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

K213167650

FACILITY: Western Michigan University		**SRN / ID:** K2131
LOCATION: 1903 West Michigan Ave, KALAMAZOO		**DISTRICT:** Kalamazoo
CITY: KALAMAZOO		**COUNTY:** KALAMAZOO
CONTACT: Mark Weiss , Director, Environmental Health and Safety		**ACTIVITY DATE:** 05/10/2023
STAFF: Monica Brothers	**COMPLIANCE STATUS:** Compliance	**SOURCE CLASS:** MAJOR
SUBJECT: Announced scheduled inspection		
RESOLVED COMPLAINTS:		

This was an announced scheduled inspection. I arrived at the WMU Power Plant at 9:30 am and met with George Jarvis, Director of Power Plant, Mark Weiss, Director of Environmental Health and Safety, Kevin Bridges, Assistant Chief Operating Engineer, Keith Pung, Environmental Specialist, and Jennifer Heilmann, Executive Assistant. No visible emissions, except steam, were observed upon arrival. I introduced myself and briefly discussed with them what equipment I would like to look at and what kinds of records I would be looking to review. George and Mark had already acquired some of the required records, so we decided to do the records review first. Mark said that they still have the same five parts washers they had during the last inspection. They have moved the printing presses that were operating under Rule 290 to Floyd Hall at the Business, Technology, and Research Park (BTR Park). There are no longer any emission units operating under Rule 290 at this location. After the records review, we took a tour of the power plant equipment, and then Mark, Keith and I went over to the main campus to view some of the generators and parts washers. I left the facility at about 11:30 am.

MI-ROP-K2131-2021a:

FGENGINES:

This flexible group is for two 3,500 (2.5 MW) natural gas-fired RICE, equipped with oxidation catalysts to reduce CO and VOC emissions. The emission units are EU-ENGINE9 and EU-ENGINE10. These units are required by their ROP to conduct a stack test for NOx, CO, and VOC (including formaldehyde) within one year of startup, and then every 8,760 hours or every 3 years after the initial test. The initial testing was completed in August 2021, so they will be due for testing in 2024. The ROP also required WMU to submit a Malfunction Abatement Plan (MAP) within 180 days of trial operation. The facility submitted this MAP to EGLE on January 14, 2021, in compliance with this requirement.

The permit limits the operating hours of FGENGINES to 9,300 hours per year, on a 12-month rolling basis. I viewed records of operation time, and they are under this limit. The permit also limits NOx emissions to 35.9 tpy, CO emissions to 72 tpy, and VOC to 30 tpy, on a 12-month rolling basis. Their records show that they are under each of these limits. They are also keeping the required maintenance records.

EUPABOILER 6:

This boiler has been decommissioned since December 2019 and has been disconnected from the fuel source. They will no longer be operating this boiler. This boiler was a 65,000 lbs steam/hr,

88MMBtu/hr, natural gas-fired boiler that was installed in 1965. They still have the required recordkeeping on file.

EU-149-EMERGEN-01:

This is a 2.75 MMBTU/hr (250 kW) diesel emergency generator that was installed in 2013. I viewed records of the sulfur content of the diesel fuel, and it indicated that the fuel is compliant with the 15 ppm sulfur limit. They are keeping track of the number of hours this unit runs per year, and I observed the documentation that this unit is a certified engine.

EU-02-PEAKGEN:

This unit is a natural gas-fired peaking and black start generator that is rated at 7.5MMBtu/hr. It was installed in 1998. It has an oxidation catalyst as its pollution control device, which has a Continuous Parameter Monitoring System (CPMS) that records the inlet temperature at 15-minute intervals. During the inspection, I reviewed these temperature records. The temperatures, while the unit is running, are usually around 700°F, which shows compliance with the requirement to be between 450° and 1350°F. The CPMS logs the temperature in a 4-hour average format as well. These were reviewed and were in compliance.

George also showed me their records of maintenance and repairs on the generator. They have a preventative maintenance service agreement with MI CAT, who comes out to do maintenance checks. These maintenance activities are done according to how many hours the unit is run. They have records of each time MI CAT has come out, either to fix something on the unit, or to do maintenance activities. They are also keeping track of the hours of operation of the unit.

