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BEYOND VOC RACT CTG REQUIREMENTS

CONTROL TECHNOLOGY CENTER

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Research Triangle Park, NC 27711

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Prepared by:

Ming Tedijanto and Greg LaFlam
Pacific Environmental Services, Inc.
5001 S. Miami Boulevard
P.O. Box 12077
Research Triangle Park, NC 27709

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Task Officer: Mohamed Serageldin, Ph.D.
Emission Standards Division
U.S. Environmental Protection Agency
Research Triangle Park, NC 27711

Prepared for:

Control Technology Center
U.S. Environmental Protection Agency
Research Triangle Park, NC 27711

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PREFACE

The Control Technology Center (CTC) was established by EPA's Office of Research and Development (ORD) and Office of Air Quality Planning and Standards (OAQPS) to provide technical assistance to State and local air pollution control agencies. Several levels of assistance are provided by the CTC. First, a CTC Hotline is available to provide telephone assistance on matters related to air pollution control technologies. Second, more in-depth engineering assistance is provided when appropriate. Third, the CTC can provide technical guidance by designing technical guidance documents, developing personal computer software, and presenting workshops on control technology matters. The CTC is also the focal point for the Federal Small Business Assistance Program (SBAP), and maintains the Reasonably Available Control Technology/Best Available Control Technology/Lowest Achievable Emission Rate (RACT/BACT/LAER) Clearinghouse and International Technology Transfer Center for Global Greenhouse Gases (ITTCGGG). Information concerning all CTC products and services can be accessed through the CTC Bulletin Board System (BBS), which is part of the OAQPS Technology Transfer Network (TTN) bulletin board system.

Technical guidance projects such as this one focus on topics of national or regional interest that are identified through contact with State and local agencies. This study was requested by the Lake Michigan Air Directors Consortium. It provides technical information that will help agencies develop strategies for achieving additional reductions in VOC emissions for CTG Groups I, II, and III, and for enhancing pollution prevention aspects of State rules.

ACKNOWLEDGEMENT

This report was prepared by Ms. Ming Tedijanto and Mr. Greg LaFlam both in Pacific Environmental Services, Inc.'s Environmental Engineering Department located in Research Triangle Park. The U.S. Environmental Protection Agency (EPA) project manager was Dr. Mohamed Serageldin of the Office of Air Quality Planning and Standards.

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1.0 EXECUTIVE SUMMARY

Air pollution control agencies that have ozone nonattainment areas within their jurisdiction are required under the Clean Air Act (CAA) to develop State implementation plans (SIPs) that will lead to attainment of the national ambient air quality standards (NAAQS) for ozone. This effort includes the development and implementation of rules that require Reasonably Available Control Technology (RACT) for sources of volatile organic compounds (VOC) located within the designated ozone nonattainment areas. In order to obtain the required VOC emission reductions, these agencies are required to establish RACT for source categories not already covered by EPA's Control Technique Guidelines (CTGs) in addition to tightening RACT for source categories for which RACT has already been defined.

This study was performed at the request of the Lake Michigan Air Directors Consortium (LADCO). It identifies and compares, by CTG source category, examples of State and local agency rules that exceed or may exceed the RACT requirements that are specified in the Federal CTGs. This study is limited to CTG Groups I, II, and III only, which cover 28 source categories. Tables summarizing these comparisons are provided in Appendices A through D. There is no summary table for Air Oxidation Processes - SOCMI (Group III CTG, Appendix C), because no State or California District rules were reviewed for this source category. Existing Federal CTGs for each source category that define RACT were thoroughly reviewed and evaluated. Also, EPA's "Blue Book" ("Issues Relating to VOC Regulation Cutpoints, Deficiencies, and Deviations - Clarification to Appendix D of November 24, 1987

Federal Register," May 25, 1988, revised 1/11/90) was used to clarify CTG related issues. Comparison and analysis of EPA's Model VOC Rules for RACT were not included in the scope of the project. This study also does not include CTGs that are currently under development.

In this report, regulations from eight states (Colorado, Connecticut, Maine, New Jersey, New York, Rhode Island, Texas, and Utah) and two California control districts were examined for as many of the source categories as time allowed (see Table 1.1). The two California Districts evaluated were the Bay Area Air Quality Management District (AQMD) and the South Coast AQMD. Information for each source category was obtained primarily from EPA's VOC Policy Work Group members (listed in Appendix G); additional information was obtained from the BNA Environment Reporter. However, due to time constraints and limited resources, a comprehensive review of all of the State VOC regulations contained in the Environment Reporter was not accomplished.

State and local regulations received for each source category were reviewed and compared for stringency with the guidelines in the applicable Federal CTG. Stringency evaluations were based on, but were not limited to, VOC content limits of coatings, emission limitations, percent emission reduction (capture and control), and transfer efficiency requirements. Other differences between the regulations and the Federal CTGs (such as equipment specifications, recordkeeping, and work practice requirements) were categorized as having the potential to "enhance" the pollution prevention aspects of a rule, but not necessarily as being more stringent in and of themselves, unless quantifiable emission reductions could be attributed to the measure. If, for example, a State or District rule has more stringent recordkeeping requirements, it is noted in the stringency column in the summary tables (Appendices A through D) through a footnote. This 'qualifying' statement indicates that the more stringent recordkeeping requirements may result in pollution prevention.

A discussion of the rule identification methodology is presented in Chapter 2, Introduction. Chapter 3 addresses the criteria description and ranking criteria used for evaluating the State and District regulations reviewed in each CTG source category. The rules reviewed are summarized and compared to the Federal CTG and against each other when appropriate. A maximum of six State rules were considered for each source category. Chapter 4 discusses the findings of this study by source category. The report contains several appendices. Appendices A through C provide summary tables of the State/local rules by CTG group, whereas Appendix D provides a summary of the California District rules. Appendices E and F focus on computational aspects of the study. Appendix G lists the members of EPA's VOC Policy Work Group. Appendix H contains a listing of the 28 Group I, II, and III CTGs.

Table 1.1 summarizes the State regulations that were found to be more stringent than the Federal CTGs. The study found that at least one State (or District) regulation was more stringent than Federal RACT in 24 of the 28 CTG categories considered. State regulations were as stringent as Federal RACT in only four CTG categories. As mentioned above, one CTG category, Air Oxidation Processes - SOCMI, was not covered by any of the State or District rules reviewed.

The Bay Area and South Coast regulations are generally more stringent than Federal RACT and the State regulations. Regulations for these two Districts are as stringent as the Federal CTG requirements in two CTG categories: Stage I Vapor Recovery and Surface Coating of Magnet Wire. Four CTG categories were not found in the District rules. These include: Gasoline Tank Truck and Vapor Collection System Leaks, Air Oxidation Processes - SOCMI, Polymer Manufacturing, and SOCMI and Polymer Manufacturing Equipment Leaks.

Of the eight States and two California Districts, the Bay Area District has the most rules that exceed Federal RACT (20 of the 28 CTG categories). The South Coast AQMD is second with 17 rules, and Connecticut is third with 4 rules that exceed CTG

RACT.

Overall, the State and California District rules reviewed exceed CTG RACT in about 50 instances. Table 1.1 provides a convenient way of identifying more stringent regulations and those that have pollution prevention provisions. The "X" under the column labelled "Stringency" identifies those rules found to be more stringent than the CTG. The X under the column labelled "Applicability" is used to identify those rules that provide specific exemptions or affect different source populations than indicated in the CTG. There were some cases where the State or District rules were applicable to a smaller population of sources than recommended in the Federal CTG. However, these State or District rules were not termed less stringent. Instead, the term applicability was used to highlight the possibility that the rule may result in lower reductions. Therefore, in this study a distinction is made between two aspects of a rule that affect the emission reduction achievable: the stringency of the rule and the applicability of the rule. If a rule appeared more attractive from a pollution prevention perspective (as discussed in Chapter 3), it was not classified as more stringent than the Federal CTG unless the reductions were quantifiable. As an example, work practices that lead to quantifiable emission reductions are considered more stringent. Such regulations were marked with an X under the "Pollution Prevention" columns. Other work or operating practices may enhance the rule but do not necessarily lead to quantifiable emission reductions. Such additional requirements ("additions") to the State rules were not considered to make the rule more stringent. They are entered in Table 1.1 under the column entitled "Potential Emission Reduction."

TABLE 1.1
SUMMARY OVERVIEW OF STATE REGULATION FINDINGS

CTG CATEGORY	STATE/DISTRICT	EMISSION REDUCTION COMPARISON[a]				POTENTIAL EMISSION REDUCTION
		STRINGENCY[b]	APPLICABILITY[c]	POLLUTION PREVENTION		
				WORK PRACTICES	OTHER	
GROUP I						
Cutback Asphalt	Rhode Island					X
	Colorado					
	Bay Area AQMD	X				X
	South Coast AQMD	X				
Fixed-Roof Petroleum Tanks	Utah					X
	Colorado		X			X
	Bay Area AQMD	X				X
	South Coast AQMD	X				X
Bulk Plants	Colorado					
	Texas	X				
	Bay Area AQMD	X		X		
	South Coast AQMD	X				X

TABLE 1.1 (Continued)

CTG CATEGORY	STATE/DISTRICT	EMISSION REDUCTION COMPARISON[a]				POTENTIAL EMISSION REDUCTION
		STRINGENCY[b]	APPLICABILITY[c]	POLLUTION PREVENTION		
				WORK PRACTICES	OTHER	

[a] Federal CTG and "Blue Book" used as the basis.
[b] State/District rule provides quantifiable additional reduction relative to CTG.
[c] State/District rule affects additional sources and may provide additional reductions relative to CTG.

TABLE 1.1 (Continued)

CTG CATEGORY	STATE/DISTRICT	EMISSION REDUCTION COMPARISON[a]				POTENTIAL EMISSION REDUCTION
		STRINGENCY[b]	APPLICABILITY[c]	POLLUTION PREVENTION		
				WORK PRACTICES	OTHER	
Gasoline Loading Terminals	Colorado					X
	Utah	X				
	Texas	X				
	Bay Area AQMD	X		X		
	South Coast AQMD	X				
Miscellaneous Refinery Sources	Colorado	X				X
	Utah					X
	Bay Area AQMD	X				
	South Coast AQMD	X	X			X
Stage I Vapor Recovery	Colorado					X
	Texas	X	X			
	Bay Area AQMD		X			
	South Coast AQMD		X	X		X

TABLE 1.1 (Continued)

CTG CATEGORY	STATE/DISTRICT	EMISSION REDUCTION COMPARISON[a]				POTENTIAL EMISSION REDUCTION
		STRINGENCY[b]	APPLICABILITY[c]	POLLUTION PREVENTION		
				WORK PRACTICES	OTHER	

[a] Federal CTG and "Blue Book" used as the basis.
[b] State/District rule provides quantifiable additional reduction relative to CTG.
[c] State/District rule affects additional sources and may provide additional reductions relative to CTG.

TABLE 1.1 (Continued)

CTG CATEGORY	STATE/DISTRICT	EMISSION REDUCTION COMPARISON[a]				POTENTIAL EMISSION REDUCTION
		STRINGENCY[b]	APPLICABILITY[c]	POLLUTION PREVENTION		
				WORK PRACTICES	OTHER	
Solvent Metal Cleaning	Colorado					X
	Rhode Island					X
	Connecticut		X	X		X
	Maine					
	Bay Area AQMD	X				
	South Coast AQMD	X	X	X		X
Surface Coating of Automobiles and Light-Duty Trucks	Colorado					
	New Jersey	X	X			X
	Bay Area AQMD	X				
	South Coast AQMD	X	X			
Surface Coating of Cans	Colorado	X				
	New Jersey		X			X
	Maine					
	Bay Area AQMD	X				

TABLE 1.1 (Continued)

CTG CATEGORY	STATE/DISTRICT	EMISSION REDUCTION COMPARISON[a]				POTENTIAL EMISSION REDUCTION
		STRINGENCY[b]	APPLICABILITY[c]	POLLUTION PREVENTION		
				WORK PRACTICES	OTHER	
	South Coast AQMD	X	X			

[a] Federal CTG and "Blue Book" used as the basis.
[b] State/District rule provides quantifiable additional reduction relative to CTG.
[c] State/District rule affects additional sources and may provide additional reductions relative to CTG.

TABLE 1.1 (Continued)

CTG CATEGORY	STATE/DISTRICT	EMISSION REDUCTION COMPARISON[a]				POTENTIAL EMISSION REDUCTION
		STRINGENCY[b]	APPLICABILITY[c]	POLLUTION PREVENTION		
				WORK PRACTICES	OTHER	
Surface Coating of Fabrics	Colorado					
	New Jersey		X			X
	Rhode Island	X				
	Utah					
	Maine					
	Bay Area AQMD	X	X			
	South Coast AQMD	X				X
Surface Coating of Large Appliances	Colorado					
	Utah					
	New Jersey		X			X
	Maine					
	Bay Area AQMD	X				
Surface Coating of Metal Coils	Colorado					
	New Jersey		X			X
	Bay Area AQMD	X				

TABLE 1.1 (Continued)

CTG CATEGORY	STATE/DISTRICT	EMISSION REDUCTION COMPARISON[a]				POTENTIAL EMISSION REDUCTION
		STRINGENCY[b]	APPLICABILITY[c]	POLLUTION PREVENTION		
				WORK PRACTICES	OTHER	
	South Coast AWMD	X				

[a] Federal CTG and "Blue Book" used as the basis.
[b] State/District rule provides quantifiable additional reduction relative to CTG.
[c] State/District rule affects additional sources and may provide additional reductions relative to CTG.

TABLE 1.1 (Continued)

CTG CATEGORY	STATE/DISTRICT	EMISSION REDUCTION COMPARISON[a]				POTENTIAL EMISSION REDUCTION
		STRINGENCY[b]	APPLICABILITY[c]	POLLUTION PREVENTION		
				WORK PRACTICES	OTHER	
Surface Coating of Metal Furniture	Colorado					
	New Jersey		X			X
	Utah					
	Maine					
	Bay Area AQMD	X				
Surface Coating of Magnet Wire	Colorado					
	New Jersey		X			X
	Utah					
	South Coast AQMD		X			
Surface Coating of Paper	Colorado					
	Maine					
	New Jersey		X			
	Rhode Island					
	Utah					
	Bay Area AQMD	X	X			

TABLE 1.1 (Continued)

CTG CATEGORY	STATE/DISTRICT	EMISSION REDUCTION COMPARISON[a]				POTENTIAL EMISSION REDUCTION
		STRINGENCY[b]	APPLICABILITY[c]	POLLUTION PREVENTION		
				WORK PRACTICES	OTHER	
	South Coast AQMD	X				X

[a] Federal CTG and "Blue Book" used as the basis.
[b] State/District rule provides quantifiable additional reduction relative to CTG.
[c] State/District rule affects additional sources and may provide additional reductions relative to CTG.

TABLE 1.1 (Continued)

CTG CATEGORY	STATE/DISTRICT	EMISSION REDUCTION COMPARISON[a]				POTENTIAL EMISSION REDUCTION
		STRINGENCY[b]	APPLICABILITY[c]	POLLUTION PREVENTION		
				WORK PRACTICES	OTHER	
GROUP II						
External Floating Roof Petroleum Tanks	Colorado					
	Utah					
	Bay Area AQMD					X
	South Coast AQMD					X
Gasoline Tank Truck and Vapor Collection System Leaks	Colorado					X
	Texas					
Graphic Arts	Colorado					
	Connecticut					X
	Maine		X			
	New Jersey	X	X			
	New York		X			
	Utah		X			
	Bay Area AQMD	X				
	South Coast AQMD	X				

TABLE 1.1 (Continued)

CTG CATEGORY	STATE/DISTRICT	EMISSION REDUCTION COMPARISON[a]				POTENTIAL EMISSION REDUCTION
		STRINGENCY[b]	APPLICABILITY[c]	POLLUTION PREVENTION		
				WORK PRACTICES	OTHER	

[a] Federal CTG and "Blue Book" used as the basis.
[b] State/District rule provides quantifiable additional reduction relative to CTG.
[c] State/District rule affects additional sources and may provide additional reductions relative to CTG.

TABLE 1.1 (Continued)

CTG CATEGORY	STATE/DISTRICT	EMISSION REDUCTION COMPARISON[a]				POTENTIAL EMISSION REDUCTION
		STRINGENCY[b]	APPLICABILITY[c]	POLLUTION PREVENTION		
				WORK PRACTICES	OTHER	
Leaks from Petroleum Refinery Equipment	Colorado					X
	Utah					X
	Bay Area AQMD	X				X
Surface Coating of Miscellaneous Metal Parts and Products	Colorado		X			
	Connecticut	X				
	Maine					
	New Jersey					
	Utah					
	Bay Area AQMD	X				
	South Coast AQMD	X	X			
Pneumatic Rubber Tire Manufacturing	Colorado					
	Connecticut	X				
	Bay Area AQMD	X				
Surface Coating of Flat Wood Paneling	New Jersey					
	Texas					

TABLE 1.1 (Continued)

CTG CATEGORY	STATE/DISTRICT	EMISSION REDUCTION COMPARISON[a]				POTENTIAL EMISSION REDUCTION
		STRINGENCY[b]	APPLICABILITY[c]	POLLUTION PREVENTION		
				WORK PRACTICES	OTHER	
	Maine					
	Utah					

[a] Federal CTG and "Blue Book" used as the basis.
[b] State/District rule provides quantifiable additional reduction relative to CTG.
[c] State/District rule affects additional sources and may provide additional reductions relative to CTG.

TABLE 1.1 (Continued)

CTG CATEGORY	STATE/DISTRICT	EMISSION REDUCTION COMPARISON[a]				POTENTIAL EMISSION REDUCTION
		STRINGENCY[b]	APPLICABILITY[c]	POLLUTION PREVENTION		
				WORK PRACTICES	OTHER	
Surface Coating of Flat Wood Paneling	Bay Area AQMD	X				
	South Coast AQMD	X				
Synthesized Pharmaceutical Products	Colorado		X			X
	Connecticut					X
	Bay Area AQMD	X				
	South Coast AQMD	X				
GROUP III						
Air Oxidation Processes-SOCMI	None[d]					
Equipment Leaks from Natural Gas/Gasoline Processing Plants	Texas					X
	Bay Area AQMD					X
	South Coast AQMD	X	X			X
Large Petroleum Dry Cleaners	Bay Area AQMD	X		X		X

TABLE 1.1 (Concluded)

CTG CATEGORY	STATE/DISTRICT	EMISSION REDUCTION COMPARISON[a]				POTENTIAL EMISSION REDUCTION
		STRINGENCY[b]	APPLICABILITY[c]	POLLUTION PREVENTION		
				WORK PRACTICES	OTHER	
	South Coast AQMD	X		X		
Polymer Manufacturing	Connecticut	X				
SOCMI and Polymer Manufacturing Equipment Leaks	Connecticut	X				

[a] Federal CTG and "Blue Book" used as the basis.
[b] State/District rule provides quantifiable additional reduction relative to CTG.
[c] State/District rule affects additional sources and may provide additional reductions relative to CTG.

2.0 INTRODUCTION

Reasonably Available Control Technology (RACT) is defined as the lowest emission limit that a particular source is capable of meeting through the application of control technology that is reasonably available considering technological and economic feasibility. For surface coating source categories generally, the Federal CTGs define RACT in terms of the VOC content limits of a coating; i.e., mass of VOC per unit volume of coating (minus water) as applied (ready for application). In some cases, however, RACT is defined in terms of the percentage emission reduction achieved with add-on control devices, equipment specifications and recordkeeping, reporting requirements, and exemption levels.

For the purposes of this study, 28 CTG documents addressing 28 source categories were reviewed. Information related to State rules that may go beyond RACT recommendations as specified in the CTGs and the "Blue Book" was solicited from members of EPA's VOC Policy Work Group. This report is based on the Work Group's responses to these information requests. The Work Group did not identify any State or District regulations as exceeding Federal RACT for the Air Oxidation Processes - SOCMI and Large Petroleum Dry Cleaner source categories.

State rules reviewed for this project were those sent by members of the Work Group following a request by the Office of Air Quality Planning and Standards. The California District rules were provided by the EPA Work Assignment Manager. Additional information with regard to State regulations came from the Environment Reporter. The Federal CTG for each source category was reviewed and summarized; the State and the District rules pertaining to each source category were compared to the Federal CTG.

Although the RACT limits in the Federal CTG's developed in the late 1970's and early 1980's do not mention "exempt" compounds in the coating limit expressions, it is assumed that exempt compounds are treated as water in mass of VOC per gallon of coating (less water) calculations as called for in the "Blue Book."[1] "Exempt" compounds are those compounds classified by EPA as having negligible photochemical reactivity as listed in 40 CFR 51.100(s). For the purposes of this study, baseline RACT consists of guidance in the CTG documents plus subsequent clarifying policy guidance included in the "Blue Book." This point clarifies why State coating VOC limits were sometimes not considered to be more stringent than the Federal CTG coating limits when the numerical limits were equal. Some States added requirements to their rules that enhance pollution prevention aspects of the rules. For example, a State may have specified how soon a leak must be repaired from the time it is detected, whereas the applicable CTG may not have such a provision. When additional requirements in a State regulation did not appear to result in a quantifiable extra reduction in pollution, the rule was not termed more stringent than the CTG RACT level. Hence, when a rule required or modified work practices in general terms it was not considered more stringent unless the emission reduction benefit could be quantified. However, when the requirement enhanced the rule, that fact was acknowledged in the summary table for that State rule.

When a rule increased (or decreased) the population of emission unit operations (or items of equipment) covered with respect to the applicable Federal CTG, this was noted by an "X" in the column headed "Applicability." Comparisons of stringency were reserved for rules that affected the same population of units or processes. Several States converted limits from mass of VOC per volume of coating (less water and exempt solvents) to an

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[1] Issues Relating to VOC Regulation Cutpoints, Deficiencies, and Deviations - Clarification to Appendix D of November 24, 1987 Federal Register - May 25, 1988 (Revised 1/11/90); U.S. EPA (AQMD); Research Triangle Park, N C.

equivalent solids (nonvolatiles) basis. The States, however, did not explicitly state the assumptions or indicate the volume of solids (nonvolatiles) used for the conversion. Appendix F discusses a procedure for performing this conversion.

3.0 COMPARISON CRITERIA

Several criteria were used to compare State regulations to the Federal RACT guidance in the CTGs in order to determine relative stringency. The following criteria were used:

(1) more stringent VOC emission limits (e.g., mass of VOC per unit of production);

(2) more stringent limits on the VOC content of a coating (e.g., paint, inks, or other);

(3) a requirement for a greater "percent reduction" than recommended as RACT;

(4) an improved transfer efficiency requirement;

(5) a requirement for more efficient capture of emissions;

(6) inclusion of work practice requirements not present in the CTG; and

(7) any other pollution prevention method.

In most cases, evaluation of criteria 1 through 3 for relative stringency was straightforward. In some cases, however, it could not be determined whether an emission limit was equivalent to a suggested overall control efficiency for a control device because the emission rate from the process was unknown.

Criteria 4 through 7 proved to be the most difficult to evaluate for stringency. For example, based on the information available, equivalency for design criteria, equipment specifications, or work practices is difficult to rank. However, in evaluating the source categories, more equipment and design specifications delineated by the State regulations were presumed to indicate greater stringency. This is especially true where such changes appear to result in quantifiable reductions. The design criteria and equipment specifications noted in the tables shown in Appendices A through D are, in most cases, in addition

to the Federal CTG specifications. An example of this type of additional requirement would be for all openings in floating roof tanks to provide a projection below the liquid surface, or for an emergency roof drain to be provided with a slotted membrane fabric cover or equivalent cover that covers at least 90 percent of the opening.

4.0 DISCUSSION OF FINDINGS BY SOURCE CATEGORY

4.1 Cutback Asphalt

Cutback asphalts are mixtures of solvent and a base asphalt of selected hardness or viscosity. There are rapid curing, medium curing, and slow curing cutback asphalts. Emulsified asphalts consist of asphalt suspended in water (98 percent) containing an emulsifier (2 percent). Water in emulsified asphalt evaporates during curing while the emulsifier is retained in the asphalt. Federal RACT for cutback asphalt is defined in terms of substitution of emulsified asphalt for cutback, rather than in terms of an emission limit. The CTG provides no exemptions for this source category. In general, the State regulations that were reviewed had stipulations for substitution of emulsified for cutback asphalt with some variation.

State and District regulations were ranked according to stringency of State/District requirements versus Federal RACT. The criteria used to rank these regulations involved the requirements of substitution and the allowable solvent content. In other words, the State regulations reviewed define RACT in terms of how and when the cutback would be substituted, in addition to including added specifications for emulsified asphalt. Although the CTG does not discuss any exemptions, the "Blue Book" suggests seasonal exemptions. In general, the State regulations echo the Federal CTG for the substitution of emulsified asphalt.

The Rhode Island regulation allows the use of cutback asphalt during certain periods of the year. Rhode Island also places several restrictions on the type of cutback asphalt that may be used during the ozone season. These restrictions will not

result in quantifiable reductions, but will enhance the quality of the rules.

The Bay Area AQMD regulations, however, prohibit the use of any rapid-cure liquid asphalt and liquid asphalt or emulsified asphalt in paving material or in paving and maintenance operations. These prohibitions are not specified in the CTG or the South Coast regulation and have not been used to determine stringency; this is an issue of applicability. The Bay Area and the South Coast specify lower VOC content for any slow-cure liquid asphalt and emulsified asphalt than the CTG. Therefore, the Bay Area and South Coast regulations are similar and more stringent than the Rhode Island or Colorado rules, or the CTG.

4.2 Fixed-Roof Petroleum Tanks

The Federal CTG does not provide an emission limit, but recommends equipment specifications. These specifications include internal floating roofs equipped with a closure seal or seals, or alternative equivalent controls. The CTG, however, does not specify the exact types of controls that can be used to achieve this.

Stringency for this source category is determined by the storage tank capacity cutoff level, control efficiency, and additional equipment specifications where the benefits are readily quantifiable. Additional requirements are defined as conditions beyond what the CTG specifies.

Two State regulations and the two California District regulations were reviewed. In general, the Utah and Colorado regulations are as stringent as the CTG. In addition, these rules provide additional operating practices that are not found in the CTG. These practices enhance the pollution prevention aspects of the rule and may result in potential emission reductions. The State of Colorado also specifies exemptions that result in fewer sources subject to the rule.

The Bay Area and South Coast regulations specify a lower product vapor pressure cutoff than Utah, Colorado, or the Federal CTG. Therefore, more operations will be required to comply with the rule. These regulations also require the same control

efficiency for an approved emission control system, but higher than that specified in the CTG. The effect of these requirements is more emission reduction. The Bay Area and South Coast regulations also have more detailed operating requirements than the CTG. These requirements, however, were not used for determining stringency.

4.3 Gasoline Bulk Plants

The Federal CTG defines a bulk plant as having a throughput of less than 76,000 liters of gasoline per day, averaged over the work days in 1 year. In addition, the CTG specifies types of bulk plant facilities, control techniques used in bulk plants, and type of operations and maintenance required to prevent leaks. No emission limit or exemptions are specified for this source category.

Two State and the two California District regulations were reviewed for stringency and compared to the corresponding CTG RACT. The criteria used to rank these regulations are the bulk plant definition (capacity), recovery system efficiency, and the required VOC emission limit (if available) during gasoline transfer.

Both the Colorado and Texas regulations define a bulk plant as having an average daily throughput of less than 76,000 liters calculated over a period of 30 days, instead of over the work days in 1 year as stated in the CTG. The shorter the timeframe (30-day period) for calculating the average throughput to meet a set limit, the better should be the compliance with the rule.

The Bay area regulation defines a bulk plant as having an annual throughput of not more than 23,000 cubic meters (6,000,000 gallons). Assuming 360 work days in 1 year (30 work days per month for 12 months), the calculated daily throughput is 17,000 gallons. The Bay Area defines a bulk plant with a lower throughput cutoff than other States or the Federal CTG; therefore, it is considered the most stringent.

The Texas and Bay Area regulations specify a maximum VOC emission limit associated with product transfer. The Bay Area emission limit is less than half that required by the Texas

regulation. No emission limit is specified in the Federal CTG or the Colorado or South Coast regulations. In addition to the bulk plant definition and emission limit, the Bay Area requires a higher vapor recovery system efficiency than the South Coast or the Federal CTG. The Bay Area and South Coast regulations also provide work practices and a shorter timeframe for repairing leaks that are not specified by the other States or the Federal CTG. For example, both regulations place a limit on the gauge pressure developed in a delivery tank during transfers, which should result in quantifiable reductions.

The Bay Area has the most stringent regulation on the basis of the VOC emission limit, lower capacity cutoff, and higher recovery efficiency. These criteria should result in a substantial reduction in emissions. On the same scale, the Texas regulation is more stringent than the South Coast, followed by Colorado and then the CTG.

4.4 Gasoline Loading Terminals

The Federal CTG describes sources and type of emissions, control techniques, compliance test methods (test conditions and test procedures) and monitoring techniques, and emission test procedures. The recommended RACT VOC emission limit for this category is 80 milligrams per liter (0.67 lb/1,000 gal) of gasoline loaded.

The State and District regulations were ranked according to their stringency versus Federal RACT. The criteria used to rank these regulations involved emission limit requirements.

Three State regulations (Colorado, Utah, and Texas) and the two Districts were reviewed for this category. The Utah emission limit is slightly lower than Colorado's, which is identical to the emission limit stated in the Federal CTG. Although the Colorado regulation specifies loading procedures, it is less stringent than the Utah regulation.

