

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

N788649999

FACILITY: Hyundai America Technical Center Inc. (HATCI)		SRN / ID: N7886
LOCATION: 6800 GEDDES RD, SUPERIOR TWP		DISTRICT: Jackson
CITY: SUPERIOR TWP		COUNTY: WASHTENAW
CONTACT: Shawn Mirza, Senior Environmental Health & Safety Engineer		ACTIVITY DATE: 08/21/2019
STAFF: Diane Kavanaugh Vetort	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MAJOR
SUBJECT: Complete scheduled compliance inspection. FCE Title V Major source.		
RESOLVED COMPLAINTS:		

N7886 Hyundai-Kia America Technical Center, Inc. (HATCI), Washtenaw County.

Contact: Shawn Mirza, Senior Environmental, Health & Safety Engineer, office phone (734) 337-2975, Cell (313) 522-0606, email: imirza@hatci.com

On the morning of August 21, 2019, I conducted a complete, scheduled compliance inspection, announced a short time prior, at the above Hyundai America Technical Center facility (hereinafter HATCI) location in Superior Township. The purpose of the inspection was to determine the facility's compliance status with the applicable federal and state regulations, Act 451, Part 55 Air Pollution Control regulations, the administrative rules and the conditions of HATCI's Renewable Operating Permit (ROP) ROP-MI-N7886-2014. HATCI currently has a renewal application in-house.

Prior inspection was conducted on July 6, 2017 and the most recent performance test was of one Engine Test Cell Dynamometer conducted on September 27-28, 2011. HATCI is a Title V Major Source due to having CO emissions greater than 100 tons per year. HATCI submitted 2018 MAERS timely and their ROP Certification/Deviation reports were submitted timely and indicated compliance.

I was accompanied today by Stephanie Weems, AQD for the purpose of training new staff. Upon our arrival to the site I did not observe any visible emissions or detect any odors. We provided our identification at the security /reception desk. We met with Shawn Mirza, Senior Environmental, Health & Safety Engineer. We held a pre-inspection conference and he accompanied us during the inspection.

During the pre- inspection conference I went over the general aspects of the inspection and informed Shawn that I needed to observe the permitted equipment and some of the exempt equipment. I told Shawn that I would need to obtain copies of all required recordkeeping. HATCI's ROP contains limits based on 12-month rolling periods as determined at the end of each month. I requested records for the previous 12-month period ending July 2018 (most recent complete month).

Shawn provided the following general facility information: HATCI and Kia are now one company and have many US locations for assembly plants (Alabama, Georgia), testing and proving grounds (California). HATCI currently employs approximately 240 people at this facility, this is up slightly from 2017. They operate normally 8 AM to 5 PM, however 2nd and 3rd shifts do operate for testing. Days of operation are Monday through Friday and less often on weekends. Dynamometer engine testing can run any schedule. Shawn said the test profiles primarily run are part-load, developmental, durability and Wide-Open Throttle (WOT). They are permitted to burn gasoline, diesel, and natural gas. Until recently the engine testing has been mostly gasoline. Today I learned they have recently started testing with diesel. Per Shawn, they have not been operating with natural gas.

Shawn informed us that generally operations have been the same with the Chassis and Dynos. However, in the last two years they have expanded their electrical and autonomous departments which included new offices, labs and engineer hires.

COMPLIANCE INSPECTION

During the inspection we met the following HATCI staff during portions of the physical inspection: Dave Cummings, Chief Technician Chassis Dyno lab; and Donald Gardner, Chief Technician, Powertrain Engine Dyno lab.

During the facility walk through inspection I observed all or portions of the following: **FG DYNOS** which includes four engine dynamometer test cells EU-Dyno1, EU-Dyno2, EU-Dyno3, EU-Dyno4; **FG-CHASSIS** which includes four Chassis dynamometers EU-VEC1, EU-VEC2, EU-VEC3, EU-MDYNE1; and **FG-UST** underground fuel storage tanks identified as EU-UST#2-3-4, EU-UST#5-6, and EU-UST#7. **FG-GASDISPGACT** gasoline dispensing facilities (GDFs) located at an area source of HAPs subject to federal MACT Subpart (6) C: EU-UST#1, EU-GASAST1, and including the above USTs. **FG-**

NSPS_SI-ICE covers EU-EMERGEN a NSPS Subpart JJJJ emergency generator. **FG-MACT-ZZZZ-EMERGENCY** covers EU-FIREPUMP a MACT Subpart ZZZZ emergency generator.

