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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.: R13-2236B
Plant ID No.: 033-00132
Applicant: Bombardier Services Corporation
Facility Name: Bridgeport Facility
Location: Harrison County
NAICS Code: 488190, 488119, 336413
Application Type: Modification
Received Date: January 29, 2015
Engineer Assigned: Steven R. Pursley, PE
Fee Amount: \$1,000.00
Date Received: February 6, 2015
Complete Date: February 27, 2015
Due Date: May 28, 2015
Applicant Ad Date: January 30, 2015
Newspaper: *The Exponent-Telegram*
UTM's: Easting: 566.399 km Northing: 4,350.14 km Zone: 17
Description: Addition of a natural gas heated spray booth, sanding booth and unheated spray booth.

DESCRIPTION OF PROCESS

Bombardier Services Corporation (Bombardier) is located at the North Central Regional Airport in Bridgeport. They provide heavy inspection of commercial and private aircraft.

This permit modification consists of adding a heated spray paint booth, a sanding booth, a glue booth and various pieces of woodworking equipment.

Various interior aircraft parts that require repair and/or refurbishing are processed by cleaning, sanding, painting and/or gluing. Some pieces may be fabricated with the woodworking equipment which includes saws, a planer and a sander. The spray booth will be heated by a 1.5 mmbtu/hr natural gas fired heater. Coating solids will be controlled with

a fabric filter while the woodworking equipment and downdraft table will be vented to a cyclone.

SITE INSPECTION

No site inspection of the facility was deemed necessary. The facility was last inspected on September 29, 2010 by Lou Ann Lee of DAQs North Central Regional Office. The facility was found to be in compliance. To get to the facility from Charleston take I-79 north to exit 119. Turn right on US Route 50 and go 2.4 miles. Then, turn left on Benedum Drive and go approximately 0.9 miles. Next, turn right on Airport Road and go approximately 0.3 miles. Then turn left on Aviation Way and go approximately ½ mile to the facility. The facility is just past the airport terminal in the North Central Regional Airport Complex.

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

VOC, HAP and PM emissions from the use of chemicals (coatings, glue, solvents, etc.) were conservatively estimated by assuming all of the subject pollutants contained in the chemical is emitted to the atmosphere (in the case of PM it was assumed all solids were released to the air as PM). Calculations were based on expected usages as experienced at a similar Bombardier facility. Emissions from the natural gas fired heater were based on AP-42 Chapter 1, Section 4.

Emissions from the modification should not exceed the following:

Pollutant	lb/hr	tpy
CO	0.13	0.55
NO _x	0.15	0.66
PM	0.19	0.23
SO ₂	0.01	0.01
VOC	23.31	2.03
Total HAPs	7.08	0.71
Ethyl Benzene	0.16	0.01
Formaldehyde	0.03	0.01
Hexamethylene-1,6-Diisocyanate	0.03	0.01
n-Hexane	0.72	0.02

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Methyl Isobutyl Ketone	0.99	0.12
Styrene	3.13	0.38
Toluene	0.25	0.01
2,4-Toluene Diisocyanate	0.03	0.01
Xylenes	1.75	0.18

REGULATORY APPLICABILITY

45CSR7 To Prevent and Control Particulate Matter Air Pollution From Manufacturing Processes and Associated Operations

The main requirement of 45CSR7 is the process weight rate based PM stack emission rate in section 4 of the rule. However, §45-4-10.5 exempts from this requirement sources that “have a potential to emit less than one (1) pound per hour of particulate matter and an aggregate of less than one thousand (1000) pounds per year for all such sources of particulate matter located at the stationary source.” As can be seen above, total PM emissions for this entire project are less than 1 pound per hour and less than 1000 pounds per year.

45CSR13: *Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, and Procedures for Evaluation*

The modification of the Bombardier facility has a potential to emit total Hazardous Air Pollutants in excess of two (2) lbs/hour and five (5) TPY on an aggregated basis and, therefore, pursuant to §45-13-2.24, the modification is defined as a “stationary source” under 45CSR13. Pursuant to §45-13-5.1, “[n]o person shall cause, suffer, allow or permit the construction . . . and operation of any stationary source to be commenced without . . . obtaining a permit to construct.” Therefore, Bombardier is required to obtain a permit under 45CSR13 for the modification and operation of the facility.

As required under §45-13-8.3 (“Notice Level A”), Bombardier placed a Class I legal advertisement in a “newspaper of general circulation in the area where the source is . . . located.” The ad ran on January 30, 2015 in *The Exponent Telegram* and the affidavit of publication for this legal advertisement was submitted on February 11, 2015.

45CSR22 Air Quality Management Fee Program

The facility's potential to emit will be less than the 45CSR30 threshold of 100 TPY for any criteria pollutant and will be less than 10 tons per year of any individual HAP and less than 25 tons per year of all combined HAPs. Additionally, no NSPS or MACT appears to apply to the facility. Therefore, the facility will not be subject to 45CSR30. Since it is not subject to 45CSR30, it is subject to 45CSR22.

