# Notice of Construction (NOC) Worksheet

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Puget Sound Clean Air Agency

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|---|---|
| **Applicant:** Safran Cabin | **NOC Number**: 11806 |
| **Project Location**: 12806 State Ave, Marysville, WA 98271 | **Registration Number**: 17033 |
| **Applicant Name and Phone**: Mike Pound, (360) 653-2600 | **NAICS:** 336413 |
| **Engineer**: Courtney Shernan (formerly O'Gorman) | **Inspector**: Tom Hudson |

## A. DESCRIPTION

For the Order of Approval:
One C4-1 adhesive application line consisting of five ovens and two coaters. One C4-2 adhesive application line consisting of five ovens and two coaters. One Legacy adhesive application line consisting of four ovens and two enclosed resin application areas. Emissions from the C4-1 line ovens and Legacy line application areas are controlled by one 1.9 MMBtu/hr natural gas-fired Triton 10.95 regenerative thermal oxidizer. Emissions from the C4-2 line ovens and Legacy line ovens are controlled by one 4 MMBtu/hr natural gas-fired Triton 15.95 regenerative thermal oxidizer.

This Order of Approval contains facility-wide emission limits for volatile organic compounds and hazardous air pollutants.

Additional Information:

**Facility Background**

Safran Cabin (Safran) manufactures aerospace parts and operates a single source consisting of three contiguous and adjacent buildings at its facility in Marysville, located at the following addresses:

- 12810 State Avenue
- 12806 State Avenue
- 12730 State Avenue

Safran currently operates three adhesive application processes in the building located at 12806 State Avenue in Marysville within Safran's facility, referred to as the C4-1, C4-2, and Legacy lines. These lines are used to produce honeycomb core, which is used as a structural material for aerospace parts. The C4-1 and C4-2 lines produce thin sheets of honeycomb core, and the Legacy line produces large honeycomb core blocks. All three lines currently use GP7649 resin, which contains phenol and formaldehyde. For the C4-1 and C4-2 lines, a continuous flow of resin is applied to the honeycomb sheet as it travels on a conveyor through the coaters, and the resin is cured in ovens staged along the conveyor. For the Legacy line, an uncoated honeycomb block is loaded into one of the enclosed resin application areas. A flow coater is used to coat the block in resin. Then, the enclosure is opened, and the block is manually transferred to a curing oven.

The lines currently consist of the following equipment:

- C4-1: Five curing ovens, two coaters. Emissions from the ovens are controlled by the Triton 10.95 RTO, and emissions from the coaters are uncontrolled.
- C4-2: Five curing ovens, two coaters. Emissions from the ovens are controlled by the Triton 15.95 RTO, and emissions from the coaters uncontrolled.
- Legacy: Four curing ovens, two enclosed resin application areas. Emissions from the ovens are controlled by the Triton 15.95 RTO. Emissions from the resin application areas are currently uncontrolled.

**Proposed Modifications**

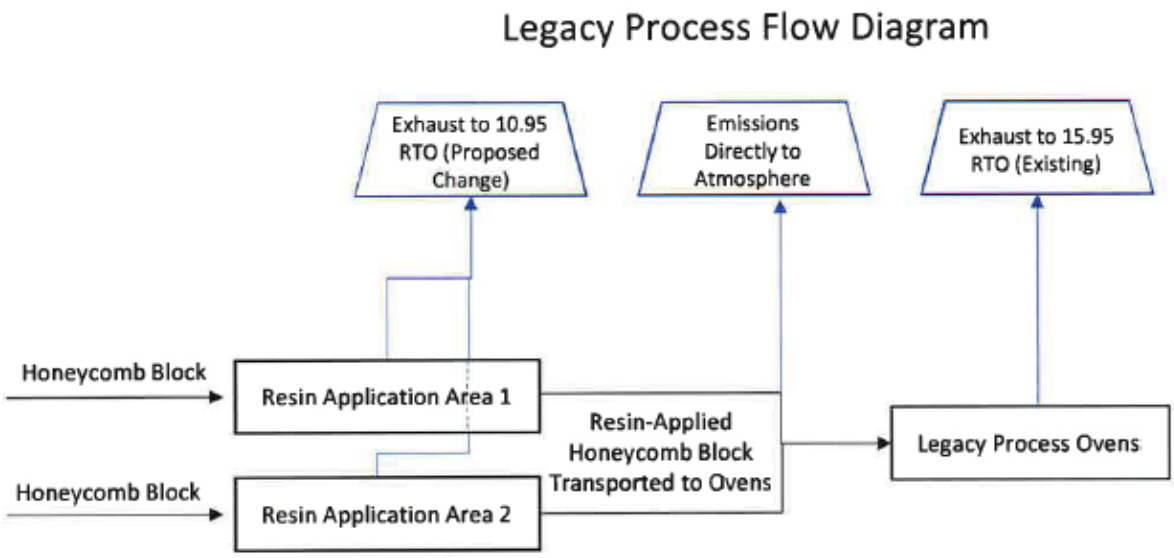
Safran is proposing to modify the existing control system for the Legacy line by routing currently uncontrolled emissions from the enclosed Legacy resin application areas to the Triton 10.95 RTO. The Legacy coating process consists of the following four steps, each with VOC and HAP emissions:

1. **Placing Block in Legacy Coater**. The Legacy coating enclosure starts closed. The enclosure is equipped with a door on one side of the enclosure that opens to allow the uncoated block into the enclosure. The door is closed and sealed prior to the start of the coating process. This step typically takes between 2 and 7 minutes. There will be some emissions associated with this step, since there will be resin that remains in the coater enclosure from coating the previous block. The capture system will still be running and is expected to capture most of the emissions.

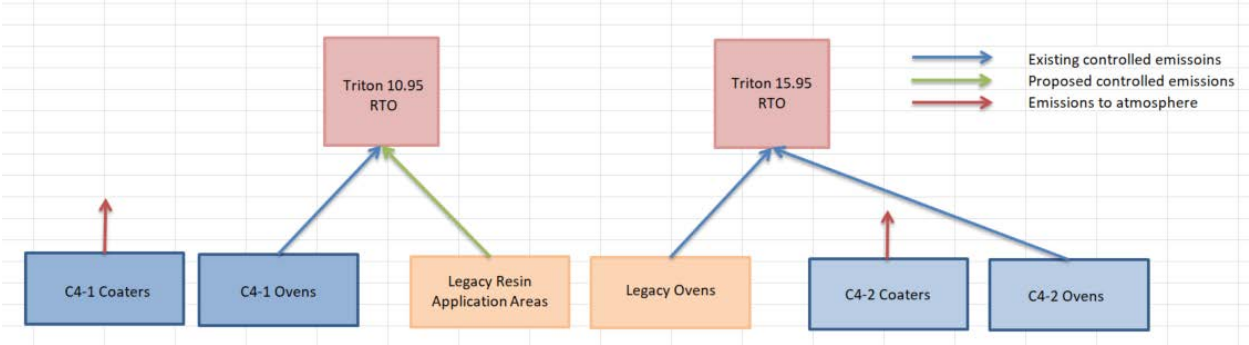
2. **Resin Application**. The enclosure is sealed once the block has been loaded. Resin is applied to the block using a flow coater and an air knife. After resin is applied to the top of the block, it is allowed to adequately seep into the block. Then, the block is rotated inside the enclosure, and resin is applied to the other side of the block. After the resin is applied, the block rests to allow the resin to seep into the block. This step typically takes between 95 and 140 minutes. Under the current configuration, these emissions are uncontrolled. Under the proposed configuration, these emissions will be routed to the Triton 10.95 RTO.

3. **Block Transfer to Oven**. After the resin application process is complete, the enclosure door is opened, and the block is manually transferred to an open oven. According to the applicant, blocks are never removed from the coating enclosures unless there is an available oven that they can be put in immediately. This step typically takes between 4 and 10 minutes. These emissions are currently uncontrolled and will remain uncontrolled upon completion of the project.

