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

B419773609				
FACILITY: AAR Mobility Systems		SRN / ID: B4197		
LOCATION: 201 Haynes St., CADILLAC		DISTRICT: Cadillac		
CITY: CADILLAC		COUNTY: WEXFORD		
CONTACT: Greg Shay ,		ACTIVITY DATE: 08/01/2024		
STAFF: Lindsey Wells	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MAJOR		
SUBJECT: on-site inspection portion of FY24 FCE, records review will be addressed in a separate report dated 8/29/24 -LW;				
RESOLVED COMPLAINTS:				

On Thursday August 1, 2024, Lindsey Wells and Shane Nixon mobilized to the AAR Mobility Systems (herein after referred to as AAR Haynes) located at 201 Haynes Street, Cadillac, Wexford County, MI. The purpose of the site visit was to conduct a site inspection as part of a full compliance evaluation (FCE) for the 2024 fiscal year (FY).

The referenced facility is classified as a major source and is permitted under Renewable Operating Permit (ROP) number MI-ROP-B4197-2016c. District records indicate an ROP renewal application for the facility was received March 21, 2021. The permit shield was issued on April 2, 2021. Staff met with Greg Shay, Environmental Manager, AAR mobility systems.

Summary: No items of non-compliance were readily apparent during the on-site inspection on 8/1/24. Based on staff observations during the 8/1/24 on-site inspection, the facility operates in general conformance with MI-ROP-B4197-2016c.

Records review will be addressed in a separate report. Note also that information from previous inspection reports such as permits, plans, and installations of record, as well as regulatory summaries has been carried forward into this report for staff reference.

On-Site Inspection:

Process overview:

AAR is a manufacturer of palletized systems, mobility-rapid deployment equipment, and mobile tactical shelters used by the military. In addition to manufacturing new products, AAR also rebuilds/reconditions pallets.

Facility records are maintained using an Automated Chemical Information Management System (ACIMS).

Products are reported to be composed of various combinations of aluminum, balsawood, and fiberglass. Manufacturing processes use a combination of hand application and computer numerical controlled (CNC) equipment. Onsite activities include woodworking, metal preparation and machining, adhesive coating application, gluing, paint coating application and assembly. The Facility purchases extruded aluminum to process onsite. Coatings and associated additives, cleaners and solvents are limited in number.

Operators utilize hardcopy log sheets located in each work area to record differential pressure of coating booths, filter changeouts, and coating usage. Relevant permit requirements are included on the sheets and booth operators receive training on permit requirements. All solvent cleanup operations take place in the booths.

Balsa Core Process Flow

What is referred to as the pallet line consists of two emission units (EUs), EUBALSACORE and EUSKINORRAIL. These units are included in the flexible group FGCOATINGS within the facility's ROP.

In the EUBALSACORE process, FM47 adhesive coating is applied to tops and bottoms of balsa wood core panels (cut to size in EUWOODROOM) using automated spray nozzle and dip roller application. Process components include a panel core duster which removes dust from the core prior to adhesive application, 48-inch glue spreader which applies adhesive to both the top and bottom surface of the panel using dip rollers, edge adhesive spray chamber which sprays adhesive onto the panel edges, infrared pass-thru oven which cures the adhesive, (maximum temperature of 400 degrees Fahrenheit (F)), and cool down booth, after which the panels are unloaded and sorted into stacks of 30 cores. The stacks are then transported to the assembly area to be incorporated into pallet frames.

Balsa Core Emissions Control and Material Usage

The balsacore process has an emission capture system and the spray booth and oven operate as a Permanent Total Enclosure (PTE). Captured emissions of volatile organic compounds (VOC) and hazardous air pollutants (HAPs, primarily toluene) are routed to the facility's Regenerative Thermal Oxidizer (RTO) for control.

The process also includes a CNC router for sizing panels which is operated only when there is insufficient staff in EUWOODROOM. At the time of report preparation the equipment does not appear to be in a ready condition, and is reported as not being used.

