

DEPARTMENT OF ENVIRONMENTAL QUALITY  
AIR QUALITY DIVISION  
ACTIVITY REPORT: Scheduled Inspection

K213149599

FACILITY: Western Michigan University		SRN / ID: K2131
LOCATION: 1903 West Michigan Ave, KALAMAZOO		DISTRICT: Kalamazoo
CITY: KALAMAZOO		COUNTY: KALAMAZOO
CONTACT: George Jarvis , Director, Power Plant		ACTIVITY DATE: 07/16/2019
STAFF: Monica Brothers	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MAJOR
SUBJECT: Announced Scheduled Inspection		
RESOLVED COMPLAINTS:		

This was an announced scheduled inspection. I emailed George Jarvis and Mark Weiss on Friday, July 12, 2019 and scheduled a 9:30am inspection for the next Tuesday, July 16, 2019. I arrived at the WMU Power Plant at 9:30am and met with George Jarvis, Power Plant Director, Mark Weiss, Director of Environmental Health and Safety, Michael Walden, Chief Operating Engineer, Kevin Bridges, Assistant Chief Operating Engineer, and Keith Pung, Environmental Specialist. No visible emissions 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 had already acquired some of the records for the Power Plant, so we decided to do the records review first. Mark said that they still have the same number of parts washers on campus and that they have not rented or installed a portable peak shaver engine this year (EU-ENGINE-01). They have installed a new emergency generator at Heritage Hall (EU-001-EMERGEN-01), and the small paper machine that was operating under Rule 290 has been removed from the main campus and is now in Floyd Hall at the Business, Technology, and Research Park (BTR Park). After the records review, we took a tour of the power plant equipment, and then Mark and I went over to the main campus to view some of the generators, parts washers, and the printing presses. I left the facility at about 12:15 pm.

PTI# 23-19:FGENGINES:

This is a PTI for two new 3,500 (2.5 MW) natural gas-fired RICE, equipped with oxidation catalysts to reduce CO and VOC emissions. The emission units are EU-ENGINE1 and EU-ENGINE2. WMU is currently in the process of installing these engines and hopes to start them up sometime in September 2019. These engines will be subject to NSPS Subpart JJJJ.

MI-ROP-K2131-2015a:EUPABOILER 6:

This is a 65,000 lbs steam/hr, 88MMBtu/hr, natural gas-fired boiler that was installed in 1965. This boiler is only run as a back-up when needed. It was run only for four months in the past two years. In November 2017 it used 9976.5 MCF of natural gas, in November 2018 it used 51.9 MCF, in January 2019 it used 977.9 MCF, and in February 2019 it used 358.8 MCF. They are keeping the required monthly and 12-month rolling records of natural gas usage. The last time it was tested was in April of 2010.

EU-ENGINE-01:

As previously stated above, they have not rented or installed a portable peak shaver engine, and therefore no records were reviewed for this.

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 730°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 do not have any records for calibration checks, but George showed me the CPMS manual, which stated that the system had an initial calibration check in the factory and should never have to be calibrated in the field. Therefore, they have never recalibrated the system.

#### 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 2015 were in December 2018, with about 3.36 tons/year. The highest 12-month rolling NOx emission for Boiler 10 were in March 2017, with about 3.15 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 test limits in the ROP.

#### 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. This document is attached.

Emissions testing was conducted on both turbines back in November of 2015 and showed that the NOx and CO emissions were in-compliance with the permit limits. 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). For the month of June 2019, they have run 311.8 hours on Turbine 7 and 238.1 hours on Turbine 8 in exhaust mode. They very rarely run in fresh air mode, but they had to for about 30.6 hours in January and February 2019 because of the extreme cold and Consumers Energy gas curtailment. 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 limit on their NOx emissions from operating only in fresh air mode on each unit. They do not have a NOx limit while operating in exhaust mode. The 30.6 hours that they operated in fresh air mode in January and February 2019 resulted in 0.12 tons/ year in NOx emissions, which is far under the 44.7 tons/year limit.

#### FG-NSPS III:

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, and EU-149-EMERGEN-01. 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 March 2019. The sulfur content is 7.18ppm and the permit limit is 15ppm. The cetane index is required to be 40 or higher, and the test results show that the fuel oil has a cetane index of 44.2.

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.

These engines are also required to be certified; otherwise, testing is required. During the last inspection in 2017, Mark emailed me the certifications for each of the engines that require it, and these are on file.

This year, Mark emailed me only the certification for the new generator at Heritage Hall. It is attached to this report. 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-001-EMERGEN-01 (new unit at Heritage Hall). 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 permissible 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 February 2019, 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.

#### 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-1(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 permissible 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 permissible 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.

#### FGPARTSWASH:

They have six parts washers at the facility that were each installed after July 1, 1979. During the facility tour, I looked at the one in the power plant. It had the rules posted and the lid closed. Mark said that none of the units were heated or agitated and that the units were maintained by an outside service provider. He said that 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. The SDS for this material shows that it has a Reid vapor pressure less than 0.3psia and contains no halogenated compounds. The units seemed to be in-compliance at the time of inspection.

#### FGRULE290:

This flexible group applies to EU-90-PRESSR-2, EU-90-PRESSF-2, and EU-27-PAPERMACH. EU-90-PRESSR-2 is a four-color web-fed Rotogravure printing press that uses solvent-based inks. EU-90-PRESSF-2 is a three-color web Comco flexographic printing press that uses water-based ink. Both printing presses are located in Welborn Hall. The presses were not operating at the time of inspection, but I did observe the ink containers that feed the presses. The ink containers have lids, with holes only large enough to fit a tube that pumps the ink to the presses. The small paper machine used to be located in McCracken Hall but was recently moved off-site to Floyd Hall in the Business, Technology, and Research Park. McCracken Hall has been demolished. The only time they used solvent in the printing process is for one particular client, one or two times a year. I observed the Rule 290 records for the presses and the paper machine. Each solvent that is used is not considered a carcinogen, so they are limited to 1000lbs/month of VOCs. Their records show that they are consistently under this limit, with the highest monthly total being 680 lbs in the printing presses for December 2018. The last time solvent was used in the paper machine was October 2018, and they used 6 lbs of N-Propyl Alcohol, which is 100% VOC. The only other month solvent was used in the last couple of years was in June of 2018, and they

used 344 lbs Ethyl Alcohol and emitted 323 lbs VOC.

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

NAME 

DATE 7/24/19

SUPERVISOR RIL 7/26/19