

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

N254758313

FACILITY: Woodward FST		SRN / ID: N2547
LOCATION: 700 N. CENTENNIAL AVE, ZEELAND		DISTRICT: Grand Rapids
CITY: ZEELAND		COUNTY: OTTAWA
CONTACT: Jonathan Eslick , EHS Specialist		ACTIVITY DATE: 06/02/2021
STAFF: Chris Robinson	COMPLIANCE STATUS: Compliance	SOURCE CLASS: SM OPT OUT
SUBJECT: FY'21 inspection to determine the facility's compliance status with PTI No. 279-99 PTI No. 50-19 and any other applicable air quality rules and regulations.		
RESOLVED COMPLAINTS:		

The purpose of this report is to document findings of an onsite inspection for Woodward FST (Woodward, SRN N2547 located at 700 Centennial Avenue in Zeeland, Michigan. The inspection was conducted by AQD staff Chris Robinson (CR) on June 2, 2021 to determine the facility's compliance status with the requirements of the federal Clean Air Act; Part 55 (Michigan's Air Pollution Control Rules) of Act 451 (Natural Resources and Environmental Protection Act (NREPA)); and the requirements established in Permit to Install (PTI) No. 279-99 and PTI No. 50-19.

Due to the Covid19 pandemic and to ensure proper staff were onsite CR contacted John Eslick, Woodward's EHS Specialist on June 1, 2021 and scheduled the inspection. CR met with both Mr. Eslick and Ms. Rachael Underwood, the facility's environmental consultant on June 2, 2021. Proper PPE and social distancing were maintained throughout the entire inspection.

The Weather conditions on June 2, 2021 were approximately 70oF, cloudy with south-southeast winds at approximately 3 mph (www.weatherunderground.com).

A) Facility & Process Description

Woodward FST (Woodward, SRN N2547) is an aerospace manufacturer that specializes in manufacturing and testing of fuel nozzles.

Nozzle components are shipped to Woodward for assembly. Although very minimal, some fabrication/modification to the received nozzles are conducted by Woodward in order to meet customer requirements. Each nozzle assembly is processed slightly different, but each go through similar steps to completion. The first step is parts assembly. Parts are received in cases as individual kits which contain most or all of the parts necessary to fully assemble the fuel nozzle. Some of the parts may require light machining prior to assembly. Once assembled, the parts are then brazed or TIG welded together then pressure tested with nitrogen and a pressure gauge to check for leaks. There are approximately 12 pressure testing stations at this facility. After the nozzle is pressure tested it is then placed into a testing chamber which is a quality control test used to assure that the nozzles can achieve proper fuel spray patterns. There are 40 testing chambers and multiple types that allow them to analyze different aspects of the fuel spray pattern. The emissions from this process are primarily caused by the venting of volatilized droplets generated during the spraying of the fuel.

After the parts are tested with calibration fluid they are dried in a parts dryer. The parts dryer blows indoor air (shop air) across the part which evaporates any remaining calibration liquid. Combined, these processes are the major contributors to the facility's VOC emissions.

The third process at the facility was the chrome plasma coating operation. This process is used to apply a very thin coating (microns thick) on the wearing portion of moving aircraft parts. Woodward achieves this by heating gases to a greatly elevated temperature and then they spray powdered chrome through the heated air. When the chrome passes through the heat it temporarily liquefies the chrome powder. This molten chrome is then deposited on the part where it solidifies. This process is used, as opposed to chrome plating because it allows for a significantly more precise coating.

Compliance Evaluation

1) PTI No. 279-99

EUFUELTEST

EUFUELTEST which are the fuel test stands are limited to a combined VOC emission limit of 95 tpy (Special Condition (SC) 1) and a test fuel usage limit of 29,818 gallons. Woodward tracks its VOC emissions with a mass-based system. In order to calculate their emissions, the facility uses how much fuel is purchased, accounts for the reclaimed waste from their capture system and assumes what is not recaptured is emitted as a VOC. Based on the records provided during the onsite inspection the maximum 12-month rolling total for the time period of January 2020 through May 2021 was 70.35 tons April 2020 and the maximum 12-month rolling fuel usage was 21,902 gallons in April 2020.

EUPLASMA

EUPASMA which is one of the two (2) plasma spraying processes is limited, annually, under this PTI to a VOC emission rate of no more than 1,450 pounds (SC 3); 2,600 pounds of Chromium Carbide powder (SC 7); and a 220-gallon anhydrol use (SC 8), all of which are based on a rolling 12-month time period. Based on the records provided the maximum 12-month rolling VOC emission rate and anhydrol usage were both zero in 2020 and thus far in 2021 since the facility is no longer using the anhydrol. The maximum 12-month rolling Chromium Carbide powder usage was 290 pounds in January 2020, which is well below the permitted limit.

Particulate Matter (PM) is limited to a continuous emission limit of 0.10 pounds per 1,000 pounds of exhaust gasses and an annual limit of 3.9 pounds. The facility uses manufacturer data that suggests that the dust collector has a 99% control efficiency. Based on the emission records provided the annual total for 2020 was 0.28 tons, which is under the permitted limit. Maintenance is conducted as needed to ensure proper operations. Filters are changed based on a schedule as well as on differential pressure gauge readings. The differential pressure gauge was reading approximately 1" w.c. and per the operator 4" w.c. would indicate an issue requiring a filter change.

