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

B404968993

FACILITY: GM Technical Center		**SRN / ID:** B4049
LOCATION: 31295 Charles Kettering Road, WARREN		**DISTRICT:** Warren
CITY: WARREN		**COUNTY:** MACOMB
CONTACT: Matt Perko , Environmental Engineer		**ACTIVITY DATE:** 06/29/2023
STAFF: Mark Dziadosz	**COMPLIANCE STATUS:** Compliance	**SOURCE CLASS:** MAJOR
SUBJECT: FY 2023 Inspection		
RESOLVED COMPLAINTS:		

31295 Charles Kettering, Warren, Michigan 48092

(Previously, 6250 Chicago Road)

Warren, Michigan 48090-9005

NAICS: 336211

Violation notice: GM was issued a VN on March 16, 2022, for failure to operate the cartridge filter system for the Styrofoam CNC Machine. GM failed to operate the cartridge filter system properly and this resulted in substantial Styrofoam fallout in South PPO area (DOC 12, Building 18). In the response letter received on 3/24/22, GM indicated this process will be permanently shut down and the Styrofoam CNC operation will be contracted out. On April 13, 2023, EGLE-AQD received notification that the system will be restarted with a new air handling system that does not vent to the outside air and is fully contained in the building. According to GM, this equipment is exempt from the requirement to obtain a permit to install via R336.1285 (2)(l)(vi)(A) and (B).

8/3/23- Received 15 Day Notification for Actual Startup for one (1) natural gas hot water generator/boiler rated at 3.5 MMBtu/hr heat input.

2/21/23-Received notification of installation of three 5.278 mmBtu/hr natural gas fired hot water boilers to be used for building and process heating in the Climatic Wind Tunnel building. Increases to PTE are NOx (6.80), CO (5.71), VOC (0.35), SO2 (0.04), and PM (0.52) tons per year, all below significance thresholds.

1/13/23- Received 15 Day Notification for Actual Startup for one (1) natural gas hot water generator/boiler rated at 3.5 MMBtu/hr heat input.

11/21/22- Received notification of installation of (2) Diesel Fire Pumps rated at 121 hp for the Estes Engineering Center. Engines are new, certified, and exempt per 285(2)(g) and subject to NSPS Subpart IIII. Increases to PTE are NOx (0.4), CO (0.3), VOC (0.2), SO2 (0.1), and PM (0.02) tons per year, all below significant thresholds.

9/27/22-Received notification of decommissioning of two 13 MMBtu/hr natural gas fired hot water boilers (EU-BOILER1CL and EU-BOILER2CL) that were used for building and process heating in the Climatic Wind Tunnel. Decreases to PTE are NOx (11.16), CO (9.38), VOC (0.57), SO2 (0.07), and PM (0.85) tons per year.

8/31/22-Received 15 Day Notification of Actual Startup for three (3) natural gas hot water generators/boilers each rated at 2.79 MMBtu/hr heat input.

8/8/22- Received Initial Notification for Installation of (1) emergency generator engine for the RSB - Kettering Research and Development building.

7/19/22- Received Initial Notification for Installation of six 4.99 MMBtu/hr natural gas fired hot water boilers to be used for building and process heating in the Wallace Battery Cell Innovation Center.

7/12/22- Received Initial Notification Report for Installation of (2) emergency generator engines and (1) firepump for the Wallace Battery Cell Innovation Center and Additive Innovation Center. Per Matt Perko and the GM files, only one emergency engine was installed.

4/22/22- Received Notification of change for Installation of 2 new certified, exempt per 285(2)(g), emergency generator engines subject to NSPS Subpart JJJJ for the new Design Studio. Increases to PTE are NOx (0.53), CO (1.06), VOC (0.26), and PM (0.02) tons per year, all below significant thresholds.

On June 29, 2023, I conducted an inspection at General Motors LLC – Warren Technical Center located at 31295 Charles Kettering, Warren. The purpose of the inspection was to determine compliance with the Federal Clean Air Act; Article II, Part 55, Air Pollution Control of Natural Resources and Environmental Protection Act, 1994 Public Act 451; Michigan Department of Environmental Quality, Air Quality Division (MDEQ-AQD) Administrative Rules; and Renewable Operating Permit ROP No. MI-ROP-B4049-2019a. Matt Perko, Environmental Engineer is GM's Tech Center's environmental contact.

GM Technical Center conducts research on all aspects of automobile development and production, including design, engineering and manufacturing. This facility operates a powerhouse that provides process steam and space heating at the Technical Center complex. It also operates an IT Center that has several emergency diesel engine electric generators to provide power during an outage. GM Technical Center currently has approximately 21,000 employees.

ROP: MI-ROP-B4049-2019 expiring October 16, 2024. Effective date: September 29, 2014. Renewal Application due between April 16, 2023, and April 16, 2024. A renewal reminder letter was sent April 24, 2023.

Active PTI: 2-23 Effective date: January 11, 2023. Two 4,680 HP diesel-fueled emergency engines. According to Matt Perko, these have not yet been installed and therefore compliance will not be determined on the units covered by this PTI.

EUVVO

This emission unit covers the vehicle validation operation (Pre-Production Body Center).

Emission source is primarily the coating line, which includes the paint spray booth, a phosphate application line, an oven, and a flash off tunnel. There is only one booth used for prime coat, topcoat and clearcoat. After priming, the vehicle body is transferred to an oven and goes back to the booth for application of topcoat and clearcoat, if needed. Most of the time, the vehicle bodies are just primed. The vehicle bodies are coated with low gloss gray primer to prevent reflection so that the high-

speed cameras can record the crash dummies during crash testing. The vehicle bodies are coated with white primer to locate where the stress points are.