4. **Oven Curing**. The blocks are placed in the curing ovens for a period typically lasting 45 to 63 minutes for drying. However, some blocks can take as little as 20 minutes or as long as 70 minutes. These ovens are completely enclosed, and emissions are currently controlled by the Triton 15.95 RTO. There are no changes being proposed to the curing ovens or the Triton 15.95 RTO.




The Triton 10.95 RTO is currently used to control emissions from the C4-1 line ovens. Emissions from the Legacy line ovens (and C4-2 line ovens) will continue to be controlled by the Triton 15.95 RTO.




**Compliance History**

The use of GP7649 resin is the main contributor to facility-wide phenol emissions, which is the largest single HAP emitted from the facility. The facility was issued Order No. 8455 on October 11, 2001, which established synthetic minor limits of 9.9 tons of individual HAP, 24.9 tons of total HAP, and 99 tons of any single regulated pollutant (e.g., VOC) during any 12 consecutive months.

On December 8, 2017, Safran was issued Notice of Violation (NOV) #3-009102 for exceeding the 9.9 ton per 12-month period limit for a single HAP established by Order No. 8455. NOV #3-009102 had a corrective action order to submit a complete air operating permit application by June 1, 2018. Safran submitted Notice of Construction #11621 on June 8, 2018 to request a new synthetic minor permit (rather than an air operating permit) and provided facility-wide emission calculations to demonstrate that Safran's emissions were below air operating permit levels. With the proposed modification to the Legacy line described above, Safran will be able to operate as a synthetic minor source of emissions. The request for new synthetic minor limits that Safran submitted via Notice of Construction #11621 is being

rolled into this Notice of Construction #11806. This Order of Approval will establish new synthetic minor limits for individual HAP, total HAP, and total VOC emissions from the facility.

**Permit History**

The Triton 10.95 and Triton 15.95 RTOs, used to control emissions from the C4-1, C4-2, and Legacy adhesive application lines, are currently permitted under Order of Approval No. 10715 (3/28/14). This Order will cancel and supersede Order of Approval No. 10715.

Order of Approval No. 8455 (10/11/01) established synthetic minor emission limits for VOC and HAP for the facility. This Order will cancel and supersede Order of Approval No. 8455.

## B. DATABASE INFORMATION

No new equipment is being installed.

Source:
17033 - Safran Cabin

Basic Equipment
Count: 22

| Reg | Name | Ite... | NC/N... | BE Code | Year Inst... | Units... | Rated C... | Rated... | NOC Not... | Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| 17033 | Safran Cabin | 11 | | 20 - curing oven | 1999 | 1 | | | ☑ | South Bldg. #2 |
| 17033 | Safran Cabin | 19 | | 20 - curing oven | | 2 | | | ☐ | Bldg # 3 |
| 17033 | Safran Cabin | 20 | | 20 - curing oven | 1988 | 2 | 80000.00 | BTU/Hr | ☐ | Bldg # 3, Two Oven |
| 17033 | Safran Cabin | 22 | 11806 | 20 - curing oven | | 5 | 1000.00 | CFM | ☐ | Bldg 2 C4 - 1 Production Line |
| 17033 | Safran Cabin | 23 | 11806 | 20 - curing oven | | 4 | 1200.00 | CFM | ☐ | BLDG#2 Legacy Line |
| 17033 | Safran Cabin | 24 | 11806 | 20 - curing oven | 1012 | 5 | 1500.00 | CFM | ☐ | Bldg 2 C4 (2) nodeline adhesive production line for 100" wide web with two coaters and five ovens 1,500scfm each |
| 17033 | Safran Cabin | 5 | | 37 - machining/wo... | 2008 | 0 | | | ☑ | Bldg # 3 S4 on map. Thermwood Area-Routers |
| 17033 | Safran Cabin | 6 | | 37 - machining/wo... | 2006 | 2 | | | ☑ | Bldg # 1 Bandsaw [composite grinding] Hand Trim |
| 17033 | Safran Cabin | 21 | | 37 - machining/wo... | | 1 | | | ☑ | Cutting Area (Honey Comb) |
| 17033 | Safran Cabin | 13 | | 37 - machining/wo... | | 1 | | | ☑ | |
| 17033 | Safran Cabin | 14 | | 37 - machining/wo... | | 3 | | | ☑ | 3 Machines exempt from permitting per Reg. I 6.03(c)#39, machining, grinding, routing of composites. |
| 17033 | Safran Cabin | 25 | | 37 - machining/wo... | 2015 | 1 | | | ☑ | C and C Trim Machine / Trim Shop Bldg #1 |

Comment: BLDG#2 Legacy Line

Control Equipment
Count: 10

| Reg | Name | Item # | NC/N... | CE Code | Year Installed | Unit... | Rated Capa... | Rated E... | NOC Not Required | Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| 17033 | Safran Cabin | 9 | | 100 - Baghouse | 2008 | 2 | | | ☑ | Bldg # 3 S4 on map TW Line Two Donaldson Torit Dust Collectors |
| 17033 | Safran Cabin | 1 | 9020 | 112 - Afterburner | 2005 | 1 | | 1000.00 | ☐ | Bldg # 2, Catalytic Products NR-1000 [Temp 1446F] |
| 17033 | Safran Cabin | 5 | | 100 - Baghouse | 2009 | 2 | | 2000.00 | ☑ | Bldg # 2 - DW54 Hand sanding composites Engineered Materials (2) |
| 17033 | Safran Cabin | 4 | | 100 - Baghouse | 2006 | 6 | | 3040.00 | ☑ | 6 Torit Dust Collectors Bldg 1 Trim Area - [13500 ea] [Model DF04-32] #1 15.95 |
| 17033 | Safran Cabin | 8 | | 101 - High-efficie... | 2015 | 2 | | 3825.00 | ☑ | Bldg. #1 North Building, map N7 HEAB, Giess Area: B/H with HEPA filter F2 2,... |
| 17033 | Safran Cabin | 2 | | 100 - Baghouse | | 1 | | 6000.00 | ☑ | Bldg # 2 |
| 17033 | Safran Cabin | 3 | 11806 | 112 - Afterburner | 2014 | 1 | | 10000.00 | ☐ | Bldg 2 RTO #2 Catalytic Products Triton 10.95 BLDG#3 |
| 17033 | Safran Cabin | 10 | | 100 - Baghouse | 2009 | 1 | 0.00 | 12000.00 | ☑ | Controls composite emissions from CNC Router. equipped with 36 cartridges... |
| 17033 | Safran Cabin | 6 | | 100 - Baghouse | 2009 | 3 | | 13500.00 | ☑ | Bldg # 2 Torits Fill & Fair (3) |
| 17033 | Safran Cabin | 7 | 11806 | 112 - Afterburner | 2015 | 1 | | 15000.00 | ☐ | RTO#1 BLDG #2 Catalytic Products - Triton 15.95 RTO |

Comment: Bldg 2 RTO #2 Catalytic Products Triton 10.95 BLDG#3

| | | | |
|---|---|---|---|
| **New NSPS due to this NOCOA?** | **No** | **Applicable NSPS: None** | **Delegated? N/A** |
| **New NESHAP due to this NOCOA?** | **No** | **Applicable NESHAP: None** | **Delegated? N/A** |
| **New Synthetic Minor due to this NOCOA?** | **Yes** | | |

## C. NOC FEES AND ANNUAL REGISTRATION FEES

**NOC Fees:**

Fees have been assessed in accordance with the fee schedule in Regulation I, Section 6.04. All fees must be paid prior to issuance of the final Order of Approval.

| Fee Description | Cost | Amount Received (Date) |
|---|---|---|
| Filing Fee | $ 1,150 | |
| Equipment (modification to RTO) | $ 600 | |
| Voluntary Limits on Emissions | $ 2,000 | |
| Public Notice | $ 700 (plus publication costs) | |
| Filing received | | $ 1,150 (5/16/2019) |
| Additional fee received | | $ 3,300 (11/7/2019) |
| **Total Remaining** | **Publication costs to be invoiced later** | |

**Registration Fees**:
Registration fees are assessed to the facility on an annual basis. Fees are assessed in accordance with Regulation I, Section 5.07. This application does not change the annual registration fees for the facility. The emission surcharges should decrease due to the reduction in phenol (VOC, HAP) emissions.

