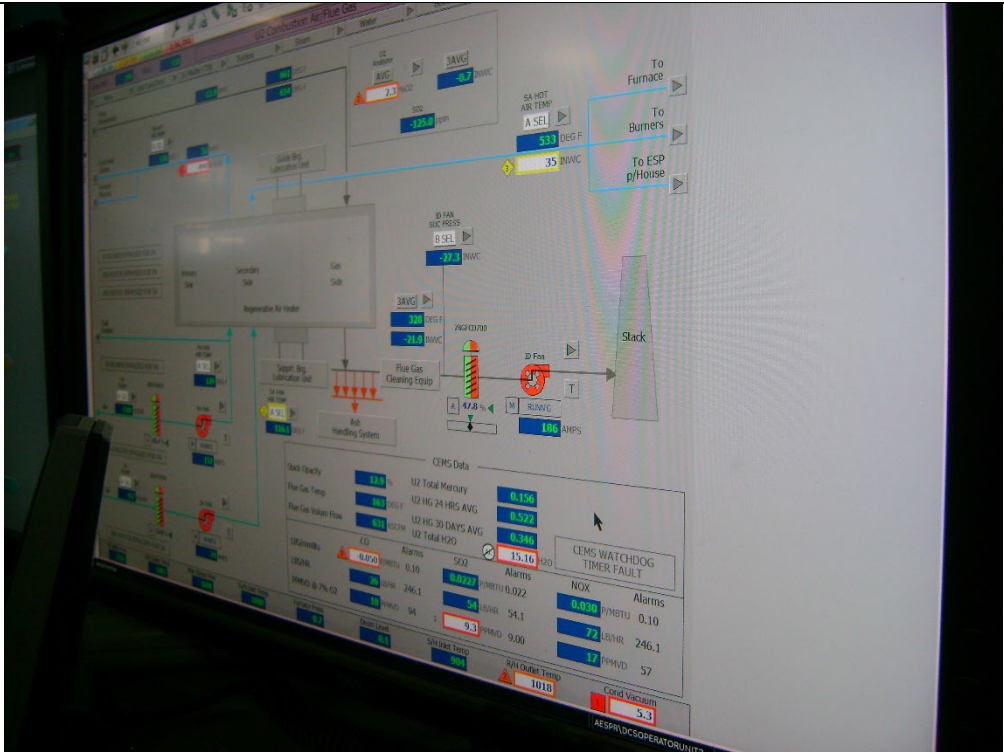
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RODRIGUEZ

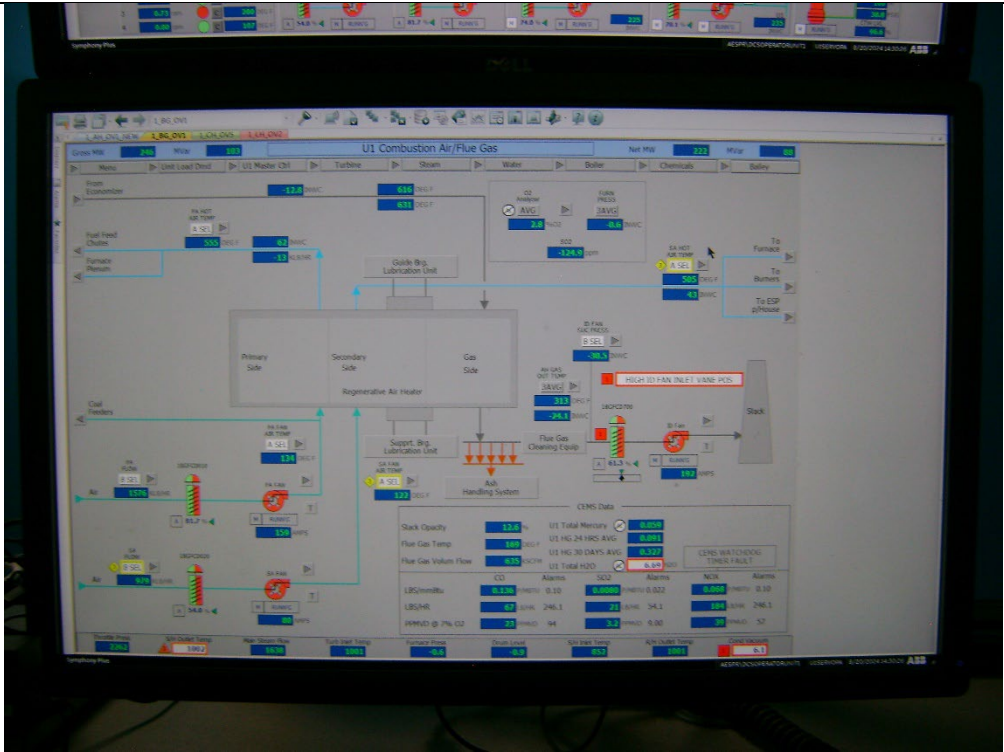
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Appendix A: Digital Image Log for AES Puerto Rico Cogeneration Plant (AES Puerto Rico, LP), Guayama, PR				
Facility Address: Road #3 km. 142 Bo. Jobos Guayama, PR 00784		Elizabeth Hubbard, ERG	Image numbers: DSC01374-DSC01395	
File name: Appendix A Digital Image Log AES PR_2024-10-17				
Image Number	File Name	Description	Date Taken	Time taken
1	DSC01374	 From left to right: ash pile, limestone dome, coal pile, dock area in distance, cooling water pond.	8/20/2024	2:18 pm