Particulate emissions from the paint spray booth are controlled by dry filters. N-Butyl Acetate is used as reducer. Recycled solvents are used for purge and cleanup. HVLP spray guns (Model SATA Jet 5000) are used. Paint usage is estimated from production. The number of full auto bodies coated are counted and multiplied by an emission factor that was derived from measuring a typical amount of coating used per auto body. Emission factor depends on the coating used. Body panels count as a fraction of a full body. All painting is manual and painted vehicles are not sold but sent to the Milford Proving Grounds for testing or scrapped (EU-VVO SC III.3). The supervisor for this area Marcus Marek is responsible for monitoring paint usage (number of auto bodies coated). Currently, EU-VVO is operating 2 shifts.

EU-VVO SC.I: From July 2021 until May 2023, highest daily average VOC emissions were 77.5 lbs. per day for July 2021. Daily limit is 400 lbs. VOC/day. 12-month rolling VOC emissions at the end of July 2021 were 6.54 tons; limit is 36.0 tons per year. The highest 12-month rolling VOC emissions in the time reviewed was 8.03 tons in October 2021.

Number of operating days is recorded along with daily, monthly, and annual VOC emissions (EU-VVO SC VI.3). Facility keeps a list of the VOC content of the coating, reducer and purge/cleanup solvents based on SDS VOC content information (EU-VVO SC V.1).

I conducted random review by comparing monthly emissions and usage record with the data entered in the 12-month rolling records. Data matches. See attached records.

During inspection, the filters were installed properly (EU-VVO SC IV.1).

There is another vehicle validation operation located at the General Services Bldg. There are no paint spray booths installed there.

EU-ENGINE7000BLDG202

This is for a 1099 KW diesel-fired emergency electric generator located at 7000 Bldg. This engine is subject to 40 CFR 63, Subpart IIII. This is a certified engine. Hours of operation for the engine is limited to 500 hours per year based on a rolling 12-month time period. A non-resettable hour meter is installed (EU-ENGINE7000BLDG202 SC IV. 1). Total hours of operation in 2022 was 8 hours (EU-ENGINE7000BLDG202 SC III.1, 2; VI. 3). See attached record of hours of operation. (202-7000 Building-Grey)

EU-EMGEN107

This is for a 60 KW natural gas-fired emergency electric generator located at Building 107. This engine is subject to 40 CFR 63, Subpart IIII. This is a certified engine. There is no limit for use of the generator during emergency situations. The engine may not operate more than 100 hours per year for necessary maintenance checks and readiness testing. EU-EMGEN107 may operate up to 50 hours per year in non-emergency situations if those 50 hours are counted towards the 100 hours for maintenance and testing. A non-resettable hour meter is installed (EU-EMGEN107 SC

IV. 1). Total hours of operation in 2022 was 28.7 hours (EU-EMGEN107 SC III. 4). See attached record of hours of operation. (EU-EMGEN107 Hour Log)

FGCOLDCLNRS

Any cold cleaner that is grandfathered or exempt from Rule 201 pursuant to Rule 278, Rule 278a and Rule 281(2)(h) or Rule 285(2)(r)(iv). Existing cold cleaners were placed into operation prior to July 1, 1979. New cold cleaners were placed into operation on or after July 1, 1979.

Cold cleaners use either solvent based or water based material. Cold cleaners have an air vapor interface area of less than 10 sq. ft. Written procedures complying with Rule 707 are posted near the cold cleaners. Attached to this report is a record of all cold cleaners currently in use and current solvent used (Doc 200-Parts Washers Serviced by Crystal Clean).

Crystal Clean now services most of the cold cleaners every 16-18 weeks. Used solvent is removed and replaced by a fresh batch. A record of how much was taken and how much was put in is kept. Net usage is calculated based on the difference. Solvent used by Crystal Clean is 100% petroleum naphtha.

Other cold cleaners are serviced by GM personnel. For these cold cleaners, solvents are replaced infrequently, only when it becomes dirty. Since operators do not log this infrequent solvent replacement, solvent usage from these cleaners is just estimated. Solvent used in the GM-serviced cold cleaners is a petroleum distillate (SK/Premium Gold) and has a VOC content of 6.6 lbs./gal. Some GM-serviced cold cleaners use water-based cleaners.

Staff randomly inspected some cold cleaners during the plant walk-thru. Covers and procedures for the cold cleaners are in place. Some of the larger cleaners have electrically or mechanically assisted covers.

The cold-cleaners are not subject to 40 CFR Part 63, Subpart T since solvents containing halogenated compounds are not used.

The list of active cold cleaners has been changing at the Tech Center. Since many operations at the Tech Center have stopped, the number of cold cleaners has been reduced. There are approximately 16 Crystal Clean parts cold cleaners. Emissions from the cold cleaners are reported in MAERS.

FGGASTANKS

There is only 1 gasoline AST remaining at the GM Tech Center. This tank is located North of the Climatic Wind Tunnel building. The tank has 3 4,000-gallon compartments that contains 93 Octane gasoline, 87 Octane gasoline, and diesel fuel.

The gasoline AST is subject to the requirements of Rule 703, loading gasoline into new stationary vessels of more than 2,000-gallon capacity at dispensing facilities. The tank is equipped with a permanent submerged fill pipe, a vapor balance system (or equivalent) and an interlock system which ensures a vapor tight collection line.

All USTs have been removed.

FGWOODMETAL

Styrofoam CNC Machine. On April 13, 2023, EGLE-AQD received notification that the system will be restarted with a new air handling system that does not vent to the outside air and is fully contained in the building. During inspection I verified the process vents to a hopper that in enclosed within the building.

Wood and metal machining operations exempt from the requirements of R 336.1201 pursuant to R 336.1285(2)(l)(vi), but subject to the requirements of R 336.1331. The number of wood and metal machining units constantly varies depending on project needs.

This flexible emission group covers wood and metal machining, metal grinding, sand blasting, and shot blasting equipment. Equipment is subject to Rule 331 and controlled by dust collectors. Dust collectors exhaust outdoors; some emit indoors. Metal shop exhausts all vent to in-plant.