NON-APPLICABILITY DETERMINATION

The facility is potentially subject to 40 CFR 63 Subpart HHHHHH should it begin using coatings that contain one of the rules targeted HAPs (currently they do not use any coatings containing any of those HAPs). However, WV has not accepted delegation of this area source GACT and has no plans to accept delegation in the near future.

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

Section 112(b) of the Clean Air Act (CAA) identifies 188 compounds as pollutants or groups of pollutants that EPA knows or suspects may cause cancer or other serious human health effects. Some ingredients used by the facility contain HAPs. However, the potential HAP emissions from the facility are below the levels that define a major HAP source. Therefore, the facility is considered a minor (or area) HAP source, and no source-specific major source NESHAP or MACT standards apply.

The following Hazardous Air Pollutants will be emitted from the facility in amounts of at least 0.01 pounds per hour (all information comes directly from EPA's Air Toxics Website):

Styrene:

Styrene is primarily used in the production of polystyrene plastics and resins. Acute (short-term) exposure to styrene in humans results in mucous membrane and eye irritation, and gastrointestinal effects. Chronic (long-term) exposure to styrene in humans results in effects on the central nervous system (CNS), such as headache, fatigue, weakness, and depression, CSN dysfunction, hearing loss, and peripheral neuropathy. Human studies are inconclusive on the reproductive and developmental effects of styrene; several studies did not report an increase in developmental effects in women who worked in the plastics industry, while an increased frequency of spontaneous abortions and decreased frequency of births were reported in another study. Several epidemiologic studies suggest there may be an association between styrene exposure and an increased risk of leukemia and lymphoma. However, the evidence is inconclusive due to confounding factors. EPA has not given a formal carcinogen classification to styrene.

Xylene

Commercial or mixed xylene usually contains about 40-65% m-xylene and up to 20% each of o-xylene and p-xylene and ethylbenzene. Xylenes are released into the atmosphere as fugitive emissions from industrial sources, from auto exhaust, and through volatilization from their use as solvents. Acute (short-term) inhalation exposure to mixed xylenes in humans results in irritation of the eyes, nose, and throat, gastrointestinal effects, eye irritation, and neurological effects. Chronic (long-term) inhalation exposure of humans to mixed xylenes results primarily in central nervous system (CNS) effects, such as headache, dizziness, fatigue, tremors, and incoordination; respiratory, cardiovascular, and kidney effects have also been reported. EPA has classified mixed xylenes as a Group D, not classifiable as to human carcinogenicity.

Toluene

Toluene is added to gasoline, used to produce benzene, and used as a solvent. Exposed to toluene may occur from breathing ambient or indoor air. The central nervous system (CNS) is the primary target organ for toluene toxicity in both humans and animals for acute (short-term) and chronic (long-term) exposures. CNS dysfunction and narcosis have been frequently observed in humans acutely exposed to toluene by inhalation; symptoms include fatigue, sleepiness, headaches, and nausea. CNS depression has been reported to occur in chronic abusers exposed to high levels of toluene. Chronic inhalation exposure of humans to toluene also causes irritation of the upper respiratory tract and eyes, sore throat, dizziness, and headache. Human studies have reported developmental effects, such as CNS dysfunction, attention deficits, and minor craniofacial and limb anomalies, in the children of pregnant women exposed to toluene or mixed solvents by inhalation. Reproductive effects, including an association between exposure to toluene and an increased incidence of spontaneous abortions, have also been noted. However, these studies are not conclusive due to many confounding variables. EPA has classified toluene as a Group D, not classifiable as to human carcinogenicity.

MIBK

Methyl isobutyl ketone is used as a solvent for gums, resins, paints, varnishes, lacquers, and nitrocellulose. Acute (short-term) exposure to methyl isobutyl ketone may irritate the eyes and mucous membranes, and cause weakness, headache, nausea, lightheadedness, vomiting, dizziness, incoordination, narcosis in humans. Chronic (long-term) occupational exposure to methyl isobutyl ketone has been observed to cause nausea, headache, burning in the eyes, weakness, insomnia, intestinal pain, and slight enlargement of the liver in humans. Lethargy and kidney and liver effects have been observed in rats and mice chronically exposed by gavage (experimentally placing the chemical in the stomach), ingestion, and inhalation. EPA has classified methyl isobutyl ketone as a Group D, not classifiable as to human carcinogenicity.

Hexamethylene Diisocyanate

Hexamethylene diisocyanate is used as a polymerizing agent in polyurethane paints and coatings. Acute (short-term) exposure to high concentrations of hexamethylene diisocyanate in humans can cause pulmonary edema, coughing, and shortness of breath.

