IN THE MATTER OF:

Boeing Commercial Airplane Group ] PSD-91-06 Amendment 2
3003 W. Casino Rd. ] DRAFT APPROVAL
Everett, WA 98203 ]

Pursuant to the U.S. Environmental Protection Agency (EPA) regulations for the Prevention of Significant Deterioration (PSD) set forth in Title 40, Code of the Federal Regulations, Part 52 and regulations set forth in the Washington Administrative Code 173-400-700 and based on the complete application submitted by Boeing Commercial Airplane Group requesting consolidation of PSD 91-03, PSD 91-05 Amendment 2, and PSD 91-06 Amendment 1 and minor permit term revisions, Ecology now finds the following:

FINDINGS

1. PSD 91-03 allowed Boeing Commercial Airplane Group (Boeing) to build and established approval conditions affecting the operation of a new clean, seal, test and paint building designated Building 40-37 at the Everett facility (Boeing-Everett). The new building accommodated cleaning, sealing, testing and surface coating new Model 777 airplane wings, body sections and small parts. Ecology issued PSD 91-03 on July 10, 1991.

2. PSD 91-05 allowed Boeing to build and established approval conditions affecting the operation of two new corrosion inhibitor compound (CIC) emissions exhaust systems for coating Model 777 aircraft in Buildings 40-25 and 40-26 at Boeing-Everett. Boeing applied CIC at the Final Body Join and Final Assembly tool positions. Ecology issued PSD 91-05 on December 23, 1991.

   a. On April 11, 1995 Boeing requested a change in Approval Condition 3 of PSD 91-05. The requested change was a reduction in specificity of coating application methodology which allowed increased operational flexibility while maintaining BACT. Ecology granted the final approval of PSD 91-05 Amendment 1 on May 17, 1995.

   b. On June 14, 1999 Boeing requested a change in Approval Condition 2 of PSD 91-05. The requested change would allow Boeing to substitute other corrosion inhibiting coatings for the Dinitrol AV-8 and AV-30 (required in PSD 91-05 Amendment 1).

      (1) BACT was maintained and there was no proposed increase in volatile organic compound (VOC) emissions allowed in Approval Condition 1 of PSD 91-05.

      (2) Ecology granted the final approval of PSD 91-05 Amendment 2 on September 2, 1999.

3. PSD 91-06 allowed Boeing to build and established approval conditions affecting the operation of eighteen new tool positions in four areas of Buildings 40-04, 40-25, 40-26,
and 40-34 at Boeing-Everett to clean, seal, and paint Model 777 airplane components. The four areas were the Wing Panel, Wing Spar, Wing Majors, and Wing Body Join tool positions.

a. The tool position that was to be the wing stub oven in 40-26 was never built because Boeing determined that the capacity of the wing stub oven in the 40-25 was sufficient to provide capacity for all 777 production.

b. Except for the Wing Majors tool positions, emissions were vented by in-line exhaust systems. The term "in-line exhaust systems" was meant to be equivalent to "dedicated exhaust systems."


d. On November 5, 1999, Boeing requested changes in approval conditions of PSD No. 91-06. The requested changes specified cleaning solvent by evaporation characteristics rather than by chemical name, allowing increased operational flexibility while maintaining BACT with no increase in allowable emissions.

e. Ecology granted the final approval of PSD 91-06 Amendment 1 on November 20, 2000.

4. On November 15, 2004, Boeing submitted an application requesting administrative consolidation of PSD 91-03, PSD 91-05 Amendment 2, and PSD 91-06 Amendment 1 into PSD 91-06 Amendment 2 and several minor approval condition revisions. On March 9, 2005, Boeing modified this request to a minor permit amendment to allow revision of several approval conditions that will require public review.

a. Consolidation of these permits will allow Boeing to reorganize subject activities in the assembly operation of the Model 777. The separately designated work areas, Buildings 40-04, 40-25, 40-26, 40-34, and 40-37 are actually work stations housed in Boeing-Everett. Reorganization of the assembly line to accommodate modernized production techniques ("Lean Manufacturing") for Model 777 requires relocating and consolidating some of these work stations within the Everett facility. This permit allows the relocation and consolidation of the 777 work stations/tool positions anywhere within the Boeing-Everett facility as long as emissions from spray coating at the Wing Spar, Wing Panel, and Wing Body Join tool positions are vented through dedicated exhaust systems.