In the woodshop at the Design Center, all particulate matter is collected by dedicated capture systems and saw dust laden exhaust air is ducted via one common manifold to a dust collector system, consisting of three baghouses, located outside the woodshop. Each baghouse has its own dedicated hopper. The hoppers are inspected daily and emptied on as needed basis. The bags are inspected once in six months. (MI-ROP-B4049-2019, FG-WOODMETAL, I.1 & IV.1: 0.1 pounds of PM per 1,000 pounds of exhaust & proper operation of dust collectors).

GM maintains a current list of equipment subject to Rule 331 and exempt under Rule 285(l)(vi) (Doc 600-Rule 285(l)(vi) Exempt). The list includes type of dust collector and whether it emits indoors or outdoors. Majority of woodworking and metal machining units are seldom used, except for units at the Design Bldg.

Since the wood and metal working units are numerous and located throughout the huge complex, the location of the units are divided into quadrants, for the purpose of conducting and recording VE readings. VE observations of the dust collector exhaust stacks are conducted monthly, by quadrant. Staff verified that monthly VE readings are recorded for each quadrant. Since majority of the units are seldom used, the units may not be running during the VE readings. However, because of good maintenance on the equipment, visible emissions are not expected. For majority of wood and metal working units, routine and preventative maintenance is conducted on the dust collectors annually. For units that are used more often, preventative maintenance is done quarterly (units at the Design Bldg.). Matt Perko determines which units are seldom used, thus annual preventive maintenance for those units is sufficient. Maintenance software called Maximo is used to schedule and track maintenance activities. A copy of the monthly VE readings per quadrant is attached. (Doc 300-FG-WOODMETAL Emissions Observations)

Facility maintains on file a calculation which demonstrates that compliance with the particulate limit. In demonstrating compliance, GM took a particulate sample from the dust collectors at the wood shop located at Parts Fabrication. After looking at all equipment subject to FGWOOD/METAL, GM determined that dust collectors from Parts Fabrication will represent worst case. Particulate emissions were then calculated using the known amount of air contaminant collected over a period of time (FG-WOODMETAL SC VI.2).

During the Tech Center complex drive-thru, staff did not notice any visible emissions from equipment subject to this flexible group.

FGRULE287C

Paint spray booths that are exempt under Rule 287(c) are installed in the following locations: Manufacturing A (EU-R287-BLDG109), Manufacturing B (EU-R287-BLDG108), Powertrain (EU-R287-BLDG207), Powertrain Emissions (EU-R287-BLDG208), Engineering South (EU-R287-BLDG111), Aero Lab (EU-R287-BLDG114), Climatic Wind Tunnel (EU-R287-BLDG105), Service Ops (EU-R287-BLDG204), Vehicle Engineering Center (EU-R287-BLDG210), Parts Fab (EU-R287-BLDG301), General Services 1 (EU-R287-BLDG302), R & D (EU-R287-BLDG106) and Design (EU-R287-BLDG113).

EU-R287-BLDG105 is used a couple times per year and uses aerosol cans.

EU-R287-BLDG207 has been out of service for 4 years.

A paint usage log is kept for each paint spray booth. Purge and cleanup solvents are collected in buckets and transferred to a hazardous waste drum. The gun cleaning station uses a little basin with solvent (not considered cold cleaners). Purge and cleanup solvent usage is not reported.

GM keeps filter inspection / replacement documentation for all booths that are using more than 100 gallons per year. Only the paint spray booths located in the Design Building, Manufacturing B Building (coating lab), and Service Ops Building use more than 100 gallons per year. (MI-ROP-B4049-2019, FGRULE287C, IV.1, VI.1.b: proper installation of filters, filter replacement documentation).

The following booths are installed in the Design Building: five large booths (Booth Nos. 36, 37, 42, 43, and 44), two small booths (Booth Nos. 41 and 45 – these booths are rarely used), and two booths used for plastering and resin casting. For the five large downdraft booths, floor dry filters are changed once a week; roof exhaust filters, twice a year. Aramark is the contractor that replaces filters.GM personnel are also responsible for filter changes. These are logged through the Maximo system. The log of filter change includes Booth No., date the filters were changed.

The two booths used for plastering and casting use a parting compound (release agent). A daily log is kept tracking parting compound usage. The usage is estimated based on the number of jobs.

All coatings are stored in the paint mix room. Hazardous waste is stored in drums at the paint mix room. Paint viscosity is carefully measured before it is sprayed. Spray guns use a disposable cup to hold the coating. As a result of using disposable cups, less purge and cleanup solvent are used. HVLP spray guns are used. Established formulations which are used in the assembly plant are generally used. Cleanup solvents are recorded but not reported as part of Rule 287 records. Booth No. 36 and 37 are state of the art booths (excellent humidity control) and are typically used more than the other large booths.

The coatings lab (located at Manufacturing B Bldg. used for painters training purposes) resembles a coating line at an assembly plant. Experiments (as well as painter training) are conducted to properly setup the robotic spray guns in the

assembly line. The coating line paint overspray, like an assembly plant, is controlled by a downdraft water wash system.

