

DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION
ACTIVITY REPORT: On-site Inspection

M067571103

FACILITY: UNIVERSITY OF MICHIGAN		SRN / ID: M0675
LOCATION: 1239 KIPKE DR, ANN ARBOR		DISTRICT: Jackson
CITY: ANN ARBOR		COUNTY: WASHTENAW
CONTACT: Brandi Campbell , Occupational Safety & Environmental Health		ACTIVITY DATE: 03/19/2024
STAFF: Diane Kavanaugh Vetort	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MAJOR
SUBJECT: 1 of 2 PCE of FCE. Compliance inspection of CPP/CHP power house. Report is also District observation of the annual RATA (Day 1 of 3/4). CPP Boiler 3 CEMs RATA was conducted today.		
RESOLVED COMPLAINTS:		

REVISED REPORT

M0675 UNIVERSITY OF MICHIGAN, 1239 Kipke Drive, Ann Arbor, MI 48109

CONTACT: Brandi Campbell (BC), Environment, Health, & Safety, Sr. Environmental Specialist, 734-647-9017, campbelb@umich.edu

AQD: Diane Kavanaugh Vetort (DKV), Jackson District Office

On March 19, 2024, EGLE AQD conducted an on-site compliance inspection, announced a short time prior, of the Central Power Plant (CPP), at the University of Michigan, Ann Arbor, Michigan. This is a partial compliance evaluation (PCE) of the Full Compliance Evaluation (FCE) of the stationary source. The remaining FCE inspection was conducted on March 25, 2024. A separate email was sent on March 18, 2024 to request the required records for UM's power plants, and the Crematory. Additional records may be requested depending on the extent of the inspection of other process equipment.

3/19/24 Day 1 inspection covered the FG/EU at the CPP. AQD also observed the RATA testing today of CPP-Boiler 3's continuous emissions monitor (CEM). CPP is the large primary power plant for the University of Michigan Central Campus. The CPP is also the location of the newer installed/operational Combined heat and power unit (CHP) with heat recovery steam generation (HRSG). This week is the scheduled relative accuracy test audits (RATAs) for Nitrogen Oxides (NOx) and Oxygen (O2) (CEMS) at CPP. CEMS are installed on Boiler numbers 3,4,5, and 6, includes the new CHP-HRSG. Boiler 4 RATA is scheduled for Wednesday, Boiler 6 for Thursday (Jeremy Howe, AQD Technical Programs Unit (TPU) is scheduled to observe with other staff on this day), and Boiler 5 CHP-HRSG for Friday. The schedule may change.

AQD TPU issued UM's RATA approval letter March 13, 2024. This testing is required by the ROP and Title 40 of the Code of Federal Regulations (40 CFR), Part 60 and 40 CFR, Part 75.

During today's inspection the following CPP FG/EU were observed: EUB0260-02, EUB0260-06, EUT0260-09, EUT0260-10, FGB0260-03-04, and FGBT0260-CO. I also observed the new EUCPP-CHPHRSG and associated EUBOILER5. All units, ductwork, and stacks appeared to be in good operating condition overall. No visible emissions, odors or other unusual conditions were observed during the inspection.

UM submitted their 2023 MiEnviro annual emissions report with supporting documentation. Therefore AQD has records for year ending 2023. I asked Brandi to submit prior 12 month rolling emission records through month ending February 2024. She agreed to supplement records as requested.

The purpose of the inspection is to determine the facility compliance status with the applicable federal and state Air Pollution Control regulations, specifically Act 451, Natural Resources and Environmental Protection, Part 55, Air Pollution Control, the administrative rules, and the conditions of UM's Renewal Operating Permit (ROP) MI-ROP-M0675-2021b.

The UM is a major source for criteria pollutants and hazardous air pollutants (HAP) and therefore is subject to one or more Major Source Maximum Achievable Control Technology (MACT) standards. UM also has installed a large number of emergency diesel and natural gas internal combustion engine generators subject to Major Source (MACT) standard (40 CFR 63 Subpart ZZZZ) and the associated New Source Performance Standard (NSPS), 40 CFR Part 60, Subpart IIII or JJJJ. UM operates

numerous natural gas and/or fuel oil capable boilers subject to the Major Source Boiler MACT standard (40 CFR 63 Subpart DDDDD) and NSPS 40 CFR 60 Subpart Dc, or Db. The existing gas turbine cogeneration systems at CPP are subject to NSPS Subpart GG, and to Compliance Assurance Monitoring (CAM). The new CHP is subject to NSPS Subpart KKKK and NESHAP Subpart YYYY. UM submitted 2023 ROP Certifications timely and reported deviations as required during the previous 12 month period (2023).

INSPECTION

Upon my arrival to the CPP at 9:30 AM, I parked in the Palmer St. parking ramp and walked to the side door to check in with the Guard and meet with contact Brandi. I observed the two brick stacks, North and South and did not observe any visible emissions. Required PPE is hard hat, steel toe footwear, hearing and eye protection.