Hexamethylene diisocyanate is also extremely irritating to the eyes, nose, and throat. Human studies have suggested that chronic (long-term) exposure to hexamethylene diisocyanate may cause chronic lung problems. Animal studies have reported respiratory effects from chronic inhalation exposure and skin irritation and sensitization from dermal exposure to hexamethylene diisocyanate. No information is available on the reproductive, developmental, or carcinogenic effects of hexamethylene diisocyanate in humans. EPA has not classified hexamethylene diisocyanate for carcinogenicity.

Formaldehyde

Formaldehyde is used mainly to produce resins used in particleboard products and as an intermediate in the synthesis of other chemicals. Exposure to formaldehyde may occur by breathing contaminated indoor air, tobacco smoke, or ambient urban air. Acute (short-term) and chronic (long-term) inhalation exposure to formaldehyde in humans can result in respiratory symptoms, and eye, nose, and throat irritation. Limited human studies have reported an association between formaldehyde exposure and lung and nasopharyngeal cancer. Animal inhalation studies have reported an increased incidence of nasal squamous cell cancer. EPA considers formaldehyde a probable human carcinogen (Group B1).

Ethylbenzene

Ethylbenzene is mainly used in the manufacture of styrene. Acute (short-term) exposure to ethylbenzene in humans results in respiratory effects, such as throat irritation and chest constriction, irritation of the eyes, and neurological effects such as dizziness. Chronic (long-term) exposure to ethylbenzene by inhalation in humans has shown conflicting results regarding its effects on the blood. Animal studies have reported effects on the blood, liver, and kidneys from chronic inhalation exposure to ethylbenzene. Limited information is available on the carcinogenic effects of ethylbenzene in humans. In a study by the National Toxicology Program (NTP), exposure to ethylbenzene by inhalation resulted in an increased incidence of kidney and testicular tumors in rats, and lung and liver tumors in mice. EPA has classified ethylbenzene as a Group D, not classifiable as to human carcinogenicity.

n-Hexane

Hexane is used to extract edible oils from seeds and vegetables, as a special-use solvent, and as a cleaning agent. Acute (short-term) inhalation exposure of humans to high levels of hexane causes mild central nervous system (CNS) effects, including dizziness, giddiness, slight nausea, and headache. Chronic (long-term) exposure to hexane in air is associated with polyneuropathy in humans, with numbness in the extremities, muscular weakness, blurred vision, headache, and fatigue observed. Neurotoxic effects have also been exhibited in rats. No information is available on the carcinogenic effects of hexane in humans or animals. EPA has classified hexane as a Group D, not classifiable as to human carcinogenicity.

2,4-Toluene Diisocyanate

2,4-Toluene diisocyanate is primarily used as a chemical intermediate in the production of polyurethane products. 2,4-Toluene diisocyanate is extremely toxic from acute (short-term) and chronic (long-term) exposures. Acute exposure to high levels of 2,4-toluene diisocyanate in humans, via inhalation, results in severe irritation of the skin and eyes and affects the respiratory, gastrointestinal, and central nervous systems (CNS). Chronic inhalation exposure to 2,4-toluene diisocyanate in humans has resulted in significant decreases in lung function in workers, an asthma-like reaction characterized by wheezing, dyspnea, and bronchial constriction. Animal studies have reported significantly increased incidences of tumors of the pancreas, liver, and mammary glands from exposure to 2,4-toluene diisocyanate via gavage (experimentally placing the chemical in the stomach). The International Agency for Research on Cancer (IARC) has classified 2,4-toluene diisocyanate as a Group 2B, possible human carcinogen.

AIR QUALITY IMPACT ANALYSIS

Since this is a minor modification to an existing minor source, as defined in 45CSR14, no modeling was required.

MONITORING OF OPERATIONS

The permittee shall be required to monitor and record the amount of each VOC or HAP containing material (glue, solvent, cleaner, ink, catalyst, etc.) used on a monthly basis. Calculations will then be performed to ensure compliance with the permits emission limits.

CHANGES TO PERMIT R13-2236A

The following changes were made to R13-2236A:

- * The permit was put in to the most recent boilerplate (the old permit was in the old style, i.e. Section A, B, C boilerplate and not the "Title V" style boilerplate). Note that due to practicality, only the equipment addressed in this application was included in Table 1.0. The table was footnoted to address that fact.
- * Old Condition A.1 (new condition 4.1.1) was updated to reflect the new emissions.
- * Old Condition A.2 (new condition 4.1.2) was changed so that it applies to both the old and new paint booths.
- * Old Condition A.7 (new condition 4.1.7) was updated to add the natural gas usage by the new paint booth heater.

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- * New conditions 4.1.10 through 4.1.13 were added.
- * New condition 4.3.7 was added.

RECOMMENDATION TO DIRECTOR

Information supplied in the application indicates that compliance with all applicable regulations will be achieved. Therefore it is the recommendation of the writer that permit R13-2236B for the modification of an aviation services facility near Bridgeport, in Harrison County, be granted to Bombardier Services Corporation.

Steven R. Pursley, PE
Engineer

April 27, 2015

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