2	DSC01375	 Unit 1 (front) and Unit 2 turbines.	8/20/2024	2:22 pm
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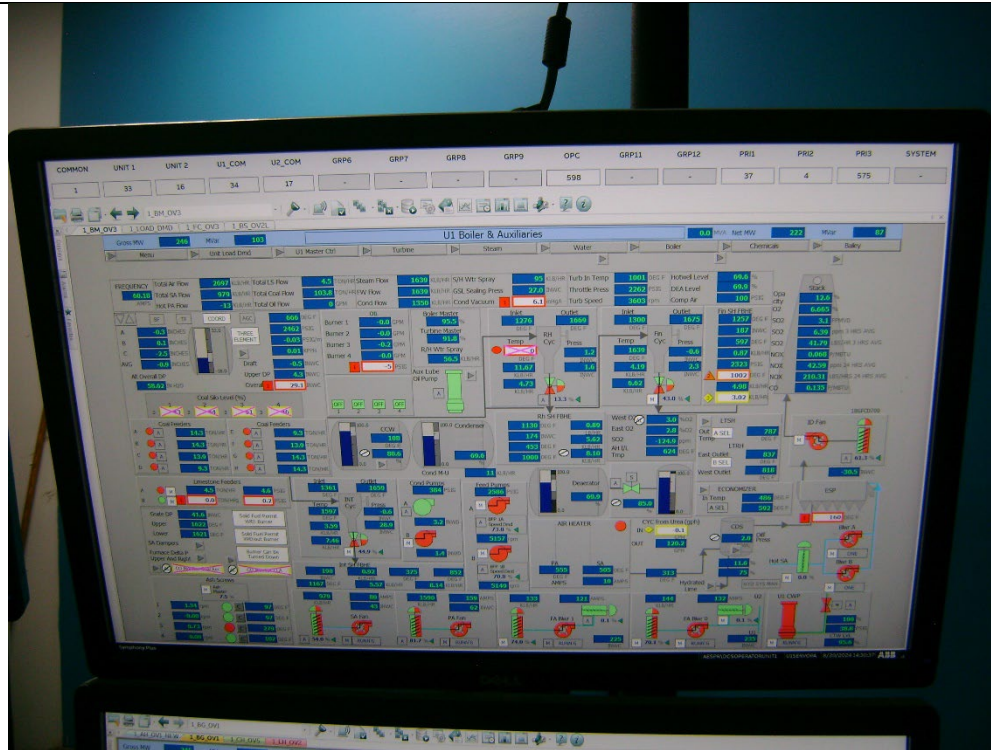
3	DSC01376	 Unit 2 CEMS instantaneous monitoring screen in operator control room.	8/20/2024	2:26 pm
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4	DSC01377		8/20/2024	2:27 pm
		Unit 2 combustion air/flue gas monitoring screen in operator control room.		