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# Invoice for Year 2019 Registration Fees

| Bill to: |
|---|
| Zodiac Aerospace |
| 12806 State Ave |
| Marysville, WA 98271 |
| |
| Attention: Accounts Payable |

| Invoice Date: | Invoice # |
|---|---|
| November 19, 2018 | 20190052 |
| **Due Date:** | **Terms:** |
| January 03, 2019 | Net 45 Days |
| **Facility ID (Registration #):** | |
| 17033 | |

**Site Address:** *Zodiac Aerospace*
*12810 State Ave, Bldg #1/#2 /#3, Marysville, WA, 98271*

The annual registration fee is required by Washington State law and Puget Sound Clean Air Agency's Regulation I.

| Facility Fees and Applicable Regulations | | | Charges |
|---|---|---|---|
| **Base Fee for Registered Sources. Reg I, 5.07(c)** | | | $ 1,150.00 |
| Reg I, 5.03(a)(3) - Facilities with annual emissions that meet or exceed thresholds<br>Reg I, 5.03(a)(4)(M) - Facilities with aerospace coating operations<br>Reg I, 5.03(a)(5) - Facilities with gas or odor control equipment (>= 200 cfm)<br>Reg I, 5.03(a)(6) - Facilities with particulate control equipment (>= 2,000 cfm) | | | |
| **Additional Fees:** | | | |
| Reg I, 5.07(c)(2) - Facilities with annual emissions that meet or exceed thresholds | | | $ 2,300.00 |
| | | | $ 3,450.00 |
| **Emission Surcharges - Reg I,5.07(c)(3)** | **Tons in 2017** | **Per Ton** | |
| CO (Carbon Monoxide) | 4 | $ 30 | $ 120.00 |
| HAP (Hazardous Air Pollutants) | 10 | $ 60 | $ 600.00 |
| NOx (Nitrogen Oxides) | 5 | $ 60 | $ 300.00 |
| VOC (Volatile Organic Compounds) | 74 | $ 60 | $ 4,440.00 |
| | | | $ 5,460.00 |
| **Fee Totals** | | | |
| **TOTAL REGISTRATION FEE** | | | $ 8,910.00 |
| *The Total Registration Fee is due by January 03, 2019. If unpaid after January 03, 2019, the facility may be subject to enforcement action with civil penalties (Reg I, 5.07(b)).* | | | |

## D. STATE ENVIRONMENTAL POLICY ACT (SEPA) REVIEW

State Environmental Policy Act (SEPA) review was conducted in accordance with Regulation I, Article 2. The SEPA review is undertaken to identify and help government decision-makers, applicants, and the public to understand how a project will affect the environment. A review under SEPA is required for projects that are not categorically exempt in WAC 197-11-800 through WAC 197-11-890. A new source review action which requires a NOC application submittal to the Agency is not categorically exempt.

A new SEPA determination is not required because the potential impacts from this project have already been reviewed. The C4-1, C4-2, and Legacy lines and Triton 15.95 RTO were reviewed under SEPA by PSCAA, and a DNS was issued by PSCAA on February 29, 2012 (Order No. 10426, issued February 29, 2012). The Triton 10.95 RTO was reviewed under SEPA by PSCAA, and a DNS was issued by PSCAA on

March 28, 2014 (Order No. 10715, issued March 28, 2014). Copies of these DNS are included below and are being relied upon for this project.

10426-dns.pdf 10715-dns.pdf

**E. REASONABLY AVAILABLE CONTROL TECHNOLOGY (RACT) REVIEW**

**Reasonably Available Control Technology (RACT)**

Replacements and substantial alternation of emissions control technology are required to use RACT to control all pollutants previously emitted. RACT is defined in WAC 173-400-030 to mean "…the lowest emission limit that a particular source or source category is capable of meeting by the application of control technology that is reasonably available considering technological and economic feasibility. RACT is determined on a case-by-case basis for an individual source or source category taking into account the impact of the source upon air quality, the availability of additional controls, the emission reduction to be achieved by additional controls, the impact of additional controls on air quality, and the capital and operating costs of the additional controls."

An emissions standard or emissions limitation means "a requirement established under the Federal Clean Air Act or Chapter 70.94 RCW which limits the quantity, rate, or concentration of emissions of air contaminants on a continuous basis, including any requirement relating to the operation or maintenance of a source to assure continuous emission reduction and any design, equipment, work practice, or operational standard adopted under the Federal Clean Air Act or Chapter 70.94 RCW."

Since Safran is proposing to substantially alter the Triton 10.95 RTO by routing an additional source of emissions to the RTO (the Legacy line enclosed resin application areas), Safran is required to use RACT to control all pollutants previously emitted.

Similar Permits

I was unable to find any RACT determinations issued by the Agency for the replacement or substantial alteration of an RTO used to control emissions from a resin application process. The table below lists recent BACT determinations for other VOC sources with similar emissions.

| Source | Description | VOC BACT |
|---|---|---|
| Order of Approval No. 11059 (2/17/16 – Milgard Manufacturing) | Two pultrusion lines for reinforced plastic composites manufacturing. | RTO with VHAP destruction efficiency of 98% or greater; or outlet VHAP concentration of no greater than 15 ppm (as C). |
| Order of Approval No. 10715 (3/28/14 – Safran Cabin; issued to "C & D Zodiac") | One 1.9 MMBtu/hr RTO (Triton 10.95) to control emissions from the C4(1) nodeline adhesive application line. | RTO with VOC destruction efficiency of at least 98.5%; or outlet concentration not exceeding 10 ppmdv. |
| BAAQMD BACT Guideline | Polyester Resin Operations – Molding and Casting | Enclosure of operation and vent to an afterburner (≥0.3 sec retention time at ≥1,400°F) or an activated carbon adsorption system (< 6 ppm at outlet);<br>Compliance w/ BAAQMD Reg. 8, Rule 50 and use of aqueous emulsion cleaner for clean-up to maximum extent possible. |
| SJVAPCD BACT Guideline 4.8.19 | Fiberglass-reinforced Composite Products – Pultruded, heat set resin products | Use of polyester resins with 35 wt% monomer (or less), use of epoxy-based resins with 1 wt% VOC (or less), and use of a covered, resin-product cooling bath;<br>Thermal/catalytic incineration;<br>Carbon adsorption system. |
| SCAQMD BACT Guidelines for Non-Major Polluting Facilities | Flow Coater, Dip Tank and Roller Coater (≥36 lbs/day VOC) | Coating with lower VOC content than required by applicable rules, and emissions from coating area, flash off area, drying area, and oven vented to control device achieving ≥90% overall efficiency. |
| MassDEP BACT Guideline | VOC Coating Sources | 99% destruction efficiency using RTO or afterburner; or<br>98% destruction efficiency using catalytic oxidizer or adsorption technology. |

Analysis

Safran is proposing to modify the existing control system for the Legacy, C4-1, and C4-2 lines by routing currently uncontrolled emissions from the enclosed Legacy resin application areas to the Triton 10.95 RTO. The Triton 10.95 RTO is currently used to control emissions from the C4-1 line ovens. Emissions from the Legacy line ovens (and C4-2 line ovens) will continue to be controlled by the Triton 15.95 RTO.