FG-BOILERS 9&10:

Each of these boilers produces 65,000 lbs steam/hr and are rated at 90MMBtu/hr for natural gas and 88 MMBtu/hr for fuel oil. Fuel oil is used only for backup, and they have not used fuel oil in either boiler since before 2014. The highest 12 month rolling NOx emissions for Boiler 9 since January 2021 were in November 2021, with about 5.57 tons/year. The highest 12-month rolling NOx emissions for Boiler 10 were in May 2022, with about 7.00 tons/year being emitted. This is far under their limit of 35.9 TPY for each boiler. They are keeping track of the number of hours they run fuel oil and the amount of each fuel used per 12 month rolling time-period. These records are attached to this report. Boiler 9 was tested in November of 2015, and they were in compliance with the permit limits in the ROP. Boiler 10 was tested with natural gas in November 2021, and they were in compliance with the permit limits in the ROP. EGLE approved the facility's request to waive the requirement for them to test with fuel oil during this testing period because they only operate on fuel oil during emergency gas curtailments. Going forward, they will need to alternate boilers for subsequent tests every 5 years.

FGPBTUHR-78:

Turbines 7 and 8 are both natural gas-fired and were installed on July 1, 1997. Each has a max heat input rate of 60 MMBTU/hr, and they also each have a duct burner that can also produce energy for the heat recovery steam generator. The duct burners are controlled by low-NOx burners, which are required to be operating at all times while the units are running.

This equipment is allowed to burn only pipeline quality natural gas, and the total sulfur content of the gas must be 20.0 grains/ 100scf or less. They provided a document from Consumers Energy about the natural gas they receive, and it showed that the natural gas contains no more than 5.0 grains/ 100scf.

Emissions testing was conducted on both turbines for NOx and CO in November 2021. The results of this testing showed that they were in compliance with their permitted limits. For this testing period, EGLE approved their request to waive the testing requirement to test NOx and CO while operating in fresh-air firing mode because they very rarely operate the turbines in this manner. They are required to retest for NOx and CO every five years, so they will be due for this testing again in 2026.

Their records show that they are keeping track of the monthly hours of operation for each mode of operation (exhaust mode with the turbines running, and fresh air mode with only the duct burners supplying energy). They very rarely run in fresh air mode, but they did just a few times since 2021 for about 172.4 hours for Turbine 7 and 449 hours for Turbine 8. They are also keeping track of their natural gas usage per month and on a 12-month rolling timescale.

NOx emissions are also calculated monthly and on a 12-month rolling timescale, and there is a 44.7 tons/year (12-month rolling) limit on their NOx emissions from operating only in fresh air mode on each unit. The 172.4 hours that Turbine 7 operated in fresh air mode since the beginning of 2021, resulted in a maximum of 0.99 tons/year (12-month rolling) in NOx emissions. The 449 hours that Turbine 8 operated in fresh air mode since the beginning of 2021, resulted in a maximum of 1.82 tons/year (12-month rolling) in NOx emissions. These emissions are far under the 44.7 tons/year (12-month rolling) limit for each turbine. They also have a 25 tons/year (12-month rolling) limit for Turbine 8. Their records show that the highest 12-month rolling NOx emissions since 2021 were 2.53 tons/month in the month of March 2021, which is far under this limit.

FG-NSPS IIII:

This flexible group applies to all emergency generators at the facility that are fired by diesel fuel or No. 2 fuel oil and were manufactured on or after 2006. The units are EU-42-EMERGEN-02, EU-44-EMERGEN-01, EU-82-EMERGEN-01, EU-155-EMERGEN-01, and EU-149-EMERGEN-01. EU-155-EMERGEN-01 is a new emergency generator as of the last inspection in 2021. Specification documents for this new emergency generator are attached to this report. The ROP requires that they test the No. 2 fuel oil either once per year or for each shipment of fuel, whichever is less frequent. Mark said that they test once per year and showed me the test results for October 2022. The sulfur content is 15 ppm and the permit limit is 15 ppm. The cetane index is required to be 40 or higher, and the test results show that the fuel oil has a cetane index of 43.8.

Mark also gave me a copy of their records for hours of operation for each generator. They are far under the limits of 500 hours or less per 12 month rolling timescale and under the 100 hours per year for maintenance checks and readiness testing. During the facility tour, the non-resettable hour meter on EU-44-EMERGEN-01 (Kohrman Hall) read 279.7 hours, and the non-resettable hour meter on EU-155-EMERGEN-01 (Arcadia Flats) was 45.1 hours.

