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

N652664839

FACILITY: CMS Generation, Livingston Generating Station		**SRN / ID:** N6526
LOCATION: 155 N. Townline Road, GAYLORD		**DISTRICT:** Gaylord
CITY: GAYLORD		**COUNTY:** OTSEGO
CONTACT: Steve Ellison , Plant Operator		**ACTIVITY DATE:** 05/02/2022
STAFF: Becky Radulski	**COMPLIANCE STATUS:** Compliance	**SOURCE CLASS:** MAJOR
SUBJECT: FY22 scheduled inspection and records review		
RESOLVED COMPLAINTS:		

Traveled to N6526 CMS Generation Michigan Power LLC - Livingston Generating Station on May 2, 2022 to conduct a Full Compliance Evaluation (FCE) FY22 scheduled inspection to determine compliance with MI-ROP-N16526-2014. The facility is an electrical power generating peaking plant.

Standard safety equipment is required - steel toe boots, safety glasses, hardhat and vest.

Present for the inspection was Adam Brentlinger, Plant Operator; Steve Ellison, former Plant Operator (retired, part time Contractor); Theon (Lee) Heisserer, Environmental HSC; Katie Cunningham ,CMS Corporate Environmental. The facility is located at 155 North Townline Road, Gaylord, in Otsego County.

INSPECTION NOTES

The facility is a peaking plant, which only operates when it is called up by Midcontinent Independent System Operator (MISO) during peak operating times. There are 4 Dresser-Ran natural gas turbine units, each with 2 engines. The turbines are equipped with water injection systems and are rated at 39 MW, though they only operate at 33 MW which they consider 100% load. The units were tested at 33 MW, therefore they do not operate above 33 MW.

During the inspection Unit 1 was operating.

MISO does not control the startup or shutdown of these turbines remotely, they are controlled onsite by the Operator. The engines are not black start capable.

The turbine units are equipped with water injection systems to control NOx emissions – the water is injected to reduce temperatures, which reduces the formation of NOx. A water to fuel ratio is continuously calculated during operation. Each unit was tested during June 2017 to determine the appropriate water to fuel ratio range that the units must operate within to demonstrate compliance with NOx and CO limits. The units were currently undergoing the next 5 year test during the first week of May 2022. The control panel for each turbine was viewed in the control room. Each unit has a screen to monitor operating parameters. Above each monitor is posted the appropriate operating parameters for that turbine, including the water to fuel ratio range that was tested for that particular turbine.

REGULATORY DISCUSSION

The facility is subject to MI-ROP-N6526-2014, which was issued January 28, 2014. The facility has the potential to emit over 100 tons per year of each NOx and CO. The ROP is currently going through renewal, which was discussed onsite.

The facility is not major for HAPS.

Four combustion turbine units, EUCOMBTURB1, EUCOMBTURB2, EUCOMBTURB3, and EUCOMBTURB4 at the stationary source are subject to the New Source Performance Standards for Stationary Gas Turbines promulgated in 40 CFR, Part 60, Subparts A and GG.

EUCOMBTURB1, EUCOMBTURB2, EUCOMBTURB3, and EUCOMBTURB4 at the stationary source are subject to the federal Acid Rain program promulgated in 40 CFR, Part 72.

EUCOMBTURB1, EUCOMBTURB2, EUCOMBTURB3, and EUCOMBTURB4 at the stationary source were subject to the Clean Air Interstate Rule NOx annual trading program pursuant to Rules 802a, 803, 821, and 830 through 834. CAIR expired in December 2014. Brian Carley, AQD, reopened the permit to incorporate applicable requirements associated with the Cross State Air Pollution Rule (CSAPR), compliance is determined by US EPA. The ROP revision was finalized June 16, 2016 with updated tables.

EUCOMBTURB1, EUCOMBTURB2, EUCOMBTURB3, and EUCOMBTURB4 at the stationary source were subject to the Clean Air Interstate Rule NOx ozone season trading program pursuant to

Rules 802a, 803 and 821 through 826. CAIR expired in December 2014. Brian Carley, AQD, reopened the permit to incorporate applicable requirements associated with the Cross State Air Pollution Rule (CSAPR), compliance is determined by US EPA. The ROP revision was finalized June 16, 2016 with updated tables.