HATCI has installed and is operating other exempt equipment including **FG-COLDCLEANERS**. I did not observe these during today's inspection.

HATCI ROP contains **FG-FACILITY** (all process equipment source-wide including equipment covered by other permits, grandfathered equipment and exempt equipment) applicable requirements include emission limits and emission factors (controlled and uncontrolled), for NOx, CO, 1, 3-Butadiene, and Benzene. Most known fuels can be burned including, unleaded gasoline, ethanol blends, diesel, natural gas and hydrogen. Fuels limitation is 230,000 gallons of fuel (total combined usage of all allowed fuels) per 12 month rolling time period as determined at the end of each calendar month. Of these 75,000 gallons uncontrolled fuel is allowed per 12 month period. Wide Open Throttle (WOT) testing is considered uncontrolled. As stated above gasoline remains HATCI's primary engine fuel.

ROP: FG-CHASSIS: EU-VEC1- 3, EU-MDYNE1 (4 enclosed vehicle test stations): These emission units are identified as: EU-VEC1, EU-VEC2, EU-VEC3, and EU-MDYNE1. Note: An additional Chassis EU-VEC4 was later installed under permit exemption Rule 285(g) exemption and is not part of this FG. This is the flexible group containing permitted emission units where whole vehicles equipped with Catalytic Converters are tested.

Following the inspection Shawn provided the following additional information for the chassis dyno cells:

VEC: Cell #1 200 hp Manufacture 12-2000
Cell #2 300 hp Manufacture 1-2005
Cell #3 200 hp X2 Manufacture 3-2007
Cell #4 300 hp X2 Manufacture 2-2013

During the inspection we walked first to the Chassis testing area and walked through to observe the test cells. Shawn introduced us to Dave Cummings, Chief Technician Chassis Dyno lab. Dave walked us through operations today: Chassis 1 was operating/testing in the AM only. Chassis 2 did not operate that morning but is scheduled to test in the PM. Chassis 3 was operating currently. Chassis 4 operated in the AM and was scheduled for solar lamp cleaning today. Generally, operate 2 shifts: 7 AM to 4 PM and 3 PM to 12 AM, 5 days per week and rarely run on the weekends; estimate <10 per year.

The EU-MDYNE1 Chassis dyno is in a separate building behind the main building. HATCI refers to it as the "Mapping Dyno" and I observed in the past that it was not operating, and building was used for storage. Shawn confirmed the status is the same.

Per Shawn and Dave, I was informed that HATCI is planning to upgrade Chassis Cell #1 or EU-VEC1. This is necessary in order to update to EPA testing standards and will involve a new dynamometer change from the current 2-wheel to a 4-wheel and various additional testing equipment upgrades. I told Shawn that HATCI needs to evaluate the implications for the existing permit and whether the proposed change is covered by exemption or a permit revision application is required.

FG-CHASSIS special conditions require all vehicles be equipped and maintained with catalytic converter. Also requires a device to monitor and record natural gas usage rate used to fuel vehicles. Required record keeping includes days of operation, and the fuel used for vehicle testing. Shawn explained in our pre-inspection conference that the Chassis (department) controls the fuel usage/manifold and records it and sends it to him. Per Dave, Tanks 5-6 primarily supply the gasoline fuel; no diesel testing currently. We observed they have day tanks for each cell and AVL fuel cabinets.

We all walked into the area behind the Chassis rooms where the soak rooms and/or other types of testing (non-fuel burning) are located. Soak Booths/Rooms: two separate booths with an exhaust stack. Basically, cars are parked in these booths and shut off. They measure emissions from them without running emissions are from evaporation or off-gassing. Between these booths and the three chassis rooms there is an open room/area which is climate controlled and they do additional measurement of parked vehicles here. This area has no applicable requirements.