5	DSC01378	 Unit 1 combustion air/flue gas monitoring screen in operator control room.	8/20/2024	2:30 pm
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6

DSC01379



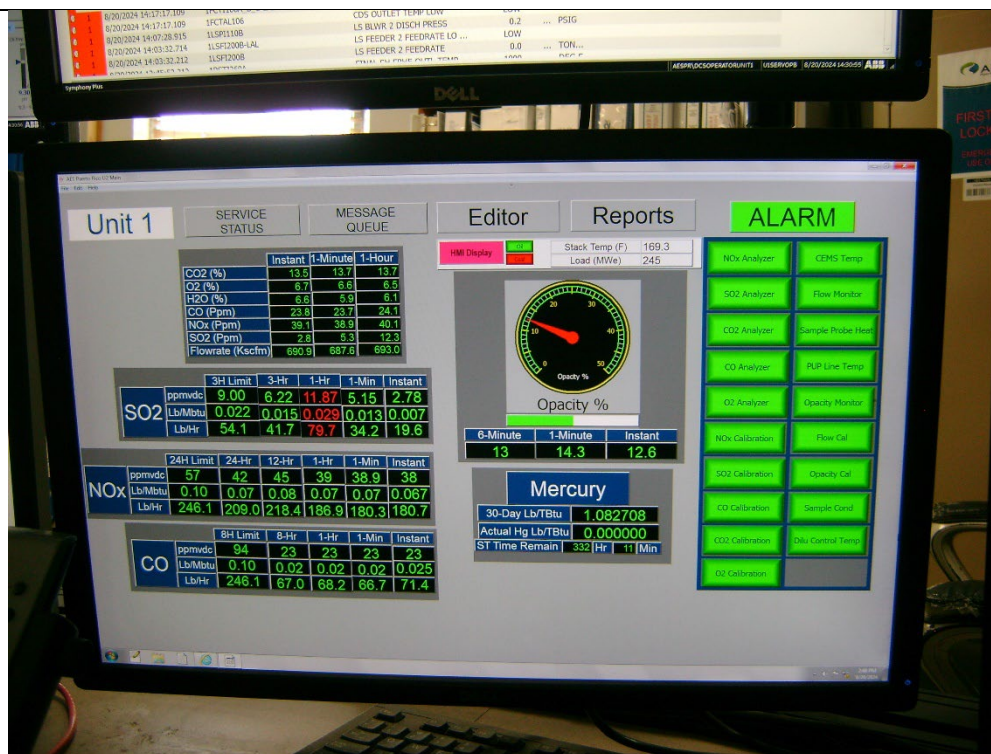
Unit 1 process monitoring screen in operator control room.

8/20/2024

2:30 pm

7

DSC01380



Unit 2 CEMS instantaneous monitoring screen in operator control room.