Paint log sheets are sent to Matt Perko monthly. Paint usage record for each booth is kept. Based upon the logs annual usage is less than 900 gallons per year. Building 108 used the most coatings (2021- 260 gallons/year; 2022- 395 gallons/ year). (MI-ROP-B4049-2019, FGRULE287C, I.1 limit: coating usage < 200 gallons per month for each emission unit). VOC emissions based on assumed 8.34 pound per gallon and 100% VOC content. The highest 12-month rolling tons VOC was in May 2021 at 4.2 tons. (FG-RULE287C SC 1.3; limit 30 tons)

2021 Annual coating usage in gallons: Man B-BLDG 108 (Jeff Bradshear) = 260, Design – Building 113 (James Wyne); Design 36 = 68, Design 37 = 63, Design 41 = 94, Design 42 = 34, Design 43 = 65, Design 44 = 3, Design 45 = 0, Design Plaster 12/Parting (Scott Schutzki) = 33, Design Plaster 12/Paint = 39, Bldg 105- CWT (Jordan Bollaert) = 0, Mfg A-Bldg 109 (Duane Peruski); DQ & V = 7, GAC Lab Weld = 0, Eng South - Bldg 111 (Tom Boni) = 13, Aero Lab - Bldg 114 (Marc Fortier) = 1, Serv Ops - Bldg 204 (Richard Michels) = 130, PT Emis - Bldg 208 (Joseph Ciagala) = 0, VEC - Bldg 210 (West) (Michele Kennedy, Aerosol Cans) = 21, Parts Fab - Bldg 301 (Manual Pickup) = 19, R&D - Bldg 106 (Nick Irish Aerosol Cans) = 0, (MI-ROP-B4049-2019, FGRULE287C, II.1 limits coating usage to 200 gallons/month per line). No coating booth exceeded 200 gallon per month. Total usage in all booths = 850 gallons per year.

2022 Annual coating usage in gallons: Man B-BLDG 108 (Jeff Bradshear) = 395, Design – Building 113 (James Wyne); Design 36 = 63, Design 37 = 71, Design 41 = 62, Design 42 = 37, Design 43 = 33, Design 44 = 6, Design 45 = 0, Design Plaster 12/Parting (Scott Schutzki) = 13, Design Plaster 12/Paint = 43, Bldg 105- CWT (Jordan Bollaert) = 0, Mfg A-Bldg 109 (Duane Peruski); DQ & V = 12, GAC Lab Weld = 0, Eng South - Bldg 111 (Tom Boni) = 26, Aero Lab - Bldg 114 (Marc Fortier) = 0, Serv Ops - Bldg 204 (Richard Michels) = 88, PT Emis - Bldg 208 (Joseph Ciagala) = 0, VEC - Bldg 210 (West) (Michele Kennedy, Aerosol Cans) = 26, Parts Fab - Bldg 301 (Manual Pickup) = 0, R&D - Bldg 106 (Nick Irish Aerosol Cans) = 0, (MI-ROP-B4049-2019, FGRULE287C, II.1 limits coating usage to 200 gallons/month per line). No coating booth exceeded 200 gallon per month. Total usage in all booths = 876 gallons per year.

Documentation of the filter replacement is only required for booths spraying more than 100 gallons of coatings per year. Facility keeps filter documentation for all booths that are using more than 100 gallons per year. In 2022, only the paint spray booth located in the Manufacturing B Building (coating lab) used more than 100 gallons per year.

The maintenance paint spray booths at Site Operations (Facility Operations-Building 101) and Service Ops (Service Technology-Building 204) are subject to additional Part 6/7 rules pertaining to plastic and metal coatings. Note: Facilities operations (EU-R287-BLDG101) has not been used in 4 years. In accordance with Rule 621 and Rule 632, the facility is exempt from these rules if all of the following is not exceeded: VOC emissions of 2,000 pounds per line per month, 10 tons per line per year, and 30 tons per year for all metal and plastic parts coating lines. GM keeps separate emissions records to show that VOC emissions from these paint booths are within the limits, and thus exempt from Rule 621 and Rule 632 (Doc 600-Paint Rule 6–7). NOTE:

Service Technology spray booth is used to repair corporate cars used by company executives.

CY 2021: Service Technology Building 204 emissions = 740 pounds of VOC per year. Site Operations Maintenance emissions = 0 pounds of VOC per year. (MI-ROP-B4049-2019, FGRULE287C, I.1-3 limits: VOC emissions < 2,000 pounds per month per line, 10 tons per year per line, 30 tons per year at GM Tech).

CY 2022: Service Technology Building 204 emissions = 511 pounds of VOC per year. Site Operations Maintenance emissions = 0 pounds of VOC per year. (MI-ROP-B4049-2019, FGRULE287C, I.1-3 limits: VOC emissions < 2,000 pounds per month per line, 10 tons per year per line, 30 tons per year at GM Tech).

FGRULE290

There are two gasoline purge units under this flexible group. These are located at the GSB-1 Bldg. and the Engineering Bldg. For safety reasons, GM does not want any gasoline (or diesel) stored in a vehicle gas tank for an extended period of time (more than 2-3 days). After the vehicle gasoline tanks have been worked on, gasoline is emptied from the gas tank. The tanks are then cleaned and purged using a liquid alkaline cleaner called SLIX. An air hose bubbles the SLIX in the gas tank for approximately 8 hours to purge the remaining gasoline in the tank. After the cycle, the SLIX is pumped back to the reservoir. Another 8 hours is required to air dry the tank. The gas tank is scrapped or stored and worked on again.

GM established an emission factor for each tank that is purged. Since gasoline contains some carcinogens, the Rule 290 limit is 20 pounds per month. In the time period reviewed, January 2022 has the highest monthly emissions of 2.73 pounds (FG-RULE290 SC I.2 (b). Emissions records are attached to this report (FG-RULE290 SC VI. 1).

FG-GENERATORSBLDG210

This flexible group is for two diesel generators rated at 2876 HP each, manufactured by Caterpillar, installed in 2001 and located at the VEC Bldg (northeast and northwest). At the time of installation in 2001, GM thought the capacity of the generators was below 10 MM BTU/hr and exempt from permits. A permit was issued to these generators.