Certain areas in Texas (Beaumont/Port Arthur, Dallas/Fort Worth, El Paso, and Houston/Galveston) have a lower emission limit (40 mg VOC/l (0.33 lb VOC/1,000 gal) of gasoline transferred), except for Gregg, Nueces, and Victoria counties.

The Texas regulation, in general, is more stringent than the Utah and Colorado rules.

The Bay Area sets the lowest emission limit and requires work practices to be followed and a maximum control efficiency for vapor control systems. Such requirements would result in quantifiable emission reductions. The South Coast emission limit is slightly lower than Texas. The South Coast also requires a shorter repair period than the Federal CTG. Therefore, the Bay Area regulation is ranked as the most stringent, followed by the South Coast, Texas, Utah, and Colorado. The Colorado regulation is as stringent as the Federal CTG.

4.5 Miscellaneous Refinery Sources

Miscellaneous refinery sources include vacuum producing systems (VPSs), wastewater separators (WSs), and process unit turnarounds (PUTs). The Federal CTG defines RACT for VPSs and WSs in terms of equipment specifications, and specifies that regulations for PUTs should be written in terms of operating procedures. In general, the State regulations define RACT in terms of equipment specifications and operating procedures.

State, Bay Area, and South Coast regulations were ranked according to stringency of the State requirements versus Federal RACT. The criteria used to rank these regulations involved comparing add-on equipment control efficiency and operating procedures. In general, State regulations that were reviewed are as specified in the CTG, with several "additions." The additions include the covering of forebays and separator sections, use of EPA approved test methods to determine compliance with the emission limitations, the use of a vapor recovery system that has at least 90 percent control efficiency, additional vapor control options, as well as specifications for the use of safety pressure relief valves.

The Colorado regulation specifies a minimum control efficiency for control equipment and contains more "additional" stipulations than Utah or the CTG. These additional provisions involve covering forebay and separator sections, the use of EPA Reference Test Methods to determine compliance, and control of

depressurization venting and process blowdowns. These additional requirements cannot be used to determine stringency since they will not result in quantifiable emission reductions. The Utah regulation, in this case, is considered as stringent as the Federal CTG.

The Bay Area and South Coast regulations require a greater combined collection and control efficiency than the Colorado rule. The CTG does not specify an add-on control efficiency. The South Coast regulation also specifies a VOC emission limit at a fixed distance (1 cm) from the drain opening and requires a shorter timeframe for repair than the CTG. Therefore, the South Coast regulation is considered more stringent than the Bay Area regulation, followed by Colorado, then the CTG.

4.6 Stage I Vapor Recovery

The Federal CTG defines RACT for this source category in a number of ways, suggesting several methods by which to conduct displaced vapors from underground storage tanks to tank trucks. It also suggests that system "design criteria" be developed to accomplish efficient control of emissions.

Stringency for this category is determined by the VOC emission limit and by any "additional" requirements or specifications beyond what the Federal CTG requires. Only those additional requirements including work practices that result in quantifiable emission reductions are considered to determine the stringency of a regulation.

The Colorado, Texas, Bay Area, and South Coast regulations were reviewed for this source category. All regulations except Colorado's contain standards that exceed the requirements specified in the CTG.

The State of Texas requires control equipment to be operated during the transfer of gasoline, and VOC emissions to be reduced to a certain limit. The CTG document does not specify a VOC emission limit for this category and the "Blue Book" only specifies control efficiency for Stage I emission control equipment. Providing an emission limit (mg/l of gasoline transferred) is more significant for the purpose of reducing

emissions than only requiring a control system efficiency. In addition to the emission limit, Texas also specifies a tank size exemption and required gauge pressure and vacuum pressure relief limits for the tank of the fuel delivery truck. Pressure relief settings are not specified in the Federal CTG.

In general, the Bay Area and South Coast regulations have adopted the guidelines in the CTG. The Bay Area regulation, however, exempts gasoline storage tanks with a capacity less than 260 gallons in this source category. The CTG exempts several tank sizes that are not found in the Bay Area. For example, if the gasoline is used for agricultural purposes, the storage tank capacity cutoff is over twice the capacity cutoff specified in the Bay Area. The Bay Area also has additional exemptions that are not specified in the CTG, but these were not used to determine stringency of the rule. These exemptions will result in fewer sources being required to comply with the rule.

The South Coast rule exempts gasoline storage tanks with capacities less than 250 gallons. In addition, the rule also exempts tanks used primarily for the fueling of implements of husbandry and agricultural wind machines. These exemptions will result in fewer affected sources. The South Coast regulation also includes work practices that would result in quantifiable emission reductions.

In conclusion, the Texas regulation is the most stringent, followed by the South Coast. The Bay Area and Colorado rules are as stringent as the CTG.

4.7 Solvent Metal Cleaning (Degreasing)

The Federal CTG divides this source category into three separate types of parts cleaning (degreasing) operations: cold cleaning, open top "vapor parts cleaners (degreasers)," and "conveyorized parts cleaners." It further specifies the control device options for each type. Stringency for this source category is defined through the efficiency of control equipment and the freeboard ratio value.

Four State and the two California District regulations were reviewed for this category. All State regulations, except for

Rhode Island, mirror the Federal CTG and include several additional work practice requirements. The Rhode Island regulation specifies a slightly higher freeboard ratio (0.75 vs. 0.70) for all cold cleaning units than the CTG. Freeboard primarily serves to reduce drafts near the air/solvent interface. A freeboard ratio is determined by the freeboard height divided by the width of the parts cleaner's air/solvent area. The higher the ratio, the less emissions are released. The CTG also indicates that an increase in ratio from 0.5 to 1.0 may yield about a 50 percent reduction in emissions.

The Bay Area and South Coast regulations specify the same control equipment for open top vapor parts cleaners, cold cleaners, and conveyorized parts cleaners, but require a greater control efficiency than the CTG. The Bay Area specifically indicates that solvent agitation must be accomplished only by pump recirculation or by means of a mixer; air agitation may not be used. The CTG states that agitation is generally accomplished through the use of pumping, compressed air, vertical motion, or ultrasonic. The CTG allows the use of air agitation involving dispersing compressed air from the bottom of the "soaking;" the air bubbles provide a scrubbing action. This type of agitation is prohibited by the Bay Area because air bubbles may create more emissions.

For facilities using the freeboard ratio as a control option, the Bay Area and South Coast regulations specify a slightly higher freeboard ratio than the CTG (0.75 vs. 0.70). The South Coast regulation provides additional operating requirements not specified in the Bay Area regulation or the CTG that may have potential in reducing emissions. The CTG exempts conveyorized parts cleaners with less than 2.0 m^2 of air/vapor interface from the requirement for a control device.

One of the general requirements specified in the Bay Area regulation prohibits waste solvent residues that are treated prior to final disposal at an appropriate waste disposal facility to contain more than 10 percent solvent by volume. The CTG does not allow waste solvent to be disposed of or transferred to

another party such that greater than 20 percent of the waste (by mass) can evaporate into the atmosphere. Both rules were developed to restrict the amount of solvent in the waste, but they are not specified in the same manner (units). The effect of each requirement can be clarified by the following example. Assume 1 gallon of waste solvent residue will be treated prior to final disposal and that it contains 10 percent by volume of solvent. Using an average solvent density of 6.7 lb/gal and a residue density of 9.2 lb/gal, the mass of solvent and of residue in the waste are 0.67 lb and 8.28 lb, respectively. The concentration of solvent by mass in the waste is 7.5 percent. When the concentration of solvent is increased to 15 percent by volume, the concentration of solvent in the waste increases 12.9 percent by mass. Note: This is in violation of the Bay Area rule, but not the Federal CTG.

In conclusion, the Bay Area regulation is as stringent as the South Coast regulation, but more stringent than Rhode Island's rule, since it has additional requirements that will result in extra, quantifiable emission reductions.

4.8 Surface Coating of Automobiles and Light-Duty Trucks

The Federal CTG recommends different emission limits for prime application, topcoat application, and final repair application coatings. The State and District regulations were ranked according to criteria including VOC emission limitations, additional emission limit for coating operations, transfer efficiencies, and control efficiencies.

Colorado, New Jersey, and the two District regulations were reviewed and ranked for this source category. The Colorado regulation echoes the emission limits specified in the CTG. The Colorado regulation also provides an alternative method to meet the emission limit for topcoat application in terms of mass of VOC per unit volume of solids (nonvolatiles) deposited on the coated part. This emission limit is not specified in the Federal CTG. However, the alternative emission limit can be calculated using the guideline given in Appendix E or F. The calculated emission limit for topcoat application is 4.5 lbs VOC/gal of

solids, not 15.1 lbs VOC/gal of solids.

New Jersey emission limits for topcoat application and final repair application are identical to the emission limits stated in the Federal CTG. The State of New Jersey divides prime application into two operations (electrophoretic dip prime and spray prime) with two emission limits. The averaged value of these limits is identical to the emission limit for prime application stated in the Federal CTG. This shows that New Jersey regulation is more process-specific than the Federal CTG, but not necessarily more stringent. In addition, the New Jersey regulation specifies two additional VOC emission limits for custom topcoating and refinishing operations. These emission limits are higher than the Federal CTG and Colorado limits for all three operations. These limits provide additional reduction of emissions and are therefore more stringent.

The New Jersey regulation requires that the emission reduction of the control apparatus be demonstrated on an hourly basis or on the basis of hourly emission rate calculated on a solids (nonvolatiles) applied basis. The CTG does not require the efficiency of a control apparatus to be demonstrated on an hourly basis. Although New Jersey's requirement may not result in quantifiable emission reductions, it will allow compliance to be evaluated more accurately.

The Bay Area specifies a lower VOC emission limit for primer application than the CTG. It also provides four additional VOC emission limits for flexible primer, color topcoat, basecoat/clearcoat, and off-line coating. The emission limit for basecoat/clearcoat is lower than that for basecoat specified in the New Jersey regulation.

The South Coast regulation provides VOC emission limits for several coating (primer, topcoat, and final) and application methods (electrophoretic dip, manual electrostatic spray, and air atomized spray). The emission limits for the topcoat and final repair coating categories are higher than those specified in the CTG and, therefore, are less stringent. The CTG specifies an emission limit for primer application based on use of an

electrophoretic system. The South Coast regulation specifies a lower VOC emission limit for electrophoretic applied primer than that in the CTG. In addition, the South Coast regulation provides emission limits for primer surfacer, spray primer, basecoat, and clearcoat that are not found in the CTG. The South Coast regulation also requires higher transfer efficiencies than the Bay Area. The Bay Area regulation follows the "Blue Book" guidelines for transfer efficiencies.

Due to a lower VOC emission limit for primer application and additional emission limits, the Bay Area regulation is ranked first, followed by the South Coast's, New Jersey's, and the CTG. Colorado's rule is considered as stringent as the CTG.

4.9 Surface Coating of Cans

The Federal CTG defines RACT limits for four coating categories: sheet base coat and over-varnish and two piece can exterior; two and three-piece can exterior body spray and two-piece can exterior end; three-piece can side-seam spray; and end sealing compounds. (Three State and the two District regulations were reviewed and ranked according to stringency of the State and District requirements versus CTG RACT. The criteria used to rank these regulations were based on the required VOC emission limits for several coating applications, additional emission limit, and the required control efficiency of a control device.

The Colorado, Maine, and New Jersey regulations specify the same VOC emission limits as the CTG. Colorado also sets an additional emission limit for "any other coating," which is not provided in the CTG or the New Jersey regulation. The New Jersey regulation also requires that the efficiency of a control apparatus be achieved on an hourly basis or on the basis of hourly emission rate calculated on a solids applied basis. This requirement will evaluate more accurately the compliance performance than having an initial or one emission test in a year. The New Jersey regulation requires the same control efficiency as the CTG and provides exemptions that are not found in the CTG. With regard to the smaller population of sources to

which the rule is applicable, the rule is not considered more stringent than the CTG. The Maine regulation contains a provision that will enhance the pollution prevention aspects of the rule.

The Bay Area regulation specifies separate emission limits for sheet basecoat and two-piece can exterior basecoat. These emission limits are lower than the limit specified in the CTG and thus are more stringent. The South Coast regulation has lower emission limits for three-piece base, two-piece exterior basecoat, and two-piece interior body spray than the CTG. In addition, the South Coast regulation specifies two emission limits for end sealing compound applicable to food and non-food cans. The Federal CTG specifies the same emission limits applicable to both food and non-food cans. The South Coast emission limit for non-food cans is lower than the CTG. The South Coast regulation also provides two additional emission limits and higher control efficiency than the Bay Area and New Jersey rules, and the CTG.

In conclusion, the South Coast regulation is the most stringent, followed by that of the Bay Area. The Colorado regulation is more stringent than New Jersey's. This is because of an additional emission limit that will apply to a greater population of sources. The New Jersey and Maine regulations are as stringent as the CTG in terms of coating emission limits and control efficiency. However, the regulations require compliance to be based on hourly emission reduction or hourly emission rate calculated on a solids applied basis.

4.10 Surface Coating of Fabrics

This category is divided into two coating operations: fabric and vinyl coating lines. The CTG defines RACT emission limits in terms of mass of VOC per unit volume of coating applied (minus water and exempt solvents). These emission limits are based on the use of an add-on control device that recovers or destroys at least 81 percent of the VOC introduced in the coating. In the CTG, the limitation for fabric coating can also be achieved by the use of a high solids coating containing about 60 volume

percent solids (nonvolatiles) or a waterborne coating with a solids content of about 24 volume percent.

Five State regulations (Colorado, New Jersey, Utah, Rhode Island, and Maine) and the two California District regulations were reviewed for this category. These regulations were ranked according to stringency of the State requirements versus the Federal RACT guidance. Ranking was accomplished by comparing the VOC emission limits and the required control efficiency.

The emission limits stated in all of the State regulations reviewed are identical to the emission limits stated in the Federal CTG. Only the Utah and Rhode Island regulations provide equivalent emission limits for fabric and vinyl operations in terms of mass of VOC per unit volume of solids (nonvolatiles). These limits were calculated using the guideline specified in Appendix F. The New Jersey regulation also requires the control device to achieve the emission reduction on an hourly basis or the hourly VOC emission rate should not be greater than the hourly emission rate calculated on a solids applied basis. The hourly requirement is not specified in the CTG. This aspect of the New Jersey regulation will evaluate more accurately compliance performance than on the basis of the requirements in the Colorado regulation or the CTG. Such a requirement also enhances the pollution prevention aspects of the rule, but may not necessarily result in a quantifiable reduction in emissions. The Rhode Island regulation requires a higher number for the overall control efficiency and, therefore, is are more stringent than the New Jersey or Colorado rule, or the CTG. Although the Maine regulation has an attractive provision, this rule is not considered more stringent than the CTG.

The Bay Area and South Coast regulations specify a lower emission limit for fabric coating processes than the CTG. The South Coast regulation requires a higher control efficiency and transfer efficiencies than the Bay Area rule or the CTG. In addition to emission limits for fabric and vinyl coating, the South Coast regulation has separate and lower emission limits for the plastisol and wash primer used in these coating operations.

Additional work practices are also found in the South Coast regulation that are not found in the Bay Area or other State regulations, or the CTG. In conclusion, the South Coast regulation is ranked the most stringent, followed by the Bay Area rule, the Rhode Island rule, and then the Federal CTG. The Colorado, Maine, and New Jersey regulations are as stringent as the CTG.

4.11 Surface Coating of Large Appliances

The Federal CTG recommends a single emission limit for a large appliance coating line in terms of mass of solvent per unit of coating applied (minus water and exempt solvents). This emission limit is derived based on the use of low organic solvent coatings containing at least 62 volume percent solids (nonvolatiles) or any waterborne equivalent. An equivalent method for achieving the desired reduction would be the use of an add-on control device such as an incinerator or a carbon adsorber that can achieve approximately an 81 percent overall emission reduction.

Four States (Colorado, Utah, Maine, and New Jersey) and the Bay Area regulation were reviewed and ranked according to the stringency of State requirements versus Federal RACT requirements. All State regulations have the same emission limit as specified in the Federal CTG. The Maine regulation provides an incentive (by allowing monthly rather than daily recordkeeping) for facilities that demonstrate that only low-VOC coatings are used. Although this provision was not factored into determining the stringency of the rule, the provision enhances the pollution prevention aspects of the rule. The New Jersey regulation has an additional requirement for a control device to achieve an efficiency on an hourly basis or an hourly VOC emission rate shall not be greater than the allowable hourly emission rate calculated on a solids applied basis. This hourly requirement is not specified in the Federal CTG. This requirement is not used to determine stringency since it may not result in quantifiable emission reductions, but it does provide for more accurate compliance performance than the CTG

recommendation. These State regulations are, therefore, as stringent as the CTG.

The Bay Area regulation has a lower emission limit and a higher overall control efficiency requirement than the CTG or the other regulations reviewed. As a result, the Bay Area regulation has been ranked the most stringent.

4.12 Surface Coating of Metal Coils

The Federal CTG specifies only a single emission limit for surface coating of metal coil operations. This emission limit is expressed as mass of VOC per unit volume of coating as applied (minus water).

Two State (Colorado and New Jersey) and the two California District regulations were reviewed and ranked according to stringency of the requirements in comparison to RACT. Stringency is based on the required emission limit, control efficiency, and other additional requirements. The Colorado and New Jersey regulations specify a VOC emission limit identical to the emission limit stated in the Federal CTG.

An alternate means of complying with the emission limit is through the use of control technologies such as add-on control devices or low-solvent coatings. The CTG states that the use of thermal or catalytic incinerators can achieve over 90 percent emission reduction. The New Jersey regulation specifies the same emission control efficiency as the CTG, but requires the VOC control device to reduce the emissions on an hourly basis or to achieve the maximum allowable hourly emission rate calculated on a solids applied basis. Although this requirement may not result in quantifiable reductions, it will, however, provide for more accurate evaluation of the compliance performance than the specifications in the CTG. The New Jersey regulation also specifies an exemption for daily coating usage. This exemption will result in a smaller population of sources being subject to the rule, but it is an issue of applicability and not the stringency of the rule. Thus, although the New Jersey regulation is more attractive, it is considered equivalent to the CTG.

The Bay Area and South Coast regulations specify the same emission limit for this category, but the limit is lower than the one specified in the CTG. In addition to the emission limit, the South Coast regulation requires greater emission control and transfer efficiency than the CTG. Therefore, the South Coast regulation is considered the most stringent, followed by the Bay Area regulation, and then the CTG.

4.13 Surface Coating of Metal Furniture

The Federal RACT emission limit for a metal furniture coating line is expressed as mass of VOC per unit volume of coating as applied (minus water). This emission limit is based on the use of low organic solvent coatings. The limit can also be achieved by the use of waterborne coatings or an add-on control device. The control device must have at least an 80 percent overall control efficiency.

Rules for four States (Colorado, New Jersey, Maine, and Utah) and one of the California Districts (Bay Area) were reviewed and ranked according to stringency of these requirements versus Federal RACT. The criteria used in determining stringency include the emission limitation, required control efficiency, and alternative emission reduction.

All of the regulations reviewed have the same emission limit as the Federal CTG. For the surface coating operation served by a control device, the New Jersey regulation requires that emission reductions be achieved on an hourly basis or an hourly VOC emission rate no greater than the maximum allowable hourly emission rate calculated on a solids applied basis. The CTG does not require the control efficiency to be demonstrated on an hourly basis. New Jersey's requirement, however, will result in more accurate compliance performance evaluation than the CTG. Maine provides an incentive for facilities that demonstrate that only low-VOC (compliant) coatings are used, by allowing them to keep monthly rather than daily records as indicated in the "Blue Book." This provision was not factored into determining the stringency of the rule. However, the provision encourages

pollution prevention actions. In general, the State regulations are as stringent as the CTG.

The Bay Area regulation specifies two VOC emission limits for this operation based on the drying techniques employed. Both emission limits are lower than those recommended in the CTG. The Bay Area also requires a slightly higher control efficiency and transfer efficiency. Therefore, the Bay Area regulation is considered to be the most stringent.

4.14 Surface Coating of Magnet Wire

The Federal CTG recommends a single emission limit for magnet wire coating operations. This limit is given in terms of mass of VOC per unit volume of coating as applied (minus water). This emission limit may also be achieved using an add-on control device such as an incinerator, provided 90 percent control efficiency is achieved.

Three State (Colorado, New Jersey, and Utah) regulations and the South Coast regulation were reviewed and ranked according to the stringency of these requirements versus Federal RACT. The criteria used in determining stringency include the VOC emission limitation and the required control efficiency.

The State and South Coast regulations specify the same emission limit as the Federal CTG. Utah specifies an equivalent emission limit in units of mass of VOC per unit mass of solids. Guidelines for equivalency calculations are given in Appendices E and F.

For surface coating operations with a control device, the New Jersey regulation requires the device to have at least 90 percent emission reduction each hour or an hourly VOC emission rate no greater than the maximum allowable hourly emission rate calculated on a solids applied basis. The CTG specifies the same control efficiency as the New Jersey regulation, but it does not require the efficiency of a control device to be demonstrated on an hourly basis. The New Jersey provision should result in more accurate evaluation of the compliance performance. The rule is not, however, necessarily more stringent than the CTG.

The South Coast regulation does not have any requirements

that will affect the relative stringency of the rule. However, they have provided several exemptions that are not specified in the CTG, which reduces the number of sources to which the rule is applicable.

4.15 Surface Coating of Paper

The Federal RACT emission limit for a paper coating line is defined in terms of mass of VOC per unit volume of coating applied (minus water). The Federal CTG also states that the emission limit can be achieved using alternative means such as incinerators, carbon adsorbers, or coatings that contain low fractions of organic solvents.

Five State (Colorado, New Jersey, Utah, Rhode Island, and Maine) and the two California District regulations were reviewed and ranked for this category. The State regulations specify the same emission limit for paper coating lines as the CTG. In addition to the emission limit, New Jersey specifies coating cutoff exemptions and requirements for an hourly emission reduction or an hourly emission rate calculated on a solids applied basis. This requirement may not result in quantifiable reductions, but it will allow the compliance performance to be more accurately evaluated. The Maine and Rhode Island regulations provide equivalent emission limits for paper coating operations in terms of mass of VOC per unit volume of solids (nonvolatiles). These limits were calculated using the guidelines specified in Appendix F. The Maine regulation contains a provision that provides an incentive (monthly rather than daily recordkeeping) for facilities which demonstrate that only low-VOC coatings are used. The provision enhances the pollution prevention aspects of the rule, but it was not used to determine relative stringency. Maine's regulation also applies to all paper coating lines (rather than only those above the CTG's emission cutoffs), which is an applicability rather than a stringency issue.

The Bay Area and South Coast regulations specify the same emission limit, which is lower than that specified in the CTG. The South Coast regulation also specifies an emission limit for

plastisol, the required capture efficiency, and operating requirements. Such information is not found in the Bay area regulation or the CTG. These operating requirements are provided to reduce or prevent emissions, but the reduction is not quantifiable. In conclusion, the South Coast regulation is the most stringent, followed by the Bay Area, then the CTG. The five State regulations are considered as stringent as the CTG.

4.16 External Floating Roof Petroleum Tanks

The Federal CTG defines RACT in terms of an applicability cutoff related to the storage capacity of a tank and the type of seals or closure devices that must be installed on the tank.

Stringency for this category is defined through additional equipment requirements which result in quantifiable emission reductions. The exemption levels required by the State regulations for this category were also evaluated. However, exemption levels for this category are not appropriate for evaluation of stringency, since the exemptions are more related to the capacity cutoff levels. Although one of the regulations reviewed for this source category was numerically less stringent than the CTG, the difference in the allowable seal gap specifications is not believed to be significant.

Two States (Colorado and Utah) and the two District regulations were reviewed for this category. The State of Colorado exemption levels mirror those found in the CTG, with one addition. Colorado exempts external floating roof (EFR) tanks that store any material whose true vapor pressure as stored "never exceeds" 1.3 psia (8.96 kPa), while the CTG exempts EFR tanks with a higher vapor pressure cutoff level (1.5 psia). Therefore, more tanks are likely to be subject to the Colorado rule. The Utah regulation cited in the summary table allows greater gap space between the seal and tank wall than the CTG. The impact on emissions is unlikely to be quantifiable.

The Bay Area and South Coast regulations have similar tank capacity cutoff requirements to the CTG, but they have a lower vapor pressure cutoff. Therefore, these regulations are more

stringent than the CTG and the other States evaluated. The Bay Area regulation also requires a greater overall control efficiency as well as a smaller gap between the tank shell and the secondary seal than the South Coast regulation or the CTG. The South Coast regulation also specifies additional operating requirements that are not found in the CTG. These additional requirements include specifications for all openings in the roof and any emergency roof, and the type of tank used for storing crude oil containing hydrogen sulfide. These requirements may not result in a quantifiable reduction in emissions, but they enhance the pollution prevention aspects of the regulation. In conclusion, the Bay Area provisions are considered the most comprehensive relative to the CTG, followed by the South Coast regulation.

4.17 Gasoline Tank Truck and Vapor Collection System Leaks

The RACT level for this source category is delineated in terms of control approaches. The control approach is a combination of testing, monitoring, and equipment design to ensure that good maintenance practices are employed to prevent leaks from truck tanks or tank compartments and vapor collection systems during gasoline transfer at bulk plants, bulk terminals, and service stations. The CTG recommends that a reading should be less than or equal to 100 percent of the lower explosive limit (LEL) at 2.5 centimeters around the perimeter of a potential leaking source as detected by a combustible gas detector. The CTG further specifies how vapor collection and vapor processing equipment should be designed and operated so as to prevent leaks.

Both the Colorado and Texas regulations mirror the Federal CTG requirements. In addition, the Colorado regulation requires periodic visual inspections. This requirement provides a desirable feature, but it does not result in a quantifiable reduction. Therefore, in general, the Colorado and Texas regulations are as stringent as the Federal CTG. (Information regarding this source category was not found in the Bay Area or South Coast regulation).

4.18 Graphic Arts

The Federal CTG defines RACT in terms of percentage of emission reduction through the application of add-on control technology or product substitution. The "Blue Book" provides a RACT emission limit for this category in terms of mass of VOC per unit mass of solids applied [0.5 kg VOC/kg (0.5 lbs VOC/lbs) solids on a per-line basis]. The percentage of solids (nonvolatiles) required in the coating is not specified. This emission limit is applicable to both flexographic and rotogravure printing processes, and to both publication and packaging printing in which maximum theoretical VOC emissions (including solvents used to clean each of these printing presses) without control devices from all printing presses are greater than or equal to 90.7 megagrams (100 tons) per year with 8,760 operating hours or maximum production. The CTG RACT does not apply to offset lithography or letterpress printing.

Six State regulations (Colorado, Connecticut, Maine, New Jersey, New York, and Utah) were reviewed and ranked according to the stringency of State requirements versus the CTG RACT requirements. The criteria used to rank these regulations depend upon how the specific concentration of nonvolatile (solid) material in inks or the volatile portion of waterborne inks was calculated. The percentage emission reduction and the requirements for an alternative control technology also affect the stringency.

The Colorado and Utah regulations basically mirror the Federal CTG. However, the Connecticut regulation requires a control system to achieve the emission limit on an <u>hourly</u> basis or every adsorption cycle. Due to these requirements, the Connecticut regulation will result in more accurate compliance performance evaluations than the CTG and may thus help to identify areas having potential emission reduction.

The Maine and New York regulations specify a lower VOC emission cutoff (50 tons per year or less for some New York areas) than the CTG, and thus, more facilities are subject to the rules. The New Jersey regulation exempts surface coating operations (commercial and research operations) that use coatings

containing VOC below the cutoff hourly or daily rate. The New Jersey regulation also specifies the emission limit in terms of mass of VOC per unit volume of coating. To compare stringency between the Federal RACT and the New Jersey regulation, the units of the emission limit were converted to mass of VOC per unit mass of solids using the procedure specified in Appendix F. The calculated emission limit is 0.3 lb VOC/lb of solids and is lower than the limit specified in the CTG (0.5 lb VOC/lb of solids). Therefore, the New Jersey regulation is considered more stringent than the CTG and the other State regulations. The Utah regulation is applicable to "special printing operations," which results in more printing operations subject to the rule. Overall, the State regulations other than New Jersey's are as stringent as the CTG.

The Bay Area and South Coast regulations specify the same emission limits in terms of mass of VOC per unit volume of coating. The calculated emission limit in terms of mass of VOC per unit mass of solids (nonvolatiles) is 0.24, which is lower than the limit specified in the "Blue Book" or the New Jersey regulation. Therefore, the Bay Area and South Coast regulations are more stringent than the New Jersey regulation or the CTG. The Bay Area, however, requires a higher overall control efficiency than the South Coast (85 vs 70 percent). The Bay Area also specifies emission limits for two additional coatings that are not specified in the South Coast regulation or the CTG. In conclusion, the Bay Area regulation is considered more stringent than the South Coast rule, followed by New Jersey, and then the CTG.

4.19 Leaks from Petroleum Refinery Equipment

The Federal CTG defines RACT in terms of operating procedures, monitoring program, and timeframe for repairing leaks. Stringency for this category is defined by a shorter timeframe for repairing leaks, additional monitoring, and operating requirements. The Utah, Colorado, and Bay Area regulations contain some requirements that are considered more stringent than the Federal CTG.

Stringency for this source category was difficult to quantify since all of the listed requirements consist of specific recordkeeping procedures, specific monitoring requirements, and additional specifications for equipment. These requirements, although necessary for determining compliance, are difficult to rank and their benefits are not readily quantifiable. Also, some of the additional equipment specifications that are now required may not have existed at the time the Federal CTG was published. Therefore, no clear distinction between "additional" requirements beyond RACT can be made.