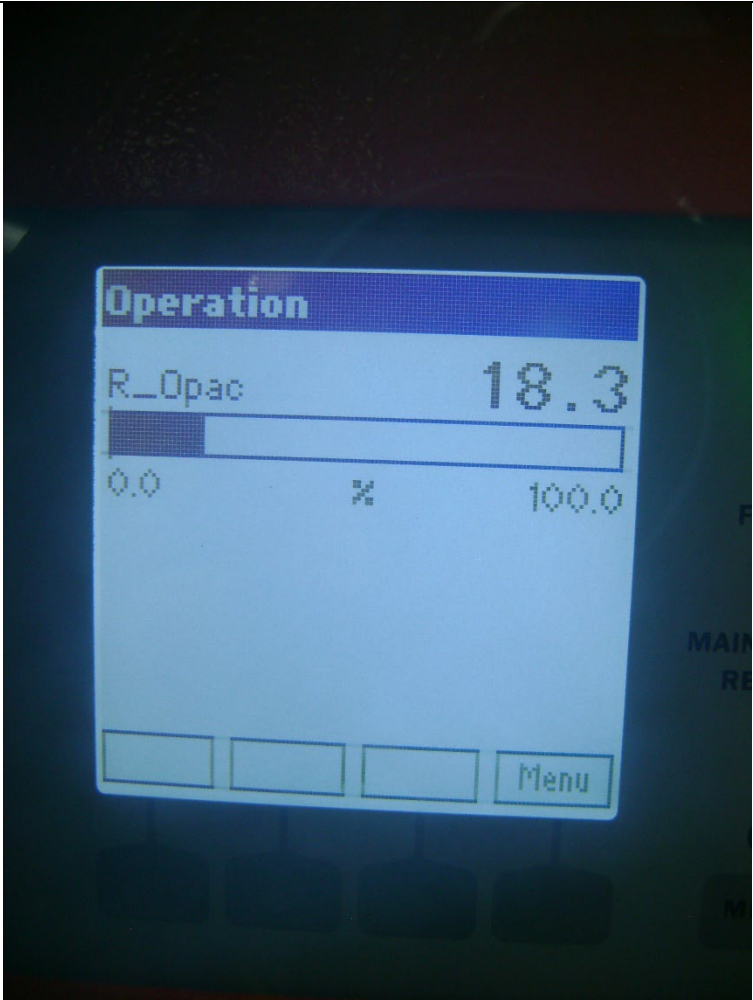
8/20/2024

2:30 pm

8	DSC01381	 Unit 1 CEMS monitors including dilution air pressure and flow and temperature control.	8/20/2024	2:54 pm
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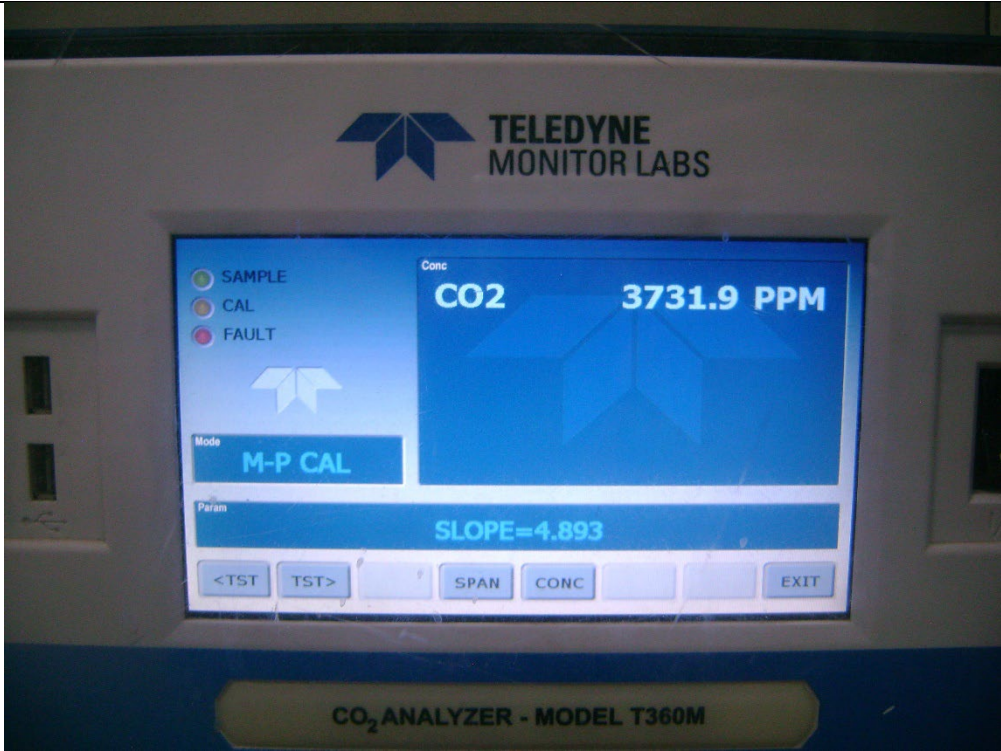
9	DSC01382	 Unit 1 CEMS monitors including carbon monoxide (CO), sulfur dioxide (SO2), and nitrogen oxides (NOx) concentrations.	8/20/2024	2:54 pm
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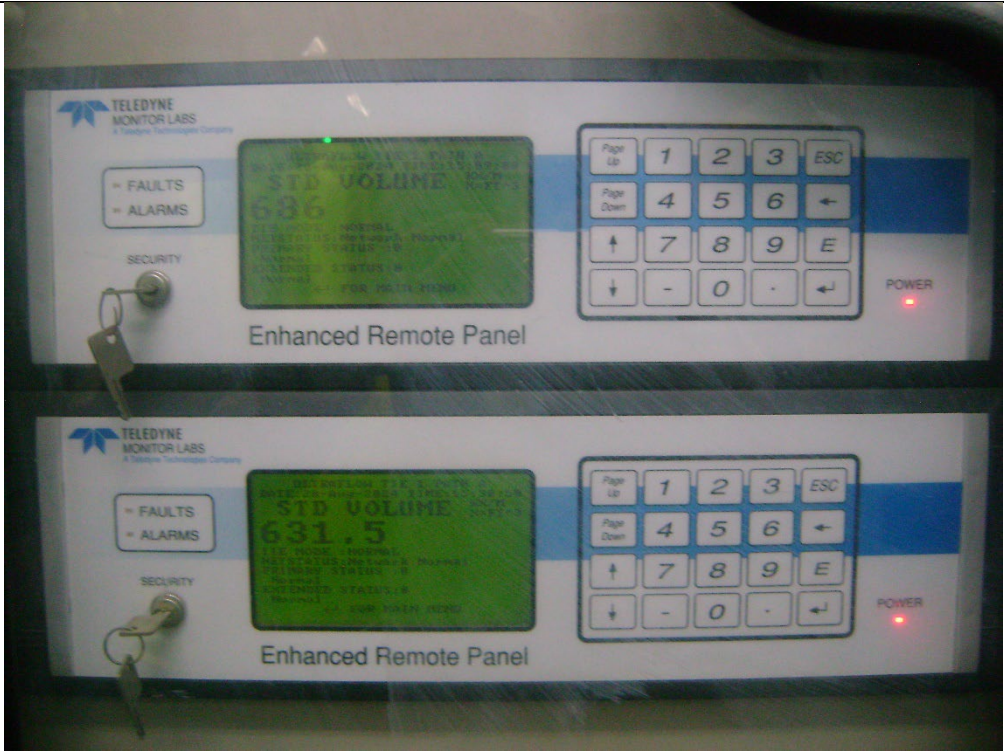
10	DSC01383	 Unit 1 CEMS monitor for carbon dioxide (CO2) concentration.	8/20/2024	2:55 pm
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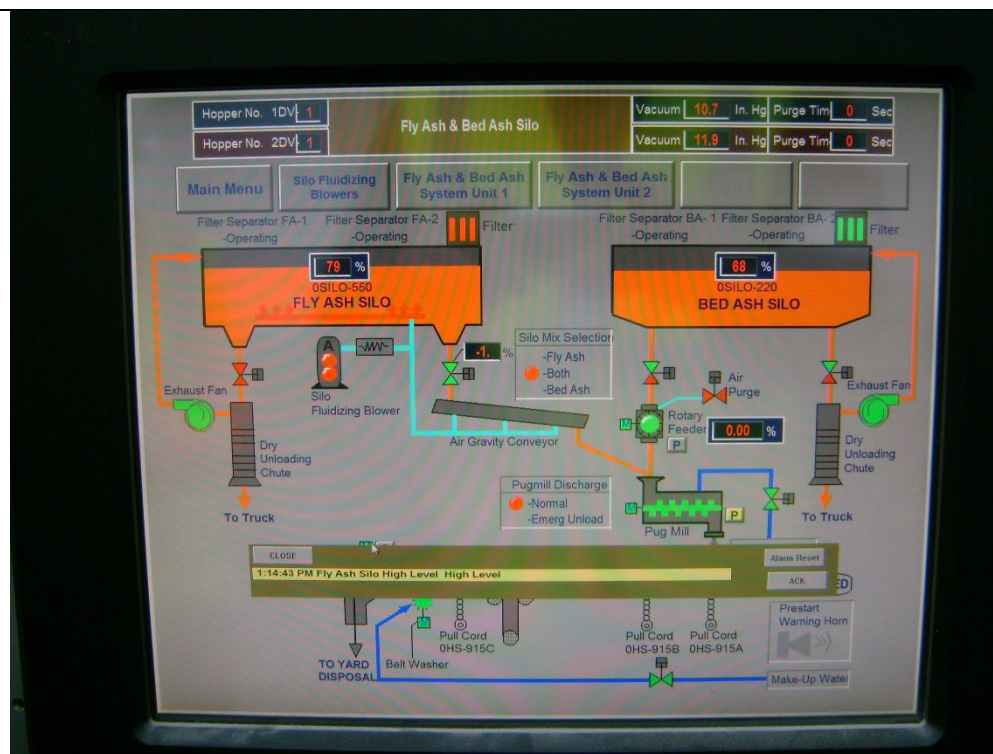
11	DSC01384	 Unit 2 CEMS opacity monitor.	8/20/2024	2:55 pm
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12	DSC01385	 Unit 2 CEMS monitors including dilution air pressure and flow, temperature control, and carbon monoxide concentration.	8/20/2024	2:55 pm
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13	DSC01386	 Unit 2 CEMS monitors including carbon monoxide (CO), sulfur dioxide (SO2), and nitrogen oxides (NOx) concentrations.	8/20/2024	2:56 pm
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14	DSC01387	 Unit 2 CEMS monitor for carbon dioxide (CO2) concentration.	8/20/2024	2:56 pm
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15	DSC01388	 Volumetric flow rate monitor for air to CDS.	8/20/2024	2:56 pm
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Fly ash and bed ash silo monitoring screen.