According to the applicant, each enclosure will have an exhaust flow rate of roughly 2,000 acfm. Based on NOC application #10715 (for the installation of the Triton 10.95 RTO), the Triton 10.95 RTO has the design capacity to handle 10,000 scfm. Based on the most recent stack test for the Triton 10.95 RTO (conducted on May 31, 2018), the RTO had an average inlet flow rate of 4,213 scfm. For the previous tests conducted on May 20, 2018 and May 20, 2015, the RTO had average inlet flow rates of 4,738 scfm and 4,410 scfm, respectively. Based on this information, it is expected that the Triton 10.95 RTO has the additional capacity available for the exhaust from the Legacy coating enclosures.

In addition, NOC application #10715 listed a residence time of 0.5 seconds for the Triton 10.95 RTO under its designed operation (10,000 scfm). This is consistent with what the Agency has recently required for other sources with afterburners, such as large coffee roasters. The manufacturer guaranteed a destruction efficiency of 98.5% with a normal operating temperature of 1,500°F.

The Triton 10.95 currently has the following emission limits established in Order of Approval No. 10715: destruction efficiency of 98.5% or an outlet VOC concentration not exceeding 10 ppmdv, as measured by EPA Method 25A as hexane, on a dry, volumetric basis corrected to 3% $O_2$. With the higher load of VOCs being routed to the Triton 10.95, it is expected that the RTO will be able to sustain a high destruction efficiency (at least 98.5%). I recommend maintaining the emission limits from Order of Approval No. 10715 to meet RACT. Safran will be required to conduct a source test within 180 days of completion of the project to verify that the RTO still meets the destruction efficiency requirement.

The Legacy enclosed resin application areas will be required to meet the criteria for a permanent total enclosure (PTE) to demonstrate that they have 100% capture efficiency. In addition, a minimum 90% (by weight) capture efficiency requirement for the entire Legacy line (Steps 1 through 4 listed in Section A of this worksheet) will be established by this Order of Approval to meet RACT. Within 180 days of the completion of the project, Safran will be required to test the emissions from the Legacy line, calculate the capture efficiency, and verify that it is above the 90% capture efficiency requirement.

## F. EMISSION ESTIMATES

### Proposed Project Emissions

The modification of the control system will not result in an increase in emissions. The overall capture efficiency of the Legacy line will increase as a result of this project, resulting in a higher percentage of emissions controlled by the Triton 10.95 RTO and an overall emission decrease of pollutants emitted by the Legacy line.

### Facility-wide Emissions

Actual Emissions

The table below shows the rolling 12-month VOC, total HAP, phenol, and formaldehyde emissions from the entire facility (prior to the proposed change) for the past two years:

| Ending Month of 12-Month Period | VOC (tpy) | Total HAP (tpy) | Phenol (tpy) | Formaldehyde (tpy) |
|---|---|---|---|---|
| Aug-17 | 74.107 | 19.017 | 9.561 | 2.183 |
| Sep-17 | 74.261 | 18.531 | 9.273 | 2.125 |
| Oct-17 | 74.826 | 18.653 | 9.361 | 2.139 |
| Nov-17 | 73.591 | 18.124 | 9.365 | 2.132 |
| Dec-17 | 71.335 | 17.752 | 9.304 | 2.110 |
| Jan-18 | 75.328 | 18.323 | 9.264 | 2.104 |
| Feb-18 | 82.471 | 19.077 | 9.222 | 2.096 |
| Mar-18 | 80.862 | 19.017 | 9.332 | 2.122 |
| Apr-18 | 80.755 | 18.783 | 9.276 | 2.123 |
| May-18 | 76.517 | 18.504 | 9.296 | 2.129 |
| Jun-18 | 77.845 | 18.809 | 9.293 | 2.138 |
| Jul-18 | 76.838 | 18.746 | 9.335 | 2.154 |
| Aug-18 | 81.574 | 19.498 | 9.261 | 2.162 |
| Sep-18 | 78.289 | 19.486 | 9.536 | 2.213 |
| Oct-18 | 77.195 | 19.468 | 9.704 | 2.244 |
| Nov-18 | 79.116 | 19.930 | 9.803 | 2.272 |
| Dec-18 | 81.126 | 20.214 | 9.845 | 2.294 |
| Jan-19 | 76.412 | 19.767 | 9.980 | 2.319 |
| Feb-19 | 71.296 | 19.100 | 9.893 | 2.307 |
| Mar-19 | 67.647 | 18.444 | 9.653 | 2.263 |
| Apr-19 | 71.819 | 19.109 | 9.590 | 2.264 |
| May-19 | 74.079 | 19.298 | 9.567 | 2.255 |
| Jun-19 | 67.640 | 18.158 | 9.382 | 2.222 |
| Jul-19 | 63.052 | 17.639 | 9.352 | 2.215 |

Currently, phenol emissions from the Legacy, C4-1, and C4-2 lines make up roughly 97% of the total phenol emissions from the facility. Over the last two years, average GP7649 resin usage for the Legacy line constituted roughly 86% of the combined GP7649 resin usage for the three lines.

The Legacy coating process consists of the following four steps, each with VOC and HAP emissions:

1. **Placing Block in Legacy Coater**. The Legacy coating enclosure starts closed. The enclosure is equipped with a door on one side of the enclosure that opens to allow the uncoated block into the enclosure. The door is closed and sealed prior to the start of the coating process. Once the enclosure is sealed, the enclosure has 100% capture of emissions. This step typically takes between 2 and 7 minutes. There will be some emissions associated with this step, since there will be resin that remains in the coater enclosure from coating the previous block. The capture system will still be running, even when the enclosure is not completely sealed, and is expected to capture most of the emissions.

2. **Resin Application**. The enclosure is sealed once the block has been loaded. Resin is applied to the block using a flow coater and an air knife. After resin is applied to the top of the block, it is allowed to adequately seep into the block. Then, the block is rotated inside the enclosure, and resin is applied to the other side of the block. After the resin is applied, the block rests to allow the resin to seep into the block. This step typically takes between 95 and 140 minutes. Under the current configuration, these emissions are uncontrolled. Under the proposed configuration, these emissions will be routed to the Triton 10.95 RTO.

3. **Block Transfer to Oven**. After the resin application process is complete, the enclosure door is opened, and the block is manually transferred to an open oven. According to the applicant, blocks are never removed from the coating enclosures unless there is an available oven that they can be put in immediately. This step typically takes between 4 and 10 minutes. These emissions are currently uncontrolled and will remain uncontrolled upon completion of the project.

4. **Oven Curing**. The blocks are placed in the curing ovens for a period typically lasting 45 to 63 minutes for drying. These ovens are completely enclosed, and emissions are currently controlled by the Triton 15.95 RTO. There are no changes being proposed to the curing ovens or the Triton 15.95 RTO.

By completely enclosing and routing the emissions from Step 2 to the Triton 10.95 RTO, the applicant has indicated that the system will be able to achieve an overall capture efficiency of 90% for the four steps of the Legacy process outlined above. Actual emissions of phenol (and subsequently total HAP) are expected to decrease by about 5 tons per year upon completion of the project. Total VOC emissions are expected to decrease by about 8 tons per year. These reductions are calculated in the workbook below.

C4Legacy Line
Summary Calculations

The calculations also assume that some of the phenol contained in the resin polymerizes in the curing ovens. Currently, a phenol polymerization rate of 37.0% is assumed. This is based on testing conducted by Georgia-Pacific in 2014. This Order of Approval will establish a condition requiring Safran to determine the phenol polymerization percentage during each source test.

As mentioned above, average GP7649 resin usage for the Legacy line constitutes roughly 86% of the combined GP7649 resin usage for the three lines. The capture efficiency of the C4-1 line was tested once and was determined to be 69%. The capture efficiency of the C4-2 line has never been tested. Since the C4-1 and C4-2 lines have low resin usage compared to the Legacy line, the capture efficiency does not currently have a large effect on the resulting facility-wide emissions. This Order of Approval will also establish a condition requiring Safran to test the overall capture efficiency of the C4-1 and/or C4-2 line if requested by the Agency.