Note: These are exempt generators. However, there is no certification on file for the generators. According to Matt, the EPA notified GM there were no certifications available for these generators. See attached e-mail from EPA. The generators have a NOx limit of 15.5 tpy each, based on a rolling 12-month period and a limit of 500 hours per generator per 12-month rolling time period. Both units are equipped with a non-resettable hour meter (FG-GENERATORBLDG210 SC IV. 1) and use diesel fuel with sulfur content less than 15 ppm (FG-GENERATORBLDG210 SC II. 1). NOx emissions are below limit and hours of operation are under the limit (FG-GENERATORBLDG210 SC III. 1) – 2021: EU-EMGEN210.1 (210NE)-.554 TPY NOx/18 hrs operation, EU-EMGEN210.2 (210NW)-.431 TPY NOx/14 hrs operation; 2022: EU-EMGEN210.1 (210NE)-.431 TPY NOx/13 hrs operation, EU-EMGEN210.2 (210NW)-.431 TPY NOx/14 hrs operation. See attached NOx records and hours of operation. (Doc 400-ICE Hours).

Both units are considered "affected source" under the RICE MACT, but with no requirements, including no notification.

FG-BACKUPGENSBLDG206

This flexible group is for (4) generator sets and (6) Diesel Rotary Uninterruptible Power Supply (DRUPS) generator sets located at the Cadillac Bldg. (IT Center).

Active PTI: 2-23 Effective date: January 11, 2023. Two 4,680 HP diesel-fueled emergency engines. FG-DRUPS7&8 have not yet been installed.

In a DRUPS, when the main electricity supply fails, the stored energy in the flywheel dives the emergency electric generator. At the same time, the diesel engine, with some delay, takes over the flywheel to drive the electric generator.

The backup generators demonstrate compliance with the NOx, HC, CO, and PM limits by providing manufacturer certification that the engines meet the emissions standards. Manufacturer certification for the gen sets and DRUPS gen sets have either been submitted or were verified by AQD (from the EPA website https://www.epa.gov/compliance-and-fuel-economy-data/engine-certification-data). Ultra-low sulfur diesel fuel is used as fuel (FG-BACKUPGENSBLDG206 SC II.1).

Each gen set is limited to 500 hours of operation per year based on a rolling 12-month period. For the purpose of necessary maintenance checks and readiness testing, each gen set is limited to 100 hours of operation per year based on a rolling 12-month time period. Each emergency gen set may operate up to 50 hours of non-emergency situations per year based on a rolling 12-month time period. The 50 hours count towards the 100 hours per year allowed for maintenance and testing. The gen sets are equipped with a non-resettable hour meter. See attached records of operation hours (Doc 400-ICE Hours).

All engine gen sets are subject to the RICE MACT (notification of startup- no emissions standards or work practice standards apply) and NSPS Subpart IIII.

Aramark is the general contractor for the maintenance of the backup gens located at the IT Center.

Monthly load test for one half hour is conducted for DRUPs.

Hours operated based upon hours-meter readings:

1. CY2021 = 15.7 (Cat 1), 24.8 (Cat 2), 24.6 (Cat 3), 24.9 (Cat 4), 16.1 (DRUP A1), 26.2 (DRUP A2), 26.6 (DRUP A3), 12.9 (DRUP B1), 25.3 (DRUP B2) and 26.8 (DRUP B3).
2. CY2022 = 15.4 (Cat 1), 14.9 (Cat 2), 15.9 (Cat 3), 14.7 (Cat 4), 14.9 (DRUP A1), 15.0 (DRUP A2), 14.2 (DRUP A3), 16.3 (DRUP B1), 14.8 (DRUP B2) and 8.6 (DRUP B3).

SC III.1 limits each engine to 500 hours of operation per year on a 12-month rolling basis. III.2 limits to 100 hours for necessary maintenance checks and readiness testing, of this only 50 hours may be non-emergency.

FGRICEMACT

This flexible group covers all exempt emergency generators less than 10 MM BTU/hr. that are subject to the RICE MACT. NOTE: If an emergency generator is permitted, it

is included in a separate emission unit or flexible group. These are certified generators. (Note: According to GM, EU-EMGEN202.4 is certified, however there is not a certificate on file. Regardless, the generator is subject to the requirements of 40 CFR Part 63 Subpart ZZZZ.)

Emission Units:

Existing RICE (commenced construction before June 12, 2006) less than or equal to 500 HP

EU-EMGEN102 (decommissioned), EU-EMGEN115, EU-EMGEN207

Existing RICE (commenced construction before December 19, 2002) greater than 500 HP

EU-EMGEN202.3, EU-EMGEN202.5 (decommissioned), EU-EMGEN210.3

New RICE (commenced construction on or after December 19, 2002) greater than 500 HP

EU-EMGEN202.4

Each gen set is limited to 500 hours of operation per year based on a rolling 12-month period. For the purpose of necessary maintenance checks and readiness testing, each gen set is limited to 100 hours of operation per year based on a rolling 12-month time period. Each emergency gen set may operate up to 50 hours of non-emergency situations per year based on a rolling 12-month time period. The 50 hours count towards the 100 hours per year allowed for maintenance and testing. The gen sets are equipped with a non-resettable hour meter (FG-RICEMACT SC IV.1). See attached records of operation hours (Doc 400-ICE Hours).

Diesel fuel with sulfur content less than 15 ppm is used (FG-RICEMACT SC VI.8).

GM keeps a list of all emergency generators that includes a summary of requirements for each of the emergency engine generators installed.

Required maintenance (including oil changes and belt inspections) were completed. Logs of required maintenance are kept. (MI-ROP-B4049-2019, FG-RICEMACT, III.4).

Note: EUEMGEN102 and EUEMGEN202.5 were decommissioned in 2018.

1. EU-EMGEN115 – Main Gate Fire Pump, Detroit Diesel 130 HP, CY 2021 = 22.6 hours of operation, CY 2022 = 25 hours of operation
2. EU-EMGEN207 – Building 207 West Courtyard, Detroit Diesel 268 HP, CY 2021 = 18.8 hours of operation, CY 2022 = 54.5 hours of operation
3. EU-EMGEN202.3 – 7000 White/Onstar South, Detroit Diesel 1495 HP, CY 2021 = 11.7 hours of operation, CY 2022 = 7.8 hours of operation
4. EU-EMGEN210.3 – VEC South, Detroit Diesel 1502 HP, CY 2021 = 32.5 hours of operation, CY 2022 = 52.5 hours of operation
5. EU-EMGEN202.4 – 7000 Green, Onan-Cummins 671 HP 500 kW, CY 2021 = 3.1 hours of operation, CY 2022 = 7 hours of operation

(MI-ROP-B4049-2019, FG-RICEMACT, III.1, 2, 3).