Brandi and I went first to the powerhouse Main Control Room and reviewed equipment operating status and the process data screens. Several operators were in the room however staff, Rich, who oversees CEMs processes, was not there. Brandi said he has been communicating by walkie-talkie with Impact Consultant conducting the RATA testing. I verified that UM is recording the process data and provides this to Impact for the final test results report. AQD requires Steam load and Fuel consumption be recorded during each Run.

During the inspection I observed the Control Screen for the entire plant and recorded the following readings:

Boilers #4 off line; and Boiler #6 off line

Boiler #3 Load 106.45 kpph

Boiler #5 Load 88.59 kpph

Boilers 7/8 each 37 kpph

Generators 1 (5 MW), 6 (15 MW), 8 (5 MW), 9 (3 MW), 10 (3 MW)

CT NOx water to fuel ratio T9 and T10 both (0.5%) natural gas.

Brandi and I next observed the Horiba CEMS located in a separate room and reviewed these cabinets. Room contains Boiler 6, Boiler 3, and Boiler 4 CEMs but not the newer CHP's. That Unit is located in the brand new building addition. The CEM is located directly next to the Unit. We observed this controlled cabinet during the inspection of the new Turbine system.

Boiler 3 CEMs reading: NOx 168.7 ppm, 121.9 ppm 9 vol % O2; O2 4.35 vol %

Brandi and I next went to where the consultant, Impact, was set up for the RATA. It appeared that everything was operating smoothly. Andy Rusnak, Impact said they are testing only Boiler 3 today and are currently on the 5th Run (@ 10:15AM). This Testing consists of (9) 21 minute runs. Sometimes extra runs are conducted. Andy said Boiler 3 has been passing early as of the 3rd run and emissions are very low. Impact's readings vs CEM reading are very close. He said additional runs will not be necessary at this time. Boiler 3 is emitting through the North Stack, natural gas only.

During Run 5, Renee, Impact took us to see the port location. Then, Brandi and I walked inside the power house building to observe the other CPP Boilers and Turbines. Boilers 4 and 6 were not operating. Turbines 9/10 and associated steam boilers 7/8 were operating.

We then went into the new building containing the CHP and observed the Horiba CEMs Boiler 5 screen reading (@10:40 AM): NOx 7.36 ppm, 5.73 ppm 15 vol%O2; O2 13.14 vol%

I observed the Turbine, Ductburner, Catalyst section (formaldehyde control equipment), and the Urea Tank. There is the potential of ammonia slip after the process and UM has an ammonia monitor. Everything appears still like new construction and in excellent condition. Brandi said they use very little Urea injection, this is located at the stack. The addition of the Catalyst as Control Device is the

most significant change since the previous inspection. UM has conducted several performance tests and submitted the required plans and the notification of change for the ROP. This will be processed during the next renewal. The applicable federal standard is MACT YYYY and it is already referenced in the ROP. I requested as part of the records that UM submit updates/revisions to the (3) Plans as applicable. Brandi told me the Malfunction Abatement Plan (MAP) has been revised and is draft pending their RO review. I agreed this can be submitted after it is finalized, likely in April.

Prior to leaving the facility, Brandi and I went back to check in with Andy, at Impac'st location. He said they were in Run #6. He showed me the numbers on his computer. It appears UM is likely in compliance based on the first 6 runs. Brandi confirmed all process data will be submitted in the report. Later that day I received an email from Brandi stating that Boiler 3 passed the RATA and she will keep me up to date on the rest of the testing this week. She emailed daily and the remainder of the RATAs were also passed.

RECORDKEEPING (Received 3/29/24. Brandi email for CPP and EUCPP-CHPHRSG copied below)

CPP

EUB0260-02

SC VI. 1. Fuel usage and emissions calculation records for the period indicated.

No fuel oil burned during this time period. Boiler 2 performs 5-year stack testing to show compliance and UM provides annual emissions via annual emissions report via MIEnviroPortal.

SC VI. 2-4. Please submit the most recent fuel oil record(s) as applicable.*

No fuel oil burned during this time period. Last Boiler MACT tune up performed on 12/15/2021.

Attached is the only fuel delivery ticket dated 12/5/2023. This will apply to all fuel oil conditions for CPP (Tanks 11 and 12 Dec 2023.pdf).

EUB0260-06

SC VI. 3-6. Please submit the most recent fuel oil record(s) as applicable.*

No fuel oil burned during this time period.

SC VI. 7. Fuel usage and emissions calculation records for the period indicated.

Attached is a sample Mass Rate for NOx, SO2, VOC, and CO for 2023 Quarter 4 for natural gas. No fuel oil burned during this time period. (6BOILERMASSRATES.xls) Last Boiler MACT tune up performed on 12/15/2021.

EUT0260-09

SC VI. 1. Statement of compliance /information as applicable.

Attached is a DTE letters stating the sulfur content to meet definition of "natural gas" (SulfurletterUofMJanuary2021.pdf)

SC VI. 2. Records or other demonstration of compliance with this condition.