**Reporting Source?** Yes. Safran is currently a reporting source of VOC, total HAP, phenol, and methanol. Methanol emissions from the facility will not be affected by this project. Safran is expected to remain above the reporting thresholds for these pollutants upon completion of the project.

Potential Emissions

Synthetic minor limits are being established by this Order of Approval to limit the potential VOC, total HAP, and single HAP emissions from the facility. Facility-wide emissions will be limited to 9.9 tons of any single HAP, 24.9 tons of total HAP, and 99.0 tons of VOC.

## G. OPERATING PERMIT OR PSD

The Title V Air Operating Permit (AOP) program applicability for the entire source has been reviewed. The facility is not a Title V air operating permit source because post project PTE remains below Title V applicability thresholds and criteria due to federally enforceable limits that are being established by this Order. The source is considered a "**synthetic minor**".

Emission increases associated with this project were reviewed for Prevention of Significant Deterioration (PSD) Program applicability. The modification of the control system will not result in an increase in emissions.

## H. AMBIENT TOXICS IMPACT ANALYSIS

The modification of the control system will not result in an increase in emissions.

## I. APPLICABLE RULES & REGULATIONS

### Puget Sound Clean Air Agency Regulations

***SECTION 5.05 (c):*** The owner or operator of a registered source shall develop and implement an operation and maintenance plan to ensure continuous compliance with Regulations I, II, and III. A

copy of the plan shall be filed with the Control Officer upon request. The plan shall reflect good industrial practice and shall include, but not be limited to, the following:
(1) Periodic inspection of all equipment and control equipment;
(2) Monitoring and recording of equipment and control equipment performance;
(3) Prompt repair of any defective equipment or control equipment;
(4) Procedures for startup, shut down, and normal operation;
(5) The control measures to be employed to ensure compliance with Section 9.15 of this regulation; and
(6) A record of all actions required by the plan.
The plan shall be reviewed by the source owner or operator at least annually and updated to reflect any changes in good industrial practice.

***SECTION 6.09***: Within 30 days of completion of the installation or modification of a stationary source subject to the provisions of Article 6 of this regulation, the owner or operator or applicant shall file a Notice of Completion with the Agency. Each Notice of Completion shall be submitted on a form provided by the Agency, and shall specify the date upon which operation of the stationary source has commenced or will commence.

***SECTION 9.03***: (a) It shall be unlawful for any person to cause or allow the emission of any air contaminant for a period or periods aggregating more than 3 minutes in any 1 hour, which is:
(1) Darker in shade than that designated as No. 1 (20% density) on the Ringelmann Chart, as published by the United States Bureau of Mines; or
(2) Of such opacity as to obscure an observer's view to a degree equal to or greater than does smoke described in Section 9.03(a)(1).
(b) The density or opacity of an air contaminant shall be measured at the point of its emission, except when the point of emission cannot be readily observed, it may be measured at an observable point of the plume nearest the point of emission.
(c) This section shall not apply when the presence of uncombined water is the only reason for the failure of the emission to meet the requirements of this section.

***SECTION 9.09***: General Particulate Matter (PM) Standard. It shall be unlawful for any person to cause or allow the emission of particulate matter in excess of the following concentrations:
Fuel Burning Equipment (other than wood): 0.05 gr/dscf @ 7% $O_2$

***SECTION 9.11***: It shall be unlawful for any person to cause or allow the emission of any air contaminant in sufficient quantities and of such characteristics and duration as is, or is likely to be, injurious to human health, plant or animal life, or property, or which unreasonably interferes with enjoyment of life and property.

***SECTION 9.13***: It shall be unlawful for any person to cause or allow the installation or use of any device or use of any means designed to mask the emission of an air contaminant which causes detriment to health, safety or welfare of any person.

***REGULATION I, SECTION 9.20(a)***: It shall be unlawful for any person to cause or allow the operation of any features, machines or devices constituting parts of or called for by plans, specifications, or

other information submitted pursuant to Article 6 of Regulation I unless such features, machines or devices are maintained in good working order.

**Washington State Administrative Code**

WAC 173-400-040(3): Fallout. No person shall cause or allow the emission of particulate matter from any source to be deposited beyond the property under direct control of the owner or operator of the source in sufficient quantity to interfere unreasonably with the use and enjoyment of the property upon which the material is deposited.

WAC 173-400-040(4): Fugitive emissions. The owner or operator of any emissions unit engaging in materials handling, construction, demolition or other operation which is a source of fugitive emission:

(a) If located in an attainment area and not impacting any nonattainment area, shall take reasonable precautions to prevent the release of air contaminants from the operation.

WAC173-400-111(7): Construction limitations.

(a) Approval to construct or modify a stationary source becomes invalid if construction is not commenced within eighteen months after receipt of the approval, if construction is discontinued for a period of eighteen months or more, or if construction is not completed within a reasonable time. The permitting authority may extend the eighteen-month period upon a satisfactory showing by the permittee that an extension is justified.

**Federal**

**NESHAP Subpart WWWW – Reinforced Plastic Composites Production**

NESHAP Subpart WWWW applies to reinforced plastic composites production facilities that are major sources of HAP emissions. Since Safran is a synthetic minor source of HAP emissions, Subpart WWWW does not apply to Safran.

## J. PUBLIC NOTICE

A notice of application was posted on the Agency's website for 15 days. No requests or responses were received. A copy of the website posting is below:

## New Construction Projects

| Company | Address | Project Description | Date Posted | Contact Engineer |
|---|---|---|---|---|
| Safran Cabin | 12810 State Ave, Marysville, WA 98271 | Application for modifications to the emission capture and control system for existing resin application processes. The applicant is also requesting voluntary emission limits to restrict potential facility-wide emissions to below the major source thresholds for hazardous air pollutants and volatile organic compounds. | 5/20/19 | Courtney O'Gorman |

This project meets the criteria for mandatory public notice under WAC 173-400-171(3)(k) for establishing a voluntary limit on emissions. This is due to requesting voluntary limits on emissions for volatile organic compounds and hazardous air pollutants. A 30-day public comment period was held from September XX, 2020 through October XX, 2020. Notices that the draft materials were open to comment were published in the Everett Herald and the Daily Journal of Commerce on September XX, 2020. The Agency posted the application, the draft Order of Approval, and the draft worksheet on the Agency's website during the comment period. Discuss comments received.

## K. RECOMMENDED APPROVAL CONDITIONS

**Standard Conditions:**

1. Approval is hereby granted as provided in Article 6 of Regulation I of the Puget Sound Clean Air Agency to the applicant to install or establish the equipment, device or process described hereon at the installation address in accordance with the plans and specifications on file in the Engineering Division of the Puget Sound Clean Air Agency.

2. This approval does not relieve the applicant or owner of any requirement of any other governmental agency.

**Specific Conditions:**

**FACILITY-WIDE EMISSION LIMIT**

3. The owner or operator shall limit facility-wide emissions of hazardous air pollutants (HAPs) as established by 42 U.S.C 7412(b)(1) and amended in 40 CFR 63 Subpart C in Section 112(b) to less than 9.9 tons of any single listed HAP, 24.9 tons of all HAPs combined, and 99.0 tons of volatile organic compounds (VOCs) during any 12 consecutive months.

4. The owner or operator shall monitor and record quantities of all purchases of raw materials and quantities of full containers of expired, unused raw materials that were shipped as waste on a monthly basis. Raw materials include all products used at the facility that contribute to HAP and VOC emissions. The owner or operator shall maintain, on-site, safety data sheets or certified product data sheets for these raw materials.