EUCOMBTURB1, EUCOMBTURB2, EUCOMBTURB3, and EUCOMBTURB4 at the stationary source were subject to the Clean Air Interstate Rule SO2 annual trading program pursuant to Rule 420. CAIR expired in December 2014. Brian Carley, AQD, reopened the permit to incorporate applicable requirements associated with the Cross State Air Pollution Rule (CSAPR), compliance is determined by US EPA. The ROP revision was finalized June 16, 2016 with updated tables.

FGCOMTURB SC III.1 as the following streamlined/subsumed requirement:

Streamlined Limit/ Requirement	**Permittee shall burn only natural gas as defined in 40 CFR 60.331(u)**	**Permittee shall not burn natural gas containing more than 0.8 percent sulfur by weight, as required by 40 CFR 60.333(b)**	**Natural gas as defined by 40 CFR 60.331(u) contains no more than 0.068% sulfur by weight, which is lower than the standard of 0.8 percent sulfur by weight in 40 CFR 60.333(b)**

EUCOMBTURB1, EUCOMBTURB2, EUCOMBTURB3, and EUCOMBTURB4 are subject to Compliance Assurance Monitoring (CAM) for their NOx limit in parts per million (SC I.1). Each emission unit uses water injection to lower the temperature which in turn lowers NOx emissions. The facility uses a ratio of water injection to fuel burned as an indicator that the control is operating properly.

SPECIAL CONDITIONS AND RECORDS REVIEW

Records were requested and provided by Theon (Lee) Heisserer, Environmental HSC on 5/17/22.

FGCOMBTURB (EUCOMBTURB1, EUCOMBTURB2, EUCOMBTURB3, and EUCOMBTURB4): Four Dresser-Rand ER-224 combustion turbines rated at 39 MW each

Emission Limits:

SC I.1, 2, 4 and 6 are determined by stack testing. The most recent completed stack test took place in June 2017. Testing is required every 5 years in the ROP, and the units are being tested in May of 2022 to meet that requirement.

SC I.1 limits NOx to 75 parts per million by volume at 15% oxygen on a dry basis, individually. Stack test results were reviewed and each EU is below the limit.

SC I.2 limits NOx to 624.0 pounds/hour for FGTURBINE. Pound/hour data was provided. The highest pound per hour was 173.6, therefore each EU is below the limit.

SC I.3 limits NOx to 224 tons/year for FGTURBINE, 12 month rolling. Records were viewed and facility and provided. NOx emissions are 20 (19.957) tons/12 month rolling as of April 2022.

SC I.4 limits CO to 0.487 pounds per million BTU heat input, individually. Stack test results were reviewed and each EU is below the limit.

SC I.5 limits CO to 844.0 pounds/hour for FGTURBINE. Pound/hour data was provided. The highest pound per hour was 227.4, therefore each EU is below the limit.

SC I.6 limits CO to 224.0 tons/year for FGTURBINE, 12 month rolling. Records were viewed and facility and provided. CO emissions are 26 (25.693) tons/12 month rolling as of April 2022.

Material Limits:

n/a

Process Operational Restrictions:

SC III.1 only natural gas is burned in the turbines. A fuel analysis was provided.

SC III.2 capacity factor must be under 10% averaged over 3 year period; annual capacity factor under 20% for calendar year. The capacity factors were provided – 3 year average is less than 10%; the annual capacity factor for 2021 was 0.3%, and for 2022 was 1%.

SC III.3 must operate at % load, and water to fuel ratio as determined by stack testing. The facility operates within these parameters. Each turbine was tested at 33 MW instead of 39 MW max capable, therefore only operates at 33 MW. The facility monitors the water to fuel ratio, which is different for each turbine, and maintains operation within these ranges.

Design/Equipment Parameters:

SC IV.1 and IV.2 – must have a working injection system; must continuously monitor water to fuel ratio. The four combustion turbine units are equipped with a working water injection system, and a system to continuously monitor water to fuel ratio. Alarms are triggered if the ratio is beyond the appropriate range.