ROP: FG-DYNOS: Engine Test Cells (EU-Dyno1, 2, 3, 4):

We next observed the FG-DYNOS testing area. Shawn introduced me to Don Gardner, Chief Technician Powertrain. We also were assisted by Jeff, Technician on Cell 2. I observed each Cell has a separate logbook with the test profiles, operating hours, and all other records required for the emission calculations.

HATCI refers to the Engine Test Cells as ETC#1-4 and uses North and South for engine locations in the cells. Cells 1 and 2 have two dynamometers in each cell. Only one can operate at a time, but it allows them to start the install/prep of another engine while testing. Cell 3 and 4 each has one dynamometer. Cell 3 is used for thermal shock (using water) and WOT. Cell 4 is used for Durability (also considered WOT). Don said they are currently running 3 shifts, 5 days/week in this department. Cells 1 & 2 are usually Developmental (low fuel use), Cells 3 & 4 are Durability (higher fuel use). However due to operational issues with Cell 3 they have been running durability testing in Cell 1. During the inspection today:

ETC#1 Cell 1 – not operating but engines in place.

ETC#2 Cell 2 – not operating but engines in place. Just started diesel testing in this Cell. There was a diesel engine on the right (south) side and a Lexus competitor engine on the left side.

ETC#3 Cell 3 – not operating, 1.6 L GDI engine in place. Is being rebuilt, under maintenance currently due to the Thermal Shock, water injection unit located in the cell is malfunctioning.

ETC#4 Cell 4 – operating running a 300 hour WOT durability test.

At Cell 1 we observed 2 engines installed. They said engines are smaller and more efficient now. A 2.5 L 4 Cyl NA GDI and also 1.6 Turbo GDI are common. One on the right side has been or would be undergoing a 300 HP WOT durability test. We were able to enter the Cell to observe the fuel cabinet and meters. AVL does an annual calibration of the fuel cabinets. Primary meters are AVL but they have different software. Jeff mentioned a Lambda meter on exhaust referred to as a "mass flow meter" also with yearly calibrations. AVL calibrated the cabinet on 8-1-19 per sticker on cabinet. The "Fill- Rite meter" pre the AVL cabinet is less precise but they use this for comparison.

Following the inspection AQD requested and received the following type, size, and year installed, for the Engine Dynamometers. Per Shawn they are rated in Kilowatts (kW):

ETC#1:	AVL: P25-2/0600-2XS-1:	250 kW	(2005)
ETC#2:	AVL: P44-2/0934-2XS-1:	440 kW	(2005)
ETC#3:	AVL: Alpha 20-500 Eddy Current:	500 kW	(2005)
ETC#4:	Meiden Frec Dynamometer:	300kW	(1996) Re-Located from HATCI previous location in (2005)

Each Cell has a Day Tank (separate room) which feeds to the fuel cabinet in each cell. We observed this contained 6 tanks. The fuel metering in each cell is required to track "uncontrolled vs controlled" fuel usage/testing. Per Jeff, about 18 gal/hr is considered a lot of fuel burned in durability testing. The AVL cabinets and fuel metering devices noted above record fuel use. Don explained both AVL cabinet and the meter are used and are accurate. Each Cell's logbook has a shift log and every shift they read the meter and log the usage. They zero the meters weekly. During the prior inspection I was told as a precaution the operators also take a screen shot of the ending values at the end of each shift.

Manifold catalysts are referred to as "mani-cats". It can still be removed and replaced per notes from my last inspection. I inquired about mani-cats versus catalyst in exhaust pipe. Don said 4 cylinders have mani-cats. V-6 will have two, one on each side.