Note that particulate emissions collected from the panel core duster are directed to the existing wood room baghouse associated with EUWOODROOM.

The operator logs the number of stacks on a daily production sheet. The adhesive is stored in the FM47 glue pump house. The operator records per shift adhesive usage in gallons on a usage log sheet. A gallon pail is used to measure adhesive for one application and a stick scale check can be used for the 55 gallon barrels. The usage logs remain in the work area and are collected by Greg at the beginning of each new month. As a quality check, what is referred to as a coupon can be compared to the coated component to confirm that the thickness of adhesive coating conforms to specifications. The coupon is a reference card with the target thickness of adhesive coating applied. The balsa cores are of a standard size so the target coating thickness and balsa core surface area can be used to check the adhesive usage.

RTO control is required in order for EUBALSACORE to operate. The balsa core coating booths are equipped with an audible alarm and colored light set near the operator's station to alert operators as to the operational status of the RTO. The red light is illuminated once the RTO temperature drops to 1450 F with the intent that the operator can pause production prior to the temperature dropping below the required minimum in the permit. EUBALSACORE also has a cold cleaner for daily cleaning of the glue rollers with scrapers. The cold cleaner will be discussed in the FGCOLDCLEANERS paragraph.

The balsa core spray booth was visibly equipped with filters, operating, and pressure drop gauge read -0.007 during the inspection. The operator indicated that the booth filters are changed daily.

EUSKINORRAIL Process Flow

EUSKINORRAIL is an automated booth system referred to as the SARGS (skin and rail glue system) booth where adhesive is applied to aluminum skins and/or side rails within an automatic spray booth, enclosed transfer conveyor, infrared oven, and cool down booth. The FM47 adhesive used on this line is heated (to a constant 85 degrees F) with a small heater and continously cycled in a sealed 55-gallon drum, which eliminates the need for purging and reduces use of thinners. The operator feeds the component into the entrance of the machine where it is conveyed to the spray booth. Once sprayed, cured, and cooled, the components are stacked and transported to the assembly area to be assembled onto balsa cores for pallet frames.

EUSKINORRAIL Emissions Control and Material Usage

This process has an emission capture system (does not include the cool down booth) and operates as a PTE. This EU is included in FGCOATINGS and requires RTO control in order to operate. Toluene is reported to be the main HAP. If the RTO temperature drops below 1450 F, the audible alarm activates and the booth is shutdown. Previous reports indicate the component in the booth will be completed prior to shutdown.

Located on the door of the booth is an adhesive usage reference chart which details that 10 skins uses 3.75 gallons, 10 long rails uses 0.12 gallons, and 10 short rails uses 0.10 gallons. The booth operator records the number and types of components on a production log (generally only one type is produced at a time) and uses the reference chart to calculate adhesive usage. Each shift, operators record booth pressure drops, filter changes, and the operational status of the RTO and booth fans. At the time of inspection the facility reports that the EUSKINORRAIL process no longer has a dedicated cold cleaner.

At the time of inspection the booth was operating, visually equipped with filters, and pressure drops were noted as -0.01 for the spray booth and -0.035 for the oven.

FGPARTICULATES

EUWOODROOM Process Flow

Previously reported to have been installed in 1979, EUWOODROOM contains several woodcutting machines including both a horizontal and vertical band saws, straight line rip saw and belt sanders used to size balsa wood panels for pallet frames.

EUWOODROOM Emissions Control & Material Usage

The permit requires dust collector control, specifically a baghouse, for EUWOODROOM to operate. The saws exhaust into the baghouse (located outside) via exhaust pickup lines located at individual saw stations. Historically the baghouse could return clean air into the plant but it is no longer connected this way due to a previous fire. A dumpster is located near the baghouse for disposal of collected material. At the time of the inspection the pressure drop gauge read -2.5" on

the baghouse. The facility utilizes a conversion from tons of dust disposed to the number of boards processed to calculate emissions and reports that this correlates well with stack testing data.