The Utah, Colorado, and Bay Area regulations were reviewed for this category. Utah and Colorado include additional "administrative" requirements, such as specification of a time-frame for a proposed monitoring program, as well as documentation and notification of the proper authorities when inspecting a leak. Each State regulation reviewed lists the same EPA Reference test methods, calibration procedures, and similar VOC monitoring procedures. The Utah regulation exempts some equipment from monitoring requirements, thereby making them applicable to a smaller population of sources than the Federal CTG and the Colorado rule. As shown in the table in Appendix B, the exemptions are specifically related to the vapor pressure of stored product, location of pressure relief valves, and the contents of the stream composition. The "unsafe to monitor" requirements found in the Utah regulation are not specifically found in the Federal CTG, the Colorado regulation, or the "Blue Book." However, the "Blue Book" recommends consistency with the SOCMI guidance in relation to "unsafe to monitor" requirements, which mirrors the requirements advised by the State (Utah) regulation. As described above, there are very minor differences in the State regulations and they are considered generally comparable. Therefore, both the Utah and Colorado regulations are determined to be as stringent as the CTG.

The Bay Area regulation defines a leak with lower VOC concentration (500 ppm from any valve or connector and 1,000 ppm from any pump or compressor) and provides a shorter timeframe for

repairing leaks (7 days vs 15 days) than the CTG, Utah, or Colorado. Both requirements will result in substantial and quantifiable emission reductions. Therefore, the Bay Area regulation is considered the most stringent.

4.20 Surface Coating of Miscellaneous Metal Parts and Products

The Federal CTG defines RACT in terms of emission limits for several types of coating categories. The recommended limits are given in terms of mass of VOC per unit volume of coating as applied (minus water). The CTG gives "case examples" of how to calculate emission limits and emission factors. It lists a typical solids (nonvolatiles) content for a conventional coating, but does not indicate to which of the five coating categories the example applies. Thus, the CTG does not give "typical" coating compositions for the coating of miscellaneous metal parts.

Stringency for this category is defined by comparing the emission limit, control efficiency, additional emission limits, and other requirements which may result in quantifiable reductions. Four State regulations and the two District regulations were reviewed for this category.

The State regulations (Utah, Colorado, Maine, and New Jersey) specify the same emission limits as the CTG. In addition to the emission limits, the Maine regulation provides an incentive for facilities which demonstrate that only low-VOC coatings are used by allowing them to keep monthly rather than daily records. The CTG specifies daily recordkeeping.

The Bay Area and South Coast regulations specify a lower emission limit than the CTG for air dried items. The South Coast regulation provides two emission limits for various coatings depending upon how the coatings are dried (air dried or baked). The emission limits for coatings that are baked are usually lower than for air dried. In addition to the emission limits, the South Coast regulation also requires a greater control efficiency for control systems and provides emission limits for "additional coatings" that were not specified in the CTG (including limits for cleaning materials). Therefore, the South Coast regulation is considered the most stringent, followed by the Bay Area, and

then the CTG.

4.21 Pneumatic Rubber Tire Manufacturing

The Federal CTG defines RACT under four main operations involved in the manufacture of rubber tires, listing control options for each of these operations and giving the expected capture and destruction efficiencies. Stringency for this source category is determined by comparing the control options and their respective efficiencies.

Two State regulations (Colorado and Connecticut) and the Bay Area regulation were reviewed for this source category. Both the Colorado and Connecticut regulations generally mirror the Federal CTG in almost all requirements. However, the Connecticut regulation could be considered more stringent since it requires the use of control equipment able to achieve higher control efficiencies than required by the CTG. The CTG states that the expected capture and control efficiency is between 65 and 85 percent. However, the State of Connecticut requires a control efficiency of at least 85 percent; therefore, its rule is considered to be more stringent. In addition, the Connecticut regulation requires the efficiency of a control system to be maintained on an hourly basis (for incinerators) or on each adsorption cycle (for carbon adsorption systems). This latter requirement will result in a more accurate compliance performance evaluation, but does not affect the stringency of the rule.

The Bay Area regulation specifies a higher overall control efficiency for emission reduction systems for this category than the Connecticut regulation or the CTG.

4.22 Surface Coating of Flat Wood Paneling

The Federal CTG defines RACT in several ways. The emission limits are expressed as mass of VOC per unit area coated, mass of VOC per unit volume of coating, and mass of VOC per unit volume of solids (nonvolatiles).

The relative stringency of rules for this category is determined by comparing the emission limits and the required control efficiency of a control device, and by examining additional emission limits. Four State regulations (New Jersey,

Maine, Texas, and Utah) and the two California District regulations were reviewed for this category. The State regulations specify the same emission limits as the CTG. In addition to these limits, the Maine regulation provides an incentive for facilities that demonstrate that only low-VOC (compliant) coatings are used (monthly rather than daily records). This incentive was not factored into determining the relative stringency; however, this provision does encourage pollution prevention activities.

The Bay Area and South Coast regulations specify only one emission limit for wood flat stock coatings. Wood flat stock is defined as panels containing wood including but not limited to redwood stocks, plywood panels, particle boards, composition hardboards, and any other panels containing solid wood or wood product. To compare stringency between the CTG and the District rules, the emission limits specified in the CTG were averaged. The averaged emission limit is 0.3 kg/l (2.53 lb/gal) of coating and is higher than the limit specified in the Bay Area or South Coast regulation. In addition to the limit, the South Coast regulation requires higher destruction and capture efficiencies than the CTG. Therefore, The South Coast regulation is considered the most stringent, followed by the Bay Area regulation, and then the CTG.

4.23 Synthesized Pharmaceutical Products

The Federal CTG defines RACT in several ways for this source category. It specifies that vents that emit at least a certain amount per day of VOC must install surface condensers or equivalent controls. The CTG gives temperature and vapor pressure specifications for surface condensers. Production equipment emitting over a certain mass per day of VOC must control to a specified percentage emission reduction. The CTG also specifies a cutoff for VOC-containing storage tanks, and contains additional work practice provisions.

Stringency for this category is defined by additional equipment and operation requirements that are not found in the Federal CTG. Both the Colorado and Connecticut regulations

generally mirror the Federal CTG. They also provide additional requirements to those specified in the CTG. These requirements include covers for all in-process tanks and making repairs immediately, rather than within 15 days as allowed by the CTG. However, the benefit of these requirements is not readily quantifiable, and therefore they are not factored into determining the stringency. For these reasons, the Colorado and Connecticut rules are ranked as stringent as the CTG.

The relative ranking of Colorado, Connecticut, and the Federal CTG is very close. As stated earlier, the differences between the three are minor with the segregating factor related to how many "additions" there are.

In addition to requirements specified in the CTG, the Bay Area and South Coast regulations specify requirements for centrifuges, rotary or vacuum filters, or any other filters. The Bay Area also requires the use of chemical sterilizers, which is not contained in the South Coast regulation or the CTG.

4.24 Air Oxidation Processes - SOCMI

Federal RACT is applicable to any air oxidation facility in the synthetic organic chemical manufacturing industry (SOCMI) in which air is used as an oxidizing agent to produce an organic chemical. Any equipment used to collect VOC for sale or reuse from a product recovery system of an oxidation facility is subject to RACT.

The CTG specifies that each air oxidation process vent stream must use a control device that reduces total organic compound emissions by 98 percent by mass or to 20 ppmv. However, this is not required for facilities that have a total resource effectiveness (TRE) index value greater than unity. The TRE index is a measure of the supplemental total resource requirement per unit VOC reduction, associated with VOC control by thermal oxidation. All resources that are expected to be used in VOC control by thermal oxidation are taken into account in determining the TRE index.

No State or District regulations concerning air oxidation processes - SOCMI were provided through the Work Group. Several

State regulations (Texas, Pennsylvania, Rhode Island, and Colorado) were consulted, but no State regulations pertaining to this category were located.

4.25 Equipment Leaks from Natural Gas/Gasoline Processing Plants

The Federal CTG for this source category defines equipment specifications and suggests a leak detection and repair (LDAR) program. The CTG also recommends the appropriate test methods to be used to determine compliance with any standards set forth, and provides an inspection schedule.

Relative stringency for this source category depends on a shorter timeframe for leak repair and by additional inspection requirements not set forth in the CTG. The Texas regulation and the two California District regulations were reviewed for this category.

The Texas regulation specifies monitoring and repair requirements for relief valves that have vented to the atmosphere within 24 hours at manned facilities or within 30 days at unmanned facilities. The CTG does not provide any timeframe for repairing leaks from relief valves. This provision, however, is not used to determine stringency since the benefit is not readily quantifiable.

The Bay Area regulation specifies the distance to measure the concentration of VOCs from the source of a leak and the timeframe for repairing any leak. The regulation provides two timeframes for repairing leaking equipment, which depend upon whether or not the equipment is essential. The Bay Area rule defines the term "essential" as applying to any equipment that cannot be taken out of service without shutting down the process which it serves. The Bay Area regulation specifies that if the leaking equipment is not essential or the equipment can be repaired without interrupting the process, the leak must be repaired within 24 hours. This part of the rule is more stringent than the CTG. For essential equipment, the Bay Area requires the leak to be minimized within 24 hours and if the leak persists and exceeds a concentration of 10,000 ppm, the equipment is to be

repaired at the next scheduled maintenance. Stringency could have been determined based on the length of time required to minimize the losses from leaks but, in this case, the requirement may not result in a quantifiable reduction in emissions. It does, however, enhance the pollution prevention aspects of the rule.

The South Coast regulation specifies several timeframes for different concentrations of leaks. The rule requires repair of a minor gas leak (in excess of 1,000 ppm but less than 10,000 ppm) within 14 calendar days. This range of concentration is not considered a leak in the CTG or the Bay Area rule, and no repair is needed. The South Coast regulation requires a leak with a VOC concentration of greater than 10,000 ppm to be repaired within 5 days (not 15 days as specified in the CTG). The timeframe is further reduced to 1 day for repairing a gas leak with VOC concentration over 50,000 ppm or any liquid leak. These requirements should result in a significant reduction in emissions.

The Bay Area and South Coast regulations also provide additional operating requirements pertaining to uncovered vessels, liquid pools, and operator inspection that will enhance the pollution aspects of the rules.

4.26 Large Petroleum Dry Cleaners

The Federal CTG for large petroleum dry cleaners sets an emission limit in terms of mass of VOC per unit mass of articles cleaned. It specifies the control equipment and a timeframe for repairing leaks.

The relative stringency for this category is determined on the basis of lower VOC emission limits or alternative emission limits, longer draining time, and additional requirements that may result in reducing emissions.

No State regulations for controlling large petroleum dry cleaners were provided through the Work Group. New York, Pennsylvania, and Texas rules were consulted, but they addressed only percholoroethylene dry cleaners.

The Bay Area and South Coast regulations require cartridge

filters to be drained in the filter housing for at least 12 hours before removal. The CTG is less stringent than the Bay Area or the South Coast regulation since it requires only 8 hours of draining time. The Bay Area and South Coast regulations also provide specific operating requirements for transferring articles to the dryer within a specified time limit, which will result in quantifiable emission reductions. The South Coast regulation specifies the same emission limit as the CTG for a dry cleaning facility with a solvent filtration system. The South Coast regulation also provides an alternative method to meet the emission limit in terms of mass of VOC per mass of solvent still. This means that if the first emission limit is not applicable, the alternative method must be used to comply with the rule. The Bay Area, on the other hand, specifies a lower VOC emission limit and a lower solvent flow rate from a solvent recovery dryer than the South Coast regulation or the CTG. These provisions would likely result in significant emission reductions. Therefore, the Bay Area regulation is considered more stringent than the South Coast rule or the CTG.

4.27 Polymer Manufacturing

The Federal CTG divides this source category into three types of polymer manufacturing plants: polystyrene, polypropylene, and high-density polyethylene. RACT for this category is defined in terms of emission limits and percentage emission reductions or emission rates. An emission limit in terms of mass of VOC per unit volume is specified only for polystyrene plants using continuous processes. Recommended limitations for both polypropylene and high-density polyethylene plants are given in terms of percent of emission reduction or emission rates. The Federal CTG states that the RACT recommendations were made on the basis of a single control device controlling all vents of VOC emissions.

Only one State regulation (Connecticut) was received from the Work Group members and reviewed for this source category. No RACT rule for this category was located in the Bay Area or South Coast regulation. The Connecticut regulation specifies only an

emission limit (in terms of mass of VOC per unit volume) for polystyrene plants. No information is available for polypropylene or high-density polyethylene plants. The State emission limit for polystyrene plants is the same as in the Federal CTG (0.12 kg of VOC/1,000 kg of product). However, Connecticut's emission limit for polystyrene plants must be achieved over a 1-hour period. In order to meet the limit, it is necessary to monitor or document the performance of the control equipment every hour. The Connecticut regulation also requires the owner or operator of a facility to maintain monitoring records for a period of 2 years, while the Federal CTG does not specify a timeframe over which these records must be kept. For these reasons, the Connecticut regulation is considered to be more stringent than the Federal CTG.

4.28 SOCMI and Polymer Manufacturing Equipment Leaks

RACT is applicable to components that appear to be leaking. These components include pumps, compressors, valves, open-ended lines, safety relief valves, etc. The CTG also specifies inspection and maintenance requirements.

Only one State regulation (Connecticut) was reviewed for this category, since information was not located for this catgegory for the Bay Area or the South Coast. The criteria used to determine relative stringency are based on compliance and reporting requirements.

The Connecticut regulation requires leaking equipment found during monitoring or on the basis of sight, smell, or sound to be repaired within 15 days after detection. Providing a specific timeframe to repair equipment leaks should help reduce VOC emissions significantly. The State regulation also requires 10-day notification prior to the scheduled quarterly monitoring. This requirement is part of the monitoring procedures to be in compliance, but it does not have any impact in reducing emissions. In general, the Connecticut regulation is more stringent than the Federal CTG.

APPENDIX A.

COMPARISON OF STATE/LOCAL VOC RULES TO FEDERAL RACT FOR GROUP I CTG CATEGORIES[2]

[2]This appendix describes Federal RACT for source categories covered in the Group I CTGs, as well as regulatory requirements for the same categories as contained in selected State/local VOC rules.

CUTBACK ASPHALT
FEDERAL RACT EMISSION LIMIT AS DEFINED BY THE CTG

Substitute emulsified asphalt for cutback asphalt.

The Blue Book[3] suggests seasonal exemptions (i.e., outside of ozone season) as opposed to temperature forecasting (e.g., <50°F), specifies (1) no higher than 7% oil distillate as maximum allowable solvent content in emulsified asphalt, as determined by ASTM distillation test D-244 or (2) allow use of certain grades or applications of emulsified asphalt with the following maximum solvent contents as determined by ASTM D-244: (a) 3% limit for seal coats used in early spring or late fall; (b) 3% limit when chip seals used with aggregate is dusty or dirty; (c) 8% limit when mixing with open graded aggregate that is not well washed; and (d) 12% limit when mixing with dense graded aggregate. Other exemptions are listed for use solely as penetrating prime coat and when stockpiled for extended periods.

[3] "Issues Relating to VOC Regulation Cutpoints, Deficiencies, and Deviations," Clarification to Appendix D of November 24, 1987 Federal Register - May 25, 1988 (revised 1/11/90), U.S. Environmental Protection Agency, Office of Air Planning and Standards, Research Triangle Park, North Carolina.

CUTBACK ASPHALT
STATE RACT RULES

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
Rhode Island	Rhode Island Air Pollution Control Regulation No. 25	Rhode Island's restrictions on the use of cutback asphalt between May 1 and October 14 are consistent with Federal guidance on the use of cutback asphalt during the ozone season.		Rhode Island has limit on application of cutback asphalt from May through October which is consistent with the CTG and other EPA guidance.

**

		In addition, the use of cutback asphalt between October 15 and April 30 is limited to: a) the use of medium curing cutback asphalt solely as a penetrating prime coat, or b) manufacture and use of patching mixtures for pavement repairs when long life stockpile storage is necessary, or c) medium curing cutback asphalt is used where less than 5% of the total solvent evaporates at up to temperatures of 500°F.		These prohibitions are not specified in the Federal CTG.

** Although this provision of the State's regulation may not necessarily result in a quantifiable reduction in emissions, it does enhance the pollution prevention aspects of the rule.

CUTBACK ASPHALT
STATE RACT RULES
(Concluded)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
Colorado	Code of Colorado Regulation Title 5, Chapter 1001, Regulation No. 7, Part XI.	Cutback asphalt may be used for any paving purpose October 1 through February 28 (29). No person shall use cutback asphalt or any emulsified asphalt March 1 through September 30 except as provided below: a. If used solely as a penetrating prime coat, or b. If the user can demonstrate to the Division that under the conditions of its intended use, there will be no emissions of VOCs to the ambient air.		The State regulation is the same as the Federal CTG, which allows some use of cutback as a penetrating prime coat.

FIXED-ROOF PETROLEUM TANKS
FEDERAL RACT EMISSION LIMIT AS DEFINED BY THE CTG

Emission limits are recommended in terms of equipment specifications. These specifications include internal floating roofs equipped with a closure seal or seals, or alternative equivalent control. The CTG, however, does not specify the exact types of controls acceptable as alternative equivalent.

The cutoffs for fixed-roof petroleum tanks, as described in the "Blue Book," are as follows:

(a) $\leq$ 150,000 liters (40,000 gallons) storage capacity of volatile petroleum liquids (greater than 10.5 kPa TVP), and

(b) $\leq$ 1,600,000 liters (420,000 gallons) storage capacity of crude oil and condensate prior to lease custody transfer.

FIXED-ROOF PETROLEUM TANKS
STATE RACT RULES
(Continued)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
Utah	Utah Air Conservation Regulation, Emission Standard Regulation, R307-1-4.4.9.1 B.(1)(b)	All openings in floating roof tanks except for automatic bleeder vents, rim space vents, and leg sleeves, shall provide a projection below the liquid surface.	**	There are no specifications in the Federal CTG requiring a projection below the liquid surface of any opening.
	B.(1)(f)	An emergency roof drain shall be provided with a slotted membrane fabric cover or equivalent cover which covers at least 90% of the opening.	**	The State requirement specifies additional requirements which were in the Federal CTG.

	B.(5)	The Executive Secretary must be notified 7 days prior to the refilling of a tank which has been emptied, or degassed for any other similar purpose.	**	The Federal CTG does not require this notification.

** Although this provision of the State's regulation may not necessarily result in a quantifiable reduction in emissions, it does enhance the pollution prevention aspects of the rule.

FIXED-ROOF PETROLEUM TANKS
STATE RACT RULES
(Continued)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
Colorado	Code of Colorado Regulation, Title 5, Chapter 1001, Regulation No. 7, Part VI.	A storage vessel must be removed from service within 45 days of an inspection if it is not repaired within that timeframe. Maintenance or inspection records must be kept for 2 years.	**	The Federal CTG does not give a specified timeframe in which leaks must be repaired. The CTG indicates that the State guideline should be followed for recordkeeping.

	I.B.2.a. (iii)(A)(1)	During a routine inspection, the operator shall measure for detectable vapor loss inside the hatch. Detectable vapor loss means a VOC concentration exceeding 10,000 ppm, using a portable hydrocarbon analyzer.	**	There are no specifications in the Federal CTG. This requirement has the potential to reduce emission losses.

** Although this provision of the State's regulation may not necessarily result in a quantifiable reduction in emissions, it does enhance the pollution prevention aspects of the rule.

FIXED-ROOF PETROLEUM TANKS
STATE RACT RULES
(Concluded)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
Colorado (Concluded)	VI.B.1	Tanks or other containers used to store the following liquids are exempt: 1) diesel fuels 1-D, 2-D, and 4-D as defined in ASTM D975-78; 2) fuel oils #1, #2, #3, #4, and #5, as defined in ASTM D396-78; and 3) gas turbine fuels 1-GT through 4-GT as defined in ASTMD 2880-78.	*	The State rule provides more exemptions than the Federal CTG. Stringency between the two cannot be determined since the additional exemptions make fewer sources subject to the standard, rather than the rule more stringent.

		Exemption for underground storage tanks whose annual volume total of liquid removed from the tank plus the sum of the volume of liquid added to it does not exceed twice the operational volume of the tank (i.e., a maximum of one turnover per year is allowed). Subsurface caverns or porous rock reservoirs are also exempt.	*	This exemption is not specified in the Federal CTG.

* This is an issue of applicability.

BULK PLANTS

FEDERAL RACT EMISSION LIMIT AS DEFINED BY THE CTG

The EPA defines a gasoline bulk plant as having a throughput of less than 76,000 liters of gasoline per day averaged over the work days in one year. A summary of the CTG RACT requirements is as follows.

- Bulk plant facilities include: 1) tanks for gasoline storage; 2) loading racks; and 3) incoming and outgoing tank trucks.
- Three control techniques employed at the bulk plants are submerged loading, vapor balance system, and leak prevention.
- Other control alternatives considered are: a) submerged filling, b) submerged filling account trucks with vapor balancing of transport trucks and storage tanks, and c) submerged filling account trucks with vapor balancing of storage tanks, account and transport trucks.
- A vapor balance system can control vapor emissions during loading and unloading of tank trucks with an efficiency greater than 90 percent.
- Proper maintenance, proper operation, and good housekeeping are required to prevent leaks and assure effective collection of VOC emissions when balance systems are installed.
- To maintain high emission reduction efficiencies, tank trucks, storage tanks, and all piping must be vapor-tight.
- No specific emission limits for bulk plants are provided.

BULK PLANTS
STATE RACT RULES

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
Colorado	Code of Colorado Regulation, Title 5, Chapter 1001, Regulation No. 7, Part VI, Section C.(3)(a).	The State defines a bulk plant as having an average daily through-put of 76,000 liters of gasoline (20,000 gal) or less over a period of 30 days.		Although the State requires a shorter period of time in calculating the average throughput, this does not necessarily signify that the State regulation is more stringent than the Federal CTG.
	C.3.d	The owner or operator of a bulk plant that serves only storage tanks may use submerged filling instead of vapor recovery.		The Federal CTG lists submerged filling as one of the possible control options.

Texas	Texas Administrative Code, Title 31, Natural resources and Conservation, Part III, Air Control Board, Chapter 115, Subchapter C. §115.211(a)(2)	In Harris County, and after January 31, 1994 in counties other than Harris, the maximum allowed loss of VOC due to product transfer is 1.2 lb VOC/1,000 gal (140 mg VOC/l) of gasoline transferred.	X[a]	The Federal CTG does not specify a maximum emission loss of VOC due to product transfer. Therefore, the State requirement is presumed to result in lower emissions than following the CTG's control technique and operational specifications.

[a] The "X" indicates that the State/local requirement is considered more stringent than the specifications in the applicable Federal CTG.

GASOLINE LOADING TERMINALS
FEDERAL RACT EMISSION LIMIT AS DEFINED BY THE CTG

Affected Units	Recommended Limitation[a]
Tank truck gasoline loading terminal	80 mg VOC/l (0.67 lb VOC/1,000 gal) of gasoline loaded

[a]This limit is based on submerged fill and vapor recovery/control systems.

The "Blue Book" defines a tank truck gasoline loading terminal as any tank truck loading operations at the primary wholesale outlet for gasoline that delivers at least 76,000 l/day (20,000 gal/day).

GASOLINE LOADING TERMINALS
STATE RACT RULES

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS

Colorado	Code of Colorado Regulation, Title 5, Chapter 1001, Regulation No. 7, Part VI, Section C.2.	As stated in the CTG with additional operating requirements listed below. The owner or operator of a gasoline terminal shall equip the terminal with proper loading equipment and shall follow the following loading procedures: (a) Install dry-break loading couplings to prevent petroleum liquid loss during uncoupling from vehicles. (b) Install a vapor collection and disposal system that gathers vapor transferred from vehicles being loaded. The system shall include devices to prevent the release of vapor	**	These loading procedures are work practices and are not specified in the Federal CTG. Although these requirements enhance the pollution prevention aspects of the rule, they may not result in quantifiable reductions. The State emission limit is the same as the CTG.

** Although this provision of the State's regulation may not necessarily result in a quantifiable reduction in emissions, it does enhance the pollution prevention aspects of the rule.

GASOLINE LOADING TERMINALS
STATE RACT RULES
(Continued)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
Colorado (Continued)		(c) Use operating procedures to ensure that petroleum liquid cannot be transferred unless the vapor collection equipment is in use. (d) Provide for the prevention of overfilling of transport vehicles with loading pump shutoffs, set stop meters, or comparable equipment.		

		(e) Operate all recovery and disposal equipment at a backpressure less than the pressure relief valve setting of transport vehicles.		

GASOLINE LOADING TERMINALS
STATE RACT RULES
(Continued)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
Colorado (Continued)		(f) Prevent the release of petroleum liquid on the ground from transport vehicles. Provision shall be made to remove any undelivered petroleum liquid with closed drainage devices.		

		(g) Maintain and operate final recovery and disposal equipment or devices in the vapor control system (i.e., control devices) so as to emit no more than 80 milligrams of volatile organic compounds per liter of gasoline being loaded. Such disposal devices shall be approved by the Division.		

GASOLINE LOADING TERMINALS
STATE RACT RULES
(Continued)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
Colorado (Concluded)		(h) Prevent loading of petroleum liquid into transport vehicles that do not have valid leak-tight certification as required in Section VI.D. No truck shall be loaded unless a certification sticker is displayed, or a certification letter is carried in the truck. (i) Follow all control procedures to prevent leaks.		

Utah	Utah Air Conservation Regulation, Emission Standard Regulation, R-307-1-4.9.2 Section A.	The State emission limit is 0.64 lb VOC/1,000 gal of gasoline transferred.	X	The State requires a slightly lower emission limit than the CTG and provides work practices and vapor collection procedures that are not included in the CTG.

GASOLINE LOADING TERMINALS
STATE RACT RULES
(Concluded)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS

Texas	Texas Administrative Code, Title 31, Natural resources and Conservation, Part III, Air Control Board, Chapter 115, Subchapter C. 115.211	The emission limit for Beaumont/Port Arthur, Dallas/Fort Worth, El Paso, and Houston/Galveston areas until January 31, 1994 is 80 mg VOC/l (0.67 lb VOC/1,000 gal) of gasoline transferred. After January 31, 1994, the emission limit will be reduced to 40 mg VOC from vapor recovery system vent per liter (0.33 lb VOC/1,000 gal) of gasoline transferred. However, for Gregg, Nueces, and Victoria counties, the emission limit is the same as in the CTG.	X	As of January 31, 1994, the Texas emission limit for these areas is lower than the Federal CTG and therefore is more stringent.

MISCELLANEOUS REFINERY SOURCES
FEDERAL RACT EMISSION LIMIT AS DEFINED BY THE CTG

The CTG states that regulations for vacuum producing systems (VPSs) and wastewater separators (WSs) should be written in terms of equipment specifications, and regulations for process unit turnarounds (PUTs) should be written in terms of operating procedures. It is suggested that non-condensables from VPSs should be piped to an appropriate firebox, incinerator, or (if spare compressor capability is available) compressing the vapors and adding them to refinery fuel gas. The hot wells that are associated with contact condensers can be covered and the vapors incinerated. Reasonable control of VOC emissions from WS consists of covering the forebays and separator sections.

Commercially operating wastewater separators include (1) a solid cover with all openings sealed totally enclosing the compartment liquid contents and (2) a floating pontoon or double-deck type cover, equipped with closure seals to enclose any space between the cover's edge and compartment wall. Also, any gauging and sampling device in the compartment cover can be designed to provide a projection (such as a probe) into the liquid surface to prevent VOC from escaping. The sampling device can also be equipped with a cover or lid that is in a closed position at all times except when the device is in actual use.

When a process unit is shut down for a turnaround the agency should require that the vessel be depressurized to vapor recovery, flare, or a firebox. The agency and the operator should agree on a timetable for compliance. Included in this timeframe should be dates for ordering, recovery installation, and start-up of necessary equipment. Each fractioner, reactor, stabilizer, etc. should be addressed. The vapors can either be added to the fuel gas system, flared, or directly vented to atmosphere. No VOC should be directly discharged to the atmosphere until the vessel pressure is less than 5 psig. The refinery operator should keep a record of each PUT listing as a minimum the date the unit was shut down, the approximate vessel hydrocarbon concentration when the hydrocarbons were first discharged to the atmosphere, and the approximate total quantity of hydrocarbons emitted to the atmosphere. These records should be kept for at least 2 years and be made available to the air pollution control agency inspector during any compliance inspection of the refinery.

MISCELLANEOUS REFINERY SOURCES
STATE RACT RULES

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
Colorado	Code of Colorado Regulation, Title 5, Chapter 1001, Regulation No. 7 Part VIII VIII.A.2.a. (iii)	The forebays and separator sections of WSs must have a vapor recovery system consisting of a vapor gathering device capable of collecting the VOC vapors discharged and a vapor disposal device capable of processing such volatile organic vapors so as to prevent their emission into the atmosphere.	**	The Federal CTG only suggests covering of the forebays and separator sections while the State regulation includes the option of sending the vapors to a control device or as in VIII.A.2.a(i), using a solid cover.

**

	VIII.B.7	Control devices must meet applicable requirements including recordkeeping and the applicable EPA Reference Methods 1-4 and 25 of 40 CFR Part 60 shall be used to determine the efficiency of the control devices. The above stated requirements also apply to VPSs.		The Federal CTG does not define the test methods that are to be utilized for determining compliance.

** Although this provision of the State's regulation may not necessarily result in a quantifiable reduction in emissions, it does enhance the pollution prevention aspects of the rule.