FG-DYNOS conditions state the tested engines must be equipped and maintained with a catalytic converter when operating in "controlled mode". Permit condition requires that each dynamometer be equipped with a fuel usage monitor capable of separately tracking fuel usage for engine testing in controlled and uncontrolled mode where WOT is considered uncontrolled. This was verified by observing the fuel monitor and recordkeeping was obtained. FG-DYNOS requires records of days of operation, type of test performed, and length of test performed daily, quantity of fuel combusted in controlled and uncontrolled modes.

ROOF/STACKS AND UST/AST

During the inspection we observed the Emergency generator (EU-EMERGEN) located outside on a portion of the roof. We also conducted a partial roof inspection and observed numerous stacks however we were not able to determine the associated process with the stack. I requested that Shawn review their stacks and provide me with a diagram of the stacks identified with the Chassis, Dynos, and Boilers. It was also suggested that labeling may be helpful.

During the inspection Shawn, Stephanie and I also went outside behind the facility to observe the areas where the underground and above ground fuel storage tanks are located. The predominant fuel used/stored is gasoline. Some diesel is now being used for testing and is used by fleet vehicles. The area appeared to be well maintained. I did not observe anything unusual.

Prior to this inspection I was aware of two other fuel storage/use containers being reported and were part of recordkeeping but were not included in the ROP under FG-UST and FG-GASDISPGACT. These are: DieselAST2 – small above ground diesel tank, and Chassis Barrel Fuel – fuel in barrels used to directly fuel complete vehicles during chassis testing. The tanks appear to qualify under Rule 284 (g) (ii). HATCI is now operating two 1000-gallon fuel dispensing tanks; one gasoline and one diesel.

FG-UST#2-3-4, #5-6, #7 Underground Storage Tanks (UST)

HATCI's primary tanks are the USTs. Primarily gasoline fuel is used for fleet vehicles, Chassis testing, and all Engine Test Cell Dynos. Shawn said they are tracking all fuel usage by fuel additions made. This is important for the FG-GASDISPGACT.

FG-GASDISPGACT: EU-UST1, EU-UST#2-3-4, #5-6, #7, and EU-GASAST1

HATCI flexible group includes existing and new/reconstructed GDFs located at an area HAP source that have maximum monthly gasoline throughput of one of the following: 1.) Less than 10,000 gallons, 2.) At least 10,000 gallons and no more than 100,000 gallons. The applicable regulation is 40 CFR 60 Subpart CCCCCC (or (6) C). The regulation requires VOC minimization measures during handling/load/unload. Records of monthly throughput are required. Barr Engineering provided requested information related to compliance. "HATCI average monthly throughput was higher than 10,000 gallons per month in 2014 – 2016, and therefore HATCI began complying with the > 10,000 gallon but less than < 100,000 gallon requirements in the ROP, as they have submerged loading on their storage tanks." August 2018 to July 2019 the 12-month rolling total throughput was 97,281 gallons and the average monthly throughput was 8,107.15 gallons. HATCI records indicate compliance.

FG-NSPS SI-ICE: EU-EMERGEN

HATCI currently has one Generac natural gas emergency generator located outdoors on a balcony type roof. This RICE is subject to NSPS Subpart JJJJ and was demonstrated to meet the manufacturer emission certification during the ROP Technical review. HATCI is required to follow recommended maintenance to maintain certification. It is set to automatically run one hour per week for testing. Its purpose is to keep HATCI Michigan & California computer servers operating. A non-resettable hour meter is required, and it is allowed a maximum of 100 hours per calendar year for maintenance/readiness testing. Per Shawn there were no power outages the past year. HATCI records indicate compliance.

FG-FACILITY RECORDKEEPING REVIEW:

Recordkeeping is required monthly including: the days of operation; the load the engine was tested for natural gas testing (condition limits loads to no greater than 90 percent); gallons fuel usage controlled/uncontrolled; natural gas use; monthly & 12 month rolling emission calculations (NOx, CO, 1,3-Butadiene, Benzene); average daily fuel use based on monthly fuel use divided by the number of days operated during the month; daily 1,3-Butadiene emission calculations based on monthly emissions divided by number of day operated during the month; and a record of maximum sulfur content in the diesel fuel for each delivery. HATCI is currently using Barr Engineering Consultants to assist with their record keeping.