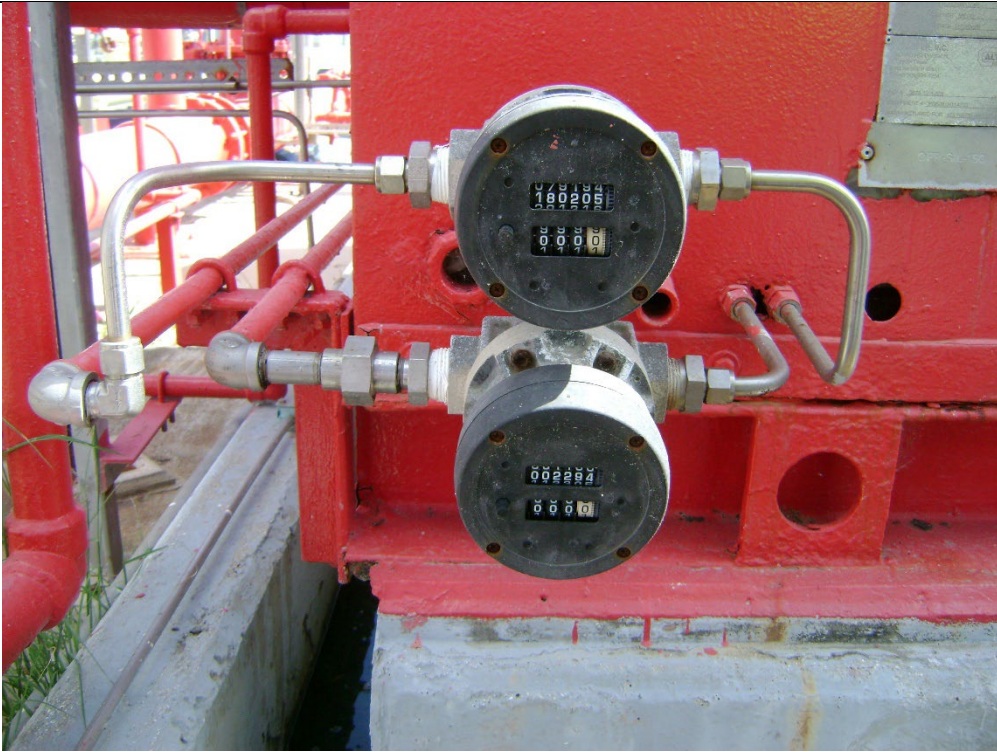
Unit 2 process monitoring screen in CEMS room.



Unit 1 process monitoring screen in CEMS room.

19	DSC01392	 Partial view of the facility black start engine.	8/20/2024	3:08 pm
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20	DSC01393	 Ash pile with water sprinkler spraying.	8/20/2024	3:09 pm
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21	DSC01394	 Diesel-powered fire water pump hour and fuel use meters.	8/20/2024	3:18 pm
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22	DSC01395		8/20/2024	3:20 pm
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Boiler stack with visible emissions, taken from the north side of the facility.