MISCELLANEOUS REFINERY SOURCES
STATE RACT RULES
(Continued)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
Colorado (Concluded)	VIII.B.2.a. and b., and VIII.B.3	For PUTs, depressurization venting of the process unit or vessel to a vapor recovery system, or to a flare or firebox must have at least 90% combustion efficiency. Also, no process unit or vessel can emit VOCs until the internal pressure is 2.5 psig or less.	X	The Federal CTG does not specify a vapor control system combustion efficiency for any of the mentioned refinery sources.

		All blowdown systems, process equipment vents, and pressure relief valves shall be vented to a vapor recovery system, or to a flare or firebox which assures at least 90% combustion efficiency.		

MISCELLANEOUS REFINERY SOURCES
STATE RACT RULES
(Continued)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
Utah	Utah Air Conservation Regulation, Emission Standard Regulation R-307-1-4.9.3 Sections D and E	Catalytic cracking units. Flue gas produced by catalytic cracker catalyst regeneration units shall be vented to a waste heat boiler, a process heater firebox, incinerated, or controlled by other methods provided the design and effectiveness of such methods are documented and submitted to and approved by the Executive Secretary.		Catalytic cracking units are not specifically addressed in the Federal CTG, but are indirectly referred to when it is suggested that vapors may be added to the refinery fuel gas system for burning.

MISCELLANEOUS REFINERY SOURCES
STATE RACT RULES
(Concluded)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
Utah (Concluded)		All safety pressure relief valves handling organic material shall be vented to a flare, firebox, or vapor recovery, or controlled according to the stipulations required under Leaks from Petroleum Refinery Equipment.	**	This requirement is not specified in the Federal CTG.

** Although this provision of the State's regulation may not necessarily result in a quantifiable reduction in emissions, it does enhance the pollution prevention aspects of the rule.

STAGE I VAPOR RECOVERY
RACT EMISSION LIMIT AS DEFINED BY THE CTG

The CTG suggests several methods to conduct displaced vapors from the underground tank to the trucks as follows: 1) two-point system, 2) coaxial systems, 3) manifolded vent lines, and 4) prescribed design criteria. Under design criteria, several distinctions have been made; they are 1) drop tube specifications, 2) gauge well, 3) vapor line connections, 4) vapor hose return, 5) type of liquid fill connection, 6) tank truck inspection, 7) closures and interlocks on underground tank vapor hose connectors, 8) vapor hose connection to the tank trucks, and 9) vent line restrictions.

The design criteria were developed to accomplish the following:

(a) assure submerged fill, i.e., discharge liquid below the gasoline surface in the storage tank;
(b) assure that the vapor return line and connections are of sufficient size and sufficiently free of restrictions to allow transfer of vapor to the truck tank and achieve the desired recovery;
(c) assure that there are no significant leaks in the system or in the tank truck that reduce vacuum in the truck or otherwise inhibit vapor transfer; and
(d) assure that the vapor return line will be connected during tank filling.

Suitable restrictive orifices or pressure relief valves are required wherever the systems would otherwise be incapable of achieving 90 percent control or would otherwise not assure that the vapor return line is connected. Either of the following restrictive devices is acceptable:

(a) Orifice of 1/2 to 3/4 inch ID.

STAGE I VAPOR RECOVERY
STATE RACT RULES

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS

Colorado	Appendix D	The State rule lists test procedures for annual pressure/vacuum testing of gasoline transport tanks (Stage I). A specific emission limit for Stage I was not located in the rule.		Test procedures include visual inspection, equipment requirements, pressure test specification, vacuum test specification, and leak checks of vapor return valves. The Federal CTG also requires tank truck visual inspection and leak testing at least twice per year.

STAGE I VAPOR RECOVERY
STATE RACT RULES
(Continued)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS

Texas	Texas Regulation V, Subchapter C 115.221	The State rule limits applicability to sources according to location. Those who are subject must not transfer, or allow the transfer of, gasoline from any delivery vessel into a stationary storage container located at a motor vehicle fuel dispensing facility, unless displaced vapors from the gasoline storage container are controlled by one of the following: (1) a vapor recovery system that reduces VOC emissions to no more than 93 mg/liter (0.8 lb/1,000 gal) of gasoline transferred; or	X	The State regulation provides specific vapor control options that are only briefly mentioned in the Federal CTG. It requires control equipment to meet a certain emission limit based on the feed rate of gasoline. This limit is not specified in the CTG. The CTG recommends only equipment specifica-

STAGE I VAPOR RECOVERY
STATE RACT RULES
(Continued)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
Texas (Continued)		(2) a vapor balance system operated and maintained in accordance with the State control requirements.		
	§115.222(4)	The vapor return line's cross-sectional area is at least one-half of the product drop line's cross-sectional area.		The State requirement is the same as stated in the Federal CTG.

	§115.222(5)	The only atmospheric emission during gasoline transfer into the storage container is through a storage container vent line equipped with either an orifice no greater than 3/4-inch internal diameter or a pressure-vacuum relief valve set to open at a pressure of no less than 8 ounces per square inch.	The State requirements are the same as stated in the Federal CTG.

STAGE I VAPOR RECOVERY
STATE RACT RULES
(Continued)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
Texas (Continued)	§115.222(8)	The gauge pressure in the tank of the fuel delivery truck does not exceed 4.5 kPa (18 inches of water) and vacuum does not exceed 1.5 kPa (6 inches of water).	**	The State requires gauge settings in tank trucks that the Federal CTG does not include. These settings are set for safety (pressure relief) purposes.

*

	§115.227(1) and (2)	The State exempts stationary gasoline storage containers with a nominal capacity less than or equal to 1,000 gallons (3,875 liters); containers used exclusively for the fueling of implements of agriculture; storage tanks equipped with external floating roof, internal floating roofs,or their equivalent; and stationary storage tanks located at a facility which dispenses less than 120,000 gallons (454,248 liters) of gasoline per year.		The Federal CTG does not list any exemptions. The Blue Book, however, has identified cutoff levels for Stage I. The throughput cutoff level for the State is the same as in the Blue Book.

STAGE I VAPOR RECOVERY
STATE RACT RULES
(Concluded)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
Texas (Concluded)				However, the State storage tank capacity cutoff exemption is higher than the CTG. Although this results in fewer sources subject to the rule, this cannot be used to determine stringency. This is an issue of applicability.

** This provision of the State's regulation does not reduce emissions, but is required for safety purposes.

* This is an applicability issue.

1) CONTROL SYSTEMS FOR COLD CLEANING

Control System A

Control Equipment:

1. Cover.
2. Facility for draining cleaned parts.
3. Permanent, conspicuous label, summarizing the operating requirements.

Operating Requirements:

1. Do not dispose of waste solvent or transfer it to another party, such that greater than 20 percent of the waste (by mass) can evaporate into the atmosphere.* Store waste solvent only in covered containers.

2. Close parts cleaner (degreaser) cover whenever not handling parts.

3. Drain cleaned parts for at least 15 seconds or until dripping ceases.

Control System B

Control Equipment:

1. Cover: Same as in System A, except if (a) solvent volatility is greater than 2 kPa (15 mm Hg or 0.3 psi) measured at 38°C (100°F),** (b) solvent is agitated, or (c) solvent is heated, the cover must be designed so that it can be easily operated with one hand. (Covers for larger parts cleaners (degreasers) may require mechanical assistance, by spring loading, counter weighting, or powered systems.)
2. Drainage facility: Same as in System A, except that if solvent volatility is greater than about 4.3 kPa (32 mm Hg or 0.6 psi) measured at 38°C (100°F), the drainage facility must be internal, so that parts are enclosed under the cover while draining. The drainage facility may be external for applications where an internal type cannot fit into the cleaning system.

3. Label: Same as in System A.
4. If used, the solvent spray must be a solid, fluid stream (not a fine atomized or shower type spray) and at a pressure that does not cause excessive splashing.
5. Major control device for highly volatile solvents: If the solvent volatility is > 4.3 kPa (33 mm Hg or 0.6 psi) measured at 38°C (100°F), or if solvent is heated above 50°C (120°F), then one of the following control devices must be used:
   a. Freeboard that gives a freeboard ratio*** $\geq$ 0.7
   b. Water cover (solvent must be insoluble in and heavier than water)
   c. Other systems of equivalent control, such as a refrigerated chiller or carbon adsorption.

Operating Requirements:

Same as in System A.

2) COMPLETE CONTROL SYSTEMS FOR OPEN TOP VAPOR PARTS CLEANERS (DEGREASERS)

Control System A

Control Equipment:

1. Cover that can be opened and closed easily without disturbing the vapor zone.

Operating Requirements:

1. Keep cover closed at all times except when processing work loads through the parts cleaner.

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*Water and solid waste regulations must also be complied with.

**Generally, solvents consisting primarily of mineral spirits (Stoddard) have volatilities < 2 kPa.

***Freeboard ratio is defined as the freeboard height divided by the width of the parts cleaner.

SOLVENT METAL CLEANING
FEDERAL RACT EMISSION LIMIT AS DEFINED BY THE CTG
(Continued)

2. Minimize solvent carry-out by the following measures:
   a. Rack parts to allow full drainage
   b. Move parts in and out of the parts cleaner at less than 3.3 m/sec (11 ft/min).
   c. Clean the work load in the vapor zone at least 30 sec. or until condensation ceases.
   d. Tip out any pools of solvent on the cleaned parts before removal.
   e. Allow parts to dry within the parts cleaner for at least 15 sec. or until visually dry.
3. Do not clean porous or absorbent materials, such as cloth, leather, wood, or rope.
4. Work loads should not occupy more than half of the parts cleaner's open top area.
5. The vapor level should not drop more than 10 cm (4 in) when the work load enters the vapor zone.
6. Never spray above the vapor level.
7. Repair solvent leaks immediately, or shut down the parts cleaner.
8. Do not dispose of waste solvent or transfer it to another party such that greater than 20 percent of the waste (by mass) will evaporate into the atmosphere. Store waste solvent only in closed containers.
9. Exhaust ventilation should not exceed 20 m^3/min per m^2 (65 cfm per ft^2) of parts cleaner's open area, unless necessary to meet OSHA requirements. Ventilation fans should not be used near the parts cleaner's opening.
10. Water should not be visually detectable in solvent exiting the water separator.

Control System B

Control Equipment:

1. Cover (same as in system A).

2. Safety switches
   a. Condenser flow switch and thermostat - (shuts off sump heat if condenser coolant is either not circulating or too warm).
   b. Spray safety switch - (shuts off spray pump if the vapor level drops excessively, about 10 cm (4 in).

3. Major Control Device:

Either: a. Freeboard ratio greater than or equal to 0.75, and if the parts cleaner's opening is > 1 m^2 (10 ft^2), the cover must be powered;

b. Refrigerated chiller;

c. Enclosed design (cover or door opens only when the dry part is actually entering or exiting the parts cleaner);

d. Carbon adsorption system, with ventilation $\geq$ 15 m^3/min per m^2 (50 cfm/ft^2) of air/vapor are (when cover is open), and exhausting <25 ppm solvent averaged over one complete adsorption cycle; or

e. Control system, demonstrated to have control efficiency equivalent to or better than any of the above.

4. Permanent, conspicuous label, summarizing operating procedures #1 to #6.

Operating Requirements:

Same as in System A.

3) CONTROL SYSTEMS FOR CONVEYORIZED PARTS CLEANERS (DEGREASERS)

Control System A

Control Equipment: None

Operating Requirements:

1. Exhaust ventilation should not exceed 20 m^3/min per m^2 (65 cfm per ft^2) of parts cleaner's opening, unless necessary to meet OSHA requirements. Work place fans should not be used near the parts cleaner's opening.

2. Minimize carry-out emissions by:
   a. Racking parts for best drainage.
   b. Maintaining vertical speed at < 3.3 m/min (11 ft/min).
3. Do not dispose of waste solvent or transfer it to another party such that greater than 20 percent of the waste (by mass) can evaporate into the atmosphere. Store waste solvent only in covered containers.
4. Repair solvent leaks immediately, or shut down the parts cleaner.
5. Water should not be visibly detectable in the solvent exiting the water separator.

Control System B

Control Equipment:

1. Major control devices; the parts cleaner must be controlled by either:
   a. Refrigerated chiller;
   b. Carbon adsorption system, with ventilation $\geq$ 15 m^2/min per m^2 (50 cfm/ft^2) of air/vapor area (when down-time covers are open), and exhausting <25 ppm of solvent by volume averaged over a complete adsorption cycle; or
   c. System demonstrated to have control efficiency equivalent to or better than either of the above.
2. Either a drying tunnel or another means such as rotating (tumbling) basket, sufficient to prevent cleaned parts from carrying out solvent liquid or vapor.
3. Safety switches
   a. Condenser flow switch and thermostat - (shuts off sump heat if coolant is either not circulating or too warm).
   b. Spray safety switch - (shuts off spray pump or conveyor if the vapor level drops excessively, e.g. > 10 cm (4 in.)).
   c. Vapor level control thermostat - (shuts off sump heat when vapor level rises too high).

4. Minimized openings: Entrances and exits should silhouette work loads so that the average clearance (between parts and the edge of the parts cleaner's opening) is either <10 cm (4 in.) or <10 percent of the width of the opening.
5. Down-time covers: Covers should be provided for closing off the entrance and exit during shutdown hours.

SOLVENT METAL CLEANING
FEDERAL RACT EMISSION LIMIT AS DEFINED BY THE CTG
(Concluded)

Operating Requirements:

1. to 5. Same as for System A.

6. Down-time cover must be placed over entrances and exits of conveyorized parts cleaners immediately after the conveyor and exhaust are shut down and removed just before they are started up.

SOLVENT METAL CLEANING
STATE RACT RULES

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
Colorado	Colorado X.A.5	Each control device shall meet the applicable requirements of subsections IX.A.3.a, b, c, e, and IX.A.8.a and b. Those sections specify test methods and recordkeeping requirements.	**	The Federal CTG does not list any additional control device requirements for demonstrating compliance.
	X.B.1.d Solvent Cold Cleaners	Similar to the Federal CTG.		

** Although this provision of the State's regulation may not necessarily result in a quantifiable reduction in emissions, it does enhance the pollution prevention aspects of the rule.

SOLVENT METAL CLEANING
STATE RACT RULES
(Continued)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS

Colorado (Continued)	X.C.2	Operating Requirements		The State regulation does not include stipulations in the Federal CTG for open top parts cleaners that restrict the vapor level from being allowed to drop more than 10 cm (4 in) when the workload enters the vapor zone, and the restriction regarding disposing of waste solvent or transferring it to another party such that greater than 20 percent of waste (by mass) will not evaporate into the atmosphere. The State regulation is considered less specific than the CTG.

SOLVENT METAL CLEANING
STATE RACT RULES
(Continued)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
Colorado (Concluded)	X.D.2.a.	Exhaust flow shall be measured by EPA Reference Methods 1 and 2 of 40 CFR part 60.	**	The Federal CTG does not specify how the exhaust flow for conveyorized parts cleaners should be measured. Providing a test method will result in data with a higher confidence level. By using the EPA test method for exhaust flow determination, the result will be more reliable.

	X.D.f	A permanent, clearly visible sign shall be mounted on or next to the parts cleaner. The sign shall list the operating requirements.	**	The Federal CTG does not mention the requirement to place signs for conveyorized parts cleaners. Following proper operating practices can minimize solvent loss to the atmosphere.

** Although this provision of the State's regulation may not necessarily result in a quantifiable reduction in emissions, it does enhance the pollution prevention aspects of the rule.

SOLVENT METAL CLEANING
STATE RACT RULES
(Continued)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
Connecticut	Title 22a, Chapter 174, Section 20	The State regulation applies to all sources that were constructed before June 1, 1990. All subject sources must comply with specified operating requirements. If a source became operational after June 1, 1990, it must comply with the earlier specified operating requirements in addition to several additional operational requirements.	*	Sources built after June 1, 1990 have additional control and work practices to ensure compliance.

	(1)(3)(D)	Covers must be closed whenever parts are not being handled in the cleaner for 2 minutes or more, or when the device is not in use.	**	In addition to the requirement for covers to be closed when parts are not being handled in the cleaner, the State rule specifies a timeframe of 2 minutes or more when not in use. That is not mentioned in the Federal CTG.

* This is an applicability issue.

** This provision of the State's regulation involves work practices that will result in quantifiable emission reductions.

SOLVENT METAL CLEANING
STATE RACT RULES
(Continued)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
Connecticut (Continued)	(1)(3)(F)	If used, supply a cleaning (degreasing) solvent spray that is a solid (geometrical) fluid stream at a pressure that does not exceed 10 pounds per square inch as measured at the pump outlet and perform such spraying within the confines of the cold cleaning unit.		Similar to the CTG.

	(1)(H) and (1)(5)(H)	Minimize the drafts across the top of each cold cleaning unit such that whenever the cover is open the unit is not exposed to drafts greater than 40 meters per minute, as measured between 1 and 2 meters upwind and at the same elevation as the tank lip.	**	This requirement is not specified in the Federal CTG. However, this requirement may have the result of reducing emissions.

** This provision of the State's regulation involves work practices that will result in quantifiable emission reductions.

SOLVENT METAL CLEANING
STATE RACT RULES
(Continued)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
Connecticut (Continued)	(1)(G)	Do not operate the unit upon the occurrence of any visible solvent leak until such leak is repaired.	**	The Federal CTG does not specify restricting the operation of a unit (cold cleaner only) when any visible solvent leaks occur. It only indicates that leaks are to be repaired properly and promptly.
	(1)(K),(1)(4)(K), and (1)(5)(M)	Maintain a monthly record of the amount of solvent added to each unit and keep such a record for a minimum of 2 years.		This requirement is not specified in the Federal CTG.

	(1)(3)(C)	Metal cleaning equipment that uses 1,1,1 trichloroethane, methylene chloride, or trichloro-triflouroethane are exempted from this rule.		The Federal CTG does not discuss these three compounds. However, these chlorinated compounds are not considered photochemically reactive by EPA. They are, therefore, exempt from the VOC definition.

** Although this provision of the State's regulation may not necessarily result in a quantifiable reduction in emissions, it does enhance the pollution prevention aspects of the rule.

SOLVENT METAL CLEANING
STATE RACT RULES
(Continued)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
Connecticut (Concluded)		If the open top vapor parts cleaner is equipped with a lip exhaust, the required cover shall be located below the lip exhaust.	**	A lip exhaust is not specified in the Federal CTG.
Maine	Air Quality Control Regulation Title 38 Chapter 130	The parts cleaner must be equipped with a thermostat to shut off the sump heat if the condenser coolant is either not circulating or if the vapor level rises above the height of primary condenser.		This requirement is identical to the Federal CTG.

** Although this provision of the State's regulation may not necessarily result in a quantifiable reduction in emissions, it does enhance the pollution prevention aspects of the rule.

SOLVENT METAL CLEANING
STATE RACT RULES
(Continued)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
Maine (Concluded)	Chapter 130 (Concluded)	The vapor parts cleaner shall be equipped with a switch that shuts off the spray pump if the vapor level drops more than 10 cm below the lowest condensing coil. The operator shall not allow this drop in vapor level to occur. Monthly records of the amount of solvent added to each unit must be maintained and kept for a period of 2 years.		This requirement is specified in the Federal CTG.

SOLVENT METAL CLEANING
STATE RACT RULES
(Continued)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
Rhode Island	Title 3, Chapter 10, 18.3.1	All cold cleaning units must have covers, regardless of solvent vapor pressure. Freeboard ratio is required to be at least 0.75. Four inches of water cover are required.	X	Unlike the Federal CTG, all cold cleaning units must have covers regardless of solvent vapor pressure. A recommended freeboard ratio of at least 0.75 instead of 0.70 is more stringent than the conditions in the CTG. The State requires a larger amount of water cover which provides some reduction in emissions.

	18.4.1	Drain cleaned parts for at least 15 seconds or until dripping ceases, whichever is longer.	**	The Federal CTG does not include the statement, "whichever is longer," an important "additional" requirement.

** Although this provision of the State's regulation may not necessarily result in a quantifiable reduction in emissions, it does enhance the pollution prevention aspects of the rule.

SOLVENT METAL CLEANING
STATE RACT RULES
(Concluded)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS

Rhode Island (Concluded)	18.3.2	Owners of open top vapor parts cleaners are required to install a refrigerated chiller having a minimum cooling capacity, based on the size of the cleaner unit. Also, install vapor level safety switches that shut the unit off if the vapor rises above the cooling coils, and a low solvent level safety switch to shut off the heating element if it becomes exposed to solvent vapor.	**	Both the Federal CTG and the State rule require the installation of a refrigerated chiller as one of the control devices, but the State rule is more specific. The State defines the chiller cooling capacity as based on the size of the parts cleaner. This definition is not found in the Federal CTG. The Federal CTG does specify that a spray safety switch should be installed, but it does not specifically state that a low solvent safety switch must also be installed. These additional requirements may have an impact on emission reduction.

** Although this provision of the State's regulation may not necessarily result in a quantifiable reduction in emissions, it does enhance the pollution prevention aspects of the rule.

SURFACE COATING OF AUTOMOBILES AND LIGHT-DUTY TRUCKS
FEDERAL RACT EMISSION LIMIT AS DEFINED BY THE CTG

Affected Units	Recommended Limitation[a]
Prime application, flashoff area, and oven[b]	0.23 kg VOC/l of coating (1.9 lb VOC/gal of coating) [minus water]
Topcoat application, flashoff area, and oven	0.34 kg VOC/l of coating (2.8 lb VOC/ gal of coating) [minus water]
Final repair application, flashoff area, and oven[c]	0.58 kg VOC/l of coating (4.8 lb VOC/gal of coating) [minus water]

[a]The CTG does not mention "exempt" solvents. However, exempt solvents are treated as water according to EPA guidance (Blue Book).
[b]The recommended emission limit is based on use of an electrophoretic system followed by a 25 percent solids waterborne "surfacer."
[c]The recommended emission limit is based on use of organic-borne enamel with 35 percent solids.

The Federal CTG provides another alternative for complying with RACT by the installation of add-on control devices. Incinerators and carbon adsorbers are the most applicable and preferred devices to reduce VOC emissions. Incineration systems can achieve over 90 percent reduction efficiency and carbon adsorption systems can achieve over 85 percent.

SURFACE COATING OF AUTOMOBILES AND LIGHT-DUTY TRUCKS
STATE RACT RULES

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS

Colorado	Code of Colorado Regulation, Title 5, Chapter 1001, Regulation No. 7, Part IX, Section B.3.	State emission limits: a) prime application, flashoff area, and oven: 0.23 kg/l (1.9 lb/gal) of coating (minus water and exempt solvents); b) topcoat application, flashoff area, and oven: 0.34 kg/l (2.8 lb/gal) of coating (minus water and exempt solvents); c) final repair application, flashoff area, and oven: 0.58 kg/l (4.8 lb/gal) of coating (minus water and exempt solvents).		The State emission limits are not more stringent than the Federal CTG for reasons explained under (a) recommended limitations.

SURFACE COATING OF AUTOMOBILES AND LIGHT-DUTY TRUCKS
STATE RACT RULES
(Continued)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS

Colorado (Concluded)	Section B.5	For topcoat application, if a compliant coating is not used to meet the emission limit, then: a. an alternative method shall meet an emission limit of 15.1 lb VOC/gal solids deposited on the coated part; and b. compliance shall be determined on a daily weighted-average basis.		In addition to the emission limits, the State provides an alternative method for topcoat application in order to achieve compliance. The alternative emission limit given in terms of mass VOC/gal solids is 4.5 lb/gal of solids (see the calculation procedure in Appendix F).

SURFACE COATING OF AUTOMOBILES AND LIGHT-DUTY TRUCKS
STATE RACT RULES
(Continued)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
New Jersey	New Administrative Code, Title 7, Chapter 27, Bureau of Air Pollution Control, Sub-chapter 16, 7:27-16.5(a)(1)	State emission limits: a) topcoat application, flashoff area, and oven: 0.34 kg/l (2.8 lb/gal) of coating (minus water); b) final repair application, flashoff area, and oven: 0.58 kg/l (4.8 lb/gal) of coating (minus water).		The State emission limits are identical to the emission limits specified in the CTG.

SURFACE COATING OF AUTOMOBILES AND LIGHT-DUTY TRUCKS
STATE RACT RULES
(Continued)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
New Jersey (Continued)		State of New Jersey divides prime application into two operations: electrophoretic dip prime and spray prime. The maximum allowable VOC content per volume of coating (minus water) for * electrophoretic dip prime: 0.14 kg/l (1.2 lb/gal); and * spray prime: 0.34 kg/l (2.8 lb/gal).	*	The State splits prime application into two separate operations with two different emission limits. The averaged emission limit for these two operations is the same as the emission limit for "prime application" stated in the Federal CTG. Therefore, the State rules are more specific than the Federal CTG, but not necessarily more stringent.

* Relative stringency cannot be determined.

SURFACE COATING OF AUTOMOBILES AND LIGHT-DUTY TRUCKS
STATE RACT RULES
(Continued)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
New Jersey (Continued)		The State also adds two additional operations: custom topcoating and refinishing (basecoat, clear coat, and all others). The emission limit for custom coating is 0.6 kg VOC/l (5 lb/gal) of coating (minus water). The maximum allowable VOC content per volume of coating (minus water) for refinishing is:	X	The State provides additional emission limits for coatings that are not specified in the CTG, so more coating operations will be regulated.

		*base coat: 0.75 kg/l (6.0 lb/gal); *clear coat: 0.54 kg/l (4.4 lb/gal); and *all others: 0.6 kg/l (5.0 lb/gal).		

SURFACE COATING OF AUTOMOBILES AND LIGHT-DUTY TRUCKS
STATE RACT RULES
(Continued)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
New Jersey (Continued)	7:27-16.5(c)(2) and (3)	As of June 15, 1990, the State provisions shall not apply to any individual coating operation in which the total surface coating formulations containing VOC are applied at rates not in excess of 0.5 gal per hour and 2.5 gal per day; or for the purpose of developing new coatings or performing research, such formulations are applied at rates not in excess of 2 gal per hour and 3 gal per day.	*	No VOC applicability threshold is provided in the Federal CTG.

* This is an applicability issue.

SURFACE COATING OF AUTOMOBILES AND LIGHT-DUTY TRUCKS
STATE RACT RULES
(Concluded)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
New Jersey (Concluded)	7:27-16.5(a)(3)	If the surface coating operation is served by VOC control equipment, the State requires: a) the control equipment to prevent no less than 90 percent by mass of the VOC content in the surface coating formulation as applied <u>each hour</u> from being discharged directly or indirectly into the outdoor atmosphere; or	**	The State requirements will result in more accurate compliance performance evaluation than the CTG.

		b) the operations result in an hourly VOC emission rate no greater than the maximum allowable hourly emission rate calculated on a solids applied basis.		

** Although this provision of the State's regulation may not necessarily result in a quantifiable reduction in emissions, it does enhance the pollution prevention aspects of the rule.

SURFACE COATING OF CANS
FEDERAL RACT EMISSION LIMIT AS DEFINED BY THE CTG

Affected Units	Recommended Limitation[a]
Sheet basecoat and over-varnish; two-piece can exterior	0.34 kg VOC/l of coating (2.8 lb VOC/gal of coating) [minus water]
Two and three-piece can interior body spray, two-piece can exterior end	0.51 kg VOC/l of coating (4.2 lb VOC/gal of coating) [minus water]
Three-piece can side-seam spray	0.66 kg VOC/l of coating (5.5 lb VOC/gal of coating) [minus water]
End sealing compound	0.44 kg VOC/l of coating (3.7 lb VOC/gal of coating) [minus water]

[a]The CTG does not mention "exempt" solvents. However, exempt solvents are treated as water according to EPA guidance (Blue Book).

For the industries where stack gas treatment is a more feasible option, it may be appropriate to state emission limits in terms of control efficiency across control devices such as incinerators or carbon adsorbers. Catalytic and non-catalytic incinerators and carbon adsorbers are expected to achieve 90% reduction.

SURFACE COATING OF CANS
STATE RACT RULES

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS

Colorado	Code of Colorado Regulation, Title 5, Chapter 1001, Regulation No. 7, Part IX, Section C.	<u>Can Coating</u> - Sheet basecoat: 0.34 kg VOC/l (2.8 lb VOC/gal) of coating (minus water and exempt solvents). - Two and three-piece can interior body spray, two-piece can exterior end (spray or roll coat): 0.51 kg VOC/l (4.2 lb VOC/gal) of coating (minus water and exempt solvents). - Three-piece can side- seam spray: 0.66 kg VOC/l (5.5 lb VOC/gal) of coating (minus water and exempt solvents). - End sealing		The State emission limits are not more stringent than the Federal CTG for reasons explained under (a) recommended limitations.

SURFACE COATING OF CANS
STATE RACT RULES
(Continued)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
Colorado (Concluded)		In addition to emission limitations as stated in the CTG, Colorado has an emission limit for "any additional (other) coat" [emission limit: 0.51 kg VOC/l of coating or 4.2 lb VOC-/gal of coating (minus water)].	X	The State rule specifies an emission limit for "any additional coat." Therefore, more coatings may be subject to the rule.
Maine	Air Quality Control Regulation Chapter 129.	Facilities which demonstrate that only low-VOC coatings are used at that facility are allowed to keep monthly, rather than daily, records.	*	This is a means of encouraging pollution prevention, but does not have a direct impact on stringency.

* Although this provision may not result in quantifiable emission reductions, it encourages pollution prevention.

SURFACE COATING OF CANS
STATE RACT RULES
(Continued)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS

New Jersey	New Jersey Administrative Code, Title 7, Chapter 27, Bureau of Air Pollution Control, Subchapter 16, 7:27-16.5	Can Coating - Sheet basecoat and two-piece can exterior:0.34 kg VOC/l (2.8 lb VOC/gal) of coating (minus water). - Two- and three-piece can interior body spray, two-piece can exterior end: 0.51 kg VOC/l (4.2 lb VOC/gal) (minus water). - Side-seam spray: 0.66 kg VOC/l (5.5 lb VOC/gal) of coating (minus water). - End sealing compound: 0.44 kg VOC/l (3.7 lb VOC/gal) of coating (minus water).		The emission limits for coating application in the State regulation are the same as those stated in the Federal CTG.