EULMS Process Flow

This process is located within the LMS building on the eastern portion of the property between the main plant and the lakeside building. EULMS is associated with the construction of Light Mobility Shelters (LMS) and uses a CNC router and saw to produce metal parts (panels) from aluminum, as well as trimming of skins and cutting out sections for doorways, etc. The facility claims exemption from permitting for the friction welding portion of the LMS process.

EULMS Emissions Control

Per the ROP, particulate (PM) emissions are captured using dust collector control, specifically a cyclone baghouse. The facility previously reported that a baghouse was present at one time but was removed years ago. Currently only a cyclone is used to capture the metallic particulate. Stack testing conducted on October 19-22, 2021 verified that PM emissions post cyclone are below emission limits.

The operators record the vacuum of the collector during operating days (note that the equipment does not operate every day). Operators also confirm the absence of visible emissions (VE) and the operational status of the collector fan. The facility reports that emission can be calculated by application of a control efficiency and gallons of shavings collected for recycling.

The stack associated with the cyclone (also referred to as the metal chip collector) SVCYLONE is previously reported to be 10 feet high, and 8-inches in diameter.

EU197LINE and EU197LINENOCTRL Process Flow

These EUs correspond to a single coating line that operates under an RTO controlled scenario, and an uncontrolled scenario, respectively. The equipment consists of one dry filter paint booth with two manual applicators and one oven that was reported to have been installed in 1994. Because the paint booth and oven are separated the EUs (EU197LINE and EU197LINENOCTRL) are not PTEs. Both units have emission capture systems to direct collected emissions to the RTO when applicable. The new LineX coating activities occur in the EU197LINE dry filter paint booth. The LineX material will be further addressed in the records review report.

EU197LINE and EU197LINENOCTRL Emissions and Material Usage

EU197LINENOCTRL was permitted to utilize a coating containing P-chlorobenzo trifluoride (PCBTF) (CAS # 98-56-6). RTO destruction of PCBTF is reported to result in the generation of dioxins, etal. The Facility reports that at the time of the site inspection PCBTF coatings are limited to zinc coating and some of the CARC coatings.

Per the ROP, EU197LINENOCTRL is limited to coatings containing less than 2.8 pounds VOC per gallon (lb/gal). The permit restricts use of the RTO to coatings that do not contain PCBTF.

Operators record the usage associated with each coating activity on a log sheet that is located in the work area. At the time of the on-site inspection, no coating activities were occurring in the booth. The facility recently installed an in-line static pressure/flow monitor in the ductwork between the EU197LINE and the RTO which will be used to demonstrate compliance with what is commonly called the metal parts coating MACT (40 CFR 63 Subpart MMMM Maximum Achievable Control Technology Standards for Surface Coating of Miscellaneous Metal Parts). The MACT requires that ductwork be maintained at the minimum flow rate observed during capture efficiency testing for capture systems that do not meet the minimum design criteria required to claim 100% capture efficiency.

EU197LINENOCTRL was reported to have previously been evaluated for coating of pallet rings under the exemption Rule 287(2)(c). The Facility reports that based on discussions with consultants and AQD staff it was determined that pallet rings coating with a zinc-coating would require permitting (PTI 163-07D).

No coating activities were taking place in either of the 197 booths during the on-site inspection on 8/1/24. The booths are equipped with differential pressure gauges and filters were visibly installed.

EUCONTAINERLINE and EUCONTNRNOCTRL Process Flow

These EUs correspond to a single coating line that operates under an RTO controlled scenario, and an uncontrolled scenario, respectively. EUCONTAINERLINE is a continuous coating line consisting of one prime filter paint booth (with two manual applicators), one dry filter paint booth (with two manual applicators), and a steam heated oven. Because the equipment is configured in a continuous and connected line with emission capture control, EUCONTAINERLINE is considered a PTE.