Attached is a sample graph of water-to-fuel ratio showing continuous monitoring within the requested time period. (CT9andCT10FueltoGasRatio7_1_23thru12_31_23.pdf)

EUT0260-10

SC VI. 1. Statement of compliance /information as applicable.

Attached is a DTE letters stating the sulfur content to meet definition of "natural gas" (*SulfurletterUofMJanuary2021.pdf*)

SC VI. 2. Records or other demonstration of compliance with this condition.

Attached is a sample graph of water-to-fuel ratio showing continuous monitoring within the requested time period. (*CT9andCT10FueltoGasRatio7_1_23thru12_31_23.pdf*)

SC VI. 4. Please provide this record.

The fuel flow meter was calibrated 11/2023 and is performed annually. The NOx water flow meter was calibrated 2/2023 and attached is a copy of the calibration sheet. Please note after last calibration, the manufacturer recommended performing calibration on the Nox water meter every 5 years. (*CT10 NOx Water Cal.pdf.*)

FGB0260-03-04 (EUB0260-03 EUB0260-04)

SC V1. 1. Fuel usage and emissions calculation records for the period indicated.

Attached is the fuel oil usage for Boiler 4. No fuel oil usage for Boiler 3 during this time period. UM provides annual emissions via annual emissions report via MIEnviroPortal. (*CPP Oil 2023 Data.pdf*)

SC VI. 2-4. Please submit the most recent fuel oil record(s) as applicable.*

Attached is the only fuel delivery ticket dated 12/5/2023. (*Tanks 11 and 12 Dec 2023.pdf*) Last Boiler MACT tune up for Boiler 3 was performed 9/24/2021 and Boiler 4 was performed on 12/13/2021.

FGT0260-CO

Fuel usage and emissions calculation records for the period indicated.

Attached is the natural gas usage for January and February 2024. FGT0260-CO performs 5-year stack testing, turbine and ductburner annual maintenance and continuously monitors the water-to-flow ratio. UM provided the annual fuel usage and annual emissions via MIEnviroPortal. (*Cogen Jan-FebFuelrecords.pdf*)

SC III.3. Records of hours of operation when firing No. 2 fuel oil

No fuel oil burned during this time period.

SC III.4. Records demonstrating fuel usage and compliance with the minimum water to fuel ratio.

Attached is a sample graph of water-to-fuel ratio showing continuous monitoring within the requested time period. (*CT9andCT10FueltoGasRatio7_1_23thru12_31_23.pdf*)

SC VI. 2-4. Please submit the most recent fuel oil record(s) as applicable.*

Attached is the only fuel delivery ticket dated 12/5/2023. (*Tanks 11 and 12 Dec 2023.pdf*)

SC VI. 6-12. Statement of compliance / applicable documentation with CAM.

Continuously monitor the water-to-fuel ratio and perform annual maintenance on the turbine as well as calibrate the flow meters. Fuel flow meters are calibrated annually and were performed 10/2023 for GT9 and 11/2023 for GT 10. The Nox water meter for CT 9 was calibrated 3/2023 and CT 10 was calibrated 2/2023 and will continue on a 5-year calibration schedule per the manufacturer. Attached are copies of the Nox water meter calibrations.

(*CT9 and CT10 Nox water cal.pdf*)

EUCPP-CHPHRSG

SC III. 2. Malfunction Abatement Plan. Please submit if any updates or significant changes from Initial Plan submittal.

The MAP is being revised to incorporate the catalyst and in draft form. A final copy of the revised MAP will be submitted once finalized.

SC III. 3. Start-up Shut-down emissions minimization plan. Please submit if any updates or significant changes from Initial Plan submittal.

No updates or significant changes at this time.

SC III. 6. Audio/Visual/Olfactory (AVO) plan for natural gas. Please submit if any updates or significant changes from Initial Plan submittal.

No updates or significant changes at this time. Attached are a couple copies of the weekly inspection per the OVA plan. (*OVA weekly checklist samples.pdf*)

SC VI. 6. Summary records for the period indicated.

Attached is the 12-month rolling worksheet for conditions a.-d. (*CHP 12-month rolling records.pdf*)

SC VI. 9. Summary of data, not already covered under SC VI 6, and necessary to demonstrate compliance.

Start up emissions testing was performed in October 2022; Performed formaldehyde emissions testing per Subpart YYYYY annually; All start up / shutdown events are accounted for on the 12-month rolling spreadsheet; Attached is a completed OVA inspection that is performed weekly; Sulfur is verified by the attached DTE letter and fuel oil delivery ticket; UM submits annual emissions report via MIEnviroPortal.

COMPLIANCE SUMMARY

The second day of the inspection will take place on 3/25/24 and is documented in a separate PCE under that date. The records requested for the CPP were received timely and reviewed. AQD has determined that UM is in substantial compliance with the applicable federal requirements and conditions of their ROP. AQD is pending receipt of the revised MAP for the CHP.

NAME *Alicia Kavanaugh Vetort*

DATE 4/23/2024

SUPERVISOR 