

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

K213141311

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: 08/25/2017
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 the day before and scheduled a 1:00pm inspection for Friday, August 25, 2017. I arrived at the WMU Power Plant at 1:00pm and met with George Jarvis, Power Plant Director, Mark Weiss, Director of Environmental Health and Safety, and Michael Walden, Chief Operating Engineer. 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 no new generators and have not rented or installed a portable peak shaver engine this year (EU-ENGINEERENT-01). After the records review, we took a tour of the power plant equipment, and then Mark took me over to the main campus to view some of the generators, parts washers, the printing presses, and the small paper machine. I left the facility at about 3:45pm.

EUPABOILER 6:

This is a 65,000 lbs steam/hr, 88MMBtu/hr, natural gas-fired boiler that was installed in 1965. While this boiler is still available to be used if needed, they have not used it since December of 2013, which used 292.4 MCF of gas. The last time it was tested was in April of 2010.

EU-ENGINEERENT-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. Records of the inlet temperatures during operation are attached. 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 is also supposed to log the temperature in a 4-hour average format as well, but George said that judging by the data he printed off, it looks like that is not being calculated properly by the system. He said that he would look into how to fix that and have the data available going forward. However, there is enough data to be able to calculate the 4-hour averages manually, if need be, and the data suggests that there is little concern about them going over the temperature limits; so, no violation notice will be sent for this at this time.

George also showed me the events log kept by the CPMS, which is attached, and he said that they have never had any malfunctions. They have a preventative maintenance service agreement with MI CAT, who comes out to do maintenance checks. Their most recent one was in June, and the report is attached. 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 and Boiler 10 were in

December of 2015, with about 3.2 tons/year being emitted by each boiler. This is far under their limit of 35.9 TPY. 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. While technically, the duct burners and the turbines could be run independently of each other, they never actually do this. 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. Mark provided a tariff sheet showing 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, they have run 309.4 hours on Turbine 7 and 134.5 hours on Turbine 8 in exhaust mode. They have not run at all in fresh air mode. 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, however 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. So, because they do not operate in fresh air mode, they are therefore in compliance with this emission 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, 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 May 2017. The sulfur content is 8.74ppm 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 42.5.

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 100 hours per month for maintenance checks and readiness testing. I asked Mark about whether they separate the hours of operation by emergency, testing, or other non-emergency, and he referred to Dan Brimmer, who is one of the engineers at WMU that is familiar with the generator operations. Dan said the following: "The amount of time the generators may have ran when utility was not available to a building is minimal. The emergency portion is so insignificant it has just been included with the testing portion. Any operation of the generators for non-emergency would be for testing. Emergency operation would be less than 8 hours per year typically."

These engines are also required to be certified; otherwise, testing is required. Mark emailed me the certifications for each of the engines that require it. These are 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, and EU-138-EMERGEN-01. 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 November of 2015, 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 automotive building. 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. Mark also gave me a spreadsheet that shows the container size, solvent type, and location of each unit. 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 is located in McCracken Hall and it is used for pilot paper processes. The only time they use 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 200lbs in the printing presses for 2016. The last time solvent was used in the paper machine was July 2017, and they used 344 lbs of ethyl alcohol and emitted 323 lbs VOC.

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

NAME



DATE

8/31/17

SUPERVISOR

MB 9/19/2017