FGFACILITY

FG-FACILITY restricts facility-wide emissions of Hazardous Air Pollutants (HAPs) to below title V thresholds to 9 tpy for any individual HAP and 22 tpy for total combined HAPs emitted (SC 9); 98.0 tpy for VOCs (SC 10); and 14.9 tpy for Particulate Matter (PM10, SC11). All of these emission limits are totals based on 12-month rolling time period. Special Condition No. 12 requires record keeping, which was provided for the time period of January 2020 through May 2021. Records are attached. Per these records the facility rolling totals appeared to be all well within limits and the maximum 12-month rolling totals were 0.93 tons for total combined HAPs in September 2020,

76.22 tons of VOCs in April 2020 and 2.16 tons of PM every month. The total combined HAP emissions are less than the PTI limit for any individual HAP therefore the combined emissions are being considered to demonstrate compliance with the 9 tpy individual limit. The facility does track HAPs individually.

2) PTI No. 50-19

EUPLASMA2

EUPLASMA2 is the 2nd plasma spraying unit which was installed in 2020 and is permitted to use a molten nickel alloy powder, which is different than what EUPLASMA is permitted to use. This unit is currently not being operated much at all. It was installed to allow the facility the ability to make repairs on components that have already been coated and to eventually replace EUPLASMA permitted under PTI 279-99. EUPLASMA2 is capable of coating with both the nickel alloy and chromium carbide and the facility would like the flexibility to do so once EUPLASMA is retired. CR informed Mr. Eslick and Ms. Underwood that in order to have that flexibility a permit modification would be necessary. Mr. Eslick noted that an emission limit increase would not be needed. CR explained that since both plasma coaters are covered by separate permits PTI 50-19 cannot share the chromium carbide material limit specified in 279-99. It would either need its own chromium carbide material limit or be combined in a flexible group under one PTI with EUPLASMA.

Particulate Matter emissions from this emission unit are controlled by a baghouse which, per Mr. Eslick, is always operated when EUPLASMA is operating. Routine maintenance is performed on the baghouse to keep it in good operating condition. Filters are replaced based on a schedule as well as if/when differential pressure exceeds 4" w.c. This gauge is required to be installed per SC IV.1. The baghouse was not operating at the time of the inspection. Special Conditions III.1,2, & 4 pertain to the baghouse. It is installed and appears to be operated and maintained in a satisfactory manner per III.1. Therefore, it is expected to be operating at 99% efficiency as required per SC III.2. The collected air contaminants are containerized and disposed as necessary per SC III.4. All waste material is kept in closed containers as required by SC III.4. All were closed at the time of the inspection.

Chemical compositions are being maintained through use of Safety data sheets as allowed by SC VI.1. Baghouse pressure drop is monitored continuously by a differential pressure gauge which are being manually recorded at least once per week. These records were reviewed onsite.

Nickel alloy powder usage is limited to 100 pounds per year per SC III.1 and usage is being tracked. However, it is being tracked combined with the chromium carbide usage used in EUPLASMA therefore based current usage records the facility is unable to determine how much nickel alloy powder is being used in EUPLASMA2. EUPLASMA2 was installed in 2019 and according to the facility one five (5) pounds of nickel alloy powder has been purchased for it. This is in compliance with the usage limit, but the facility will need to modify current records to track it individually.

3) Rule 201 permitting exemptions

Woodward also has two (2) test cells for testing various conditions and operating parameters of components of jet engines. Fumes are vented to the outside air but must first pass through a baffle system which knocks down any fuel spray allowing some of it to be recaptured. Woodward has estimated in the past that the baffle system limits fuel emissions to 30%. As a condition of the

permit, Woodward tracks the material throughput of the exempt processes. This process has been evaluated in the past and appeared to be for research only. None of the components tested were being sold. Therefore, the process appears to be exempt from Rule 201 permitting requirements per Rule 283(2)(a).

A small emergency generator is installed at the facility. Based on tags inside the cabinet the generator appears to have been manufactured in approximately 2004. Since the information did not come from build tags, which were not located, the exact date is unknown as is the engines HP rating. Since it was constructed prior to June 6, 2006, located at a non-major source for Hazardous Air Pollutants (HAPs) and Woodward is not considered to be a residential, commercial, or institutional facility this generator appears to subject to the National Emission Standards for Hazardous Air Pollutants (NESHAP) for Stationary Reciprocating Internal Combustion Engines promulgated in 40 CFR Part 63, Subpart ZZZZ (RICE MACT). The AQD does not have delegation of authority for this MACT. Therefore, compliance with these requirements was not determined. Since the exact order date and HP rating is unknown several options were looked at in order to determine if the emergency generator is subject to the New Source Performance Standards (NSPS) for Stationary Spark Ignition Internal Combustion Engines as promulgated under 40 CFR Part 60 Subpart JJJ. Since it was not manufactured after January 1, 2009, July 1, 2008 and not modified since it was installed, the emergency generator does not appear to be subject to the NSPS. Lastly, although the exact HP rating of the engine is unknown the physical size of the unit indicates that it would most likely be exempt from Rule 201 permitting requirements per Rule 285(2)(g) for internal combustion engines with a maximum heat input of 10,000,000 Btu/hour.

4) MAERS

The facility's 2020 emissions data submitted to MAERS in 2021 was reviewed by the AQD on March 10, 2021. No changes were made to the database as submitted. However, EUWELD and EUVAPORATOR, which are specifically called out in PTI 279-99 were not reported. With the new fee structure and reporting criteria all emission units specifically identified in a permit must be reported. CR discussed this with Mr. Eslick and Ms. Underwood, and this will be corrected going forward. Source-wide information reported by the facility is summarized in the table below.

Pollutant	Amount (tons)
CO	0.01
NOx	0.01
PM10	0.71
PM2.5	0.0001
SO2	0.001
VOC	67.39

B) Compliance Determination

Based on a review of this facility's records and observations and discussions made during the onsite portion of this inspection, Woodward FST appears to be in compliance with applicable air quality rules and regulations including the requirements established in PTI No. 279-99 and PTI No. 50-19.

NAME 

DATE 6/14/2021

SUPERVISOR 