b. As part of the relocating and consolidating of equipment, Boeing will replace limited existing equipment and will modify limited existing processes and equipment. Boeing has demonstrated that the combined VOC emissions increases from these changes are less than the significance threshold of 40 tpy, and that therefore these changes do not trigger PSD review as a major modification.

c. Boeing requested that certain assembly processes dedicated to Model 777 production that were not included in any of the three PSD permits be included in the single, consolidated PSD permit. Examples of these processes include, but are not limited to systems installation, empennage and body section assembly. These processes have minor levels of emissions from activities such as solvent wipe cleaning, sealing, and
touch-up coating. Emissions from these processes are estimated to be less than 5 tpy of VOC and do not cause the facility to exceed the VOC emissions cumulatively allowed under PSD 91-03, PSD 91-05, and PSD 91-06.

d. Boeing requested deletion of defunct/satisfied approval conditions or approval conditions that duplicate existing, federally enforceable Puget Sound Clean Air Agency regulations:

(1) PSD 91-03, Approval Condition 7 limited Boeing to pressure testing no more than two wings in any continuous 24-hour period. Since Boeing will use only non-pollutant gas (air, nitrogen, inert gas, or carbon dioxide) for 777 models in the future, this restriction is no longer necessary. Approval Condition 2 in this amendment limits Boeing to using only non-pollutant gasses in wing pressure testing, but does not limit the number of wing pressure tests that may be performed in any time period.

(2) PSD 91-03, Approval Condition 8, PSD 91-05 Amendment 2, Approval Condition 5, and PSD 91-06 Amendment 1, Approval Condition 8 required Boeing to obtain and maintain VOC offset reduction totaling 263 tons per year (TPY). In the December 4, 1992 Ecology letter from Joseph R. Williams (Ecology Air Quality Program Manager) to Kirk J. Thomson (Boeing Director of Environmental Affairs), Ecology agreed that 140 TPY of the VOC offset requirement had been permanently satisfied. In the February 6, 1995 letter from David Kircher (Puget Sound Clean Air Agency Engineering Manager) to Kirk J. Thomson, Puget Sound Clean Air Agency acknowledged Boeing's satisfaction of the remaining VOC offset requirement in the form of emission reduction credits. Consequently, the relevant approval conditions have been permanently satisfied, and are deleted from this amendment.

(3) PSD 91-03, Approval Condition 9 and PSD 91-05 Amendment 2 and Approval Condition 7 require that the operations relevant to those permits comply with Regulation II of the Puget Sound Clean Air Agency. Regulation II prescribes the maximum VOC content allowed in coatings used in any aerospace equipment manufacturing in Puget Sound Clean Air Agency's jurisdiction. The regulation is fully federally enforceable. Its inclusion as an approval condition in a PSD permit is redundant, and adds nothing to the stringency or enforceability of the requirement. It is deleted in this amendment.

(4) PSD 91-03, Approval Condition 10, PSD 91-05 Amendment 2, Approval Condition 8, and PSD 91-06 Amendment 1, Approval Condition 11 required that construction of the respective operations be commenced within eighteen (18) months of issuance of the permit. The facilities are already constructed. This amendment consolidates the existing permits. Consequently, those approval conditions are satisfied, and are deleted from this amendment.

5. Boeing-Everett qualifies as a major source because it emits more than 250 tons per year of VOC.

6. Boeing Everett is located in an area which is designated Class II for the purposes of PSD
evaluation under 40 CFR 52.21 dated July 1, 1990.

7. Boeing-Everett is within an area which is currently designated as attainment relative to the state and national air quality standards for ozone. The area has gone out of, then been brought back into, attainment with national ambient air quality standards for ozone since the original PSD permits were issued.

8. This PSD amendment allows no increase in VOC emissions from Boeing-Everett relative to PSDs 91-03, 91-05 Amendment 2, and 91-06 Amendment 1.