HATCI CO emissions for the 12-month rolling period ending July 2019 = 91.48 tons CO. This is **Compliant** with limit of 224 tons per year.

HATCI NOx emissions for the 12-month rolling period ending July 2019 = 3.94 tons NOx. This is **Compliant** with limit of 15 tons per year.

HATCI Benzene emissions for the 12-month rolling period ending July 2019 = 0.07 tons Benzene. This is **Compliant** with limit of 0.263 tons per year.

HATCI 1,3-Butadiene emissions are limited to 5.232 pounds per day (lbs/day). HATCI records show a monthly total and this is divided by the total operating days in the month to obtain the daily average pounds for each month. In July 2019 operated 18 days and monthly emissions = 4.82E-03 1,3-Butadiene. Daily Average emissions in lbs/day = 2.68E-04. This is **Compliant** with 5.232 lbs/day 1,3-Butadiene emission limit.

HATCI 1,3-Butadiene emissions for the 12-month rolling period ending July 2019 = 0.03935 tons 1,3-Butadiene. This is **Compliant** with limit of 0.109 tons per year.

Fuel Use is reported as gasoline only (during this 12-month period no diesel or natural gas was burned in Engine or Chassis Dynos) and is the Sum of UST2-7 (gallons per month). As of month, ending July 2019, 12-month rolling was: 38,997.53 gallons. This is **Compliant** with 230,000 gallon per year limit.

FG-DYNOS **controlled fuel use**: 220.35 gal/mo for July 2019. FG-DYNOS **uncontrolled fuel use**: 4476.00 gal/mo for July 2019. FG-CHASSIS fuel usage: 202.70 gal/mo for July 2019.

HATCI records indicate the 12-month rolling **combined fuel use** for ALL DYNOS month ending July 2019 = **40,243 gallons gasoline**. This is compliant with permit limit of **230,000 gallons** per 12-month rolling time period as determined at the end of each calendar month.

Of the 230,000 gallons HATCI is not to burn more than a total of **75,000 gallons of uncontrolled fuel** per 12-month rolling time period. HATCI records indicate the 12-month rolling uncontrolled fuel use for month ending July 2019 = **29,192 gallons gasoline**. This is compliant with the limit.

NOTE: Records include separately the small quantity of Diesel fuel that is burned in the Fire Pump and Emergency Generator. Also includes, the small amount of Natural Gas that is burned in other combustion equipment such as boilers and heaters.

CLOSING CONFERENCE

I gave Shawn some Environmental Assistance developed cold cleaner Orange Stickers that include the applicable administrative rules from Part 6 and 7. I indicated that the facility appeared to be in compliance with the conditions of their ROP and applicable regulations, however it is necessary that I review all the required recordkeeping prior to making this determination. Also, the plant diagram / information for the stacks associated with ROP is requested. HATCI was also advised to review/evaluate the Chassis Cell change for permit applicability prior to making the change. Shawn stated he will email the recordkeeping spreadsheet and plant diagram to me soon. If either of us have any questions we agreed to contact each other. I informed Shawn that a formal inspection report will be prepared and an email with a copy will be sent to him.

COMPLIANCE SUMMARY

On August 21, 2019, I received HATCI's complete record keeping spreadsheet for the period January 2018 through July 2019. This was emailed from consultant Barr Engineering, Rose E. Waypa, PE Chemical Engineer. HATCI Air Records Master.xlsx print out is attached to this report to be placed in AQD files. The plant stack diagram should be received in September 2019. Shawn also submitted a statement regarding the Chassis Cell change: "As for the Chassis cell 1 project, it's really an upgrade and not an expansion. It's basically replacing the 2-wheeler dyno with a 4-wheeler dyno and will not provide significant additional test capability for the lab as a whole."

The AQD has determined based on the inspection and information received that HATCI is in substantial compliance with the federal and state applicable requirements of their current ROP and with the applicable exemptions. Related records and correspondence are attached to the report to file.

NAME



DATE

9/5/19

SUPERVISOR