FGSUBPARTIIII

This flexible group covers exempt emergency compression ignition internal combustion engines less than 30 l/cylinder constructed (ordered) after July 11, 2005, and manufactured after April 1, 2006. NOTE: If an emergency generator is permitted, Subpart IIII NSPS requirements are included in the emission unit or flexible group for the permitted generator.

Emission Units:

CI internal combustion engine with maximum engine power less than 100 HP

EU-EMGEN219

CI internal combustion engine greater than or equal to 100 HP and less than or equal to 500 HP

NA

CI internal combustion engine greater than 500 HP

EU-EMGEN106.1, EU-EMGEN106.2, EU-EMGEN202.2, EU-EMGEN501.2, EU-EMGEN501.3

For the purpose of necessary maintenance checks and readiness testing, each gen set is limited to 100 hours of operation per year. Each emergency gen set may operate up to 50 hours of non-emergency situations per year. The 50 hours count towards the 100 hours per year allowed for maintenance and testing. The gen sets are equipped with a non-resettable hour meter (FG-SUBPARTIIII SC IV.1). See attached records of operation hours (Doc 400-ICE Hours).

Diesel fuel used has a sulfur content of less than 15 ppm and a cetane index of 47. Cetane index is calculated based on the fuel's density and distillation range. It is a measure of the diesel fuel's ignition quality. (FG-SUBPARTIIII SC II.1).

A 601 HP diesel generator is installed at Bldg. 106 R & D Courtyard (Research #3). It is not yet operating. Notification of installation was submitted 8/5/22. Engine family is GMDDL14.0ZWK. EGLE-AQD has a copy of the engine nameplate stating that it complies with 40 CFR 60.4202 certification and an EPA certification for the engine family.

EU-EMGEN219- One diesel-fueled, 69 HP, 51 kW, <10 L/cylinder displacement emergency generator engine manufactured by Cummins and located at Building 219 installed in 2017. (This engine is an "affected source" under NESHAP ZZZZ but has no requirements per 40 CFR 63.6590(c)(7)).

EU-EMGEN106.1-A Detroit Diesel 685 HP generator was installed in 2008 (2007 model year, located at Bldg 106, R&D). This engine is certified. There is a faceplate attached to the engines stating that the engines conform to EPA regulations. I also verified this from the EPA website, based on model year, manufacturer and engine family.

EU-EMGEN106.2-A Detroit Diesel 600 HP generator was installed in 2016 (located at Bldg 106, R&D). This engine is certified. There is a faceplate attached to the engines

stating that the engines conform to EPA regulations. I also verified this from the EPA website, based on model year, manufacturer and engine family.

EU-EMGEN202.2-A MTU Detroit Diesel 1495 HP generator was installed in 2016 (located at Bldg 202). This engine is certified. There is a faceplate attached to the engines stating that the engines conform to EPA regulations. I also verified this from the EPA website, based on model year, manufacturer and engine family.

EU-EMGEN501.2-A Cummins 680 HP generator was installed in 2015 (located at Bldg 501). This engine is certified. There is a faceplate attached to the engines stating that the engines conform to EPA regulations. I also verified this from the EPA website, based on model year, manufacturer and engine family.

EU-EMGEN501.3-A Cummins 755 HP generator was installed in 2019 (located at Bldg 501). This engine is certified. There is a faceplate attached to the engines stating that the engines conform to EPA regulations. I also verified this from the EPA website, based on model year, manufacturer and engine family.

1. EU-EMGEN219 CY 2021 = 23.4 hours of operation, CY 2022 = 28.2 hours of operation
2. EU-EMGEN106.1 CY 2021 = 11.2 hours of operation, CY 2022 = 10.9 hours of operation
3. EU-EMGEN106.2 CY 2021 = 13 hours of operation, CY 2022 = 11.8 hours of operation
4. EU-EMGEN202.2 CY 2021 = 10 hours of operation, CY 2022 = 8 hours of operation
5. EU-EMGEN501.2 CY 2021 = 10.1 hours of operation, CY 2022 = 7.9 hours of operation
6. EU-EMGEN501.3 CY 2021 = 31.9 hours of operation, CY 2022 = 33 hours of operation

FG-SUBPARTJJJJ
This flexible group covers exempt emergency spark ignition internal combustion engines greater than or equal to 100 HP (except gasoline or rich burn LPG) that commenced construction (ordered) after June 12, 2006, and manufactured on or after January 1, 2009.

NOTE: If an emergency generator is permitted, Subpart JJJJ NSPS requirements are included in the emission unit or flexible group for the permitted generator.
The gen sets are equipped with a non-resettable hour meter (FG-SUBPARTJJJJ SC IV.1). See attached records of operation hours (Doc 400-ICE Hours). Operation is limited to 50 hours per year.

Emission Units:
SI internal combustion engine with maximum engine power less than 100 HP
NA
SI internal combustion engine greater than or equal to 100 HP and less than or equal to 500 HP
EU-EMGEN129, EU-EMGEN207, EU-EMGEN221
SI internal combustion engine greater than 500 HP
EU-EMGEN101, EU-EMGEN108

A 500-kW natural gas fired generator was installed in September 2016 at Bldg 101

(Site Ops). This was a non-certified engine. This engine was removed on May 11, 2017. It was replaced with EU-EMGEN101, a certified generator, which was installed in May 2017.

EU-EMGEN129-A Cummins 125 kW generator was installed in 2018 (located at Bldg 129). This engine is certified.