9. The VOC emissions from the site are subject to PSD review.

10. Best available control technology (BACT):

   a. Cleaning and surface coating:

      (1) Surface coating efficiency of not less than 60 percent except for application of corrosion inhibitor compound, touch-up and repair operations, stenciling, lettering, and identification marking using an airbrush, and use of hand-held aerosol cans,

      (2) Capture, containment and recovery of paint gun cleaning solvents,

      (3) Capture and containment of VOCs emitted from spent cleaning rags, and

      (4) Low pressure application of bulk solvent except for cleaning intricate surfaces or those inaccessible to low pressure application.

   b. CIC coating process:

      (1) High-volume-low-pressure (HVLP), air-assisted airless, and airless spray gun surface coating and near surface spraying techniques, or other equipment/technique combinations with equivalent or better transfer efficiencies.

      CIC Emission factors:

      (a) "Advanced" CIC, which generally has the greatest film thickness of these CIC’s and is typically used in areas of the airplane most prone to corrosion, must have a maximum calculated VOC emission factor no greater than .023 kilogram per meter squared (kg/m²).

      (b) “Heavy Duty ” CIC, which is typically used for areas that are prone to moisture accumulation, must have a maximum calculated VOC emission factor no greater than .016 kg/m².

      (c) CIC other than those listed above must have a maximum calculated VOC emission factor no greater than .012 kg/m².

      (d) CIC applied by hand held spray cans shall meet the above emission factors and propellant shall not be included in calculating the emission factor.

   (2) Capture, containment and recovery of CIC surface coating equipment cleaning solvents.

   c. Wing Panel, Wing Spar, Wing Majors, and Wing Body Join:
(1) High volume low pressure (HVLP) surface coating or other application equipment/technique combinations with 60% or better transfer efficiency.

(2) Substitution of low vapor pressure, aqueous-based, or water-soluble cleaning for methyl ethyl ketone.

(3) This amendment allows use of higher vapor pressure solvents for the de minimis-use activities of research and development, quality control, laboratory testing, and cleaning and surface activation by hand wiping prior to adhesive bonding. These are exempted from the requirements under 40 CFR 63 Subpart GG, "National Emission Standards for Aerospace manufacturing and Rework Facilities."

(4) Capture, containment, and recovery of solvents used in cleaning of surface coating equipment.

(5) Control and containment of VOC from waste cleaning rags.

d. Touch-up and repair coating, stenciling, lettering, and applying other identification marking, and coating surfaces that are peculiarly difficult to access: Good operating practice performed by properly trained personnel.


f. Hand wiping inside fuel cells: Limiting solvents to those having a VOC composite vapor pressure no greater than 72 mm Hg at 20 °C.

g. Cleaning and surface activation prior to adhesive bonding, and cleaning solvent usage associated with research, development, quality control, and laboratory testing: Good operating practice performed by properly trained personnel.

11. The project will have no significant impact on ambient air quality.

12. The project is anticipated to have no noticeable effect on industrial, commercial, or residential growth in the Everett area.

13. Visibility will not be impaired in any Class I area due to the proposed emissions.

14. Ambient pollutant concentrations in any Class I area are not predicted to change due to the project with the approval conditions.

15. PSD 91-06 Amendment 2 will supercede all prior versions of PSD 91-06 immediately upon its final and effective approval.

16. PSD 91-03 and PSD 91-05 (including all amended versions) will be rescinded immediately on final and effective approval of PSD 91-06 Amendment 2.

17. Ecology finds that all requirements for amending PSD 91-06 have been satisfied. Ecology grants approval of Boeing’s request for a second amendment to PSD 91-06 subject to the following approval conditions and upon rescission of PSD 91-03 and PSD 91-05 (including all amended versions):

APPROVAL CONDITIONS
Boeing-Everett's requirements in the following approval conditions to notify or report to or acquire approval or agreement from "Ecology and the Puget Sound Clean Air Agency" may be satisfied by providing such notification, reporting, or approval request to the Puget Sound Clean Air Agency if the approval conditions of this PSD permit have been incorporated in Boeing-Everett's Title V permit (40 CFR Part 70). Notifications, reports and approval requests provided to the Puget Sound Clean Air Agency before the issuance of this second amendment to PSD 91-06 need not be provided to Ecology; and approvals previously granted by the Puget Sound Clean Air Agency are not subject to further review or approval by Ecology.