SURFACE COATING OF CANS
STATE RACT RULES
(Continued)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS

New Jersey (Continued)	7:27-16.5 (c)(2) and (3).	As of June 15, 1990, the State provisions shall not apply to any individual surface coating operation in which the total surface coating formulations containing VOC are applied at rates not in excess of 0.5 gal per hour or 2.5 gal per day; or for the purpose of developing new coatings or performing research, such formulations are applied at rates not in excess of 2 gal per hour and 3 gal per day.	*	No VOC cutoff point is given in the Federal CTG.

* This is an applicability issue.

SURFACE COATING OF CANS
STATE RACT RULES
(Concluded)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
New Jersey (Concluded)	7:27-16.5 (a)(3)	If the surface coating operation is served by VOC control equipment, the State requires: a) the control equipment to prevent no less than 90% by mass of the VOC content in the surface coating formulation as applied <u>each hour</u> from being discharged directly or indirectly into the outdoor atmosphere; or	**	The State requirements will evaluate compliance performance more accurately than the CTG.

		b) the operations result in an hourly VOC emission rate no greater than the maximum allowable hourly emission rate calculated on a solids applied basis.		

** Although this provision of the State's regulation may not necessarily result in a quantifiable reduction in emissions, it does enhance the pollution prevention aspects of the rule.

SURFACE COATING OF FABRICS
FEDERAL RACT EMISSION LIMIT AS DEFINED BY THE CTG

Affected Units	Recommended Limitation[a]
Fabric Coating Line	0.35 kg VOC/1 of coating (2.9 lb VOC/gal of coating) (minus water)
Vinyl Coating Line	0.45 kg VOC/1 of coating (3.8 lbs VOC/gal of coating) (minus water)

[a] The CTG does not mention "exempt" solvents. However, exempt solvents are treated as water according to EPA guidance (Blue Book). These limitations are based on use of an add-on control system that has an overall control efficiency of 81% (90 percent capture/90 percent control).

SURFACE COATING OF FABRICS
STATE RACT RULES

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
Colorado	Code of Colorado Regulation, Title 5, Chapter 1001, Regulation No. 7, Part IX, Section E	Fabric coating line: 0.35 kg VOC/l (2.9 lb VOC/gal) of coating.		The emission limit is identical to the CTG.
	Section K	Vinyl coating line: 0.45 kg VOC/l (3.8 lb/gal) of coating.		The emission limit is identical to the CTG.
New Jersey	New Jersey Administrative Code, Title 7, Chapter 27, Bureau of Air Pollution Control, Subchapter 16, 27-16.5(a)(1)	Maximum allowable VOC content per volume of coating (minus water) for fabric coating lines: 0.35 kg/l (2.9 lb/gal) and for vinyl coating line: 0.45 kg/l (3.8 lb/gal).		The emission limits are identical to the CTG.

SURFACE COATING OF FABRICS
STATE RACT RULES
(Continued)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
New Jersey (Continued)	7:27-16.5 (c)(2) and (3)	As of June 15, 1990, the State provisions shall not apply to any individual surface coating operation in which the total surface coating formulations containing VOC are applied at rates not in excess of 0.5 gal per hour or 2.5 gal per day; or for the purpose of developing new coatings or for the purpose of performing research, such formulations are applied at rates not in excess of 2 gal per hour and 3 gal per day.	*	No VOC cutoff point is given in the Federal CTG.

* This is an applicability issue.

SURFACE COATING OF FABRICS
STATE RACT RULES
(Continued)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS

New Jersey (Concluded)	7:27-16.5 (a)(3)	If the surface coating operation is served by VOC control equipment, the State requires: a) the control equipment to prevent no less than 90% by mass of the VOC content in the surface coating formulation as applied each hour from being discharged directly or indirectly into the outdoor atmosphere; or b) the operations result in an hourly VOC emission rate no greater than the maximum allowable hourly emission rate calculated on a solids applied basis.	**	The State requirements evaluate compliance performance more accurately than the Federal CTG and may result in more emission reductions.

** Although this provision of the State's regulation may not necessarily result in a quantifiable reduction in emissions, it does enhance the pollution prevention aspects of the rule.

SURFACE COATING OF FABRICS
STATE RACT RULES
(Continued)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
Utah	Utah Air Conservation Regulation, Emission Standard Regulation, R-307-1-4.9.6 Section C (1)	Fabric coating line: 0.35 kg VOC/l (2.9 lb VOC/gal) of coating, excluding water and exempt solvents. Vinyl coating line: 0.45 kg VOC/l (3.8 lb/gal) of coating.		The EPA "Blue Book" clarifies that exempt solvents are treated as water in the "lb VOC/gal of coating less water" calculation.

	Section C (2)	The State indicates that in determining compliance, equivalency calculations for coatings shall be performed in units of lb VOC/gal of solids rather than lb VOC/gal of coating. The equivalent emission limit is 4.8 lb VOC/gal of solids for fabric coating, and 7.9 lb VOC/gal of solids for vinyl coating.		The emission limit in terms of mass VOC per mass of solids (non-volatiles) can be calculated using the guidelines provided in Appendix F.

SURFACE COATING OF FABRICS
STATE RACT RULES
(Continued)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
Rhode Island	Rhode Island Air Pollution Regulation No. 19.3.1	VOC emission limit for: a) Fabric coating line: 2.9 lb VOC/gal of coating (minus water) and 4.79 lb VOC/gal of solids. b) Vinyl coating line: 3.8 lb VOC/gal of coating (minus water) and 7.86 lb VOC/gal of solids.		The guidelines provided in Appendix F to calculate can be used the emission limit in terms of mass of VOC per unit volume of solids (non-volatiles).
	19.3.2	The State requires an approved control system to have a total emission reduction of 85% or greater.	X	The State requires higher overall reduction efficiency than the Federal CTG (85% vs 81%).

SURFACE COATING OF FABRICS
STATE RACT RULES
(Concluded)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
Maine	Air Quality Control Regulation Chapter 129.	Facilities which demonstrate that only low-VOC coatings are used at that facility are allowed to keep monthly, rather than daily, records.	*	This is a means of encouraging pollution prevention, but does not have a direct impact on stringency.

* Although this provision does not necessarily result in quantifiable emission reductions, it encourages pollution prevention.

SURFACE COATING OF LARGE APPLIANCES
FEDERAL RACT EMISSION LIMIT AS DEFINED BY THE CTG

Affected Units	Recommended Limitation[a]
Prime, single, or topcoat application area, flashoff area, and oven	0.34 kg VOC/1 of coating (2.8 lb VOC/gal of coating) [minus water]

The Federal CTG states that the emission limit is based on use of low organic solvent coatings containing at least 62 volume percent solids or any other waterborne equivalent. An equivalent reduction can also be achieved by use of add-on control devices such as incinerators or carbon adsorbers which would result in approximately 81% reduction in VOC emissions over conventional organic-borne coatings which contain about 25 volume percent solids.

[a]The CTG does not mention "exempt" solvents. However, exempt solvents are treated as water according to EPA guidance (Blue Book).

SURFACE COATING OF LARGE APPLIANCES
STATE RACT RULES

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
Colorado	Code of Colorado Regulation, Title 5, Chapter 1001, Regulation No. 7, Part IX, Section F.	For prime, single, or topcoat application area, flashoff area, and oven the emission limit is 0.34 kg VOC/1 of coating (2.8 lb VOC/gal of coating).		The State emission limit is the same as the Federal CTG.
Utah	Utah Air Conservation Regulation, Emission Standard Regulation, R-307-1-1-4.9.6, Section E.	For prime, single, or topcoat application area, fashoff area, and oven the limit is 0.34 kg VOC/1 of coating (2.8 lb VOC/gal of coating).		The State emission limit is the same as the Federal CTG.

SURFACE COATING OF LARGE APPLIANCES
STATE RACT RULES
(Continued)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
New Jersey	New Jersey Administrative Code, Title 7, Chapter 27, Bureau of Air Pollution Control, Subchapter 16, 7:27-16.5	As of June 15, 1990, the State provisions shall not apply to any individual surface coating operation in which the total surface coating formulations containing VOC are applied at rates not in excess of 0.5 gal per hour or 2.5 gal per day.	*	The Federal CTG does not provide any cutoff point.

* This is an issue of applicability.

SURFACE COATING OF LARGE APPLIANCES
STATE RACT RULES
(Concluded)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
New Jersey (Concluded)	New Jersey Administrative Code, Title 7, Chapter 27, Bureau of Air Pollution Control, Subchapter 16, 7:27-16.5	The State also requires the control equipment to achieve no less than 90% by mass of the VOC content in the surface coating formulation as applied each hour from being discharged directly or indirectly into the outdoor atmosphere; or an hourly VOC emission rate no greater than the maximum allowable hourly emission rate calculated on a solids applied basis.	**	The Federal CTG does not specify this requirement. The State requirement will result in more accurate compliance performance evaluation.

** Although this provision of the State's regulation may not necessarily result in a quantifiable reduction in emissions, it does enhance the pollution prevention aspects of the rule.

SURFACE COATING OF METAL COILS
FEDERAL RACT EMISSION LIMIT AS DEFINED BY THE CTG

Affected Units	Recommended Limitation[a]
Prime and topcoat or single coat operation	0.31 kg VOC/l of coating (2.6 lb VOC/gal of coating) [minus water]

[a]The CTG does not mention "exempt" solvents. However, exempt solvents are treated as water according to EPA guidance (Blue Book).

Three control options are specified: thermal incineration, catalytic incineration, and waterborne & high solids coatings. Thermal incineration is estimated to achieve 90 to 98 percent VOC emission reduction, 90 percent using catalytic incineration, and 70 to 95 percent using product substitution.

SURFACE COATING OF METAL COILS
STATE RACT RULES

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
Colorado	Code of Colorado Regulation, Title 5, Chapter 1001, Regulation No. 7, Part IX, Section D(3).	The emission limit for prime and topcoat or single coat operation is 0.31 kg VOC/l (2.6 lb VOC/gal) of coating (minus water and exempt solvents).		The State emission limit is the same as the Federal CTG.
New Jersey	New Jersey Administrative Code, Title 7, Chapter 27, Bureau of Air Pollution Control, Subchapter 16, 7:27-16.5 (a)(1)	The maximum allowable VOC content per volume of coating for coil coating operations is 0.31 kg/l (2.6 lb/gal) (minus water).		The State emission limit is the same as the Federal CTG.

SURFACE COATING OF METAL COILS
STATE RACT RULES
(Continued)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
New Jersey (Continued)	7:27-16.5(c)(2) and (3)	As of June 15, 1990, the State provisions shall not apply to any individual surface coating operation in which the total surface coating formulations containing VOC are applied at rates not in excess of 0.5 gal per hour or 2.5 gal per day; or for the purpose of developing new coatings or performing research, such formulations are applied at rates not in excess of 2 gal per hour and 3 gal per day.	*	No VOC cutoff point is given in the Federal CTG.

**

	7:27-16.5(a)(3)	If the surface coating operation is served by VOC control equipment, the State requires: a) the control equipment to prevent no less than		The Federal CTG does not specify this requirement. The State requirement will result in more accurate compliance performance evaluation than the CTG.

* This is an applicability issue.

** Although this provision of the State's regulation may not necessarily result in a quantifiable reduction in emissions, it does enhance the pollution prevention aspects of the rule.

SURFACE COATING OF METAL COILS
STATE RACT RULES
(Concluded)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
New Jersey (Concluded)		90% by mass of the VOC content in the surface coating formulation as applied each hour from being discharged directly or indirectly into the outdoor atmosphere; or b) the operations result in an hourly VOC emission rate no greater than the maximum allowable hourly emission rate calculated on a solids applied basis.		

SURFACE COATING OF METAL FURNITURE
FEDERAL RACT EMISSION LIMIT AS DEFINED BY THE CTG

Affected Units	Recommended limitation[a]
Metal Furniture Coating Line	0.36 kg VOC/l of coating (3 lb VOC/gal coating) (minus water)

[a] The CTG does not mention "exempt" solvents. However, exempt solvents are treated as water according to EPA guidance (Blue Book). This emission limit is based on the use of low organic solvent coatings.

This emission limit can also be achieved by using waterborne coatings and is approximately equivalent (on a solids applied basis) to use of an add-on control device which collects or destroys about 80% of the solvent from a conventional high organic solvent coating.

SURFACE COATING OF METAL FURNITURE
STATE RACT RULES

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
Colorado	Code of Colorado Regulation, Title 5, Chapter 1001, Regulation No. 7, Part IX, Section H.	Metal furniture coating line: 0.36 kg VOC/l (3.0 lb VOC/gal) of coating (minus water and exempt solvents).		
New Jersey	New Jersey Administrative Code, Title 7, Chapter 27, Bureau of Air Pollution control, Subchapter 16, 7:27-16.5(a)(1)	Maximum allowable VOC content per volume of coating (minus water) for metal furniture coating line is 0.36 kg VOC/l (3.0 lb VOC/gal) of coating (minus water).		

SURFACE COATING OF METAL FURNITURE
STATE RACT RULES
(Continued)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
New Jersey (Continued)	7:27-16.5-(c)(2) and (3)	As of June 15, 1990, the State provisions shall not apply to any individual surface coating operation in which the total surface coating formulations containing VOC are applied at rates not in excess of 0.5 gal per hour or 2.5 gal per day; or for the purpose of developing new coatings or performing research, such formulations are applied at rates not in excess of 2 gal per hour and 3 gal per day.	*	No VOC cutoff point is provided in the Federal CTG.

SURFACE COATING OF METAL FURNITURE
STATE RACT RULES
(Continued)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS

New Jersey (Concluded)	7:27-16.5 (a)(3)	If the surface coating operation is served by VOC control equipment, the State requires: a) the control equipment to prevent no less than 90% by mass of the VOC content in the surface coating formulation as applied each hour from being discharged directly or indirectly into the outdoor atmosphere; or b) the operations to result in an hourly VOC emission rate no greater than the maximum allowable hourly emission rate calculated on a solids applied basis.	**	The Federal CTG does not specify that the control efficiency is to be met every hour. The State requirement will evaluate more accurately the compliance performance than the CTG.

** Although this provision of the State's regulation may not necessarily result in a quantifiable reduction in emissions, it does enhance the pollution prevention aspects of the rule.

SURFACE COATING OF METAL FURNITURE
STATE RACT RULES
(Concluded)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
Utah	Utah Air Conservation Regulation, Emission Standard Regulation, R-307-1-4.9.6, Section D(1).	Metal furniture coating line: 0.3 kg VOC/l (3 lb VOC/gal) of coating (excluding water and exempt solvents).		
Maine	Air Quality Control Regulation Chapter 129.	Facilities which demonstrate that only low-VOC coatings are used at that facility are allowed to keep monthly, rather than daily, records.	*	This is a means of encouraging pollution prevention, but does not have a impact on stringency.

* Although this provision may not result in quantifiable emission reductions, it encourages pollution prevention.

SURFACE COATING FOR INSULATION OF MAGNET WIRE
FEDERAL RACT EMISSION LIMIT AS DEFINED BY THE CTG

Affected Units	Recommended Limitation[a]
Wire Coating Oven	0.2 kg VOC/l of coating (1.7 lb VOC/gal of coating) (minus water)

The Federal CTG states that the recommended emission limit can be met with application of high solids coatings having greater than 77 volume percent of solids, powder coatings, and hot melt coatings. The emission limit can also be met with a waterborne coating that contains 29 volume percent solids, 8 volume percent organic solvent, and 63 volume percent water. The limit can also be met by a conventional coating provided 90 percent emission reduction by incineration is achieved.

[a] The CTG does not mention "exempt" solvents. However, exempt solvents are treated as water according to EPA guidance (Blue Book).

SURFACE COATING FOR INSULATION OF MAGNET WIRE
STATE RACT RULES

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
Colorado	Code of Colorado Regulation, Title 5, Chapter 1001, Regulation No. 7, Part IX, Section G(3).	Wire coating operation: 0.20 kg VOC/l (1.7 lb/gal) of coating (minus water and exempt solvents).		The State emission limit is identical to the Federal CTG.
New Jersey	New Jersey Administrative Code, Title 7, Chapter 27, Bureau of Air Pollution Control, Subchapter 16, 7:27-16.5 (a)(1)	The maximum allowable VOC content per volume of coating (minus water) is 0.20 kg/l (1.7 lb/gal).		The State emission limit is the same as the Federal CTG.

SURFACE COATING FOR INSULATION OF MAGNET WIRE
STATE RACT RULES
(Continued)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
New Jersey (Continued)	7:27-16.5 (c)(2) and (3)	As of June 15, 1990, the State provisions shall not apply to any individual surface coating operation in which the total surface coating formulations containing VOC are applied at rates not in excess of 0.5 gal per hour or 2.5 gal per day; or for the purpose of developing new coatings or performing research, such formulations are applied at rates not in excess of 2 gal per hour and 3 gal per day.	*	No VOC cutoff point is given in the Federal CTG.

SURFACE COATING FOR INSULATION OF MAGNET WIRE
STATE RACT RULES
(Continued)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS

New Jersey (Concluded)	7:27-16.5(a)(3)	If the surface coating operation is served by VOC control equipment, the State requires: a) the control equipment to prevent no less than 90 percent by mass of the VOC content in the surface coating formulation as applied each hour from being discharged directly or indirectly into the outdoor atmosphere; or b) the operations to result in an hourly VOC emission rate no greater than the maximum allowable hourly emission rate calculated on a solids applied basis.	**	The Federal CTG does not specify this requirement. The State requirement will evaluate more accurately the compliance performance than the CTG.

** Although this provision of the State's regulation may not necessarily result in a quantifiable reduction in emissions, it does enhance the pollution prevention aspects of the rule.

SURFACE COATING FOR INSULATION OF MAGNET WIRE
STATE RACT RULES
(Concluded)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
Utah	Utah Air Conservation Regulation, Emission Standard Regulation, R-307-1-4.9.6, Section F(1)	Magnet wire coating: 0.20 kg VOC/l (1.7 lb VOC/gal) of coating.		The State emission limit is identical to the CTG.

	Section F(2)	The State rule requires equivalent calculations for coatings to be performed in units of pounds VOC per gallon of solids rather than pounds VOC per gallon of coating when determining compliance. The calculated emission limit is 2.2 lb VOC per gallon of solids.		The emission limit in terms of mass VOC/mass solids (non-volatiles) was calculated using the procedure given in Appendix F.

SURFACE COATING OF PAPER
FEDERAL RACT EMISSION LIMIT AS DEFINED BY THE CTG

Affected Units	Recommended Limitation[a]
Coating Line	0.35 kg VOC/l of coating (2.9 lb VOC/gal of coating) (minus water)

[a] The CTG does not mention "exempt" solvents. However, exempt solvents are treated as water according to EPA guidance (Blue Book).

This limit can be achieved in all cases using incinerators and in many cases with coatings that contain low fractions of organic solvents. The estimated emission reduction using incinerators is 95 percent, and 80 to 99 percent using low solvent coatings.

SURFACE COATING OF PAPER
STATE RACT RULES

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
Colorado	Code of Colorado Regulation, Title 5, Chapter 1001, Regulation No. 7, Part IX, Section I.	Coating line emission limit is 0.35 kg VOC/l (2.9 lb VOC/gal) of coating (less water and exempt solvents)		The emission limit is the same as stated in the Federal CTG.
New Jersey	New Jersey Administrative Code, Title 7, Chapter 27, Subchapter 16, 7:27-16.5.a.1.	The maximum allowable VOC content per volume of coating (minus water) for a paper coating line is 0.35 kg/l (2.9 lb/gal).		The emission limit is identical to the limit stated in the Federal CTG.

SURFACE COATING OF PAPER
STATE RACT RULES
(Continued)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
New Jersey (Continued)	a.4.(c)2	As of June 15, 1990, the State provisions shall not apply to any individual surface coating operation in which the total surface coating formulations containing VOC are applied at rates not in excess of 0.5 gal per hour or 2 and 0.5 gal per day; or for the purpose of developing new coatings or performing research, such formulations are applied at rates not in excess of 2 gal per hour and 3 gal per day.	*	No VOC cutoff point is provided in the Federal CTG.

	7:27-16.5(a)3i	If the surface coating operation is controlled by VOC control equipment, the State requires: (i) the control equipment		

* This is an issue of applicability.

SURFACE COATING OF PAPER
STATE RACT RULES
(Continued)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
New Jersey (Concluded)		Achieve no less than 90% by mass of the VOC content in the surface coating formulation as applied each hour from being discharged directly or indirectly into the outdoor atmosphere; or (ii) an hourly VOC emission rate no greater than the maximum allowable hourly emission rate calculated on a solids applied basis.	**	The Federal CTG does not require the efficiency of control equipment to be met on an hourly basis. The State requirement will result in more accurate compliance performance evaluation than the CTG.

Utah	Utah Air Conservation Regulation, Emission Standard Regulation, R-307-1-4.9.6, Section B.1 and 2.	VOC emission limit is 0.35 kg/l (2.9 lb/gal) of coating applied. The equivalent emission limit is 4.8 lb VOC/gal of solids.		

** Although this provision of the State's regulation may not necessarily result in a quantifiable reduction in emissions, it does enhance the pollution prevention aspects of the rule.

SURFACE COATING OF PAPER
STATE RACT RULES
(Continued)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
Utah (Concluded)	Section B.2	The State indicates that the emission limit can be achieved by (a) application of low solvent coating; or (b) incineration, provided that a minimum of 90% reduction of nonmethane VOC which enter the incinerator is achieved.		The Federal CTG states that add-on control devices can achieve over 90% reduction.
Rhode Island	Rhode Island Air Pollution Control Regulation No. 19.3.1	Coating line emission limit of 0.35 kg VOC/l of coating (2.9 lb VOC/gal (minus water) and 4.79 lb VOC/gal of solids.		The emission limit in terms of mass VOC per volume of solids was calculated using the guidelines provided in Appendix F.

SURFACE COATING OF PAPER
STATE RACT RULES
(Concluded)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
Rhode Island (Concluded)		State rule applies to all paper coating lines.	*	Federal CTG applies to lines with 15 lb/day actual emissions or theoretical emissions of at least 10 tpy.
Maine	Air Quality Control Regulation Chapter 123	The owner/operator of a paper coating line subject to this regulation which is controlled by an add-on control device at all times the paper coating line is operating must reduce the VOC emissions to a rate equal to 4.8 lb VOC/gal of solids applied to the substrate on a continuous basis.		The equivalent emission limit on a pounds VOC per volume solids basis is calculated using the guidelines provided in Appendix F.

		Facilities which demonstrate that only low-VOC coatings are used at that facility are allowed to keep monthly, rather than daily, records.	**	This is a means of encouraging pollution prevention, but does not have a direct impact on stringency.

* This is an issue of applicability.

** Although this provision may not result in quantifiable emission reductions, it enhances the pollution prevention aspects of the rule.

APPENDIX B.

COMPARISON OF STATE/LOCAL VOC RULES TO FEDERAL RACT FOR GROUP II CTG CATEGORIES[1]

[1]This appendix describes Federal RACT for source categories covered in the Group II CTGs, as well as regulatory requirements for the same categories as contained in selected State/local VOC rules.

EXTERNAL FLOATING ROOF PETROLEUM TANKS
FEDERAL RACT EMISSION LIMIT AS DEFINED BY THE CTG

This category is defined as external floating roof tanks (EFRTs) larger than 150,000 liters (40,000 gal) storing petroleum liquids with a true vapor pressure (TVP) greater than 10.5 kPa (1.5 psi).

A continuous (rim mounted) secondary seal or equivalent closure must be installed on all affected storage tanks, plus certain inspection and recordkeeping requirements, if the tank is:

a) a welded EFRT, equipped with a primary metallic shoe or liquid-mounted seal, or any other closure device that can be demonstrated equivalent to the above primary seals, and the TVP of the stored liquid is 27.6 kPa (4 psi) or greater;
b) a riveted EFRT, equipped with a primary metallic shoe or liquid-mounted seal, or any other closure device that can be demonstrated equivalent to the above primary seals, and the TVP of the stored liquid is 10.5 kPa (1.5 psi) or greater; or
c) a welded or riveted EFRT, equipped with primary vapor-mounted seal, or any other closure device that can be demonstrated equivalent to the above primary seals, and the TVP of the stored liquid is 10.5 kPa (1.5 psi) or greater.

When such primary closure device can be demonstrated equivalent to the primary seals described above, the seal closure devices must meet the following requirements:

a) there shall be no visible holes, tears, or other openings in the seal(s) or seal fabric;
b) the seal(s) must be intact and uniformly in place around the circumference of the floating roof between the floating roof and the tank wall; and

EXTERNAL FLOATING ROOF PETROLEUM TANKS
FEDERAL RACT EMISSION LIMIT AS DEFINED BY THE CTG
(Concluded)

Exemptions:

1) EFRTs with storage capacities less than 1,600,000 liters (420,000 gallons) used to store produced crude oil and condensate prior to custody transfer;

2) fixed-roof tanks with or without internal floating roofs, or small production tanks;

3) welded tanks with a primary metallic-type shoe seal and a secondary seal from the top of the shoe seal to the tank wall;

4) external floating roof tanks storing waxy, heavy pour crudes;

5) petroleum liquid storage vessels:
   a) containing petroleum liquid with a TVP less than 10.5 kPa (1.5 psia), and
   b) containing petroleum liquid with a TVP less than 27.6 kPa (4.0 psia) that are of welded construction and presently possess a metallic-type shoe seal, a liquid-mounted or liquid-filled type seal, or other approved closure device of demonstrated equivalence; and

6) horizontal underground storage tanks storing JP-4 jet fuel.

EXTERNAL FLOATING ROOF PETROLEUM TANKS
STATE RACT RULES

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
Color ado	Code of Colorado Regulation, Title 5, Regulation No. 7, Part VI.	Exemptions: EFRTs that store any material whose true vapor pressure as stored never exceeds 1.3 psia.	*	The State sets a lower vapor pressure limit for storage tanks than the Federal CTG. Therefore, more tanks are subject to the State rule.

Utah	Utah Air Conservation Regulation, Emission Standard Regulation, R307-1-4.9.1.C (2)(c).	For vapor-mounted primary seals, the accumulated area of gaps between the secondary seal and the tank wall shall not exceed 21.2 cm^2 per meter of tank diameter (1.0 $inch^2$ per ft. of tank diameter) and the width of any gap shall not exceed 1.27 cm (0.5 inch).		The State gap space limit of 1.27 cm (0.5 in) exceeds the Federal CTG gap space limit of 0.32 cm (1/8 inch), so the Federal CTG specification is more stringent than the State rule. All other State requirements mirror the recommendations in the CTG.

* This is an issue of applicability.

LEAKS FROM GASOLINE TANK TRUCKS AND VAPOR COLLECTION SYSTEMS
FEDERAL RACT EMISSION LIMIT AS DEFINED BY THE CTG

During loading or unloading operations at service stations, bulk plants, and bulk terminals, there shall be no reading greater than or equal to 100% of the lower explosive limit (LEL) at 2.5 centimeters around the perimeter of a potential leak source as detected by a combustible gas detector. There shall be no avoidable visible liquid leaks. The vapor collection and vapor processing equipment shall be designed and operated to prevent the gauge pressure in the tank truck from exceeding 4,500 Pascals (18 inches of water) and to prevent vacuum from exceeding 1,500 Pascals (6 inches of water). Vapor collection systems should be monitored by regulatory agencies as needed. Bulk terminal, bulk plant, and service station owners or operators must keep records for 2 years indicating the last time the vapor collection system passed a leakage test and identifying points at which VOC leakage exceeded 100% of the LEL.

Gasoline tank trucks and their vapor collection systems shall not sustain a pressure change of more than 750 Pascals (3 inches of water) in 5 minutes when pressurized to 4,500 Pascals (18 inches of water) or evacuated to 1,500 Pascals (6 inches of water). There shall be no avoidable visible liquid leaks. Trucks shall be certified leak tight annually, and shall have a sticker displayed on each tank indicating the identification number of the tank and the date the tank last passed the pressure/vacuum test. Tank trucks should be monitored by regulatory agencies as needed. Trucks with leaks greater than or equal to 100% of the LEL are to be repaired within 15 days and must take and pass a pressure/vacuum test as described in the CTG.

LEAKS FROM GASOLINE TANK TRUCKS AND VAPOR COLLECTION SYSTEMS
STATE RACT RULES

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
Colo-rado	Code of Colorado Regulations, Title 5 - Chapter 1001 - Regulation No. 7 - Part XV.	The operator shall, within 15 days, repair and retest a vapor collection or control system that exceeds the pressure limits.		The Federal CTG specifies the same timeframe for repairing leaking equipment.

		Tank trucks are specifically required to be vapor-tight and to have valid leak-tight certification. The visual inspection procedure must be conducted at least once every 6 months. [The specified procedure involves inspection of domes, dome vents, cargo tank, piping, hose connections, hoses and delivery elbows for wear, damage, or misadjustment that could be a potential leak source.]	**	The Federal CTG does not specify a periodic visual inspection of the tank truck equipment.

** Although this provision of the State's regulation may not necessarily result in a quantifiable reduction in emissions, it does enhance the pollution prevention aspects of the rule.

