The Boeing Company
P.O. Box 516
St. Louis, MO 63166-0516
(314) 232-0232

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John Therriault, Acting Clerk
Illinois Pollution Control Board
100 West Randolph Street, Suite 11-500
Chicago, IL 60601

Charles E. Matoesian
Illinois Environmental Protection Agency
Division of Legal Counsel
1021 North Grand Avenue East
P.O. Box 19276
Springfield, IL 62794-9276

PC# 1
R13-18

REF: Pollution Control Board Regulatory Agenda, Item n), Organic Material Emission Standards and Limitations for Chicago and Metro East Areas, Parts 218 and 219. Illinois Register, Dec. 21, 2012.

ATTACH: Recommended Rule Revisions to Align Illinois Volatile Organic Material Rules with Control Technology Guidelines and Other State Rules

Dear Mr. Therriault and Matoesian:

The most recent Pollution Control Board Regulatory Agenda states that Illinois intends to develop amendments to the VOM rules for Chicago and Metro East, to "clean up various errors and outdated portions of the rules." The Boeing Company operates a manufacturing facility at Mid-America Airport near Mascoutah, Illinois, and is subject to two of the Metro East VOM rules that should be amended.

At present, the solvent cleaning and surface coating rules contain applicability provisions that are contrary to the latest federal Control Technology Guidelines (CTGs). Because of this, Illinois rules have the effect of imposing emission limits on aerospace operations that do not represent Reasonably Available Control Technology (RACT), and are inconsistent with VOM rules that govern aerospace in other states. Federal CTGs recognize that cleaning and coating requirements for aerospace components are different from other manufactured goods, and that aerospace is a distinct source category under Section 183(b) of the Clean Air Act. Aerospace cleaning and coating specifications are critical to flight safety, and are subject to very specific performance requirements of the Federal Aviation Administration, NASA, and Department of Defense. Because of this, EPA issued an Aerospace CTG in December 1997 for aerospace coatings and solvent cleaning. Subsequent CTGs issued for industrial solvent cleaning, surface coating, and adhesive source categories

state that aerospace is to be excluded from state RACT rules that cover these other solvent cleaning and coating activities. Details and citations are attached.

To comply with Illinois rules as presently written, Boeing manufacturing operations in Metro-East cannot exceed the applicability thresholds of the solvent cleaning and surface coating rules, namely 15 lbs. VOM per day for surface coating and 500 lbs. VOM per month for solvent cleaning. We wish to work with you to remedy this situation, to ensure that Illinois air emission regulations account for unique aerospace cleaning and coating requirements.

We've attached recommended rule revisions, to align Illinois rules with federal CTGs and with VOM rules of other states. Our immediate concern is with Metro-East. The citations provided in the attachment are from Metro East rules, but the VOM rules for Chicago largely parallel the Metro East rules. It will be important for future expansion of the aerospace supply base in Illinois that Chicago rules also conform to CTG guidance and VOM requirements of other Midwestern states.

Our point of contact for regulatory development is David Shanks, located at Mail Stop S111-2491 at the Boeing St. Louis address above. He can be reached at (314) 777-9227 and david.l.shanks@boeing.com. He is available to meet with Illinois EPA and/or Pollution Control Board staff in Springfield or Chicago, as needed to provide more detail.

Sincerely,

Bret Spoerle, Senior Manager
Environment, Health and Safety
St. Louis Area Sites
The Boeing Company

cc: David Bloomberg, IEPA Air Quality Planning Section

ATTACHMENT

Recommended Rule Revisions to Align Illinois Volatile Organic Material (VOM) Rules with Control Technology Guidelines and Other State Rules

A 1996 ILLINOIS NEGATIVE DECLARATION REGARDING THE NEED FOR AN AEROSPACE RACT RULE HAS LED TO A GAP IN REGULATORY COVERAGE FOR SMALL AEROSPACE FACILITIES.

On October 11, 1996, Illinois EPA submitted a negative declaration to federal EPA, regarding the need for an aerospace VOM RACT rule in Illinois ozone nonattainment areas. In the declaration, Illinois determined that there were no major[1] aerospace sources of VOM in the Chicago or Metro-East nonattainment areas.[2]

Federal EPA approved the negative declaration in 1997, agreeing that there were no aerospace sources of VOM with potential to emit greater than 25 ton/year VOM in the Chicago or Metro-East areas.[3] As a result of this finding, Illinois EPA did not develop an aerospace VOM rule.

Today, we are not aware of any aerospace facilities in Chicago or Metro-East that have potential VOM emissions greater than 25 tons/year. The Boeing facility near Mascoutah has potential emissions far below this threshold. Therefore, the 1996 negative declaration for major sources may still be valid, but lack of an Illinois aerospace rule has led to regulatory gaps described below.