**Emission Limits**

2. Only air, nitrogen, inert gas, or carbon dioxide may be used to pressure test Model 777 wings.

3. VOC emissions from Model 777 assembly operations described in Findings 1 through 4, above, at Boeing-Everett:

   3.1 Shall not exceed 238.8 tons per year.

   3.2 As used in this permit, VOCs are defined in 40 CFR 51.100(s).

4. Corrosion-inhibiting compound (CIC) coatings used at the Final Body Join and Final Assembly tool positions must meet the following VOC emission factors. For CIC coatings applied with hand held aerosol spray cans, the propellant shall not be included in calculating the coating VOC emission factor of the coating. "Advanced" and "Heavy Duty" CIC shall be consistent with the description in Finding 10b, above.

   4.1 “Advanced” CIC: Maximum calculated VOC emission factor no greater than .023 kilogram VOC per meter squared of coated surface (kg VOC/m²).

   4.2 “Heavy Duty ” CIC: Maximum calculated VOC emission factor no greater than .016 kg VOC/m² of coated surface.

   4.3 CIC other than those listed above: Maximum calculated VOC emission factor no greater than .012 kg VOC/m² of coated surface.

5. Surface coating equipment will have a transfer efficiency of 60 percent or greater with the following exceptions:

   5.1 Application of corrosion inhibiting compound (CIC) at the Final Body Join and Final Assembly tools positions as provided in Approval Condition 6.

   5.2 In the lower lobe of the aircraft body sections.

   5.3 In aircraft sections that Ecology and PSCAA agree are too difficult to reach with a spray gun.

   5.4 Touch-up and repair operations meeting the following definition: That portion of the coating operation that is the incidental application of coating used to cover minor imperfections in the coating finish or to achieve complete coverage. This definition includes out-of-sequence or out-of-cycle coating.
5.5 Stenciling, lettering, and identification marking using an airbrush.

5.6 Hand-held aerosol cans.

6. When spray-applying CICs at the Final Body Join and Final Assembly tool positions, Boeing shall use air-assisted airless and airless spray gun painting systems and near-surface spraying techniques or other equipment/technique combinations with equivalent or better transfer efficiencies.

7. Spray guns and hoses will be cleaned by one or more of the following, or equivalent methods that are approved by Ecology and the Puget Sound Clean Air Agency:

7.1 Enclosed system:

7.1.1 Clean the spray gun in an enclosed system that is closed at all times except when inserting or removing the spray gun.

7.1.2 Cleaning shall consist of forcing solvent through the gun.

7.2 Nonatomized cleaning:

7.2.1 Clean the spray gun by placing cleaning solvent in the pressure pot and forcing it through the gun with the atomizing cap in place.

7.2.2 No atomizing air is to be used.

7.2.3 Direct the cleaning solvent from the spray gun into a vat, drum, or other waste container that is closed when not in use.

7.3 Disassembled spray gun cleaning:

7.3.1 Disassemble the spray gun and clean the components by hand in a vat, which shall remain closed at all times except when in use.

7.3.2 Alternatively, soak the components in a vat, which shall remain closed during the soaking period and when not inserting or removing components.

7.4 Atomized cleaning:

7.4.1 Clean the spray gun by forcing the cleaning solvent through the gun.

7.4.2 Direct the resulting atomized spray into a waste container that is fitted with a device designed to capture the atomized cleaning solvent emissions.

7.5 Nozzle tips on automated and robotic systems shall be programmed to spray into a closed, container where that is an element of their designed capability.

7.6 Spray gun cleaning operations exempted from the requirements in Approval Conditions 7.1 through 7.5:

7.6.1 Cleaning of the nozzle tips of automated spray equipment systems that do not have the design capability described in Approval Condition 7.5 are exempt from the requirements in Approval Conditions 7.1 through 7.5.

7.6.2 Cleaning solvents having low concentrations of VOCs and hazardous air
pollutants (HAPs):

7.6.2.1 The VOC concentrations must be less than 1.0 percent by weight

7.6.2.2 HAPs are those chemicals listed in 42 USC 7412(b)(1) and incorporating subsequent revisions made in accordance with 42 USC 7412(b)(2).

7.6.2.3 The HAP concentration must be less than

7.6.2.3.1 .1 percent by weight for carcinogens and
7.6.2.3.2 1.0 percent by weight for noncarcinogens.