EU-EMGEN207-A Cummins 132 HP generator was estimated installed in 1999 (located at Bldg 207). This engine is certified.

EU-EMGEN221-A Cummins 150 kW generator was installed in 2018 (located at Bldg 221). This engine is certified.

EU-EMGEN101-A Cummins 530 HP generator was installed in 2017 (located at Bldg 101). This engine is certified.

EU-EMGEN108-A Caterpillar 691, 515 kW HP generator was installed in 2008 (located at Bldg 108). This engine is certified.

1. EU-EMGEN129 CY 2021 = 10.4 hours of operation, CY 2022 = 19.4 hours of operation
2. EU-EMGEN207 CY 2021 = 17.1 hours of operation, CY 2022 = 26.4 hours of operation
3. EU-EMGEN221 CY 2021 = 27.7 hours of operation, CY 2022 = 35.4 hours of operation
4. EU-EMGEN101 CY 2021 = 38.3 hours of operation, CY 2022 = 14.7 hours of operation

EU-EMGEN108 CY 2021 = 22.4 hours of operation, CY 2022 = 31.4 hours of operation

FG-BOILERSBLDG107

Three natural gas-fired boilers (EU-BOILER1-107, EU-BOILER2-107, EU-BOILER3-107) with a maximum nameplate heat input capacity of 108 MMBtu/hr (subject to NSPS Db and NESHAP DDDDD).

CY 2022: 500 MM SCF per year pipeline quality natural gas is used in the three boilers (Boiler 1 = 179 Boiler 2 = 143 Boiler 3 = 179 NG per year) (MI-ROP-B4049-2019, FG-BOILERSBLDG107, II.1-2 limits: only NG, 1,050 million cubic feet of NG per 12-month rolling time period).

GM calculated 16 tons of NOx per year for CY 2021 (MI-ROP-B4049-2019, FG-BOILERSBLDG107, I.2 limit: 34.0 tpy NOx) based upon MAERS EF of 64 lb/MMcf (0.064 lb/MMBtu-used as worse case). Vendor recommended is 0.036 lb/MMBtu.
CY 2021: 482 MM SCF per year pipeline quality natural gas is used in the three boilers (Boiler 1 = 167 Boiler 2 = 170 Boiler 3 = 145 NG per year) (MI-ROP-B4049-2019, FG-BOILERSBLDG107, II.1-2 limits: only NG, 1,050 million cubic feet of NG per 12-month rolling time period, SC VI.2).

GM calculated 15.4 tons of NOx per year for CY 2021 (MI-ROP-B4049-2019, FG-BOILERSBLDG107, I.2 limit: 34.0 tpy NOx) based upon MAERS EF of 64 lb/MMcf (0.064 lb/MMBtu-used as worse case). Vendor recommended is 0.036 lb/MMBtu.

Each boiler is equipped with an Oxygen Trim System that maintains an optimum air to fuel ratio (MI-ROP-B4049-2019, FG-BOILERSBLDG107, III.1: continuous oxygen trim system on each boiler).

Each boiler is equipped with a gas meter and low NOx burner (MI-ROP-B4049-2019, FG-BOILERSBLDG107, IV.1 & II)

The 30-day average NOx lb/MMBtu heat input from July 1, 2021, to June 23, 2023 was: 0.026, 0.027 & 0.039 Boiler Nos. 1, 2, & 3, respectively (MI-ROP-B4049-2019, FG-BOILERSBLDG107, I.1 limit: 0.064 lb / MMBtu. Each Boiler is equipped with a Predictive Emission Monitoring System (PEMS). A monitor installation plan was received for the PEMS on February 8, 2018 (SC VI.2). On February 26, 2018 - March 2, 2018, the initial PEMS relative accuracy test audits (RATAs) took place. (SC V.1). The PEMS were certified on May 24, 2018.

On July 17, 2019, per 40 CFR, Part 60 Performance Specification (PS) 16, a request was received and approved to reduce the quarterly PEMS RAA to once a year. Performance Specification 16 (PS16) allows a single mid-year relative accuracy audit (RAA) RAA in the second year in place of the quarterly RAAs.

GM is submitting excess emission report (EER) and summary report (PTI No. 102-16, FG2017BOILERS, Appendix A 8 limit: excess emission report (EER) and summary report).

Monthly natural gas usage records are kept (MI-ROP-B4049-2019, FG-BOILERSBLDG107, SC VI.3: monthly natural gas usage records).

During inspection, boiler #2 gas flow rate was 15.44 kSCF.

CEDRI

Boiler MACT 5D requires a five-year performance tune-up (MI-ROP-B4049-2019, FG-BOILERSBLDG107, SC V.3).

On September 26, 2022, Boilers 1 & 2 had a tune up performed and Boiler 3's was performed on November 11, 2022. (MI-ROP-B4049-2019, FG-BOILERSBLDG107, SC III.1)

FGBOILERSCL

9/27/22-Received notification of decommissioning of two 13 MMBtu/hr natural gas fired hot water boilers (EU-BOILER1CL and EU-BOILER2CL) that were used for building and process heating in the Climatic Wind Tunnel. Decreases to PTE are NOx (11.16), CO (9.38), VOC (0.57), SO2 (0.07), and PM (0.85) tons per year.

2/21/23-Received notification of installation of three 5.278 mmBtu/hr natural gas fired hot water boilers to be used for building and process heating in the Climatic Wind Tunnel building. Increases to PTE are NOx (6.80), CO (5.71), VOC (0.35), SO2 (0.04), and PM (0.52) tons per year, all below significant thresholds.

Three natural gas-fired climatic boilers were installed to create climatic conditions to

conduct physical analysis of vehicles in the climatic wind tunnel. These boilers are now used only as backup since steam for the climatic wind tunnel is now supplied by the main steam plant (Powerhouse). The climatic boilers are only operated mostly during the weekends as well as for monthly testing. However, GM is moving away from this, and the new boilers will once again be used to create climatic conditions in the climatic wind tunnel.