In states that have a VOM RACT rule for aerospace,[4] the aerospace rule clearly defines the surface coating and cleaning activities that are either 1) subject to the aerospace rule, 2) within the aerospace source category, but exempted from particular emission controls, or 3) are not subject to a VOM rule because facility emissions are below that state's aerospace rule applicability threshold. In these states, and also in states that lack an aerospace rule, other surface coating and solvent cleaning rules that might otherwise be read to include aerospace activities contain clear exemptions for aerospace coating and cleaning.[5]

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[1] In this case, the term "major" referred to the Aerospace CTG recommendation of 25 tons/year VOM potential to emit as a RACT rule threshold.

[2] Page 5-2, "Control of Volatile Organic Compound Emissions from Coating Operations at Aerospace Manufacturing and Rework Operations" [hereinafter Aerospace CTG], EPA Office of Air Quality Planning and Standards, December 1997, EPA-453/R-97-004. The Aerospace CTG recommends a 25 ton/year threshold for moderate, serious, or severe ozone nonattainment areas, and a 10 ton/year threshold for extreme nonattainment areas.

[3] Approval and Promulgation of Implementation Plans; Illinois, Direct Final Rule, 62 Federal Register 6127, February 11, 1997.

[4] See, for example, Missouri 10 CSR 10-5.295, Utah R307-355, or Pennsylvania Title 25, Chapter 129.73.

[5] Because Missouri has an aerospace VOC rule that can be referenced, the Missouri industrial surface coating rule at 10 CSR 10-5.330(1)(D)8, exempts "Surface coating and cleaning of aerospace vehicles or components..." and further clarifies the exemption of aerospace facilities that are subject to the

Lacking an aerospace RACT rule to provide source category clarification, Illinois VOM surface coating and solvent cleaning rules have incomplete or missing exclusions for aerospace activities. These incomplete or missing exclusions are contrary to the documented scope of the relevant CTGs. These are described below.

THE ILLINOIS MISCELLANEOUS METAL AND PLASTIC PARTS SURFACE COATING RULE 219.204(q) IS INCONSISTENT WITH THE CTG FOR THIS SOURCE CATEGORY.

The Metro-East Coating Operations rule in Part 219, Subpart F does not include any VOM limits for aerospace coatings. Neither does it contain the exclusion for aerospace coatings found in the September 2008 CTG for Miscellaneous Metal and Plastic Parts Coating.[6] This CTG clearly states that the miscellaneous metal parts and plastic parts coatings source category does "not include coatings that are a part of other product categories listed under Section 183(e) of the Act for which CTGs have been published and/or addressed by other CTGs. These other categories..include... aerospace coatings,..."[7] Aerospace components generally have a metal or reinforced plastic composite substrate, but EPA issued a separate Aerospace CTG because aerospace parts are subjected to extremes of temperature, wind shear, pressure, vibration, and corrosive environments that require specific coatings that are unique to aerospace products and not used in other industrial applications.

While the Part 219 Coating Operations rule does not mention aerospace,[8] the Illinois definition of "Miscellaneous Metal Parts and Products Coating" at Section 211.3850(c), states that such coating does not include "the following coatings: ...coatings applied to the exterior of airplanes..."[9] This partial exemption for airplane exteriors appears to be based on earlier, now-obsolete guidance, not on the 2008 CTG. The 2008 Miscellaneous Metal and Plastic Parts Coating CTG exempts all aerospace coatings, in recognition that aerospace coatings, whether interior or exterior, must meet extreme performance requirements that are different from other products. The broader "aerospace coating" exclusion in the 2008 CTG (as opposed to "airplanes") also recognizes that a

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10 CSR 10-5.295 Missouri aerospace rule or within its exemptions. A less detailed, but still effective, exemption is found in the Utah miscellaneous metal parts coating rule, R307-350-3, which simply exempts "Surface coating of aerospace vehicles and components."

[6] "Control Techniques Guidelines for Miscellaneous Metal and Plastic Parts Coatings," EPA Office of Air Quality Planning and Standards, September 2008, EPA-453/R-08-003.

[7] Page 6, CTG for Miscellaneous Metal and Plastic Parts Coatings.

[8] The partial exemption for airplane exteriors will not be found in the text of the Subpart F rule, but can only be discovered in some, but not all, relevant definitions in Section 211.