LEAKS FROM GASOLINE TANK TRUCKS AND VAPOR COLLECTION SYSTEMS
STATE RACT RULES
(Concluded)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
Texas	Texas Administrative Code, Title 31, Subchapter C, §115.212	Vapor recovery systems . . . must be designed and operated [such that] no VOC leaks . . . shall be allowed from any potential leak source when measured with a portable combustible gas detector. [VOC leak is defined as 10,000 ppm_v.]		The Federal CTG specifications are the same as the State requirements.

GRAPHIC ARTS
FEDERAL RACT EMISSION LIMIT AS DEFINED BY THE CTG

The Federal CTG RACT specifications are applicable to packaging rotogravure, publication rotogravure, and flexographic printing. The CTG does not address letterpress printing or offset lithography. The recommendations apply to any packaging rotogravure, publication rotogravure, or flexographic printing facility whose maximum theoretical emissions of VOC (including solvents used to clean each printing press) without control devices from all printing presses are greater than or equal to 90.7 Megagrams (100 tons) per year with design capacity and 8,760 operating hours or maximum production (this cutoff is stated in the EPA "Blue Book"). The Federal CTG does not specify an emission limit for this category. RACT is defined in terms of emission reduction efficiencies by application of control technology. The specifications stated in the Federal CTG are as follows:

1. RACT requires installation of the best practicable capture systems to assure that VOC is directed to the control device.
2. Publication rotogravure operations controlled by carbon adsorption systems can achieve an overall reduction efficiency of 75 percent.
3. Packaging rotogravure printing operations controlled by incineration systems can achieve an overall reduction efficiency of 65 percent.
4. Flexographic printing operations controlled by incineration systems can achieve an overall reduction efficiency of 60 percent.
5. Waterborne inks achieving 70 percent overall VOC reduction is equivalent to the exhaust treatment systems described above.
6. A waterborne ink whose volatile portion consists of 75 volume percent water and 25 volume percent organic solvent (or a lower VOC content) is considered equivalent to the exhaust treatment systems.

GRAPHIC ARTS
STATE RACT RULES

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
Colorado	Colorado Department of Health, Air Quality Control Commission, Title 5, Chapter 1001, Part XIII (B)(1)(e)	Flexographic and packaging rotogravure printing facilities shall limit emissions to 0.5 kg VOC/kg (0.5 lb VOC/lb) solids in the inks.		The State emission limit is the same as the one stated in the Federal CTG.

	(B)(1)(b)	The owner or operator of a facility subject to this section and employing VOC containing ink shall not cause, allow, or permit the operation of the facility unless the ink (minus water) as it is applied to the substrate, contains 60 volume percent or more non-volatile (solid) material.		If the Colorado regulation excludes water in determining compliance with the emission limit, they allow a higher percentage of solvent material and still meet the emission limit exemption.

GRAPHIC ARTS
STATE RACT RULES
(Continued)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
Connecticut	Regulation of Connecticut State Agencies, Title 22a, Environmental Protection Chapter 174, Section 22a-174-20(v)(2)(A)	The State regulation applies to any packaging rotogravure, publication rotogravure, or flexographic printing facility whose maximum theoretical VOC emissions (including solvents used to clean each printing press) from all printing presses are greater than or equal to 50 tons per year (25 tpy for sources in one section of the State).	*	Connecticut has a lower threshold requirement (as an ozone control strategy) than the Federal CTG and therefore its rule may apply to more facilities.

* This is an applicability issue.

GRAPHIC ARTS
STATE RACT RULES
(Continued)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS

Connecticut (Continued)	20(v)(2)(A)	The owner or operator of a packaging rotogravure, publication rotogravure, or flexographic printing facility subject to the regulation and employing solvent-containing ink shall not cause or permit the discharge into the atmosphere of any VOC unless: (A) The volatile fraction of each ink, as it is applied to the substrate, contains 25 percent by volume or less VOC and 75 percent by volume or more of water and any exempt VOC; or		The State requirements are identical to the Federal CTG.
	20(v)(2)(B)	(B) Each ink as it is applied to the substrate, less water		Same as Federal CTG.

GRAPHIC ARTS
STATE RACT RULES
(Continued)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS

Connecticut (Continued)		and exempt compounds, contains 60 volume percent or more nonvolatile material (solids); or		
	20(v)(2)(C)	(C) The owner or operator installs and operates: (i) A carbon adsorption system which reduces volatile organic emissions from the capture system by at least 90% by mass over the adsorption cycle, or 24 hours, whichever is shorter; or (ii) An incineration system provided that 90% of the nonmethane volatile organic compounds (measured as total combustible carbon) which enter the incinerator per hour are oxidized to carbon dioxide and water; or,	**	The CTG does not specify that the efficiency of control equipment be verified on an hourly basis or every adsorption cycle. The State requirements will result in more accurate compliance performance evaluation than the CTG.

** Although this provision of the State's regulation may not necessarily result in a quantifiable reduction in emissions, it does enhance the pollution prevention aspects of the rule.

GRAPHIC ARTS
STATE RACT RULES
(Continued)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
Connecticut (Concluded)	20(v)(2)(C)	(iii) A system demonstrated to have control efficiency equivalent to or greater than the above required 90% and approved by the Commissioner by permit or order.		

Maine	Department of Environmental Protection, Bureau of Air Quality Control, Air Quality Control Regulation, Chapter 132 (1)	The State regulation applies to any packaging rotogravure, publication rotogravure, or flexographic printing facility whose maximum theoretical VOC emissions (including solvents used to clean each printing press) from all printing presses are greater than or equal to 50 tons per year.	*	Maine has a lower threshold requirement (as an ozone control strategy) than the Federal CTG and therefore its rule may apply to more facilities.

* This is an issue of applicability.

GRAPHIC ARTS
STATE RACT RULES
(Continued)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
Maine (Concluded)		Facilities which demostrate that only low-VOC inks are used at that facility are allowed to keep monthly, rather than daily, records.	*	This is a means of encouraging pollution prevention, and does not have a direct impact on stringency.

New Jersey	New Jersey Administrative Code, Title 7, Chapter 27 Bureau of Air Pollution Control, Subchapter 16, 7:27-16.5 f(c) (2) and (3)	As of June 15, 1990, the State provisions shall not apply to any individual coating operation in which the total surface coating formulations containing VOC are applied at rates not in excess of 0.5 gal per hour and 2.5 gal per day; or for the purpose of developing new coatings or performing research, such formulations are applied at rates not in excess of 2 gal per hour and 3 gal per day.	*	The Federal CTG does not set any VOC cutoff point.

* This is an issue of applicability. (The EPA "Blue Book" specifies daily recordkeeping.)

GRAPHIC ARTS
STATE RACT RULES
(Continued)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS

New Jersey (Concluded)	7:27-16.5 (a)(1) Table 3D	The State requires that for formulations that do not contain water, the maximum allowable VOC content per volume of formulation (minus water) is 0.35 g/l (2.9 lb/gal).	X[a]	The "Blue Book" provides an alternative emission limit in terms of mass of VOC per mass of solids. The State emission limit was converted to these units using the procedure specified in Appendix F. The calculated limit is 0.3 lb VOC/lb solids, and is lower than the emission limit specified in the Blue Book

a The "X" indicates that the State/local requirement is considered more stringent than the specification in the applicable Federal CTG.

GRAPHIC ARTS
STATE RACT RULES
(Continued)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS

New York	Title 6, Chapter III-Air Resources, Subchapter A-Prevention and Control of Air Contamination and Pollution, Part 234.1.b.4	Any packaging rotogravure, publication rotogravure, flexographic, offset lithographic process, or screen printing process at any facility located in the New York City metropolitan area, regardless of its potential to emit VOC and which was constructed after September 1, 1988, must have demonstrated compliance with this part upon startup.		The State regulation applies to a larger population of printers than the CTG, and it also applies to offset lithographic and screen printing facilities. The State rule also contains a lower applicability cutoff than the Federal CTG.

GRAPHIC ARTS
STATE RACT RULES
(Continued)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS

New York (Continued)	Part 234.1.c.3	Each owner or operator of a packaging rotogravure, publication rotogravure, flexographic, or offset lithographic printing process, or screen printing process at any facility located in the Lower Orange County metropolitan area, for which the annual potential to emit VOC from all sources regardless of process type, but excluding combustion installations, is equal to or exceeds 25 tons, must submit a compliance plan to the Department of Environmental Conservation by November 15, 1993.	*	The Federal CTG applies to facilities that have the potential to emit 100 tons or more per year. Therefore, the State regulation may apply to more facilities.

* This is an applicability issue.

GRAPHIC ARTS
STATE RACT RULES
(Continued)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS

New York (Concluded)	Part 234.1.c.4	Each owner or operator of a packaging rotogravure, publication rotogravure, flexographic, offset lithographic printing process, or screen printing process at any facility located outside the New York City and Lower Orange County metropolitan areas and for which the annual potential to emit VOC from all sources regardless of process type, but excluding combustion installations, is equal to or exceeds 50 tons, must submit a compliance plan by November 15, 1993. The plan is to contain a schedule of the steps necessary to achieve compliance or to limit annual potential to emit below the applicability	*	The Federal CTG requirement applies to facilities that have the potential to emit 100 tons/yr or more. Therefore, the State regulation may apply to more facilities.

* This is an applicability issue.

GRAPHIC ARTS
STATE RACT RULES
(Concluded)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
Utah	Utah Air Conservation Regulation, Emission Standard Regulation, R-307-1-4.9.6, Section I	The State regulation for this section also applies to specialty printing operations. The State also indicates that machines which have both "coating" units (application of a uniform layer of material across the entire width of a web) and "printing" units (formation of words, designs, and pictures) shall be considered as performing a printing operation.	*	The Federal CTG does not apply to specialty printing and, therefore, is less inclusive than the State regulation.

* This requirement affects the applicability of the rule.

LEAKS FROM PETROLEUM REFINERY EQUIPMENT
RACT EMISSION LIMIT AS DEFINED BY THE CTG

The owner or operator of a petroleum refinery complex shall develop and conduct a VOC monitoring program as defined in the CTG appendix. The recommended monitoring intervals are: annual (pump seals, pipeline valves in liquid service, and process drains); quarterly (compressor seals, pipeline valves in gas service, and pressure relief valves in gas service); weekly (visual inspection of pump seals), and no individual monitoring (pipeline flanges and other connections, and pressure relief valves in liquid service).

Whenever a liquid leak from a pump seal is observed during visual inspection or when a relief valve vents to the atmosphere, the operator must immediately monitor the VOC concentration of that component. If a leak (greater than 10,000 ppm) is detected, the leak should be repaired within 15 days. The refinery operator should report quarterly leaks that cannot be repaired in 15 days, and arrange for repairs to be made during the next scheduled turnaround or, if unable to bring a component into compliance, apply for a variance on an individual basis.

Three types of monitoring are mentioned; they include individual source monitoring, unit walk-through monitoring, and multiple fixed-point monitoring. The CTG details only individual source monitoring.

LEAKS FROM PETROLEUM REFINERY EQUIPMENT
STATE RACT RULES

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
Utah	Utah Conservation Regulation, Emission Standard Regulation, R-307-1-4.9.3.F(1)	The owner or operator of a petroleum refinery complex shall develop and conduct a VOC monitoring program. This program must be submitted 30 days prior to startup of the complex or as determined necessary.	**	The requirement to develop and conduct a monitoring program is exactly the same as the Federal CTG specification. However, the State has added a timeframe in which this plan must be submitted.
	4.9.3.F(3)(d)	The refinery owner or operator must monitor within 24 hours (with a portable VOC detection device) or repair within 15 days any pump seal from which liquids are observed dripping.	**	The CTG specifies the same monitoring in order to determine the concentration of a leak. However, the Federal CTG does not require monitoring within 24 hours.

** Although this provision of the State's regulation may not necessarily result in a quantifiable reduction in emissions, it does enhance the pollution prevention aspects of the rule.

LEAKS FROM PETROLEUM REFINERY EQUIPMENT
STATE RACT RULES
(Continued)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS

Utah (Continued)	4.9.3.F(3) (g)	Specifies that any relief valve that is vented to the atmosphere must be monitored within 24 hours. "Unsafe to monitor" valves must be monitored when conditions allow them to be monitored safely (e.g., at unit turnaround). For all other valves considered inaccessible during an annual inspection, the owner/operator shall document to the Executive Secretary the number of valves considered inaccessible, the reasons for inaccessibility, and the location of the valves.	**	There are no specific "unsafe to monitor" provisions in the Federal CTG or the EPA "Blue Book." However, the "Blue Book" recommends consistency with the SOCMI leak CTG guidance. The State requirement is the same as the one recommended in the SOCMI guidance.

** Although this provision of the State's regulation may not necessarily result in a quantifiable reduction in emissions, it does enhance the pollution prevention aspects of the rule.

LEAKS FROM PETROLEUM REFINERY EQUIPMENT
STATE RACT RULES
(Continued)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
Utah (Continued)		This documentation shall be submitted for approval to the Executive Secretary 15 days after the last day of each calendar year.	**	The timeframe is an additional requirement.

*

	4.9.3.F(4)	The State rule exempts the following from the monitoring requirement: - Pressure relief devices connected to an operating flare header, firebox, or vapor recovery device, storage tank valves, and valves that are not externally regulated; - Refinery components containing a stream composition less than 10% by mass VOC; and		The Federal CTG does not provide any exemptions.

** Although this provision of the State's regulation may not necessarily result in a quantifiable reduction in emissions, it does enhance the pollution prevention aspects of the rule.

* This is an applicability issue.

LEAKS FROM PETROLEUM REFINERY EQUIPMENT
STATE RACT RULES
(Continued)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
Utah (Concluded)	4.9.3.F(4) (Concluded)	- Refinery equipment containing natural gas supplied by a public utility as defined by the Utah Public Service Commission.		
Colorado	Colorado Regulation Title 5, Chapter 1001, Regulation No. 7, Part VIII C.4.A	The State requires annual monitoring inspections for heat-exchanger body flanges and other accessible flanges in VOC service.		These requirements are recommended by the CTG.

LEAKS FROM PETROLEUM REFINERY EQUIPMENT
STATE RACT RULES
(Concluded)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
Colorado (Concluded)	C.4.D	The owner or operator of a petroleum refinery subject to this regulation shall monitor using a VOC detector within 24 hours and make a record of any component from which VOC liquids are observed leaking.	**	The CTG states that whenever a liquid leak is observed during visual inspection, the operator must immediately monitor the VOC concentration of that component. The term "immediately" is not defined. The State regulation provides a more specific timeframe.

** Although this provision of the State's regulation may not necessarily result in a quantifiable reduction in emissions, it does enhance the pollution prevention aspects of the rule.

SURFACE COATING OF MISCELLANEOUS METAL PARTS AND PRODUCTS
FEDERAL RACT EMISSION LIMIT AS DEFINED BY THE CTG

Coating Category	Recommended Limitation[a]
Air or forced air dried items	0.42 kg VOC/l of coating (3.5 lb/gal) [minus water]
Clear Coat	0.52 kg VOC/l of coating (4.3 lb/gal) [minus water]
No or infrequent color change or small number of colors applied	
1. Powder Coatings	0.05 kg VOC/l of coating (0.4 lb/gal) [minus water]
2. Other	0.36 kg VOC/l of coating (3.0 lb/gal) [minus water]
Outdoor, harsh exposure, or extreme performance characteristics	0.42 kg VOC/l of coating (3.5 lb/gal) [minus water]
Frequent color changes, large number of colors applied, or first coat on untreated ferrous substrate	0.36 kg VOC/l of coating (3.0 lb/gal) [minus water]

[a] The CTG does not mention "exempt" solvents. However, exempt solvents are treated as water according to EPA guidance (Blue Book).

SURFACE COATING OF MISCELLANEOUS METAL PARTS AND PRODUCTS
STATE RACT RULES

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
Utah	Air conservation Regulation, Emission Standards Regulation R-307-1-4.9.H(b)	Air or forced air dried items: 0.42 kg VOC/l coating (3.5 lb/gal)		The limits given here are assumed to apply for coatings that contain only VOCs and nonvolatiles (solids).
	307-1-4.9.H(a)	Clear coat coatings: 0.52 kg VOC/l coating (4.3 lb/gal)		
	307-1-4.9.H(c)	Outdoor, harsh exposure, or extreme performance characteristic coatings: 0.42 kg VOC/l coating (3.5 lb/gal)		The units given here are assumed to apply for coatings that contain only VOCs and nonvolatiles (solids).

	307-1-4.9.H(d)	Frequent color changes, large number of colors applied, or first coat on un-treated ferrous substrate: 0.36 kg VOC/l coating (3.0 lb/gal)		

SURFACE COATING OF MISCELLANEOUS METAL PARTS AND PRODUCTS
STATE RACT RULES
(Continued)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
Utah (Concluded)	307-1-4.9.H(5)(b)	Any incineration system used to control VOC emissions from this process must oxidize a minimum of 90% of the nonmethane VOCs to carbon dioxide and water.		The State requirement is similar to that specified in the CTG.

Colorado	Code of Colorado Regulation, Title 5, Chapter 1001, Regulation No. 7, Part IX, Section L.	The State emission limits are exactly the same as the Federal CTG. The State provides exemptions for high performance coatings on a case-by-case basis, and full exterior repainting of automobiles and light-duty trucks if fewer than 18 vehicles are painted per day.	*	This State requirement is an issue of applicability. The Federal CTG does not exclude high performance coatings while the State requirements do. Thus, the Federal CTG may apply to more sources.

* This is an issue of applicability.

SURFACE COATING OF MISCELLANEOUS METAL PARTS AND PRODUCTS
STATE RACT RULES
(Concluded)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS

Maine	Maine Department of Environmental Protection, Bureau of Air Quality Control Regulation Chapter 129.	Facilities which demonstrate that only low-VOC coatings are used at that facility are allowed to keep monthly, rather than daily, records.	*	This recordkeeping requirement has been adopted as a means of encouraging pollution prevention.
New Jersey	New Jersey Administrative Code, Title 7, Chapter 27 Bureau of Air Pollution Control, Subchapter 16, 7:27-16.5.	Clear coating is 0.52 kg VOC/l (4.3 lb/gal) Air dried coating is 0.42 kg VOC/l (3.5 lb/gal) Extreme performance coating is 0.42 kg VOC/l (3.5 lb/gal) All other coating is 0.36 kg VOC/l (3.0 lb/gal)		The State emission limits expressed as mass of VOC/volume of coating as applied (minus water) is exactly the same as the Federal CTG, for clear coatings, air dried, extreme performance coatings, and other coatings. The State rule does not give a limit for "other coatings" listed under color change coatings.

* Although this provision may not result in quantifiable emission reductions, it encourages pollution prevention.

PNEUMATIC RUBBER TIRE MANUFACTURING
FEDERAL RACT EMISSION LIMIT AS DEFINED BY THE CTG

The CTG addresses four major operations (undertread cementing, tread-end cementing, bead preparation, and green tire spraying) within the tire manufacturing process. The following is a summary of control technology used in the four operations.

Affected Unit	Control System	Expected Capture Efficiency(%)	Control Efficiency (%)
Undertread cementing	Carbon	65 - 85	95
	adsorption Incineration	65 - 85	90
Tread-end cementing	Carbon	65 - 85	95
	adsorption Incineration	65 - 85	90

PNEUMATIC RUBBER TIRE MANUFACTURING
RACT EMISSION LIMIT AS DEFINED BY THE CTG (Continued)

Bead dipping	Carbon	75 - 85	95
	adsorption Incineration	75 - 85	90
Green tire spraying	Water-based coating	NA	NA
	Carbon	80 - 90	95
	adsorption Incineration	80 - 90	90

Exemptions:

Production of specialty tires for "antique or other vehicles" when produced on an irregular basis or with short production runs, only if these tires are produced on equipment separate from normal production lines for passenger type tires. (This exemption is not specified in the CTG, but is stated in the EPA "Blue Book.")

PNEUMATIC RUBBER TIRE MANUFACTURING
STATE RACT RULES

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
Colorado	Colorado Department of Health, Air Quality Control Commission, Regulation No. 7, Section IX (N).	Same as above.		The State adopted the CTG recommendations.

Connecticut	Regulation of Connecticut State Agencies, Title 22a, Chapter 174, Section 22a-174-20 (u)(2)(A).	The owner or operator of any undertread cementing, tread-end cementing, or bead dipping operation shall install and operate a capture system, designed to achieve maximum reasonable capture of at least 85% by mass of VOC.	X	The high control and capture efficiencies stated in the Federal CTG are the minimum efficiencies required by the State. Therefore, the State regulation is considered more stringent than the CTG.

PNEUMATIC RUBBER TIRE MANUFACTURING
STATE RACT RULES
(Concluded)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
Connecticut (Concluded)	22a-174-20(u)(B)(i) and (ii).	The State requires (i) a carbon adsorption system to achieve 90% VOC removal by mass for each adsorption cycle or 24 hours, whichever is shorter; or (ii) an incineration system that oxidizes at least 90% of the nonmethane VOC that enters the incinerator to carbon dioxide and water.	**	The CTG specifies a higher reduction efficiency of an adsorption system than the State. However, it does not specify the timeframe.

	22a-174-20(u)(2)(B)-(iii).	The State permits the use of alternative control techniques that achieve at least 90% VOC reduction efficiency.		The State provides more flexibility to a facility as long as the same emission reduction is achieved. This, however, does not result in a more stringent regulation.

** Although this provision of the State's regulation may not necessarily result in a quantifiable reduction in emissions, it does enhance the pollution prevention aspects of the rule.

SURFACE COATING OF FLAT WOOD PANELING

FEDERAL RACT EMISSION LIMITS AS DEFINED BY THE CTG

1) Printed hardwood, plywood, and particleboard	2.9 kg VOC/100 m^2 or 6.0 lb VOC/1,000 ft^2 (equivalent to an average coating with a VOC content of 0.20 kg/l [1.7 lb VOC/gal])	Minus Water and Exempt Solvents[b] 0.66 kg VOC/l (5.7 lb VOC/gal) (assume 23% organic solvent and 33% water)	Solids Basis[b] 0.51 kg VOC/l (4.25 lb VOC/gal solids) (assume 40% solids)
2) Natural finished hardwood plywood	5.8 kg VOC/100 m^2 or 12.0 lb VOC/1,000 ft^2 (equivalent to an average coating with a VOC content of 0.40 kg/l [3.3 lb VOC/gal])	0.72 kg VOC/l (6 lb VOC/ gal) (assume 45% organic solvent, and no waterborne coatings are used)	0.73 kg VOC/l (6 lb VOC/gal solids) (assume 55% solids)

SURFACE COATING OF FLAT WOOD PANELING

FEDERAL RACT EMISSION LIMITS AS DEFINED BY THE CTG

(Concluded)

3)	Class II finishes for hardboard paneling	4.8 kg VOC/100 m^2 or 10.0 lb VOC/1,000 ft^2 (equivalent to an average coating with a VOC content of 0.34 kg/l [2.8 lb VOC/gal])	0.85 kg VOC/l (7 lb VOC/gal) (assume 38% organic solvent and 22% water)	0.85 kg VOC/l (7 lb VOC/gal) (assume 40% solids)

[a] The CTG does not mention "exempt" solvents. However, exempt solvents are treated as water according to EPA guidance (Blue Book).

[b] All assumptions based on the values provided in the CTG (EPA-450/2-78-032, Appendix B).

SURFACE COATING OF FLAT WOOD PANELING
STATE RACT RULES

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
New Jersey	New Jersey Administrative Code, Title 7, Chapter 27, Bureau of Air Pollution Control, Subchapter 16, 7:27-16.5.	Emission limit for: - printed hardwood, plywood panels, and particleboard panels: 0.32 kg VOC/l (2.7 lb/gal). - natural finish hardwood plywood: 0.40 kg VOC/l (3.3 lb/gal). - hardboard panels: 0.34 kg VOC/l (3.6 lb/gal).		The State VOC emission limit for printed hardwood, plywood panels, and particleboard panels is higher than the Federal CTG; the emission limits for natural finish hardwood plywood and hardboard panels are the same as the CTG.

SURFACE COATING OF FLAT WOOD PANELING
STATE RACT RULES
(Continued)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
Maine	Maine Department of Environmental Protection, Bureau of Air Quality Control Air Quality Control Regulation Chapter 129.	Facilities demonstrating that only low-VOC coatings are used at that facility are allowed to keep monthly, rather than daily, records.	**	

** Although this provision does not result in quantifiable emission reductions, it encourages pollution prevention.

SURFACE COATING OF FLAT WOOD PANELING
STATE RACT RULES
(Continued)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
Texas	Texas Regulations Subchapter E: 115.421(10)	State emission limit: - 2.9 kg/100 m^2 of coated surface (6.0 lb/1,000 ft^2) printed interior wall panels made of hardwood plywood and thin particleboard. - 5.8 kg/100 m^2 of coated surface (12.0 lb/1,000 ft^2) natural finish hardwood plywood panels. - 4.8 kg/100 m^2 of coated surface (10.0 lb/1,000 ft^2) hardboard paneling with Class II finish.		The State emission limits for each type of panel coating are the same as the limits in the Federal CTG.

Utah	Utah Air Conservation Regulation, Emission Standard Regulation, R-307-1-4.9-.6.G.	Emission limit for: 1) Printed hardwood, plywood, and particleboard: 0.20 kg VOC/l (1.7 lb VOC/gal]) coating (minus water and exempt solvents) or 2.2 lb VOC/gal solids.		The emission limit in terms of mass of VOC per volume of solids was calculated using the procedure given in Appendix F.

SURFACE COATING OF FLAT WOOD PANELING
STATE RACT RULES
(Concluded)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
Utah (Concluded)		2) Natural finished hardwood plywood: 0.40 kg VOC/l coating (3.3 lb VOC/gal) coating (minus water and exempt solvents) or 6.0 lb VOC/gal solids. 3) Class II finishes for hardboard paneling: 0.34 kg VOC/l coating (2.8 lb VOC/gal) (minus water and exempt solvents) or 4.5 lb VOC/gal solids.		The State's emission limits and those in the Federal CTG are the same. The emission limit in terms of mass of VOC/mass of solids was calculated using the guidelines specified in Appendix F.

SYNTHESIZED PHARMACEUTICAL PRODUCTS
FEDERAL RACT EMISSION LIMIT AS DEFINED BY THE CTG

1. (a) For each vent from reactors, distillation operations, crystallizers, centrifuges, and vacuum dryers that emit 6.8 kg/day (15 lb/day) or more of VOC, require surface condensers or equivalent controls.

   (b) If surface condensers are used, the condenser outlet gas temperature should not exceed:

   (i) -25°C when condensing VOC of vapor pressure greater than 40 kPa (5.8 psi),*

   (ii) -15°C when condensing VOC of vapor pressure greater than 20 kPa (2.9 psi),*

   (iii) 0°C when condensing VOC of vapor pressure greater than 10 kPa (1.5 psi),*

   (iv) 10°C when condensing VOC of vapor pressure greater than 7 kPa (1.0 psi), * and

   (v) 25°C when condensing VOC of vapor pressure greater tan 3.5 kPa (0.5 psi).*

   (c) Equivalent control results when emissions are reduced at least as much as when using a surface condenser according to 1(b).

*Vapor pressures as measured at 20°C.

2. (a) For air dryers and production equipment exhaust systems that emit 150 kg/day (330 lb/day) or more of VOC, require 90 percent emission reduction.

(b) For air dryers and production equipment exhaust systems that emit less than 150 kg/day (330 lb/day), require emission reduction to 15 kg/day (33 lb/day).

SYNTHESIZED PHARMACEUTICAL PRODUCTS
FEDERAL RACT EMISSION LIMIT AS DEFINED BY THE CTG
(Concluded)

3. (a) For storage tanks storing VOC with a vapor pressure greater than 28 kPa (4.1 psi) at 20°C, allow 1 liter of displaced vapor to be released to atmosphere for every 10 liters transferred (i.e., a 90% effective vapor balance or equivalent), on truck/rail car delivery to all tanks greater than 7,500 liters (2,000 gallons) capacity except where tanks are equipped with floating roofs, vapor recovery, or equivalent. This guideline does not apply to transfer of VOC from one in-plant location to another.

   (b) For tanks storing VOC with a vapor pressure greater than 10 kPa (1.5 psi) at 20°C, require pressure/vacuum conservation vents set at ± 0.2 kPa, except where more effective air pollution control is used.

4. Enclose all centrifuges containing VOC, rotary vacuum filters processing liquid containing VOC, and any other filters having an exposed liquid surface where the liquid contains VOC. This applies to liquids exerting a total VOC vapor pressure of 3.5 kPa (0.5 psi) or more at 20°C.
5. All in-process tanks must have covers. Covers should be closed whenever possible.
6. For liquids containing VOC, all leaks in which liquid can be observed to be running or dripping from vessels and equipment (for example: pumps, valves, flanges) should be repaired as soon as practicable.

SYNTHESIZED PHARMACEUTICAL PRODUCTS
STATE RACT RULES

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
Colorado	Colorado Air Pollution Regulation No. 7, Title 5, Chapter 1001, Section XIV.B.6	The covers required for all in-process tanks shall remain closed unless sampling, maintenance, short duration production procedures, or inspection procedures require access.	**	The Federal CTG specifies that all in-process tanks be covered when possible. The State rule is more specific as to what this entails.

** Although this provision of the State's regulation may not necessarily result in a quantifiable reduction in emissions, it does enhance the pollution prevention aspects of the rule.

SYNTHESIZED PHARMACEUTICAL PRODUCTS
STATE RACT RULES
(Continued)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
Colorado (Concluded)	XIV.B.7	All leaks from which a liquid, containing VOC, can be observed running or dripping shall be repaired and completed the first time the equipment is off-line. No leaks shall go unrepaired for more than 14 days after initial detection unless the Division issues written approval.	**	The State requirement is more specific than the Federal CTG in reference to repairs and the timeframe for those repairs. The Federal CTG states that repairs should be made as soon as practicable.