These engines are also required to be certified; otherwise, testing is required. During previous inspections, these engines were confirmed to be certified. During this inspection, I confirmed that the new emergency engine, EU-155-EMERGEN-01 is also certified. Maintenance of each of the generators at the facility is scheduled and logged in a computer system. There is also a list of preventative maintenance operations that are scheduled for each unit.

FG-NSPS JJJJ:

This flexible group applies to all emergency generators at the facility that are fired by natural gas and installed or manufactured on or after 2010. The units are EU-29-EMERGEN-02, EU-59-EMERGEN-01, EU-138-EMERGEN-01, and EU-127-EMERGEN-01. EU-127-EMERGEN-01 is a new emergency generator as of the last inspection in 2021. They are keeping track of the hours of operation for each unit in the same manner as for FG-NSPS IIII. All units are in-compliance and under the permittable hours. Each of these units is also a certified engine, except for EU-138-EMERGEN-01, located at Sangren Hall. Because this engine is not certified, they are required to test the unit for NOx, CO, and VOC either every 8,760 hours or every three years, whichever comes first. The last time this unit was tested was in November 2021, and the test showed that they were in-compliance with the ROP limits of 160 ppmvd NOx, 540 ppmvd CO, and 86 ppmvd VOC, all at 15% oxygen. During this inspection, I confirmed that the new emergency generator, EU-127-EMERGEN-01, is also certified. The non-resettable hour meter on this new engine read 11.5 hours during the inspection. Specification documents for this new generator are attached to this report.

FG-EMGEN-GAS:

This flexible group applies to all emergency generators at the facility that are fired by propane or natural gas and were manufactured before 2004. The units are EU-56-EMERGEN-01 (60kW), EU-71-EMERGEN-01(60kW), EU-72-EMERGEN-01(60kW), EU-73-EMERGEN-01(100kW), and EU-145-EMERGEN-01(500kW). The hours of operation for each unit are being tracked in the same manner as for FG-NSPS IIII. All units are in compliance and under the permittable hours.

FG-EMERGEN-OIL:

This flexible group applies to all emergency generators at the facility that are fired by diesel or No. 2 fuel oil and were manufactured or installed before 2003. The units are EU-13-EMERGEN-01 (200kW), EU-15-EMERGEN-01(200kW), EU-28-EMERGEN-01(100kW), EU-29-EMERGEN-01 (300kW), EU-46-EMERGEN-01(60kW), EU-61-EMERGEN-01(100kW), EU-75-EMERGEN-01(60kW), EU-107-EMERGEN-1(230kW). The hours of operation for each unit are being tracked in the same manner as for FG-NSPS IIII. All units are in-compliance and under the permittable hours. They use the same fuel oil in these units as for the units regulated under FG-NSPS IIII. The sulfur content cannot exceed 0.05%, and the attached fuel oil sample test shows that they are in-compliance with this condition. The test also shows the density and the BTU/gal of the fuel. They have the fuel oil tested once each year.

FG4JEXEMPTENG:

This flexible group applies to all emergency generators at the facility that are subject to NSPS JJJJ but are exempt from new source review permitting. This applies to EU-001-EMERGEN-01, EU-174-EMERGEN-01, and EU-175-EMERGEN-01. The hours of operation for each unit are being tracked in the

same manner as for FG-NSPS IIII. All units are in compliance and under the permittable hours. Each of these units is also a certified engine.

FGPARTSWASH:

They have five parts washers at the facility that were each installed after July 1, 1979. During the facility tour, I looked at the units in the power plant, the Valley 1 Building, and Kohrman Hall. All three had the lid closed, and I gave Keith some new AQD stickers to put on the units. None of the units are heated or agitated, and the units are maintained by an outside service provider. They never keep used solvent on site. None of the units have an air/vapor interface larger than 10sq. ft., and they are all covered units. The units all use the same mineral spirits as during the previous inspection in 2021. The units seemed to be in-compliance at the time of inspection.

FGRULE290:

There are no longer any units at the facility that are exempt under Rule 290. The printing presses and paper machine that used to be on campus have been moved to a different off-site WMU location at Floyd Hall.

The facility seemed to be in compliance with their permit at the time of inspection.

NAME _____ DATE 6/15/23 SUPERVISOR RIL 6/15/23