[9] The Illinois definition of Miscellaneous Metal Parts and Products Coating at 211.3850 and Miscellaneous Metal Parts or Products Coating Line at 211.3870 exclude coatings applied to the exterior of airplanes, but the same exclusion is not found in the Illinois definition of "Miscellaneous Metal Parts and Products" at 211.3830. This discrepancy is striking, since the other exclusions in the three definitions are largely identical.

variety of aerospace vehicles were considered in the development of the Aerospace CTG, not just "airplanes," but rockets, missiles, helicopters, and space vehicles.[10]

The aerospace industry and military services have, since the 1997 publication of the Aerospace CTG, established surface coating specifications that conform to the more than 57 coating categories in the CTG. Some of these aerospace coatings have higher VOM content than coatings for non-aerospace miscellaneous metal and plastic parts, and some have lower VOM content. The Aerospace CTG has a large number of coating categories, which leads to more lengthy RACT rules, but by defining coatings narrowly, EPA was able to impose the lowest available VOM content that would still perform the specialized function of each coating type.

Illinois surface coating rules have, at most, a partial exemption for coatings on "exterior of airplanes," so that coatings applied to other aerospace vehicles and interior aircraft structures can be read to fall within Illinois' miscellaneous metal and plastic parts coating limits. These VOM limits, developed for other industrial source categories, cannot be met with many aerospace coatings. These aerospace coatings are specified for use nationally and internationally, meet the VOM limits of other state/local jurisdictions, and comply with VOM limits of the Aerospace NESHAP.[11]

Recommended Revisions, Surface Coating

Boeing recommends an explicit exemption for aerospace surface coating in the Subpart F Coating Operations rule at Sec. 219.204(q). Conforming modifications are also needed in several definitions of Section 211.

- An exemption for "aerospace vehicles and assemblies" in 219.204(q) should be placed in the first paragraph, so that it covers both miscellaneous metal parts and miscellaneous plastic parts. This is important because some reinforced plastic composite aerospace components could be read to fall within the broad Illinois definition of "plastic part" at 211.4740.[12]

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[10] The Aerospace CTG definition of "aerospace vehicle or component" is "any fabricated part, processed part, assembly of parts, or completed unit, with the exception of electronic components, of any aircraft including but not limited to airplanes, helicopters, missiles, rockets, and space vehicles." This is the same definition that is used in the Aerospace NESHAP at 40 CFR 63.742.

[11] Due to the high degree of overlap between aerospace VOM materials and organic Hazardous Air Pollutants, the Aerospace NESHAP imposes both VOM and organic HAP limits on primers, topcoats, and chemical milling maskants. The NESHAP does not set VOM/HAP limits on the 57 specialty coatings that are subject to Aerospace CTG limits, because these are used in very low volumes, as compared to primers and topcoats. See 40 CFR 63.745 and 63.747.

[12] Modern aerospace vehicles use reinforced plastic composites for strength and weight reduction in lieu of metals in certain applications. These composite parts contain resin systems and are typically cured in autoclaves. As such, they could fit within the Illinois definition of "plastic part," which is "a product, or piece of a product, made from a substance that has been formed from resin through the application of pressure or heat or both." Since aerospace vehicles often contain a mix of metal and

- Suggested placement: "On or after May 1, 2012, the owner or operator of a miscellaneous metal or plastic parts coating line shall comply with limitations in this subsection (q). The limitations in this subsection (q) shall not apply to surface coating of aerospace vehicles and assemblies, aerosol coating products....."

- Since "aerospace vehicles and assemblies" are not defined elsewhere in the Illinois VOM rules, such a definition should be added to the Sec. 211 definitions rule. To be consistent with the Aerospace CTG and NESHAP definitions, aerospace vehicles and assemblies should be defined as "any fabricated part, processed part, assembly of parts, or completed unit, with the exception of electronic components, of any aircraft, including but not limited to airplanes, helicopters, missiles, rockets, and space vehicles."[13]
- The Illinois definitions of "Miscellaneous Metal Parts and Products," " Miscellaneous Metal Parts and Products Coating," and "Miscellaneous Metal Parts or Products Coating Line" in Section 211 should be harmonized to eliminate the discrepancies between them, and to replace the obsolete term "coatings applied to the exterior of airplanes" with the term "coatings applied to aerospace vehicles and assemblies."

ILLINOIS SOLVENT CLEANING RULE 219.187 IS INCONSISTENT WITH THE CTG FOR INDUSTRIAL CLEANING SOLVENTS.

Prior to August 12, 2011, the Metro-East solvent cleaning rule for "Other Industrial Solvent Cleaning Operations" at Sec. 219.187 exempted "aerospace coating." This was eliminated at the last rule revision. While the prior "aerospace coating" exemption was incomplete and ambiguous, the Illinois rule as revised does not reflect the proper scope of this source category, as described in the Solvent Cleaning CTG and the Aerospace CTG.