5. Within 15 days of the end of each month, the owner or operator shall calculate the facility-wide emissions for each HAP, total HAP, and total VOC for the previous 12 months using a mass balance approach. Emissions shall be calculated using either the actual HAP content for each lot of material provided by the manufacturer or the maximum HAP content (% composition or lb/gallon), the VOC content (% composition or lb/gallon) of each coating, and the total amount (pounds or gallons) of each HAP- and VOC-containing material applied. Purchase records may be used as a surrogate for usage. If the actual HAP content for each lot of material provided by the manufacturer is used, the owner or operator shall maintain records from the manufacturer that show the HAP content contained in the batch as a weight percentage. For the C4-1, C4-2, and Legacy lines, emissions shall be calculated in accordance with Condition 7. The owner or operator shall prepare monthly records that demonstrate that facility-wide emissions do not exceed the emission limits in Condition 3. Monthly records shall include the following:

    a. Monthly emissions of each HAP;
    b. Monthly emissions of total HAP;
    c. Monthly emissions of total VOC; and
    d. Emissions of each HAP, total HAP, and total VOC emitted over the previous consecutive 12-month period.

6. The owner or operator may not credit shipments of waste in the mass balance calculation, except waste shipments of full containers of expired, unused raw materials. For each waste shipment credited in the facility-wide emission calculations, the owner or operator shall maintain documentation showing that the material has been shipped offsite, including the name of the product, the date that the waste was shipped offsite, and the amount of material shipped.

7. For the emission calculations required by Condition 5 for the C4-1, C4-2, and Legacy lines, the owner or operator shall comply with the following:

    a. The owner or operator shall apply a destruction efficiency for the percentage of the VOC, total HAP, and individual HAP emissions captured and routed to the regenerative thermal oxidizers (RTOs). The destruction efficiency used for each RTO for the current monthly emission calculations shall be determined by using the lowest destruction efficiency achieved by each RTO using the two most recent source tests for that RTO conducted in accordance with Conditions 14 and 15.

    b. The owner or operator may use the actual phenol content for each batch of GP7649 resin used, instead of the maximum phenol content provided on the safety data sheet, provided that the owner or operator maintains records from the resin manufacturer for each batch received that shows the phenol content contained in the batch as a weight percentage.

    c. The owner or operator may assume that a percentage of the phenol contained in the GP7649 resin polymerizes and remains in the final honeycomb core product. If the owner or operator chooses to use this assumption, the phenol polymerization rate used for the current monthly emissions calculation shall be the lesser of 37% or the lowest polymerization rate measured during the phenol polymerization testing conducted in accordance with Condition 16.

8. The owner or operator shall notify the Puget Sound Clean Air Agency in writing, within 30 days after the end of each 12-month period if, during that period, emissions of any individual HAP exceeded 8.0 tons, emissions of any combination of HAP exceeded 20.0 tons, or emissions of VOC exceeded 80.0 tons. The report shall include a summary of the total 12-month emissions and the amount of resin used for the C4-1, C4-2, and Legacy lines for the time period for which these thresholds were exceeded. Upon request, the owner or operator shall provide the supporting emission calculations for the reported emission totals.

**REGENERATIVE THERMAL OXIDIZER EMISSION LIMITS**

9. The exhaust from the Legacy and C4-2 production line ovens shall be vented to the Catalytic Products Triton-15.95 Regenerative Thermal Oxidizer (RTO) for control. The RTO shall be operated at all times while the Legacy ovens or C4-2 production line is running.

10. The exhaust from the C4-1 production line ovens and the two enclosed Legacy resin application areas shall be vented to the Catalytic Products Triton-10.95 RTO for control. The RTO shall be operated at all times while the Legacy coater or C4-1 production line is running

11. Each RTO must meet one of the following emission limits, as determined by EPA Method 25A:

a. A minimum non-methane organic compound (NMOC) destruction efficiency of 98.5 percent; or
b. An outlet NMOC concentration of no greater than 10 parts per million as hexane, on a dry, volumetric basis corrected to 3% $O_2$.

**CAPTURE EFFICIENCY LIMITS**

12. The owner or operator shall capture at least 90% by weight of the VOC emissions from the Legacy line, including the ovens, resin application areas, and all intermediate steps. The Legacy enclosed resin application areas shall meet the criteria for a Permanent Total Enclosure (PTE) in 40 CFR Part 51, Appendix M, Method 204.

**COMPLIANCE DEMONSTRATION**

13. Within 180 days of the issuance of this Order of Approval, the owner or operator shall test emissions from the Triton 10.95 RTO in accordance with Regulation I, Section 3.07 to demonstrate compliance with Condition 11. Testing shall consist of at least three, one hour runs using EPA Method 25A and shall include simultaneous measurements at the inlet and outlet of the RTO. The owner or operator shall submit a compliance test plan with the test notification submitted under Regulation I, Section 3.07(b) at least 45 days prior to the compliance test. The test plan shall detail the test methods used for each pollutant, the operational data that will be collected during the test, and any other relevant information about the test.

14. To demonstrate ongoing compliance with Condition 11, the owner or operator shall test emissions from the Triton 10.95 RTO and the Triton 15.95 RTO at least once every three years in accordance with Regulation I, Section 3.07. Testing shall consist of at least three, one hour runs using EPA Method 25A and shall include simultaneous measurements at the inlet and outlet of each RTO. The owner or operator shall submit a compliance test plan with the test notification submitted under Regulation I, Section 3.07(b) at least 45 days prior to each compliance test. The test plan shall detail the test methods used for each pollutant, the operational data that will be collected during the test, and any other relevant information about the test.

15. For each source test conducted in accordance with Condition 13 or 14, the owner or operator shall determine the phenol polymerization percentage during each test run. In the test plan required by Condition 13 or 14, the owner or operator shall detail the proposed testing methodology, including test method that will be used and the methodology used for calculating the polymerization percentage.

16. Within 45 days of the issuance of this Order of Approval, the owner or operator shall evaluate the Legacy enclosed resin application areas to determine if they meet the criteria for a Permanent Total Enclosure (PTE) in 40 CFR Part 51, Appendix M, Method 204 and submit documentation of the results to the Agency. The test shall be conducted in accordance with Regulation I, Section 3.07.

17. Within 180 days of the issuance of this Order of Approval, the owner or operator shall test the overall capture efficiency of the Legacy line to demonstrate compliance with Condition 12. The owner or operator shall submit a compliance test plan with the test notification submitted under Regulation I, Section 3.07(b) at least 45 days prior to the compliance test. The test plan shall detail

the testing procedure, the operational data that will be collected during the test, and any other relevant information about the test.

18. If requested by the Agency, the owner or operator must test the overall capture efficiency of the C4-1, C4-2, or Legacy line in the timeframe requested by the Agency. If a test is required by the Agency, the owner or operator shall submit a compliance test plan and test notification at least 45 days prior to the compliance test. The test plan shall detail the testing procedure, the operational data that will be collected during the test, and any other relevant information about the test.

**OPERATING LIMITS**

19. After the Legacy resin application process is complete and the resin application enclosure is opened, each block shall immediately be transferred to an open curing oven.

20. The RTOs shall be operated at or above the average temperature maintained during the last stack test but shall not be operated at less than 1,400°F. The average temperature during the last stack test for each RTO shall be identified at or near the temperature monitor.

21. Each RTO shall be equipped with a thermocouple near the exit of the combustion chamber to measure temperature to +/- 14 degrees Fahrenheit. Temperature data must be measured and recorded continuously (or sampled at intervals no greater than 10 seconds and recorded as 1 minute averages).

22. The owner or operator shall annually test and calibrate or replace the thermocouples for each RTO. If performed, the test shall consist of either a physical or electronically simulated comparison and shall follow manufacturer specifications. The results of the test readings must be within +/- 14 degrees Fahrenheit. If the results of the test readings exceed +/- 14 degrees Fahrenheit of the reference value, the thermocouple must be replaced or adjusted to read within +/- 14 degrees Fahrenheit of the reference value. The owner or operator shall keep records of thermocouple calibration test reports, including the date and results of each test, the test method used, and a record of who performed the test. If the thermocouple is replaced, the owner or operator shall keep a record of the date it was replaced and who replaced it.

**RECORDS**

23. The owner or operator shall maintain records required by this Order of Approval for five years and make them available to Puget Sound Clean Air Agency personnel upon request.