**

	XIV.B.8	Each surface condenser must have at least one temperature indicator with its sensor located in the outlet gas stream.		The Federal CTG is not specific about the temperature indicator (safety requirement).

** Although this provision of the State's regulation may not necessarily result in a quantifiable reduction in emissions, it does enhance the pollution prevention aspects of the rule.

SYNTHESIZED PHARMACEUTICAL PRODUCTS
STATE RACT RULES
(Continued)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
Connecticut	Section 22a-174-20(t)	Visible leaks that are detected must be repaired immediately.	**	The Federal CTG states that repairs should be made as soon as is practical, whereas the State specifies a timeframe for repairs. This is considered more specific and, thus, may have the potential to further reduce emissions.

		The owner or operator of a synthetic pharmaceutical manufacturing facility shall control VOC emissions from all operations. Surface condensers or equivalent controls shall be used provided that:		The State requirements are the same as specified in the Federal CTG.

** Although this provision of the State's regulation may not necessarily result in a quantifiable reduction in emissions, it does enhance the pollution prevention aspects of the rule.

SYNTHESIZED PHARMACEUTICAL PRODUCTS
STATE RACT RULES
(Continued)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS

Connecticut (Continued)	Section 22a-174-20(t)	(A) If surface condensers are used, the outlet gas temperature from the condenser must not exceed: - -25°C when condensing VOCs having a vapor pressure of 40 kPa (5.8 psi) or greater at 20°C, - -15°C when condensing VOCs having a vapor pressure of 20 kPa (2.9 psi) or greater at 20°C, - 0°C when condensing VOCs having a vapor pressure of 10 kPa (1.5 psi) or greater at 20°C,		The State requirements are the same as specified in the Federal CTG.

** Although this provision of the State's regulation may not necessarily result in a quantifiable reduction in emissions, it does enhance the pollution prevention aspects of the rule.

SYNTHESIZED PHARMACEUTICAL PRODUCTS
STATE RACT RULES
(Concluded)

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
Connecticut (Concluded)		- 10°C when condensing VOCs having a vapor pressure of 7 kPa (1.0 psi) or greater at 20°C, or - 25 °C when condensing VOCs having a vapor pressure of 3.5 kPa (0.5 psi) or greater at 20°C, or (B) If equivalent controls are used, the VOC emissions must be reduced by at least as much as when using a surface condenser that meets the requirements of subparagraph (A).		The State requirements are the same as specified in the Federal CTG.

APPENDIX C.

COMPARISON OF STATE/LOCAL VOC RULES TO FEDERAL RACT FOR GROUP III CTG CATEGORIES[2]

[2]This appendix describes Federal RACT for source categories covered in the Group III CTGs, as well as regulatory requirements for the same categories as contained in selected State/local VOC rules.

AIR OXIDATION PROCESSES - SOCMI
FEDERAL RACT EMISSION LIMIT AS DEFINED BY THE CTG

Federal RACT is applicable to any air oxidation facility under the synthetic organic chemical manufacturing industry (SOCMI) in which air is used as an oxidizing agent to produce an organic chemical. Any product recovery equipment used to collect VOC for sale or reuse from a product recovery system of an air oxidation facility is subject to RACT.

RACT would require, for each air oxidation process vent stream, either use of a combustion device which reduces total organic compound emissions (minus methane and ethane) 98 percent by mass or to 20 ppm by volume (ppmv), whichever is less stringent, or maintenance of a total resource effectiveness (TRE) index value greater than 1.0.

Thermal oxidation is the only demonstrated VOC control technology universally applicable to all SOCMI air oxidation processes. Other control devices (flares, boilers, process heaters, and catalytic oxidizers) have also demonstrated the ability to achieve 98% destruction or the 20 ppmv emission limit.

It is recommended that air oxidation process VOC emissions not be required to meet the 98% reduction standard until the combustion device is replaced for other reasons.

For facilities having a TRE index value that exceeds the cutoff level (1.0), a VOC emission reduction of 98% or the 20 ppmv limit would not be required.

No State or District regulations concerning air oxidation processes - SOCMI were provided through the Work Group. However, the Texas, Pennsylvania, Rhode Island, and Colorado rules were consulted, and no State rules pertaining to air oxidation processes were found.

VOC EQUIPMENT LEAKS FROM NATURAL GAS/GASOLINE PROCESSING PLANTS
RACT AS DEFINED BY THE CTG

This category applies to equipment in VOC service within a process unit in on-shore natural gas processing plants. Natural gas processing plants are defined as facilities engaged in the separation of natural gas liquids from field gas and/or fractionation of the liquids into natural gas products, such as ethane, propane, butane, and natural gasoline. The provisions affect only those pumps, compressors, valves, pressure relief devices, open-ended lines, flanges, and connections containing or contacting process streams with a VOC concentration of 1.0 percent by mass or more.

A leak is defined as a VOC concentration greater than 10,000 ppm. Any leaking component that has a VOC concentration over 10,000 ppm must be tagged and repaired within 15 days or at next shutdown.

RACT procedures include weekly visual inspection of pumps and quarterly monitoring of pumps, valves, compressors, and relief valves. Relief valves should be monitored and repaired if necessary after they have vented to the atmosphere. Affected facilities must implement a leak detection and repair (LDAR) program. This program involves the use of a portable hydrocarbon detection device meeting the specifications and performance criteria set forth in EPA Reference Test Method 21 (40 CFR 60, appendix A). Affected pumps, valves, compressors, and pressure relief devices must be monitored at a frequency interval of no more than quarterly. Difficult-to-monitor components (the monitoring of which requires the use of scaffolding or requires monitoring personnel to be elevated higher than 2 meters above permanent support) may be monitored with a frequency of no less than annually. Any component that appears to be leaking on the basis of sight, smell, or sound, including flanges and connections that need not be monitored regularly, should be tagged for repair. Leaking components must be repaired within 15 days of leak detection; however, if repair is not technically feasible without shutting down the process unit, repair may be delayed until the equipment can be isolated for repair or during the next scheduled process unit turnaround.

Open-ended lines must be controlled by installation of a cap, plug, flange, or second valve on the open end of the line.

Exempted:

1. Facilities that do not fractionate the mixed natural gas liquids and that have design throughput less than 10 million standard cubic feet per day.

2. Components operating under vacuum service and equipment at underground storage facilities.

EQUIPMENT LEAKS FROM NATURAL GAS/GASOLINE PROCESSING PLANTS
STATE RACT RULES

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
Texas	Texas Administrative Code, Title 31, Chapter 115, Subchapter D, §115.344	The owner or operator of a natural gas/gasoline processing operation shall measure emissions from any relief valve that has vented to the atmosphere within 24 hours at manned facilities or within 30 days at unmanned facilities.	**	The CTG states that relief valves should be monitored and repaired <u>if necessary</u> after they have vented to the atmosphere. Therefore, the State regulation is more attractive in that it encourages pollution prevention activities.

** Although this provision of the State's regulation may not necessarily result in a quantifiable reduction in emissions, it does enhance the pollution prevention aspects of the rule.

LARGE PETROLEUM DRY CLEANERS
FEDERAL RACT EMISSION LIMIT AS DEFINED BY THE CTG

Each owner or operator of a petroleum solvent dry cleaning facility that consumes 123,000 liters or more of petroleum solvent annually shall either:

(1) limit VOC emissions to the atmosphere to an average of 3.5 kg of VOC per 100 kg dry mass of articles dry cleaned, or

(2) install and operate a solvent recovery dryer in a manner such that the dryer remains closed and the recovery phase continues until a final recovered solvent flow rate of 50 milliliters per minute is attained.

Each owner or operator of a petroleum solvent dry cleaning facility with a solvent filtration system shall either:

(1) reduce the VOC content in all filtration wastes to 1.0 kg or less per 100 kg dry mass of articles dry cleaned, before disposal, and exposure to the atmosphere; or

(2) install and operate a cartridge filtration system, and drain the filter cartridges in their sealed housings for 8 hours or more before removal.

Each owner or operator shall repair petroleum solvent vapor or liquid leaks within 3 working days after identifying the source of the leak. If necessary repair parts are not on hand, the owner or operator shall order these parts within 3 working days, and repair the leaks no later than 3 working days following the arrival of the parts.

No State or District regulations concerning large petroleum dry cleaners were provided through the Work Group. The New York State, Pennsylvania, and Texas regulations address only perchloroethylene dry cleaners.

POLYMER MANUFACTURING
FEDERAL RACT EMISSION LIMIT AS DEFINED BY THE CTG

Affected Units	Recommended Limitation[a]
Polystyrene plants (using continuous processes) Material recovery section	0.12 kg VOC/1,000 kg of product (0.24 lb VOC/2,000 lb of product)
Polypropylene plants (using liquid phase processes)	98 mass percent reduction, or reduction to 20 ppm of continuous VOC emissions from the polymerization reaction section, the material recovery section, and the product finishing section.
High-density polyethylene plants (using liquid phase slurry processes)	98 mass percent reduction, or reduction to 20 ppm of continuous VOC emissions from the material recovery section and the product finishing section.

[a] Emission limits are based on the use of condensers.

POLYMER MANUFACTURING
STATE RACT RULES

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
Connecticut	Regulations of Connecticut State Agencies, Title 22a, Environmental Protection, Chapter 174, Sec. 22a-174-20(y).	For polystyrene plants using continuous processes: 0.12 kg VOC/ 1,000 kg product from the material recovery section on an hourly basis.	**	The State requirement will result in more accurate compliance performance evaluation than the CTG.

** Although this provision of the State's regulation may not necessarily result in a quantifiable reduction in emissions, it does enhance the pollution prevention aspects of the rule.

SOCMI AND POLYMER MANUFACTURING EQUIPMENT LEAKS
FEDERAL RACT EMISSION LIMIT AS DEFINED BY THE CTG

The CTG RACT procedures are described by the following requirements:

1) RACT is applicable only to components in VOC service (containing 10% or greater VOC by mass).

2) VOC equipment leaks from SOCMI and polymer manufacturing include capping of open-ended lines and quarterly leak detection and repair of pumps, valves, compressors, and safety/relief valves.

3) Any component that appears to be leaking, on the basis of sight, smell, or sound, should be repaired.

4) Light liquid is defined as a fluid with a vapor pressure greater than 0.3 kPa at 20°C.

5) A component is considered in light liquid service if it contacts a fluid containing greater than 10% by mass light liquid.

6) A component is considered in gas service if it contains process fluid that is in the gaseous state at operating conditions.

7) Leak detection should consist of quarterly monitoring of the following components in VOC service with an organic detection instrument: pumps in light liquid service, valves in light liquid service, valves in gas service, compressors, and safety/relief valves in gas service. However, States may choose monthly monitoring for pumps instead of quarterly monitoring, for cost effectiveness purposes.

8) Pumps in light liquid service should be visually inspected weekly for indication of leaks.

9) Safety/relief valves should be monitored after each overpressure relief to ensure the valve has properly reseated.

10) Compressor seal quarterly monitoring will be determined on a case-by-case basis.

SOCMI AND POLYMER MANUFACTURING EQUIPMENT LEAKS
FEDERAL RACT EMISSION LIMIT AS DEFINED BY THE CTG
(Concluded)

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11) EPA Reference Method 21 or an equivalent State method should be employed to detect and monitor VOC.

12) A source is considered leaking if monitoring results in an instrument reading of 10,000 ppmv or greater.

Exemptions:

- Small process units (e.g., units processing small quantities of light liquid (fluid with vapor pressure >0.3 kPa at 20°C) and gaseous VOC) may be exempted from implementing routine leak detection and repair (LDAR) programs on the basis of cost effectiveness.

- Process units processing only heavy liquid (fluid with vapor pressure <0.3 kPa at 20°C) VOC or processing only non-VOC and equipment operating under a vacuum.

- Less frequent monitoring may be required for difficult-to-monitor valves than the quarterly plan considered as RACT for valves in gas or light liquid service.

SOCMI AND POLYMER MANUFACTURING EQUIPMENT LEAKS
STATE RACT RULES

STATE	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
Connecticut	Regulation of Connecticut State Agencies, Title 22a-Environmental Protection, Chapter 174, Section 22a-174-20(x)(4)	As stated in the CTG with additional requirements. The State requires leaking equipment (found during monitoring or on the basis of sight, smell, or sound) to be repaired within 15 days after detection.	X[a]	The State regulation is more stringent than the Federal CTG, because the State requires leaking equipment to be repaired within a specified time period.
	22a-174-20(x)(5)	The State requires the owner or operator to notify the Department's air compliance unit at least 10 days prior to the scheduled quarterly monitoring.		This additional reporting requirement does not result in increased emission reductions.

a The "X" indicates that the State/local requirement is considered more stringent than the

APPENDIX D.

COMPARISON OF BAAQMD AND SCAQMD VOC RULES
TO FEDERAL RACT FOR GROUPS I, II, AND III CTGs[3]

[3]This appendix describes Federal RACT for source categories covered in the Groups I, II, and III CTGs, and presents regulatory requirements for the same categories as contained in the two California District (local) VOC rules. Since this appendix was developed several months after Appendices A, B, and C, and time did not allow combining with these other appendices, Appendix D is included as a separate appendix.

CUTBACK ASPHALT
FEDERAL RACT EMISSION LIMIT AS DEFINED BY THE CTG

Substitute emulsified asphalt for cutback asphalt.

The Blue Book[4] suggests seasonal exemptions (i.e., outside of ozone season) as opposed to temperature forecasting (e.g., <50°F), specifies (1) no higher than 7% oil distillate as maximum allowable solvent content (by volume) in emulsified asphalt, as determined by ASTM distillation test D-244 or (2) allow use of certain grades or applications of emulsified asphalt with the following maximum solvent contents as determined by ASTM D-244: (a) 3% limit for seal coats used in early spring or late fall; (b) 3% limit when chip seals used with aggregate is dusty or dirty; (c) 8% limit when mixing with open graded aggregate that is not well washed; and (d) 12% limit when mixing with dense graded aggregate. Other exemptions are listed for use solely as penetrating prime coat and when stockpiled for extended periods.

"Issues Relating to VOC Regulation Cutpoints, Deficiencies, and Deviations," Clarification to Appendix D of November 24, 1987 Federal Register - May 25, 1988 (revised 1/11/90), U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Research Triangle Park, NC.

CUTBACK ASPHALT
CA DISTRICT RACT RULES

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRIN-GENT?	COMMENTS
Bay Area Air Quality Management District	Regulation 8, Rule 15, Section 301	The District sets the following standards: - A person shall not use any rapid-cure liquid asphalt in paving material or in paving and maintenance operations.	**	The District places some prohibitions on the use of rapid-cure asphalt in paving material or in paving and maintenance operations which are not specified in the Federal CTG.
	Section 304	- A person shall not use any slow-cure liquid asphalt which contains more than 0.5 percent by volume of petroleum solvents which boil at less than 260°C (500°F) in paving material or in paving and maintenance operations.	X[a]	The Federal CTG specifies that slow- cure may contain 20 to 30 percent (by volume) of diluent (petroleum distillate), average 25%.

** Although this provision of the District's regulation may not necessarily result in a quantifiable reduction in emissions, it does enhance the pollution prevention aspects of the rule.

[a] The "X" indicates that the District requirement is considered more stringent than the applicable Federal CTG.

CUTBACK ASPHALT
CA DISTRICT RACT RULES
(Concluded)

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRIN-GENT?	COMMENTS
Bay Area AQMD (Concluded)	Regulation 8, Rule 15, Section 305	A person shall not use any emulsified asphalt containing petroleum solvents in excess of 3% by volume in paving material or in paving and maintenance operations.	X	The District requires a lower VOC content than the CTG.
South Coast Air Quality Management District	Rule 1108 Section b	A person shall not sell or offer for sale for use in the District, or use any cutback asphalt containing more than 0.5% by volume organic compounds that evaporate at 260°C (500°F) or lower.	X	The CTG specifies a higher VOC content than the District.
	Rule 1108.1	A person shall not sell or offer for sale for use in the District, or use any emulsified asphalt containing organic compounds that evaporate at 260°C (500°F) or lower, in excess of 3% by volume for slow and rapid setting type; and 3% by volume for medium setting type for use with any aggregate.	X	The Federal CTG allows 7% as the maximum solvent content (by volume) in emulsified asphalt, as determined by ASTM distillation test D-244.

FIXED-ROOF PETROLEUM TANKS
FEDERAL RACT EMISSION LIMIT AS DEFINED BY THE CTG

Emission limits are recommended in terms of equipment specifications. These specifications include internal floating roofs equipped with a closure seal or seals, or alternative equivalent control. The CTG, however, does not specify the exact types of controls that can be used to achieve this.

The cutoffs for fixed-roof petroleum tanks provided in the CTG are as follows:

(a) greater than 150,000 liters (40,000 gallons) storage capacity containing volatile petroleum liquids (greater than 10.5 kPa or 1.5 psi TVP) are covered, and

(b) less than 1,600,000 liters (420,000 gallons) storage capacity of crude oil and condensate prior to lease custody transfer are exempted.

FIXED-ROOF PETROLEUM TANKS
CA DISTRICT RACT RULES

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
Bay Area Air Quality Management District	Regulation 8, Rule 5, Section 304	A person shall not store organic liquid in any storage tank with a capacity greater than 75,000 l (19,813 gal) unless such tank meets the following conditions: 1. Storage tanks with a capacity greater than 75,000 l (19,813 gal) but less than 150,000 l (39,600 gal) storing an organic liquid with a true vapor pressure greater than 1.5 psia must meet the requirements of Section 311. 2. Storage tanks with a capacity of 150,000 l (39,600 gal) or greater storing an organic liquid with a true vapor pressure greater than 0.5 psia must meet the requirements of Section 311.	X	The Bay Area regulation has a lower cutoff level than the Federal CTG. Therefore, more tanks may be subject to the rule.

FIXED-ROOF PETROLEUM TANKS
CA DISTRICT RACT RULES
(Continued)

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
Bay Area AQMD (Continued)	Section 311.2	An internal floating roof shall be equipped with seals that satisfy one of the following requirements: a. A liquid primary seal, mounted in full contact with the liquid in the annular space between the tank shell and floating roof; b. A vapor-mounted primary and a secondary seal; or c. A liquid-mounted primary and a secondary seal that satisfy the requirements in Sections 321 and 322 if the seals were installed after February 1, 1993.		The Federal CTG only specifies that internal floating roofs should be equipped with a closure seal or seals. The Bay Area, on the other hand, provides detailed specifications for each type of seal.

FIXED-ROOF PETROLEUM TANKS
CA DISTRICT RACT RULES
(Continued)

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
Bay Area AQMD (Concluded)	Section 311.3	An approved emission control system that collects and processes all organic vapors and gases and has an abatement efficiency of at least 95% by mass.	**	The Federal CTG indicates that an internal floating roof can achieve VOC emission reduction of 90% or greater.
	Section 320	Floating roofs must meet certain fitting requirements.	**	These requirements are not specified in the Federal CTG.
	Sections 321 and 322	The Bay Area provides specific operating requirements for tanks equipped with both primary and secondary seals.	**	These requirements are not specified in the Federal CTG.

** Although this provision of the District's regulation may not necessarily result in a quantifiable reduction in emissions, it does enhance the pollution prevention aspects of the rule.

FIXED-ROOF PETROLEUM TANKS
CA DISTRICT RACT RULES
(Continued)

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
South Coast Air Quality Management District	Regulation IV, Rule 463, Section b.1	No person shall place, store, or hold in any stationary tank, reservoir, or other container of 150,000 l (39,630 gal) or greater capacity, any organic liquid having a true vapor pressure of 0.5 psi absolute or greater under actual storage conditions, and in any above ground stationary tank or other above ground container of more than 75,000 l (19,815 gal) but less than 150,000 l (39,630 gal) capacity, and organic liquid having a true vapor pressure of 1.5 psi absolute or greater under actual storage conditions, unless such tank is designed and equipped with vapor loss control devices, properly installed, properly maintained, and in good operating order.	X	The South Coast regulation has a lower vapor pressure cutoff level than the Federal CTG (0.5 psi vs 1.5 psi).

FIXED-ROOF PETROLEUM TANKS
CA DISTRICT RACT RULES
(Continued)

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
South Coast AQMD (Continued)	Section b.2.D	Compliance shall be verified by measuring with a combustible gas detector the concentration of organic compounds in the vapor space above the internal floating roof in terms of the lower explosive limit (LEL). Such reading for an internal floating roof shall not exceed 50% of the LEL for those installed prior to June 1, 1984, or 30% for those installed after June 1, 1984.	**	This compliance requirement is not specified in the Federal CTG.

** Although this provision of the District's regulation may not necessarily result in a quantifiable reduction in emissions, it does enhance the pollution prevention aspects of the rule.

FIXED-ROOF PETROLEUM TANKS
CA DISTRICT RACT RULES
(Concluded)

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
South Coast AQMD (Concluded)	Section b.3	A vapor recovery system capable of collecting all organic vapors and a vapor return or disposal system capable of processing such vapors so as to reduce their emission to the atmosphere at an efficiency of at least 95% by mass.	**	The Federal CTG indicates that an internal floating roof can achieve VOC emission reduction of 90% or greater.

** Although this provision of the District's regulation may not necessarily result in a quantifiable reduction in emissions, it does enhance the pollution prevention aspects of the rule.

BULK PLANTS
FEDERAL RACT EMISSION LIMIT AS DEFINED BY THE CTG

The EPA defines a gasoline bulk plant as having a throughput of less than 76,000 liters (20,000 gallons) of gasoline per day averaged over the work days in 1 year. A summary of the CTG RACT requirements is given below.

- Bulk plant facilities include: 1) tanks for gasoline storage; 2) loading racks; and 3) incoming and outgoing tank trucks.
- Three control techniques employed at bulk plants are submerged loading, balance system, and leak prevention.
- Other control alternatives considered are: a) submerged filling; b) submerged filling account trucks with vapor balancing of transport trucks and storage tanks; and c) submerged filling account trucks with vapor balancing of storage tanks, and account and transport trucks.
- A vapor balance system controls vapor emissions during loading and unloading of tank trucks with an efficiency greater than 90%.
- Proper maintenance, operation, and good housekeeping are required to prevent leaks and assure effective collection of VOC emissions when balance systems are installed.
- To maintain high reduction efficiencies, tank trucks, storage tanks, and all piping must be vapor-tight.
- No specific emission limit for bulk plant controls is provided.

BULK PLANTS
CA DISTRICT RACT RULES

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
Bay Area Air Quality Management District	Regulation 8, Rule 39, Section 302	A person shall not load or permit the loading of gasoline into or out of a gasoline bulk plant unless a CARB certified vapor recovery system is properly connected and used. Such system shall not emit into the atmosphere more than 60 g of precursor organic compounds/m^3 (0.5 lb/1,000 gal) of organic liquid loaded.	X	The Federal CTG does not specify a VOC emission limit, but only provides equipment specifications.
	Regulation 8, Rule 39, Section 308	The system shall be maintained and operated in a manner that prevents the gauge pressure in the delivery tank from exceeding 46 cm (18 in) of water column during product loading.	*	The gauge pressure requirement during product loading is not specified in the Federal CTG.

* This provision of the District's regulation involves work practices that will result in emission reductions.

BULK PLANTS
CA DISTRICT RACT RULES
(Continued)

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
Bay Area AQMD (Continued)	Rule 6, Section 304	A person shall not allow the delivery of any organic liquid to any bulk plant storage tank having a capacity between 7.6 and 150 m^3 (2,000 and 40,000 gallons) inclusive, unless a vapor recovery system of at least 95% efficiency, or an equivalent vapor loss control system, has been properly installed on the storage tank and is properly connected during delivery.	X	The Federal CTG requires a vapor recovery system to achieve at least 90% efficiency. Therefore, the District requirement is more stringent than the Federal CTG.

BULK PLANTS
CA DISTRICT RACT RULES
(Continued)

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
Bay Area AQMD (Concluded)	Rule 6, Section 307	Standard for operating practices: any organic liquid having a true vapor pressure greater than 0.1 bar (1.5 psia) shall not be spilled, discarded in sewers, stored in open containers, or handled in any other manner that would result in evaporation to the atmosphere.	*	These operating practices are not specified in the Federal CTG.
	Rule 6, Section 201	A bulk plant is defined as having an annual throughput of not more than 23,000 cubic meters (6,000,000 gallons). Assuming 360 workdays in one year, the maximum daily throughput is 17,000 gallons.	*	The Bay Area daily gasoline throughput cutoff of 17,000 gallons is lower than the daily cutoff of 20,000 gallons specified in the Federal CTG.

* This provision of the District's regulation involves work practices that will result in emission reductions.

BULK PLANTS
CA DISTRICT RACT RULES
(Continued)

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
South Coast Air Quality Management District	Regulation IV, Rule 462, Section b.1.B	South Coast regulation defines a bulk plant as a Class B facility, which shall be equipped with a vapor recovery system capable of returning the displaced vapors from the delivery vessel being filled back to the stationary storage container (vapor balance technique).	X	The Federal CTG provides several options including the vapor balance technique to reduce emissions during transfer operations. This technique provides a higher control efficiency than submerged fill (90% vs 58%).
		The backpressure in the vapor recovery system shall not exceed 18 inches of water. The transfer equipment shall be operated so that there are no overfills, fugitive vapor leaks, fugitive liquid leaks, or excess organic liquid leaks.	**	These additional requirements are not specified in the Federal CTG. They have a potential for reducing emissions resulting from filling operations.

** Although this provision of the District's regulation may not necessarily result in a quantifiable reduction in emissions, it does enhance the pollution prevention aspects of the rule.

BULK PLANTS
CA DISTRICT RACT RULES
(Continued)

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
South Coast AQMD (Continued)	Section b.1.E	Any source of a fugitive vapor or liquid leak shall be corrected to comply with the fugitive vapor or liquid leak limit of this rule within 2 days after notification in writing of detection. The Executive Officer shall be notified within 2 days after the work is completed. A fugitive vapor leak is defined as an escape of organic vapors from a source other than the tank truck, trailer, or railroad tank car, measured in excess of 3,000 ppm above background at a distance of 2 cm (0.8 inch) from the source for more than 10 seconds duration, or	X	This requirement is not found in the Federal CTG. It is more stringent than the timeframe of 15 days set in the CTG for repairing leaks from petroleum refinery equipment.

BULK PLANTS
CA DISTRICT RACT RULES
(Concluded)

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
South Coast AQMD (Concluded)		equivalent test method as determined by the Executive Officer. A fugitive liquid leak is a dripping of liquid organic compounds at a rate in excess of three drops per minute from any single leak source other than the disconnect operations, liquid fill line(s), and vapor line(s).		

GASOLINE LOADING TERMINALS
FEDERAL RACT EMISSION LIMIT AS DEFINED BY THE CTG

Affected Units	Recommended Limitation[a]
Tank truck gasoline loading terminal	80 mg VOC/l (0.67 lb VOC/1,000 gal) of gasoline loaded

[a]This limit is based on submerged fill and vapor recovery/control systems.

The "Blue Book" defines the affected facility as any tank truck loading operations at the primary wholesale outlet for gasoline which delivers at least 76,000 liters/day (20,000 gallons/day).

GASOLINE LOADING TERMINALS
CA DISTRICT RACT RULES

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
Bay Area Air Quality Management District	Regulation 8, Rule 33, Section 301	A person shall not load or permit the loading of gasoline into or out of a gasoline bulk terminal unless a CARB certified vapor recovery system is properly connected and used. Such system shall not emit into the atmosphere more than 9.6 mg of precursor organic compounds/l (0.08 lb/1,000 gal) of organic liquid loaded.	X	The District VOC emission limit is much lower than the one specified in the Federal CTG.
	Regulation 8, Rule 6, Section 304	A person shall not allow the delivery of any organic liquid to any storage tank having a capacity between 7.6 and 150 m^3 (2,000 and 40,000 gallons) inclusive, unless a vapor recovery system of at least 95% efficiency, or an equivalent vapor loss control system, has been properly installed on the storage tank and is properly connected during delivery.	X	The Federal CTG does not specify a control efficiency requirement for a vapor control system.

GASOLINE LOADING TERMINALS
CA DISTRICT RACT RULES
(Continued)

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
Bay Area AQMD (Concluded)	Section 307	Any organic liquid having a true vapor pressure greater than 0.1 bar (1.5 psia) shall not be spilled, discarded in sewers, stored in open containers, or handled in any other manner that would result in evaporation to the atmosphere.	*	These work practices are not specified in the Federal CTG.
South Coast Air Quality Management District	Regulation IV, Rule 462, Section b.1.A	South Coast defines a loading terminal as a Class A facility. The Class A facility shall be equipped with an approved vapor recovery and/or disposal system which has continuous monitoring and a recording system to measure emissions to the atmosphere.	**	The Federal CTG does not specify any continuous monitoring.

* This provision of the District's regulation involves work practices that will result in quantifiable emission reductions.

** Although this provision of the District's regulation may not necessarily result in a quantifiable reduction in emissions, it does enhance the pollution prevention aspects of the rule.

GASOLINE LOADING TERMINALS
CA DISTRICT RACT RULES
(Continued)

STATE	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
South Coast AQMD (Continued)		The emission limit for this facility is 35 mg/l (0.29 lb non-methane organic vapors/1,000 gal) of liquid transferred.	X	The South Coast regulation specifies less than half of the emission limit specified in the Federal CTG.
		The backpressure in the vapor recovery system shall not exceed 18 inches of water.	*	The pressure requirement is not specified in the Federal CTG.
		The transfer equipment shall be operated so that there are no overfills, fugitive vapor leaks, fugitive liquid leaks, or excess organic liquid leaks.	**	The EPA "Blue Book" clarifies that trucks used in the loading terminal should pass a leak-tight test. The South Coast regulation requires all transfer equipment, not only trucks, to be leak-free.