When the Industrial Cleaning Solvent CTG[14] was issued in 2006, EPA had already determined presumptive RACT for aerospace cleaning operations, and not just those associated with "coating." Since many of the VOM materials used in aerospace solvent cleaning are also hazardous air pollutants, the Aerospace CTG represents not only presumptive RACT for aerospace cleaning, but also Maximum Achievable Control Technology, to align with the Aerospace NESHAP.[15] Specifically, the Aerospace CTG sets forth detailed solvent cleaning requirements for the three following cleaning activities:

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composite parts in the same assembly or subassembly, the same NESHAP and CTG-compliant aerospace coatings are generally used on both types of substrates.

[13] Page A-4 of Aerospace CTG and 40 CFR 63.742 Aerospace NESHAP definitions.

[14] "Control Techniques Guidelines: Industrial Cleaning Solvents," EPA Office of Air Quality Planning and Standards, September 2006, EPA 453/R-06-001.

[15] Page 4-6, "Control of Volatile Organic Compound Emissions from Coating Operations at Aerospace Manufacturing and Rework Operations," [hereinafter Aerospace CTG], EPA Office of Air Quality Planning and Standards, December 1997, EPA-453/R-97-004.

- Hand Wipe Cleaning. In addition to closed container and housekeeping provision, aerospace hand wipe solvents must meet either:
    - 45 mmHg maximum vapor pressure, or
    - Aqueous cleaner

  While a variety of NESHAP/CTG-compliant cleaners are used for different aerospace cleaning purposes, the 45 mm vapor pressure solvent blends are widely used in applications where cleanliness standards are critical and where residues from aqueous cleaning surfactants cannot be tolerated. The Illinois solvent cleaning rule sets an 8 mmHg limit, which is well below the maximum vapor pressure specified in the Aerospace CTG. VOM content of aerospace 45 mm blends varies, but is generally in the 700-800 gram/liter range, well above the 50 g/l default value for "All other cleaning operations" in Illinois' Sec. 219.187 solvent cleaning rule. The aerospace industry and military services have, since 1995, established cleaning solvent specifications to conform to the NESHAP, CTG, and aerospace RACT rule requirements of other states. Testing and qualifying beyond-NESHAP/CTG hand wipe cleaning solvents and modifying specifications for only one jurisdiction (Illinois) would be a very significant obstacle to an aerospace operation that planned to exceed the 500 lb/mo VOM threshold of the Illinois solvent cleaning rule.
- Spray Gun Cleaning. The Illinois rule for Other Industrial Solvent Cleaning Operations includes spray gun cleaning.[16] Since aerospace spray guns do not fit any of the industry-specific cleaning descriptions in the Illinois rule,[17] the default limits are 50 g/l VOM content and 8 mmHg vapor pressure.[18] Two-part coatings are most commonly used on aerospace parts, in order to meet paint adhesion, durability, corrosion control and other flight safety requirements. These two-part coatings undergo a chemical reaction in the paint pot, which partially polymerizes the resin system prior to painting. Removal of partially-reacted two-part coatings from paint equipment requires solvents that generally do not meet a low VOM content or low vapor pressure. In recognition of the coatings that must be removed from aerospace spray guns, the Aerospace CTG sets prescriptive work practices, rather than VOM content or vapor pressure limits on solvent used.
- Flush Cleaning. Given the wide range of distinct aerospace cleaning operations that fall within the CTG definition of flush cleaning, the Aerospace NESHAP and CTG set prescriptive work practices, rather than solvent content or vapor pressure limits.

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[16] Section 219.187(a)(1).

[17] See cleaning categories at Section 219.187 b)1)A), B), C) or D). This is not surprising, since the Industrial Solvent Cleaning CTG would not have listed cleaning activities that were outside the scope of this CTG, and aerospace cleaning is outside the scope.

[18] Section 219.187 b)1)E) and b)2).

Recommended Revision, Solvent Cleaning

To align the Illinois solvent cleaning rule with the Industrial Solvent Cleaning and Aerospace CTGs, we recommend adding the following term to the rule exemption at Sec. 219.187(a)(2)(B): "Cleaning of aerospace vehicles and assemblies, or tools and equipment used to apply aerospace surface coatings."