24. Upon issuance of this Order of Approval, this Order supersedes and cancels Order of Approval No. 8455 dated October 11, 2001, and Order of Approval No. 10715 dated March 28, 2014.

## L. CORRESPONDENCE AND SUPPORTING DOCUMENTS

From: Courtney O'Gorman Sent: Thu 5/23/2019 9:18 AM
To: 'Mike.Pound@zodiacaerospace.com'
Cc: 'Jennifer.Fowler@zodiacaerospace.com'; Tom Hudson; 'Reynolds, David C'
Subject: NOC #11806 Incomplete - Safran Cabin (Reg. 17033)

HI Mike,

Thank you very much for the NOC application you submitted for the proposed changes to the capture/control system for the Legacy line. I have reviewed the application and determined that the application is incomplete. Could you please provide the following information?

1. How long does it take to unload the honeycomb blocks from the application area and transport them to the oven room? Are they immediately loaded into the oven at this point, or is there a waiting period in the oven room before they are loaded into the oven? If so, how long is the waiting period?
    a. It would be helpful if you could provide the relative amounts of time spent for each step (e.g., application room, unloading from application room, transport to oven room, waiting in oven room, etc.).
2. What is the exhaust flow rate (cfm) from each of the Legacy application areas?
3. On the Permitted Equipment Map, can you describe what "Legacy Coater 2 Coater 3" refers to? How is this different from what happens in the enclosed application areas?
4. What is the overall capture efficiency you expect for the emissions generated from all three lines (not just the Legacy line as described in the application)? Please provide supporting calculations for how you arrive at this number.
5. My intent is to establish a capture efficiency limit in the new synthetic minor permit with a testing requirement to verify compliance. What would Safran propose as a testing procedure to be able to determine the total capture efficiency for the emissions from the three lines?

I think it would be helpful for me to come up and see the area of the facility where these processes are again – now that I have a clearer picture of the changes that are being proposed. Would any of the following days work for you for Tom and me to visit the facility?

- Friday, May 31 - anytime
- Wednesday, June 5 –morning
- Tuesday, June 11 - anytime

Thank you!

**Courtney O'Gorman**
Engineer II
CourtneyO@pscleanair.org
206.689.4022

From: Reynolds, David C <dave.reynolds@terracon.com> Sent: Tue 8/27/2019 11:35 AM
To: Courtney O'Gorman; Mike.Pound@zodiacaerospace.com
Cc: Jennifer.Fowler@zodiacaerospace.com; Tom Hudson; Kurtz, Josh J
Subject: RE: NOC #11806 Incomplete - Safran Cabin (Reg. 17033)

Courtney,

Thanks for taking the time to talk to me yesterday about the questions and the capture testing methodology. We have updated the proposed testing methodology below based on our discussion.

I have listed your questions and Safran's responses to the questions.

***1. How long does it take to unload the honeycomb blocks from the application area and transport them to the oven room? Are they immediately loaded into the oven at this point, or is there a waiting period in the oven room before they are loaded into the oven? If so, how long is the waiting period?***

***a. It would be helpful if you could provide the relative amounts of time spent for each step (e.g., application room, unloading from application room, transport to oven room, waiting in oven room, etc.).***

The Legacy coating process has been separated into the following steps.

**Step 1: Placing Block in Legacy Coater.** The Legacy coating enclosure starts closed. The enclosure is equipped with a door on one side of the enclosure that opens to allow the uncoated block into the enclosure. The door is closed and sealed prior to the start of the coating process. The length of time that it took to complete this step ranged from 1 minute 55 seconds to 6 minutes 31 seconds. There will be some emissions associated with this step as there will be resin that remains in the coater enclosure from coating the previous block. The capture system will still be running and will capture a significant amount of the emissions, however since the door will be open the face velocity across the open door will not achieve 200 feet/minute. Therefore, no control is being assumed for this step.

**Step 2: Resin Application.** After the enclosure is sealed, the coating process will begin. The resin is applied to the block using a flow coater and an air knife. After applying the resin to the top of the block, it is allowed to adequately seep into the block, the block is rotated inside the enclosure, and resin is applied to the "bottom" of the block. After the resin is applied it also rests to allow the resin to seep into the block. Based on Safran's standard operating procedures, the time the blocks remain in the enclosure ranges from 95 to 140 minutes. This exhaust from the coater box will achieve 100% capture since there will be higher than 200 feet per minute entering any openings and it is being vented to an RTO.

**Step 3: Block Transfer to Oven.** After Step 2 is completed the door is opened and the block is manually transferred to an open oven. The time to transfer the blocks from the enclosures to the ovens was measured between 4-10 minutes, however 11 of the 12 blocks in the study were transferred in less than 6 minutes. Safran confirmed that the blocks are never removed from the coating enclosures unless there is an oven that they can be put in immediately. The emissions associated with this step are not controlled.

**Step 4: Oven Drying.** Based on Safran operating procedures, the blocks are placed in the ovens for a period of 55-63 minutes for drying. The ovens are enclosed and meet 100% capture and are vented to an RTO.

The times referenced above were taken from the data that Safran collected on the times it took to complete these four steps while processing 12 blocks. The table below documents the time it took to complete each step.

**Legacy Processing Step Times**

| Run | Step 1 Loading Block (Min:Sec) | Step 2 Coating (Min) | Step 3 Transfer to Oven (Min:Sec) | Step 4 Drying in Oven (Min) |
|---|---|---|---|---|
| Run 1 | 3:20 | 113 | 4:10 | 57 |
| Run 2 | 3:45 | 122 | 4:35 | 57 |
| Run 3 | 5:25 | 97 | 5:45 | 60 |
| Run 4 | 2:15 | 125 | 4:15 | 57 |
| Run 5 | 1:55 | 99 | 4:15 | 56 |
| Run 6 | 4:10 | 112 | 5:45 | 55 |
| Run 7 | 6:31 | 140 | 10:00 | 58 |
| Run 8 | 5:52 | 110 | 5:30 | 59 |
| Run 9 | 3:22 | 96 | 4:50 | 57 |
| Run 10 | 3:17 | 101 | 4:35 | 56 |
| Run 11 | 2:55 | 125 | 4:15 | 63 |
| Run 12 | 4:10 | 95 | 5:35 | 56 |
| Average | 3:54 | 111.3 | 5:17 | 57.6 |
| Minimum | 1:55 | 95 | 4:10 | 55 |
| Maximum | 6:31 | 140 | 10:00 | 63 |

***2. What is the exhaust flow rate (cfm) from each of the Legacy application areas?***

The exhaust flow rate from each of the coater boxes is being designed to be greater than 2,000 acfm. Safran has modified the opening above the each of the coater enclosures to be less than 2.5 square feet. This should result in a face velocity across the opening that greatly exceeds 200 feet/minute to document 100 percent capture of the VOCs in the enclosure during coating. The final exhaust flow rate and the exact area of natural draft openings will be measured for each booth after the installation of the fan and ductwork.

***3. On the Permitted Equipment Map, can you describe what "Legacy Coater 2 Coater 3" refers to? How is this different from what happens in the enclosed application areas?***

Legacy Coater 2 and Coater 3 are the internal terms that refer to the two enclosed application areas for the Legacy coating process. They refer to the same type of equipment.

***4. What is the overall capture efficiency you expect for the emissions generated from all three lines (not just the Legacy line as described in the application)? Please provide supporting calculations for how you arrive at this number.***

In Safran's original proposal to PSCAA, it was estimated that collecting the VOC emissions from Legacy coating enclosures should capture roughly two-thirds of the emissions that occur in steps 1-3 of the Legacy process and achieve an overall capture efficiency for the Legacy process of greater than 90%.

Previous Method 204 capture testing of the C4-1 coating line indicated that 69 percent of the overall emissions occur in the oven and the remaining 31 percent of the emissions occur in either the coating application areas or transfer areas. The calculation below builds upon this data and calculates the expected capture efficiency from the legacy process when the emissions from step 2 are controlled.