8. Waste solvent cleaning rags will be deposited in containers which contain and capture VOCs and are approved by Ecology and the Puget Sound Clean Air Agency.

9. Bulk application of solvent will be by low pressure hose except for
9.1 Cleaning intricate surfaces, or
9.2 Where access is limited to the extent that using a low pressure hose is infeasible.

10. Cleaning operations at the Wing Panel and the Wing Spar tool positions shall be conducted by either:
10.1 Flush cleaning using a semi-aqueous solution containing a minimum of 60 percent by weight water and having a VOC composite vapor pressure no greater than 5 millimeters of mercury (mm Hg) at 20 degrees Celsius (°C), or
10.2 Hand wiping:
10.2.1 Shall use a solvent with a volatile organic compound (VOC) composite vapor pressure no greater than 45 mm Hg at 20 °C.
10.2.2 Cleaning and surface activation by hand wiping prior to adhesive bonding or cleaning solvent usage associated with research and development, quality control, and laboratory testing is exempt from Approval Condition 10.2.1.

11. Solvent used for hand wiping at the Wing Majors, Wing Body Join, and mid-section seal and paint tool positions:
11.1 Other than as specified in Approval Conditions 11.2 and 11.3, shall have a VOC composite vapor pressure no greater than 45 mm Hg at 20 °C.
11.2 Solvent used for hand wiping inside fuel tanks and fuel cells shall have a VOC composite vapor pressure no greater than 72 mm Hg at 20 °C.
11.3 The following are exempted from Approval Conditions 11.1 and 11.2:
11.3.1 Cleaning and surface activation prior to adhesive bonding.
11.3.2 Cleaning solvent usage associated with research, development, quality control, and laboratory testing.
12. The emission exhaust systems serving the clean, seal and paint processes at the Wing Panel, Wing Spar, Wing Body Join, and mid-section seal and paint tool positions shall be equipped with a filtering system to achieve 98.9 or greater percent chromium VI removal.

Compliance Monitoring

13. Boeing-Everett shall monitor compliance with Approval Conditions 2, 5, 6, 7, 8, 9, 10, and 11 by

13.1 Conducting inspections of the work practice activities of the Model 777 assembly area at least once per calendar quarter.

13.2 Work practices shall be randomly sampled during each inspection, and observed for consistency with permit requirements.

14. Boeing-Everett shall calculate VOC vapor pressure for monitoring compliance with Approval Conditions 10 and 11 according to the equation in section 40 CFR 63.750(b) of Subpart GG, National Emission Standards for Aerospace Manufacturing and Rework Facilities.

15. Boeing-Everett shall monitor compliance with Approval Condition 3 by annually updating and maintaining on-site:

15.1 A list of all primers, topcoats, temporary protective coatings, CIC coatings, and cleaning solutions used in Model 777 assembly within the immediately past twenty-four months.

15.2 The corresponding Material Safety Data (MSD) Sheets or other manufacturer-supplied data on VOC content.

16. Boeing-Everett shall monitor compliance with Approval Condition 4 from the data maintained pursuant to Approval Condition 15.

17. Boeing-Everett shall monitor compliance with Approval Condition 12 by

17.1 Maintaining documentation that all chromium VI filter systems have been precertified using Method 319 (Determination of Filtration Efficiency for Paint Overspray Arrestors, 40 CFR Part 63 Appendix A), and

17.2 Conducting inspections of the chromium VI filtering system at least once per calendar quarter.

17.2.1 Said inspections shall include checking the primary dry filter systems, where visible, for proper seating and complete coverage over the exhaust plenum.

17.2.2 If a multi-stage filtration system is used to meet the required efficiencies, the primary filter is the visible filter that is part of the multi-stage system used to meet the required efficiency.

Recordkeeping, Notification and Reporting

18. Boeing-Everett shall keep the following records:
18.1 With respect to compliance inspection requirements described in Approval Conditions 13 and 17.2, these shall include as a minimum:

18.1.1 Date of the inspection.
18.1.2 Emission unit(s) inspected.
18.1.3 Who performed the inspection.
18.1.4 All observations made that are germane to compliance with Approval Conditions 2, 5, 6, 7, 8, 9, 10, and 11.