EUCONTAINERLINE vents VOC emissions to the RTO prior to exhausting to the outer atmosphere. Emissions for coatings containing greater than 3.5 lb VOC/gallons as applied, minus water are vented to the RTO for destruction. The

facility previously reported that the referenced coating VOC content were associated with a proposed product line that did not go into production. The equipment is presently operated with the RTO bypassed. The Facility reports it has operated in bypass since 2019.

The ROP conditions for EUCONTAINERLINE are limited to those found in FGCOATINGS and FGMACT.

The process EUCONTNRNOCTRL bypasses the RTO and is limited to conditions when coatings contain PCBTF which cannot be vented to the RTO and/or when VOC content for coatings is \leq 3.5 lb/gallon as applied, less water. Currently, the line is used primarily for applying chemical resistant coatings (AKA CARC Coatings) which meet the material limits. The facility reports that alcohol is the cleanup solvent associated with EUCONTAINERLINE.

No coating activities were taking place in the container line booth during the on-site inspection on 8/1/24. The containerline booths are equipped with differential pressure gauges and filters were visibly installed.

EUGRIND/PAINT Process Flow

This process is located within the lakeside building and is previously reported to be installed in 1966. No PTIs are associated with this EU. Used pallets are dismantled and reusable aluminum components recycled/reused to construct new pallets. Once dismantled, the balsa core is ground/chipped onsite to be transported offsite for fuel. Wood cores unable to be recycled into new frames or burned as fuel are reported to properly be disposed of at the landfill. Emissions are released into the in-plant environment.

Old adhesive is removed from the aluminum components to be recycled/reused using a hand grinder. FM47 adhesive solvent is applied by hand to the aluminum pallet frame prior to transport to the main building for assembly. Similar to the SARGS booth of EUSKINORRAIL, the adhesive use is calculated based on the number of rails coated. The number of rails coated can be determined from production logs that record the number of refurbished pallets.

In 2015 and 2022, the Facility reported approximately 70-80 percent of the panels were made from recycled panel parts.

Regenerative Thermal Oxidizer (RTO)

The RTO is the control device for VOC and HAP emissions for the various coating processes. Destruction efficiency is verified by stack testing every five years. RTO parameters (minimum operating temperature) to demonstrate continued compliance with permit requirements for 40 CFR Part 63 Subpart MMMM and the CAM Rule are determined during these stack tests.

Previous reports indicate that there are three calibrated thermocouples in the RTO destruction chamber to monitor temperature. Inspections and calibrations are conducted quarterly (at minimum) during downtime by Pyromation. The Facility uses a computerized maintenance management system (CMMS) to schedule regular maintenance activities. Quarterly events are done when unscheduled downtime or when the RTO temperature graph indicates that a probe is not reading correctly.

At the time of the inspection the RTO control panel read 1571F. Previously only a circular strip chart was available for continuous temperature recording. Sometime in 2023, the facility upgraded to electronic RTO temperature recording in part to have the ability to record 3 hour rolling average temperatures required by the metal parts coatings rule (40 CFR 63 MMMM). The facility also reported at the time of inspection that from January 2023 – April 2023, the facility did not construct pallets and did not operate the RTO. During this time, only coatings that do not require RTO control were applied.

Miscellaneous Equipment and Activities

The permit requires that at all times unless operator access is needed, containers of coatings and solvents remain closed. No unattended, open containers were observed during the 8/1/24 inspection.

FGCOLDCLEANERS

The facility's ROP Renewal Application included the following cold cleaners in use at the facility. At the time of the 8/1/24 inspection, the facility reports no new solvents are in use.

Cold Cleaner	Solvent	EU/Activity
#1	Denatured Alcohol	EUCONTAINERLINE
#2	Methyl N-Amyl Ketone	
	(MAK)	
#3	FM47 thinner	EUSKINORRAIL
#4	FM47 thinner	EUGRIND/PAINT
#5	Tertiary Butyl Acetate (TBA)	CARC Coatings
		(EUCONTNRNOCTRL)
#6	Mineral Spirits	

EU500HPBOILER

This EU consists of a Natural Gas (NG) -fired boiler for building heat. The unit was installed in 2007 and is rated at 20.9 MMBtu/Hr heat input. No pollution control equipment is associated with the EU.