Testing/Sampling:

SC V.1 NOx testing and V.2 CO testing. The facility tested in 2017 and met limits of the ROP. Ranges were set for the water to fuel ratio. Testing is taking place the first week in May 2022. At this time ranges will be updated if needed.

Monitoring/Record Keeping:

SC VI.1 continuously monitor and record the fuel and water injection flows by volume for each unit. The facility continuously monitors and records the fuel and water flows. Monitors were viewed and ratios observed. Unit 1 was operating and meeting the established ratio.

SC VI.2 continuously calculate and record the water to fuel ratio, by volume for each unit. The water to fuel ratio is kept continuously. The ratio setpoint can be seen on the screen shots from the monitors, as well on the End of Summary Report.

SC VI.3 shall record hours of operation for each calendar month. Hours are tracked and were viewed on site, and are provided. The hours are also recorded and submitted quarterly.

SC VI.4 shall calculate the annual capacity factor for the facility each year. The annual capacity factor is calculated and was provided when requested (see SC III.2).

SC VI.5 shall monitor and record natural gas usage on an hourly and monthly basis for each turbine unit. Natural gas records are maintained and were provided as requested.

SC VI.6 shall monitor and record the operating load with associated water to fuel ratio for each turbine unit. The operating load is continuously monitored and recorded. The units will not operate above 33 MW, as that is the load used when the water to fuel ratio was established during testing.

SC VI.7 shall calculate and record the NOx and CO emissions on an hourly, monthly and 12 month rolling basis. NOx and CO are calculated and recorded.

SC VI.8 shall analyze fuel burned in FGCOMBTURB. Fuel is sent for analysis – results were provided. The Certificate of Analysis was provided by SPL, sample taken from the inlet stream. No issues with report.

SC VI.9 – VI.13 – CAM conditions – As mentioned in the Regulatory Summary Section of this report, EUCOMBTURB1, EUCOMBTURB2, EUCOMBTURB3, and EUCOMBTURB4 are subject to CAM for their NOx limit in parts per million (SC I.1). Each emission unit uses water injection to lower the temperature which in turn lowers NOx emissions. The facility uses a ratio of water injection to fuel burned as an indicator that the control is operating properly. CAM requires continuous monitoring of fuel consumption and water injection, as well as the calculation of water to fuel ratio, to demonstrate proper operation of the control. The ratios ranges are determined during stack testing for each turbine every 5 years. The ratio is different for each unit. The facility submits reports on excursions or exceedances, excess emissions and monitor downtimes as required. These reports are reviewed as they are received.

<u>Reporting:</u>

The facility reports are required to be submitted on time. There have been no issues with timeliness.

<u>Stacks:</u>

Each turbine unit has a stack with minimum height requirements of 39 feet, and maximum exhaust dimensions of 258.8 x 145.2 inches. The stacks have not been modified and based on visual estimation, appear to meet this specifications.

<u>Other Requirements:</u>

SC IX.1 – continuous compliance plan. The facility has a Continuous Compliance Plan, which was updated in November 2017 following the June 2017 stack test. The plan includes updated water to fuel ratio ranges for each turbine unit. A new compliance plan will be completed following the May 2022 testing.

SC IX.2-9 – these conditions refer to CSPAR, acid rain. The facility is responsible for working with US EPA for compliance.

SC IX.10 – 11 – update CAM plan and comply with CAM. The facility submits CAM reports as required and has a CAM Plan dated November 2017.

SC IX.12 – comply with New Source Performance Standards for Stationary Gas Turbines promulgated in 40 CFR, Part 60, Subparts A and GG. The facility appears to be in compliance with GG, no information has come forward to indicate otherwise.

COMPLAINTS

There have been no complaints reported for this facility in past fiscal year. There is no history of complaints in MACES.

MAERS

MAERS was submitted and reviewed separately. There were no issues.

COMPLIANCE

This facility appears to be in good operating conditions. No visible emissions or odors were observed during the onsite visit. The facility appears to be in compliance with MI-ROP-N1266-2014 and all applicable requirements.

NAME Becky Radulski DATE 12-2-22 SUPERVISOR Shane Nixon