18.2 With respect to Approval Condition 14, the related calculations made to demonstrate compliance each time a solvent composition is changed pursuant to use in the operations described in Approval Conditions 10 or 11.

18.3 With respect to Approval Condition 16, these shall include as a minimum:

18.3.1 CIC coating density.
18.3.2 Theoretical coverage.
18.3.3 Derivative calculations.

18.4 Records shall be retained for not less than five years after their origination.

18.5 At a minimum, the most recent two years of data shall be retained on site. The remaining three years of data may be retained off site.

18.6 Records shall be available to Ecology and the Puget Sound Clean Air Agency within ten days of request.

19. Boeing-Everett shall report the types, quantities and VOC content of the CICs, cleaning solutions, and paints and the VOC emissions annually to Ecology and the Puget Sound Clean Air Agency.

20. Prior to incorporation of the approval conditions of this PSD permit into Boeing-Everett's Title V permit (40 CFR Part 70), each occurrence of VOC emissions measured in excess of the limit specified in Approval Condition 3 and each observed failure to comply with Approval Conditions 2, 4, 5, 6, 7, 8, 9, 10, 11, or 12:

20.1 Shall be reported in writing to Ecology or the Puget Sound Clean Air Agency in accordance with WAC 173-400-107(3).

20.2 As used in WAC 173-400-107(3), "as soon as possible" shall mean in no case later than twelve hours after the deviation is discovered.

20.3 Such reports shall include:

20.3.1 As a minimum:

20.3.1.1 The time of the occurrence.
20.3.1.2 Magnitude of excess from the emission limit.
20.3.1.3 The duration of the excess.
20.3.1.4 Any agency contacted.

20.3.2 Upon request by Ecology or the Puget Sound Clean Air Agency:

20.3.2.1 The probable cause.

20.3.2.2 Corrective actions taken or planned.

21. After incorporation of the approval conditions of this PSD permit into Boeing-Everett's Title V permit (40 CFR Part 70), each occurrence of VOC emissions measured in excess of the limit specified in Approval Condition 3 and each observed failure to comply with Approval Conditions 2, 4, 5, 6, 7, 8, 9, 10, 11, or 12 shall be reported in writing to Ecology or the Puget Sound Clean Air Agency as required by that Title V permit in accordance with WAC 173-401-615(3)(b).

**Standard Requirements**

22. Nothing in this determination shall be construed so as to relieve the company of its obligations under any state, local, or federal laws or regulations.

23. Access to Boeing-Everett Model 777 assembly by the U.S. Environmental Protection Agency (EPA), Ecology, and state or local regulatory personnel shall be permitted upon request for the purpose of compliance assurance inspections. Failure to allow access is grounds for revocation of this determination of approval.

24. The effective date of this permit shall not be earlier than the date upon which the USEPA notifies Ecology that the USEPA has satisfied its obligations, if any, under Section 7 of the Endangered Species Act 16 U.S.C. § 1531 et seq., 50 C.F.R. part 402, subpart B (Consultation Procedures) and Section 305(b)(2) of the Magnuson-Stevens Fishery and Conservation Act 16 U.S.C. § 1801 et seq., 50 C.F.R. part 600, subpart K (EFH Coordination, Consultation, and Recommendations).

25. For federal regulatory purposes and in accordance with 40 CFR 124.15 and 124.19: If there was a public comment requesting a change in the preliminary determination or a proposed approval condition during the public review and comment period, the effective date of this permit shall not be earlier than 30 days after service of notice to the commenters and applicant on the final determination.

25.1 If a review of the final determination is requested under 40 CFR 124.19 within the 30-day period following the date of the final determination, the effective date of the permit is suspended until such time as the review and any subsequent appeal against the permit are resolved.

25.2 If there was no public comment requesting a change in the preliminary determination or a proposed approval condition during the public review and comment period, this permit is effective upon the date of finalization subject to consideration of Approval Condition 24 (EPA's ESA requirement), above.

Reviewed by:

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Ecology was notified by the USEPA that the USEPA has satisfied its obligations under the Endangered Species and Magnuson-Stevens Acts relative to PSD Permit 03-03 issued to Cardinal FG Company, Winlock, WA on: April 8, 2005

Stuart A. Clark, Program Manager
Air Quality Program
Washington State Department of Ecology