This calculation method assumes that the emission rate from steps 1-3 will be consistent, however it is expected that the emission rate during step 2 will actually be higher due to the application of liquid resin and increased volatilization.

Although this preliminary capture efficiency calculation indicates the Legacy process may achieve a capture efficiency of 94.8%, Safran is proposing a capture efficiency of 90% for the Legacy process.

Estimated Legacy Process Capture Efficency[1]

| Step | Average Time (min) | Controlled (Y/N) | Percent of time in Step | Percent of Emissions Controlled |
|---|---|---|---|---|
| Step 1: Block Placed in Enclosure | 3.9 | N | 2.2% | |
| Step 2: Block Coating | 111.3 | Y | 62.5% | 62.5% |
| Step 3: Tranfer from Enclosure to Oven | 5.3 | N | 3.0% | |
| Step 4: Drying in Oven | 57.6 | Y | 32.3% | 32% |

| | |
|---|---|
| Estimated Capture Efficiency | 94.8% |
| Proposed Capture Efficiency | 90% |

[1] The estimated Legacy Process Capture Efficiency is calculated based on amount of time it takes to complete each of the four steps associated with the Legacy process. The initial calculation assumes that the emissions associated with the process are uniform across the four steps.

The C4-1 and C4-2 lines are very similar and Safran expects that the capture efficiency associated with both of these lines to be the same. Safran believes that the 69% capture efficiency that was achieved on the C4-1 line during the Method 204 testing that was performed is also appropriate to apply to the C4-2 line.

***5. My intent is to establish a capture efficiency limit in the new synthetic minor permit with a testing requirement to verify compliance. What would Safran propose as a testing procedure to be able to determine the total capture efficiency for the emissions from the three lines?***

Since the C4-1 and C4-2 lines are very similar, Safran believes that the previously completed capture testing for the C4-1 line should also be applied to the C4-2 line and that further testing should not be required.

Since the Legacy process is different than the C4-1 and C4-2 lines and PSCAA has indicated that they are uncomfortable with applying the tested C4-1 line capture efficiency to the Legacy process, Safran is proposing the following test methodology to determining the capture efficiency of the Legacy process.

As we discussed, demonstrating capture using Method 204 for the Legacy process would be very difficult and expensive due to the manual transfer of the blocks from the coating enclosures to the ovens and considering that the ovens are in a different room.

Safran is proposing to verify the capture efficiency of the Legacy process by measuring the VOC concentrations using EPA Method 25A and measuring the corresponding exhaust flow rates. Safran is proposing to complete the capture testing by collecting data for steps 1-4 for the processing of three blocks in the Legacy process. Safran is proposing to collect the following information for each step.

**Step 1. Block Placed in Enclosure**

Time: For each of the three runs, Safran will record the start time when the enclosure is first opened and record the end time when the block has been placed in the enclosure and the door has been closed and sealed. Safran will coordinate with the testing firm to ensure that the testing firm is aware of the start and end times associated with step 1.

VOC Concentration: For each of the three runs, Safran will have a testing firm measuring the concentrations leaving the enclosure using an FID as detailed in EPA Method 25A. The average concentration will be determined based on the concentration readings observed during the times identified above.

Air flow: The testing firm will measure the air flow from the enclosure.

**Step 2. Block Coating**

Time: For each of the three runs, Safran will record the start time for this step when the door is closed in step 1 and the end time will be recorded when the door is opened to remove the block for transfer to the ovens. Safran will coordinate with the testing firm to ensure that they are aware of the start and end times associated with step 2.

VOC Concentration: For each of the three runs, Safran will have a testing firm measuring the concentrations leaving the enclosure using an FID as detailed in EPA Method 25A. The average concentration will be determined based on the concentration readings observed during the times identified above.

Air flow: The testing firm will measure the air flow from the enclosure.

**Step 3. Transfer from Enclosure to Oven**

Time: For each of the three runs, Safran will record the start time for this step when the enclosure door is opened to remove the block and transfer it to the oven and the end time will be recorded when block has been placed in the oven and the oven door is closed. Safran will coordinate with the testing firm to ensure that they are aware of the start and end times associated with step 3.

VOC Concentration: Since the area between the enclosure and the ovens will not be enclosed there will be no way of measuring the concentration associated with this step. However, since there will not be any resin applied in this step, Safran believes that the emission rate from this step will be equal to or less than the final emission rate that was observed in Step 2. Safran is proposing to apply this emission rate (average concentrations multiplied by flow rate) for the length of time it takes to complete Step 3.

Air flow: Since this step will not be enclosed and there is not any direct venting associated with Step 3, there will not be any air flow rate associated with this step. Safran believes that the emission rate from this step will be equal or less than the final emission rate that was observed in Step 2.

**Step 4. Drying in Oven**

Time: For each of the three runs, Safran will record the start time for this step when the oven door is closed, and the end time will be recorded when the oven door is opened to remove the block. Safran will coordinate with the testing firm to ensure that they are aware of the start and end times associated with step 3.

VOC Concentration: For each of the three runs, Safran will have a testing firm measuring the concentrations leaving the oven using an FID as detailed in EPA Method 25A. The average concentration will be determined based on the concentration readings observed during the times identified above.

Air flow: The testing firm will measure the air flow from the oven.

**Total Enclosure Evaluation of Coating Enclosure (Step 2) and Oven (Step 4)**

Safran will have the testing firm measure all of the natural draft openings associated with the coating enclosure (Step 2) and the Oven (Step 4). This information and the measured flow rates for each step will be used to demonstrate that each of the areas meet the 200 feet/minute face velocity to qualify as 100 percent capture.

**Legacy Process Capture Efficiency Calculation Methodology**

Safran will calculate the capture efficiency for the Legacy process by using the following steps. Similar to Method 204 testing, the actual emission rates associated with each of the steps is not required. The methodology is only used to calculate an accurate ratio of the emissions between the various steps.

Step 1: The average measured concentration (ppm) during Step 1 will be multiplied by the air flow rate leaving the enclosure (acfm) and the length of time it took to complete Step 1 (minutes).

Step 2: The average measured concentration (ppm) during Step 2 will be multiplied by the air flow rate leaving the enclosure (acfm) and the length of time it took to complete Step 2 (minutes).

Step 3: The last measured concentration (ppm) during Step 2 will be multiplied by the air flow rate leaving the enclosure (acfm) and the length of time it took to complete Step 3 (minutes).

Step 4: The average measured concentration (ppm) during Step 4 will be multiplied by the air flow rate leaving the enclosure (acfm) and the length of time it took to complete Step 4 (minutes).

The total of the steps will be calculated and considered to be the "total emissions" from the Legacy process. The percentage of emissions from each step will be calculated by dividing the "emissions" calculated for each step by the "total emissions" from the sum of all four steps.

After calculating the ratio of emissions associated with each step, the ratio of emissions associated with Step 2 and 4 will be totaled and assumed to by the capture efficiency associated with the Legacy process. Safran believes that the system will achieve a capture efficiency greater than 90%, however Safran is proposing to use a capture efficiency for the Legacy process in the permit that will be slightly less than the capture efficiency that is calculated using this methodology.

Hopefully this helps explain how Safran is proposing to perform the testing to calculate the capture efficiency from the Legacy process.

I know this is lengthy and complicated. We should set up a call to discuss it in more detail to make sure that you understand what it being proposed.

Thanks, and let me know if you have any questions.

Sincerely,

**David C. Reynolds, PE** (licensed in MN)
**Senior Associate**
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**M. REVIEWS**

| Reviews | Name | Date |
|---|---|---|
| Engineer: | Courtney Shernan (formerly O'Gorman) | 7/31/2020 |
| Inspector: | Tom Hudson | 11/5/2019 |
| Second Review: | Carole Cenci | 8/4/2020 |
| Applicant Name: | David Reynolds | 8/10/2020 |