Note that a second identical unit from a sister plant located out of state has been relocated onsite, but at the time of the 8/1/24 inspection the unit is not hooked up for operation and is used for parts. The facility reports to perform annual tune-ups which will be evaluated in records review.

EUAIRSTRIPPER

This EU consists of a packed scrubber tower used to strip VOCs from the groundwater pumped from the aquifer located beneath the plant. The EU was installed in 1988 under a consent decree for cleanup of chemicals associated with a bath and etching process operated by a previous owner. The PTI associated with the air stripper is 100-84.

Facility staff previously reported that in 2014, contaminant levels associated with the site had reached levels in which the stripper was no longer required but the facility continued operating the air stripper until 2023. When operational, water samples from the influent and effluent of the air stripper were analyzed by a third party laboratory and were used to calculate emissions. In December 2023 the facility contacted AQD staff for guidance on removin the equipment from the ROP. Staff confirmed with EGLE's remediation and redevelopment division (RRD) that the facility is no longer required to operate EUAIRSTRIPPER and communicated that once the equipment has been removed or rendered inoperable the facility can submit the required permit modification forms which can be incorporated into the renewal package.

New LineX Coating

The facility contacted AQD for clarification on requirements with regard to the use of this new coating material on 5/15/2024. This is a two-part coating, that once mixed (one to one) using dedicated equipment that controls pressure and temperature, are applied from the spray gun as a 100% solid material. The material is currently applied in the EU197NOCTRL coating line. Staff recommended engaging a consultant to perform a meaningful change analysis. At the time of the 8/1/24 site inspection, the facility will include email communication from permit section in submitted records. The use of LineX coating will be further evaluated and addressed in a separate report.

Bead Blaster Equipment

The bead blaster on-site is not currently in use. It is previously reported to have been installed since 2015. This equipment was for the AM2 matting process, which did not go into production after initial trials. The facility claimed exemption from permitting in the ROP renewal process received in 2021.

P2 Etch Equipment

Also on site is what is called the P2-Etch process in which aluminum components are treated in a sulfuric acid bath, three rinse baths and a dryer. The first rinse is treated in a batch treatment system using sodium hydroxide neutralizer. Previous inspection reports indicate the Facility is in possession of correspondence dated May 14, 2000, confirming eligibility under the referenced exemption.

Touch-up coatings

The most recent inspection report from 6/15/2022 notes paint touch-ups on shelters are reported to be done using "Preval" applicators. Per Rule 287(2)(b) they need to be no greater than 8 ounces each. Rule 285(2)(hh) exempts hand held aerosol cans from Rule 201 permitting. At the time of 8/1/24 report preparation, the Facility indicated that preval application recordkeeping was implemented but has not been consistently maintained. They report that the prevals are filled with coating from the same lot at the corresponding line, and that the coating volume provided for prevals has been accounted for as part of the use for the line for that shift.

Facility Applied Exemptions

Previous reports indicate the facility applies exemptions from Rule 201 permitting to the following equipment:

- Woodworking and metal working equipment in machine shop (Main Building) under R 285(2)(I)(A) and/or (B)
- Bead blaster under R 285(2)(I)(vi)(C)*
- Cold Cleaners under R 281 (2)(h)
- Touch-Up Paints under R 287(2)(b) using Preval applicators or R285(2)(hh) for hand held aerosol cans
- Small coating projects (<200 gallon as applied, minus water/day) R 287 (2)(c) refer to FG287.
- P2 Etch Process Wash booth (open tanks in enclosed rooms) under R 285(2)(r))

Other Equipment

Fuel source for the facility is reported to be Natural Gas (NG). No emergency generators exist onsite. Compressors for the facility are reported to be electric. Office space is reported to use HVAC units to control temperatures

Regulatory Summary

AAR has been determined to have the potential to emit over 100 tons per year of the following criteria pollutants and is a major source of Volatile Organic Compounds (VOCs) and Particulate Matter (PM).