THE AEROSPACE CTG REINFORCES THAT AEROSPACE EXCLUSIONS THAT SHOULD BE EXPLICITLY INCORPORATED INTO STATE RACT RULES FOR OTHER SOURCE CATEGORIES

The Aerospace CTG, issued in 1997, states: "The operations covered by this CTG shall not be subject to another CTG. The operations and applications exempted under this CTG shall not be subject to another CTG."[19] [emphasis added]. Subsequent CTGs, such as the Industrial Solvent Cleaning CTG in 2006 the Miscellaneous Metal and Plastic Parts CTG in 2008, and the Industrial Adhesives CTG in 2008, all exclude aerospace from the scope of their respective presumptive RACT determinations, because aerospace VOM activities were already considered separately.

THE ILLINOIS MISCELLANEOUS INDUSTRIAL ADHESIVES RULE CONFORMS TO THE INDUSTRIAL ADHESIVES CTG

The Aerospace CTG set VOM limits for eight categories of aerospace adhesives,[20] listed among the "specialty coatings" in the CTG. As with other CTGs, the 2008 CTG for Miscellaneous Industrial Adhesives states: "The miscellaneous industrial adhesives product category does not include adhesives that are addressed by CTGs already issued for categories listed under CAA Section 183(e) or by earlier CTGs. These include the CTGs issued under Section 183(e) for aerospace coatings..."[21]

The Illinois Miscellaneous Industrial Adhesives rule at Subpart JJ, Section 219.900(b)(1) excludes "...industrial adhesive application operations associated with A) Aerospace coatings.." Since aerospace adhesives are listed as specialty "coatings" in the Aerospace CTG, the Illinois rule appears to accurately capture the aerospace exclusion of the Miscellaneous Industrial Adhesives CTG. Boeing does not recommend any changes to the Subpart JJ industrial adhesives rule. This most recently drafted Illinois rule (2010) accurately reflects CTG source category boundaries. As a matter of consistency, the Illinois surface coating and solvent cleaning rules should also reflect the scope of their respective CTG.

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[19] Page 4-1, Aerospace CTG.

[20] Page 4-2, Aerospace CTG. These adhesives are highly specific to aerospace applications. They are: commercial interior adhesive, cyanoacrylate adhesive, fuel tank adhesive, nonstructural adhesive, rocket motor bonding adhesive, rubber-based adhesive, structural autoclavable adhesive, and structural nonautoclavable adhesive.

[21] Page 4. "Control Techniques Guidelines for Miscellaneous Industrial Adhesives," EPA Office of Air Quality Planning and Standards, September 2008, EPA-453/R-08-005.

ILLINOIS MAY WANT TO CONSIDER AN AEROSPACE RULE IN THE FUTURE

The recommendations above address the situation where an aerospace facility has potential VOM emissions less than 25 ton/year,[22] but greater than the 15 lb/day VOM threshold in the existing Illinois surface coating rule or 500 lb/month threshold in the solvent cleaning rule.

If an aerospace facility were to significantly expand or attempt to site a new major facility in the Chicago or Metro-East nonattainment area, the absence of an aerospace VOM rule would create a SIP issue for the state, and a potential compliance uncertainty for the facility. In its approval of Illinois' negative declaration for aerospace, federal EPA states that "Illinois also determined that should such a major [aerospace] source exist it would be subject to regulation under the provisions of the State non-CTG rules."[23] It is unclear what EPA meant by "non-CTG rules," but if Illinois rules do not represent RACT for aerospace, and have source category definitions that do not align to their corresponding CTGs, it would prevent aerospace manufacturers from locating a major new facility or growing to 25 ton/year VOM in the Metro-East or Chicago regions.

A review of the Aerospace CTG will show that aerospace RACT rules are necessarily complex and lengthy, due to the large number of specialty coating limits and coating definitions (57+), the scope that covers both surface coating and solvent cleaning, and exemptions within the CTG for some highly-specific coating application and solvent cleaning activities.[24] Because of this, states that have an aerospace RACT rule have found that a freestanding aerospace rule is generally easier to draft than trying to fit these requirements into existing coating and cleaning rules.

If, in the future, Illinois EPA wishes to draft a CTG-based aerospace RACT rule to cover major sources, Boeing stands ready to assist. In those jurisdictions where Boeing, our suppliers, or our customers have emissions sufficient to be considered major, it is important to have emission rules that are as consistent as possible with the Aerospace NESHAP and with RACT rules in other nonattainment areas.

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[22] The aerospace RACT rule threshold recommended in the Aerospace CTG for areas other than Extreme ozone nonattainment.

[23] 62 Federal Register 6128, February 11, 1997.

[24] Several states have minimized the page count of their aerospace VOM rule, by referencing, rather than repeating, specialty coating definitions, located in Appendix A to the Aerospace NESHAP. The Utah rule further reduced its page count by also referencing the VOM limits for specialty coatings found in Table 4-1 of the Aerospace CTG.