The new climatic boilers are subject to the requirements of the Boiler MACT, 40 CFR 63 Subpart DDDDD. The new climatic boilers will require tuneups biennially (heat input capacity of less than 10 million Btu per hour, but greater than 5 million Btu per hour).

BOILER MACT
In addition to the boilers located at the power plant and climatic wind tunnel, there are other smaller boilers and hot water heaters located at the facility that are subject to the boiler MACT. Compliance requirements that include tune-ups, one-time energy assessment and submission of compliance reports were done.

Emission Units:
Less than 5 MMBtu/hr
EU-MISCBOIL7000(1-3), EU-MISCBOILERGAE(1-2), 2 New Manufacturing B hot water boilers, 3 new Design Studio West hot water boilers, 6 new Wallace Battery Cell Innovation Center hot water boilers

Equal to or greater than 5 MMBtu/hr and less than 10 MMBtu/hr
EU-MISCBOILMTS(1-2), 3 New CL Boilers

Equal to or greater than 10MMBtu
EU-BOILER1CL (decommissioned), EU-BOILER2CL (decommissioned)

15-Day Notification of Actual Startup of an Affected Source under 40 CFR 63 Subpart DDDDD—National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters was received on February 21, 2023, for the 3 new climatic boilers.
The new climatic boilers will require tuneups biennially (heat input capacity of less than 10 million Btu per hour, but greater than 5 million Btu per hour).

15-Day Notification of Actual Startup of an Affected Source under 40 CFR 63 Subpart DDDDD—National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters was received on August 3, 2023. This boiler is located at Manufacturing B and rated at 3.5 MMBtu/hr heat input. Tuneup will be required every 5 years (less than 5 MMBtu/hr).

15-Day Notification of Actual Startup of an Affected Source under 40 CFR 63 Subpart DDDDD—National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters was received on January 13, 2023. This is boiler is located at Manufacturing B Coatings Lab and rated at 3.5 MMBtu/hr heat input. Tuneup will be required every 5 years (less than 5 MMBtu/hr).

15-Day Notification of Actual Startup of an Affected Source under 40 CFR 63 Subpart

DDDDD—National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters was received on August 31, 2022. These boilers are located at Design Studio West and each is rated at 2.79 MMBtu/hr heat input. Tuneup will be required every 5 years (less than 5 MMBtu/hr).

Received Initial Notification for Installation of six 4.99 MMBtu/hr natural gas fired hot water boilers to be used for building and process heating in the Wallace Battery Cell Innovation Center on July 19, 2022. Tuneup will be required every 5 years (less than 5 MMBtu/hr).

GM keeps a list of all affected sourced at the facility and the associated tune-up/reporting requirements.

GM does not use any fuel other than NG (MI-ROP-B4049-2019, FG-BOILERMACT, VI.2)

2021: Boiler tuneup performed on EUMISCBOILMTS1 & EUMISCBOILMTS1 on March 22, 2021 (Required biennially). (FG-BOILERMACT SC III1). Notification sent to CEDRI. (SC VII 5)

Boiler tuneup performed on EU-BOILER1CL & EU-BOILER2CL on March 22, 2021 – March 24, 2021(Required annually).

2022: Boiler tune up performed on Unit # 1 (9/26/2022) & 2 (11/11/2022) GAE. (Required every 5 years (less than 5 MMBtu/hr))(FG-BOILERMACT SC III1). Notification sent to CEDRI. (SC VII 5)

Boiler tuneup was not performed on EU-BOILER1CL & EU-BOILER2CL due to units being decommissioned.

2023: Boiler tuneup performed on EUMISCBOILMTS1 & EUMISCBOILMTS1 on May 23, 2023 (Required biennially). (FG-BOILERMACT SC III1). Notification sent to CEDRI. (SC VII 5)

PTI No. 46-20, FG-BATTERY (EU-HIGHBAY, EU-LOWBAY) Battery Thermal Testing Areas, Building No. 207.

Pollution control equipment: Baghouse followed in series by HEPA filter that controls one bay at a time.

During the inspection, Andrew McMichael, assisted me.

In low-bay area (EU-LOWBAY), there is a prep area. Two cells are present. Each cell has a capture hood. High current failure is introduced such that battery cells catch fire. Up to 3 battery cells can be tested at any given time. The purpose is to validate battery chemistry.

In high-bay area (EU- HIGHBAY), larger scale testing is done for 24-48 hrs. One side exhaust air is drawn to the control system, from other side inlet air louvers to admit outside ambient air.

To control smoke and particulates, a control system is present that consists of a column containing 150 bags followed by HEPA filter system. Exhaust from the system is released to ambient air via a stack. VE observation is done during the first test of each month (PTI No. 46-20, FG-BATTERY, V.1). During inspection, I observed the June VE readings, which showed no VE).

Cells tested (2021): EU-HIGHBAY = 1,469 and EU-LOWBAY = 37; (2022): EU-HIGHBAY = 1429 and EU-LOWBAY = 61 (PTI No. 46-20, FGBATTERY, II, 1 thru 4 limits for cells tested: 1,833 cells per month & 22,000 cells per year for EU-HIGHBAY and 125 cells per month & 1,500 cells per year for EU-LOWBAY).

EUHIGHBAY and EULOWBAY are not operated simultaneously during thermal testing and a baghouse followed in series with HEPA filter are operated properly. HEPA filter is changed every 6 months and the bags in the baghouse are changed every 3 years. There is a magnehelic on the baghouse. Also, number tests recorded. (PTI No. 46-20, FG-BATTERY, III, 1-2, IV.1-3, VI.1).

Conclusion

GM Tech Center appears to be in compliance with all evaluated permits and regulations. GM is also submitting PEMS audit and excess emissions reports per NSPS Db for the boilers.

NAME _____ DATE September 14, 2023 SUPERVISOR _____