The following EUs are subject to Federal Standards:					
EMISSION UNIT	40 CFR SUBPART	TITLE			
EU500HPBOILER	Part 63, Subpart A DDDDD	and MACT for NESHAP for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters (BOILER MACT)			
EU197LINE EU197LINENOCTRL EUCONTAINERLINE EUCONTNRNOCTRL EUBALSACORE EUSKINORRAIL EUCLEANUP	Part 63, Subpart A MMMM	and NESHAP for Surface Coating of Misc. Metal Parts and Products			

In addition to the previously identified Federal regulations, the AAR Facility has multiple units subject to Compliance Assurance Monitoring (CAM) under 40 CFR Part 64. In the case of the AAR Facility, proper operation of the RTO under Subpart MMMM is considered presumptively acceptable monitoring in lieu of CAM. The two remaining EUs (EUWOODROOM and EUBALSACORE) are subject to CAM for PM emissions and have a CAM Plan (January 13, 2011) associated with them.

EU with pre control emissions > 100 tons	Applicable Contaminant	Presumptively acceptable monitoring condition in lieu of CAM
EU197LINE	VOC	Yes - 40 CFR Part 63, Subpart MMMM
EUCONTAINERLINE	VOC	Yes - 40 CFR Part 63, Subpart MMMM
EUBALSACORE	VOC	Yes - 40 CFR Part 63, Subpart MMMM
EUSKINONRAIL	VOC	Yes - 40 CFR Part 63, Subpart MMMM
EUCLEANUP	VOC	Yes - 40 CFR Part 63, Subpart MMMM
EUWOODROOM	PM	No
EUBALSACORE	PM	No

Permits of Record:

Previous reports included the following permits of record for the facility:

- Brooks & Perkins: one permit issued, not incorporated into ROP
- · AAR Brooks & Perkins Corp: 13 permits issued; 1007-84 and 293-91 Rev 3 incorporated into ROP
- AAR Cadillac Manufacturing: 2 permits issued; 934-93 and 261-00 incorporated into ROP
- AAR Mobility Systems: 10 permits issued; 163-07B, 163-07C, 163-07D, 4-09, 183-17 incorporated into ROP.

Note PTI 183-17 established EUCONTAINERLINE as a PTE for use of the AM2 Coatings containing Diglycidyl ether of bisphenol A, Michigan Air Toxic. RTO control would be required with the annual throughput proposed for production of the AM2 Matts. The Facility reports this project never went into full scale production, that production was first article only which was a few matts. Both coatings for the AM2 Matting are less than or equal to 3.5 lbs VOC/gal.

Plans of Record: EMISSION UNIT	PERMIT CONDITION	DOCUMENT	MOST RECENT PLAN DATE
EU197LINE, EUCONTAINERLINE, EUBALSACORE, EUSKINORRAIL	SC III.10 (FGMACT)	SSMAP	SSMAP Rev.#8 – 4/22/2019
FGCOATINGS	SC III.4	MAP (RTO)	SSMAP Rev.#8 – 4/22/2019
FGPARTICULATES	SC IX.1	MAP	SSMAP Rev.#8 - 4/22/2019
FGPARTICULATES FGCOATINGS	SC III.5, IX.3 UNKNOWN SC III.9	CAM Plan (Particulates) CAM Plan (RTO) Work Practices Plan	1/13/2011 12/10/2020 6/28/2022

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EU197LINE, EUCONTAINERLINE, EUBALSACORE, EUSKINORRAIL (previously 2/18/2008

Based on staff observations during the 8/1/24 on-site inspection, the facility operates in general conformance with MI-ROP-B4197-2016c. Records review and compliance determination will be addressed in a separate report (records review).

(FGMACT)

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DATE 12-2-24

NXon SUPERVISOR