* This provision of the District's regulation involves work practices that will result in quantifiable emission reductions.

** Although this provision of the District's regulation may not necessarily result in a quantifiable reduction in emissions, it does enhance the pollution prevention aspects of the rule.

GASOLINE LOADING TERMINALS
CA DISTRICT RACT RULES
(Concluded)

STATE	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
South Coast AQMD (Concluded)	Section b.1.E	Any source of a fugitive vapor or liquid leak shall be corrected to comply with the limits of this rule within 2 days after notification in writing of detection. The Executive Officer shall be notified within 2 days after the work is completed.	X	The CTG does specify written notification. The District regulation requires shorter time to repair leak than the CTG and, therefore, is more stringent.

MISCELLANEOUS REFINERY SOURCES
FEDERAL RACT EMISSION LIMIT AS DEFINED BY THE CTG

The CTG states that regulations for vacuum producing systems (VPSs) and wastewater separators (WSs) should be written in terms of equipment specifications, and regulations for process unit turnarounds (PUTs) should be written in terms of operating procedures. It is suggested that non-condensables from VPSs be piped to an appropriate firebox, incinerator, or (if spare compressor capability is available) compressing the vapors and adding them to refinery fuel gas. The hot wells associated with contact condensers can be covered and the vapors incinerated. Reasonable control of VOC emissions from a WS consists of covering the forebays and separator sections.

Commercially operating wastewater separators include (1) a solid cover with all openings sealed, totally enclosing the compartment liquid contents; and (2) a floating pontoon or double-deck type cover, equipped with closure seals to enclose any space between the cover's edge and compartment wall. Also, any gauging and sampling device in the compartment cover should be designed to provide a projection (such as a probe) into the liquid surface to prevent VOC from escaping. The sampling device can also be equipped with a cover or lid that is in a closed position at all times except when the device is in actual use.

When a process unit is shut down for a turnaround, the agency should require that the vessel be depressurized to vapor recovery, a flare, or a firebox. The agency and the operator should agree on a timetable for compliance. Included in this timeframe should be dates for ordering, recovery installation, and startup of necessary equipment. Each fractioner, reactor, stabilizer, etc. should be addressed. The vapors can either be added to the fuel gas system, flared, or directly vented to atmosphere. No VOC should be directly discharged to the atmosphere until the vessel pressure is less than 5 psig. The refinery operator should keep a record of each PUT, listing as a minimum the date the unit was shut down, the approximate vessel hydrocarbon concentration when the hydrocarbons were first discharged to the atmosphere, and the approximate total quantity of hydrocarbons emitted to the atmosphere. These records should be kept for at least 2 years and be made available to the air pollution control agency inspector during any compliance inspection of the refinery.

MISCELLANEOUS REFINERY SOURCES
CA DISTRICT RACT RULES

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
Bay Area Air Quality Management District	Regulation 8, Rule 8, Sections 301, 302	Any wastewater separator and/or forebay shall not be operated unless such system is equipped with an organic compound (OC) vapor recovery system with a combined collection and destruction efficiency of at least 95%, by mass.	X	The Federal CTG does not specify a required collection and destruction efficiency.
South Coast Air Quality Management District	Regulation XI, Rule 1123, Section b.2	For every refinery that uses inert gas displacement or vacuum eduction for process turnaround, a person operating the refinery shall submit to the Executive Officer a plan that describes at least the following: - the procedure used for gas displacement or eduction; - the disposition of the displaced or educed organic gases;	**	This is an additional requirement that is not specified in the Federal CTG.

** Although this provision of the District's regulation may not necessarily result in a quantifiable reduction in emissions, it does enhance the pollution prevention aspects of the rule.

MISCELLANEOUS REFINERY SOURCES
CA DISTRICT RACT RULES
(Continued)

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
South Coast AQMD (Continued)		- the stage in the displacement or eduction procedure at which the disposition is changed from a control facility to atmospheric venting, and - the criteria by which said stage is identifiable.		
	Section b.3	The Executive Officer shall approve the plan upon his determination that it provides for the maximum feasible control of emissions of displaced or educed organic gases without causing damage to equipment, malfunction of pollution control or safety devices, or violations of safety regulations and without installation or structural modification of equipment that is not needed to comply with this rule.	**	This requirement is applied when the owner/operator of the plant is subject to Section b.2.

** Although this provision of the District's regulation may not necessarily result in a quantifiable reduction in emissions, it does enhance the pollution prevention aspects of the rule.

MISCELLANEOUS REFINERY SOURCES
CA DISTRICT RACT RULES
(Continued)

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
South Coast AQMD (Continued)	Section b.4	After approval of a plan, all displacement operations shall be conducted according to said plan unless another specifically approved plan is used.	**	This requirement is not specified in the Federal CTG.
	Section d	Any vessel that has been depressurized to less than 5 psi shall be exempted from the provision of Section b.2 by the Executive Officer upon determination by the Executive Officer that the use of existing control facilities to comply with Section b.2 is likely to damage equipment, cause the malfunction of pollution control or safety devices, or cause violations of safety regulations.	*	No exemption is specified in the Federal CTG.

** Although this provision of the District's regulation may not necessarily result in a quantifiable reduction in emissions, it does enhance the pollution prevention aspects of the rule.

* This is an applicability issue.

MISCELLANEOUS REFINERY SOURCES
CA DISTRICT RACT RULES
(Continued)

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
South Coast AQMD (Continued)	Rule 1176, Section c.2.B	Wastewater separators shall be replaced by covered tanks that are approved by the Executive Officer; or provided with any one of the following: a) a floating cover equipped with seals; b) a fixed cover, equipped with a closed vent system that directs vapors to a control device with a control efficiency of 95% by mass or greater. The closed vent system shall not produce detectable VOC emissions in excess of 500 ppm measured at a distance of 1 cm or less from the source; or c) any measure that is equivalent to, or better than, the above requirements.	X	The Federal CTG specifies a fixed cover and a floating cover, equipped with closure seals. The CTG, however, does not specify that a fixed cover must be equipped with a control device.

MISCELLANEOUS REFINERY SOURCES
CA DISTRICT RACT RULES
(Continued)

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS

South Coast AQMD (Continued)	Rule 1176, Section c.3	The following shall not be used unless equipped and operated as specified below: a. Separator forebays and sewer lines: All interconnections with the receiving wastewater separators shall be enclosed by fixed covers such that no liquid surface is exposed to the atmosphere. b. Process drains: At any drain opening to the atmosphere, VOC emissions shall not exceed 500 ppm measured at a distance of 1 cm or less from the source. c. Junction boxes: Junction boxes shall be totally enclosed with a solid, gasketed, or manhole cover.	X	The Federal CTG only says to cover the forebays and separator sections. The South Coast regulation, on the other hand, indicates specifically how each item of equipment should be covered. No emission limit is given in the CTG.
		Requirement for covers.	**	The Federal CTG does not discuss requirements for covers.

** Although this provision of the District's regulation may not necessarily result in a quantifiable reduction in emissions, it does enhance the pollution prevention aspects of the rule.

MISCELLANEOUS REFINERY SOURCES
CA DISTRICT RACT RULES
(Concluded)

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
South Coast AQMD (Concluded)	Section e	Operator inspection and maintenance requirements 1. Air pollution control device(s) required shall be subjected to a performance test semiannually, for verification of control efficiency.	X	The Federal CTG indicates pollution control equipment should be checked by an air pollution control agency inspector, at least once a year.
		2. Closed vent systems and process drains shall be inspected monthly for VOC emissions.	**	The Federal CTG does not specify monthly inspections.
		3. Defect(s) or leak(s) detected through either operator or District inspection shall be repaired within 3 calendar days of detection. The repaired or replaced component shall be reinspected within 15 days of the repair or replacement.	X	The Federal CTG specifies leaks from petroleum refinery equipment are to be repaired within 15 days.

** Although this provision of the District's regulation may not necessarily result in a quantifiable reduction in emissions, it does enhance the pollution prevention aspects of the rule.

STAGE I VAPOR RECOVERY
RACT EMISSION LIMIT AS DEFINED BY THE CTG

The CTG suggests several methods to conduct displaced vapors from the underground tank to the trucks as follows: 1) two-point system, 2) coaxial systems, 3) manifolded vent lines, and 4) prescribed design criteria. Under design criteria several distinctions have been made; they are 1) drop tube specifications, 2) gauge well, 3) vapor line connections, 4) vapor hose return, 5) type of liquid fill connection, 6) tank truck inspection, 7) closures and interlocks on underground tank vapor hose connectors, 8) vapor hose connection to the tank trucks, and 9) vent line restrictions.

The design criteria were developed to accomplish the following:

(a) assure submerged fill, i.e., discharge liquid below the gasoline surface in the storage tank;
(b) assure that the vapor return line and connections are of sufficient size and sufficiently free of restrictions to allow transfer of vapor to the truck tank and achieve the desired recovery;
(c) assure that there are no significant leaks in the system or the tank truck which reduce vacuum in the truck or otherwise inhibit vapor transfer; and
(d) assure that the vapor return line will be connected during tank filling.

Suitable restrictive orifices or pressure-relief valves are required whenever the systems would otherwise be incapable of achieving 90% control or would otherwise not assure that the vapor return line is connected. Either of the following restrictive devices is acceptable:

(a) Orifice of 1/2 to 3/4 inch ID.
(b) Pressure-vacuum relief valve set to open at 8 oz. per square inch or greater pressure and 4 oz. per square inch or greater vacuum. The vacuum relief feature of a P-V valve is not required for Stage I recovery purposes but may be required by safety authorities.

Exemptions (See Blue Book):
- Storage tanks < 550 gallons capacity for agricultural use.
- Storage tanks < 2,000 gallons capacity in place before 1/1/79.
- Storage tanks < 250 gallons capacity in place after 12/31/78.
- Service stations with < 10,000 gal/month (120,000 gal/year) throughput.

STAGE I VAPOR RECOVERY
CA DISTRICT RACT RULES

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
Bay Area Air Quality Management District	Regulation 8, Rule 7, Section 111	The rule exempts storage tanks with a capacity of less than 1 cubic meter (260 gallons).	*	Although the Federal CTG provides exemptions for different tank sizes depending upon the purpose and age of the tanks, more facilities are subject to this rule.
	Section 111	Other exemptions: 1. Storage tanks installed before October 1, 1974 at facilities with an annual throughput of less than 60,000 gallons which were not equipped with Phase I vapor recovery as of July 1, 1983.	*	These exemptions are not specified in the Federal CTG. This is an issue of applicability.

* This is an applicability issue.

STAGE I VAPOR RECOVERY
CA DISTRICT RACT RULES
(Continued)

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
Bay Area AQMD (Concluded)	Section 111 (Concluded)	2. Storage tanks used primarily for the fueling of implements of husbandry, provided such tanks are equipped with a submerged fill pipe.		
South Coast Air Quality Management District	Regulation IV Rule 461 Section c.1	The rule applies to any storage tank with a capacity of 950 liters (251 gallons) or more.	*	The South Coast regulation has a lower cutoff level than the Federal CTG.
	Section c.1.D	The hatch on any tank truck, trailer, or railroad tank car shall not be opened for more than 3 minutes for each visual inspection, provided that: a. transfer or pumping has been stopped for at least 3 minutes prior to opening; and b. the hatch is closed before transfer or pumping is resumed.	**	These additional requirements are not specified in the Federal CTG.

* This is an applicability issue.

** This provision of the District's regulation involves work practices that will result in emission reductions.

STAGE I VAPOR RECOVERY
CA DISTRICT RACT RULES
(Concluded)

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
South Coast AQMD (Concluded)	Section c.1.F	The South Coast regulation contains specific requirements for operating and maintaining equipment subject to the rule.	**	These requirements are not specified in the Federal CTG.
	Section d	The provisions of this rule shall not apply to the transfer of gasoline: 1. into or from any stationary tank if 75% of its monthly throughput is used for the fueling of implements of husbandry, provided such a tank is equipped with a submerged fill tube. 2. into or from any stationary tank used exclusively for fueling agricultural wind machines.	*	These exemptions are not provided in the Federal CTG.

* This is an issue of applicability.

** Although this provision of the District's regulation may not necessarily result in a quantifiable reduction in emissions, it does enhance the pollution prevention aspects of the rule.

SOLVENT METAL CLEANING
FEDERAL RACT EMISSION LIMIT AS DEFINED BY THE CTG

1) CONTROL SYSTEMS FOR COLD CLEANING

Control System A

Control Equipment:
1. Cover.
2. Facility for draining cleaned parts.
3. Permanent, conspicuous label, summarizing the operating requirements.

Operating Requirements:

1. Do not dispose of waste solvent or transfer it to another party, such that greater than 20 percent of the waste (by mass) can evaporate into the atmosphere.* Store waste solvent only in covered containers.

2. Close parts cleaner (degreaser) cover whenever not handling parts in the cleaner.

3. Drain cleaned parts for at least 15 seconds or until dripping ceases.

Control System B

Control Equipment:

1. Cover: Same as in System A, except if (a) solvent volatility is greater than 2 kPa (15 mm Hg or 0.3 psi) measured at 38°C (100°F),** (b) solvent is agitated, or (c) solvent is heated, then the cover must be designed so that it can be easily operated with one hand. (Covers for larger parts cleaners (degreasers) may require mechanical assistance, by spring loading, counterweighting, or powered systems.)

2. Drainage facility: Same as in System A, except that if solvent volatility is greater than about 4.3 kPa (32 mm Hg or 0.6 psi) measured at 38°C (100°F), then the drainage facility must be internal, so that parts are enclosed under the cover while draining. The drainage facility may be external for applications where an internal type cannot fit into the cleaning system.

3. Label: Same as in System A.

4. If used, the solvent spray must be a solid, fluid stream (not a fine, atomized, or shower type spray) at a pressure that does not cause excessive splashing.

5. Major control device for highly volatile solvents: If the solvent volatility is > 4.3 kPa (33 mm Hg or 0.6 psi) measured at 38°C (100°F), or if solvent is heated above 50°C (120°F), then one of the following control devices must be used:
   a. Freeboard that gives a freeboard ratio*** ≥ 0.7,
   b. Water cover (solvent must be insoluble in and heavier than water), or
   c. Other systems of equivalent control, such as a refrigerated chiller or carbon adsorber.

Operating Requirements:

Same as in System A.

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* Water and solid waste regulations must also be complied with.
** Generally, solvents consisting primarily of mineral spirits (Stoddard) have volatilities < 2 kPa.
*** Freeboard ratio is defined as the freeboard height divided by the width of the parts cleaner (degreaser).

2) COMPLETE CONTROL SYSTEMS FOR OPEN TOP VAPOR PARTS CLEANERS (DEGREASERS)

<u>Control System A</u>

Control Equipment:

1. Cover that can be opened and closed easily without disturbing the vapor zone.

Operating Requirements:

1. Keep cover closed at all times except when processing work loads through the parts cleaner (degreaser).

SOLVENT METAL CLEANING
FEDERAL RACT EMISSION LIMIT AS DEFINED BY THE CTG
(Continued)

2. Minimize solvent carry-out by the following measures:
   a. Rack parts to allow full drainage
   b. Move parts in and out of the parts cleaner (degreaser) at less than 3.3 m/sec (11 ft/min).
   c. Degrease the work load in the vapor zone at least 30 sec. or until condensation ceases.
   d. Tip out any pools of solvent on the cleaned parts before removal.
   e. Allow parts to dry within the parts cleaner (degreaser) for at least 15 sec. or until visually dry.
3. Do not degrease porous or absorbent materials, such as cloth, leather, wood, or rope.
4. Work loads should not occupy more than half of the parts cleaner's open top area.
5. The vapor level should not drop more than 10 cm (4 in) when the work load enters the vapor zone.
6. Never spray above the vapor level.
7. Repair solvent leaks immediately, or shut down the parts cleaner.
8. Do not dispose of waste solvent or transfer it to another party such that greater than 20% of the waste (by mass) will evaporate into the atmosphere. Store waste solvent only in closed containers.
9. Exhaust ventilation should not exceed 20 m^3/min per m^2 (65 cfm per ft^2) of parts cleaner's open area, unless necessary to meet OSHA requirements. Ventilation fans should not be used near the parts cleaner opening.
10. Water should not be visually detectable in solvent exiting the water separator.

Control System B

Control Equipment:

1. Cover (same as for system A).

2. Safety switches
   a. Condenser flow switch and thermostat - (shuts off sump heat if condenser coolant is either not circulating or too warm).
   b. Spray safety switch - (shuts off spray pump if the vapor level drops excessively, about 10 cm (4 in).

3. Major Control Device:

Either:
   a. Freeboard ratio greater than or equal to 0.75, and if the parts cleaner's opening is > 1 m^2 (10 ft^2), the cover must be powered;
   b. Refrigerated chiller;
   c. Enclosed design (cover or door opens only when the dry part is actually entering or exiting the parts cleaner);
   d. Carbon adsorption system, with ventilation $\geq$ 15 m^3/min per m^2 (50 cfm/ft^2) of air/vapor are (when cover is open), and exhausting <25 ppm solvent averaged over one complete adsorption cycle; or
   e. Control system, demonstrated to have control efficiency equivalent to or better than any of the above.

4. Permanent, conspicuous label summarizing operating procedure nos. 1 to 6.

Operating Requirements:

Same as for System A.

3) CONTROL SYSTEMS FOR CONVEYORIZED PARTS CLEANERS (DEGREASERS)

Control System A

Control Equipment: None

Operating Requirements:

1. Exhaust ventilation should not exceed 20 m^3/min per m^2 (65 cfm per ft^2) of parts cleaner's opening, unless necessary to meet OSHA requirements. Work place fans should not be used near the parts cleaner's opening.

2. Minimize carry-out emissions by:
   a. Racking parts for best drainage.
   b. Maintaining vertical speed at < 3.3 m/min (11 ft/min).

3. Do not dispose of waste solvent or transfer it to another party such that greater than 20% of the waste (by mass) can evaporate into the atmosphere. Store waste solvent only in covered containers.

4. Repair solvent leaks immediately, or shut down the parts cleaner.

5. Water should not be visually detectable in the solvent exiting the water separator.

SOLVENT METAL CLEANING
FEDERAL RACT EMISSION LIMIT AS DEFINED BY THE CTG
(Continued)

Control System B

Control Equipment:

1. Major control devices; the parts cleaner must be controlled by either:
   a. Refrigerated chiller;
   b. Carbon adsorption system, with ventilation $\geq$ 15 m^2/min per m^2 (50 cfm/ft^2) of air/vapor area (when down-time covers are open), and exhausting <25 ppm of solvent by volume averaged over a complete adsorption cycle; or
   c. System demonstrated to have control efficiency equivalent to or better than either of the above.

2. Either a drying tunnel, or another means such as rotating (tumbling) basket, sufficient to prevent cleaned parts from carrying out solvent liquid or vapor.

3. Safety switches
   a. Condenser flow switch and thermostat - (shuts off sump heat if coolant is either not circulating or too warm).
   b. Spray safety switch - (shuts off spray pump or conveyor if the vapor level drops excessively, e.g. > 10 cm (4 in.)).
   c. Vapor level control thermostat - (shuts off sump heat when vapor level rises too high).

4. Minimized openings: Entrances and exits should silhouette work loads so that the average clearance (between parts and the edge of the parts cleaner's opening) is either <10 cm (4 in.) or <10% of the width of the opening.

5. Down-time covers: Covers should be provided for closing off the entrance and exit during shutdown hours.

SOLVENT METAL CLEANING
FEDERAL RACT EMISSION LIMIT AS DEFINED BY THE CTG
(Concluded)

Operating Requirements:

1. to 5. Same as for System A.

6. Down-time cover must be placed over entrances and exits of conveyorized parts cleaners immediately after the conveyor and exhaust are shut down and removed just before they are started up.

Exemptions:

1. Conveyorized parts cleaners with less than 2.0 m^2 of air/vapor interface should be exempted from the requirement for a major control device.

2. Open top parts cleaners with less than 1 m^2 of open area should be exempted from having to operate with either a refrigerated chiller or a carbon adsorber.

SOLVENT METAL CLEANING
CA DISTRICT RACT RULES

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
Bay Area Air Quality Management District	Regulation 8, Rule 16, Section 301.4	Vapor solvent cleaners shall not operate without one of the following control devices: - A freeboard chiller where the chilled air blanket temperature measured at the coldest point on the vertical axis in the center of the solvent cleaner is no greater than 30% of the initial boiling point of the solvent used or 40°F; - An approved emission control device with a control efficiency of 90% or more on a mass basis.	X	The Federal CTG states that the recommended control methods can reduce VOC emissions by 25 to 60%, depending on the type of cleaner and controls installed. The Bay Area, on the other hand, requires a much higher control efficiency than those stated in the CTG. The Bay Area also gives detailed specifications for the freeboard chiller that are not provided in the CTG.

SOLVENT METAL CLEANING
CA DISTRICT RACT RULES
(Continued)

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
Bay Area AQMD (Continued)	302.5	Conveyorized solvent cleaners shall not operate without one of the following control devices: - A freeboard chiller where the chilled air blanket temperature measured at the coldest point on the vertical axis in the center of the solvent cleaner is no greater than 30% of the initial boiling point of the solvent used or 40°F; - An approved emission control device with a control efficiency of 90% or more on a mass basis.	X	See comments above under Section 301.4.

SOLVENT METAL CLEANING
CA DISTRICT RACT RULES
(Continued)

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
Bay Area AQMD (Continued)	Section 303.2	Cold cleaner operating requirements: - solvent agitation shall be accomplished only by pump recirculation or by means of a mixer. Air agitation shall not be used.	X	The Federal CTG allows agitation with compressed air. The Bay Area specifically prohibits air agitation.
	Section 303.4	Cold cleaners shall not operate without one of the following control devices: - A freeboard ratio greater than or equal to 0.75 where the maximum solvent reservoir capacity is clearly marked by a suitable mechanical or physical means. - A water cover, provided the solvent is insoluble in and heavier than water.	X	Freeboard ratio is defined as the ratio of freeboard height to cleaner width. Freeboard height is the distance from the solvent to the top edge of the cold cleaner. Therefore, the larger the ratio, the less the emissions. The Federal CTG specification for freeboard ratio is lower than in the Bay Area regulation.

SOLVENT METAL CLEANING
CA DISTRICT RACT RULES
(Continued)

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
Bay Area AQMD (Continued)	Section 303.4 (Concluded)	- A freeboard chiller where the chilled air blanket temperature measured at the coldest point on the vertical axis in the center of the solvent cleaner is no greater than 30% of the initial boiling point of the solvent used or 40°F; - An approved emission control device with a control efficiency of 90% or more on a mass basis.	X	In addition, the Federal CTG does not provide detailed specifications for a freeboard chiller and requires a lower control efficiency than the Bay Area. Overall, the Bay Area regulation is more stringent than the CTG.

SOLVENT METAL CLEANING
CA DISTRICT RACT RULES
(Continued)

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
Bay Area AQMD (Concluded)	Section 301.1, subsection 1.4	General operating requirements for vapor solvent cleaners, conveyorized solvent cleaners, and cold cleaners: Waste solvent residues treated prior to final disposal at an appropriate waste disposal facility shall not contain more than 10% solvent by volume and shall be stored in covered containers.	X	The CTG does not allow waste solvent to be disposed of or transferred to another party, such that greater than 20% of the waste (by mass) can evaporate into the atmosphere.

SOLVENT METAL CLEANING
CA DISTRICT RACT RULES
(Continued)

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
South Coast Air Quality Management District	Rule 1122, Section c.2.I	Solvent agitation, where necessary, shall be carried out only by pump recirculation, ultrasonics, a mixer, or by air agitation. Air agitation shall be carried out under the following conditions: - The air agitation unit shall be equipped with a gauge and a device that limits air pressure into the cleaner to less than 2 psig; and - the cover must remain closed while the air agitation system is in operation.	**	Although the South Coast regulation allows the same agitation equipment as the Federal CTG, it has several restrictions on the use of air agitation. These restrictions are not specified in the CTG.
	Section d.3	Batch-loaded cold cleaners with a high volatility solvent shall be fitted with a drainage facility inside the cleaner and have a freeboard ratio of at least 0.75.	X	The South Coast regulation requires a higher freeboard ratio than the Federal CTG (0.7).

** Although this provision of the District's regulation may not necessarily result in a quantifiable reduction in emissions, it does enhance the pollution prevention aspects of the rule.

SOLVENT METAL CLEANING
CA DISTRICT RACT RULES
(Continued)

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
South Coast AQMD (Continued)	Section e.6	Specific operating requirements for open top vapor cleaners: - when equipped with a lip exhaust system, the exhaust fan shall be off whenever the cleaner is covered; - if the inside length or width of the cleaner is equal to or greater than 10 ft, the workload area may exceed half of the cleaner's open top area provided the hoist speed, while lowering and raising parts, does not exceed 1.7 m/min (5.5 ft/min); - at startup, the refrigerated condenser and freeboard chiller shall be turned on either simultaneously or before the sump heater is turned on. At shutdown, the pump heater shall be turned off, either heater	**	These operating requirements are not stated in the Federal CTG.

** Although this provision of the District's regulation may not necessarily result in a quantifiable reduction in emissions, it does enhance the pollution prevention aspects of the rule.

SOLVENT METAL CLEANING
CA DISTRICT RACT RULES
(Continued)

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
South Coast AQMD (Continued)		simultaneously or before the condenser water and refrigerated chiller are turned off. The (hot) cleaner must be covered whenever the primary condenser is turned off; - the workload shall be degreased in the vapor zone until condensation ceases.		
	Section f.6	Conveyorized cleaners that have air-vapor or air-solvent interface surface areas of more than 1 m^2, but less than or equal to 2 m^2, shall have either: - refrigerated freeboard chillers, designed such that the refrigerant temperature at the cleaner outlet does not exceed 4.4 °C (40°F); or - a carbon adsorption system.	*	The Federal CTG exempts any conveyorized (hot) cleaner with less than 2 m^2 of air-vapor interface from the requirement for a control device.

* This is an issue of applicability.

SOLVENT METAL CLEANING
CA DISTRICT RACT RULES
(Continued)

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
South Coast AQMD (Continued)	Section h	Any person owning or operating a carbon adsorption system, in association with any cleaner covered under this rule, shall meet the following requirements: - the system shall have a hood or enclosure with a delivery system or ductwork designed to collect parts cleaner emissions and to vent them to a carbon adsorption system with a control efficiency of at least 90% in terms of organic input to the bed; - the output of the carbon adsorption system shall not be more than 25 ppm, calculated as carbon.	X	The South Coast regulation provides specific instructions on how the enclosure should be installed. The Federal CTG indicates that carbon adsorption systems controlling open top vapor cleaners and conveyorized non-boiling cleaners can achieve 60 and 65% emission reduction, respectively. In general, the South Coast regulation is more stringent than the CTG.

SOLVENT METAL CLEANING
CA DISTRICT RACT RULES
(Concluded)

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
South Coast AQMD (Concluded)	Section 1	The provisions of this rule shall not apply to: - Cleaning solvents that have a VOC content of 2% or less by volume, based on the total volume of the material as used; - Solvent cleaning activities carried out in batch-loaded cold cleaners with open top surface areas less than 0.1 m^2 and solvent usage less than 1 gal per day; or - Solvent blends that contain less than 10% VOC by volume.	*	These exemptions are not specified in the Federal CTG.

* This is an applicability issue.

SURFACE COATING OF AUTOMOBILES AND LIGHT-DUTY TRUCKS
FEDERAL RACT EMISSION LIMIT AS DEFINED BY THE CTG

Affected Units	Recommended Limitation[a]
Prime application, flashoff area, and oven[b]	0.23 kg VOC/l of coating (1.9 lb VOC/gal of coating) [minus water]
Topcoat application, flashoff area, and oven	0.34 kg VOC/l of coating (2.8 lb VOC/gal of coating) [minus water]
Final repair application, flashoff area, and oven[c]	0.58 kg VOC/l of coating (4.8 lb VOC/gal of coating) [minus water]

[a] The CTG does not mention "exempt" solvents. However, exempt solvents are treated as water according to EPA guidance (Blue Book).
[b] The recommended emission limit is based on use of an electrophoretic system followed by a 25% solids waterborne "surfacer."
[c] The recommended emission limit is based on use of organic-borne enamel with 35% solids.

The Federal CTG provides another alternative to comply with RACT by installation of add-on control devices. Incinerators and carbon adsorbers are the most applicable and preferred devices for reducing VOC emissions. Incineration systems can achieve over 90% reduction efficiency and carbon adsorption system can achieve over 85%.

SURFACE COATING OF AUTOMOBILES AND LIGHT-DUTY TRUCKS
CA DISTRICT RACT RULES

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
Bay Area Air Quality Management District	Regulation 8, Rule 13, Section 302	A person shall not apply to any flexible part or product subject to this rule any coating that has the following VOC content, unless emissions are controlled by use of an abatement device with control efficiency of at least 90%. VOC emission limit for: a) flexible primer is 0.49 kg/l (4.1 lb/gal), excluding water; b) color topcoat is 0.45 kg/l (3.8 lb/gal), excluding water; c) basecoat/clearcoat (combined system) is 0.54 kg/l (4.5 lb/gal), excluding water.	X	This additional requirement is not specified in the Federal CTG and should reduce the emissions resulting from these processes.

SURFACE COATING OF AUTOMOBILES AND LIGHT-DUTY TRUCKS
CA DISTRICT RACT RULES
(Continued)

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
Bay Area AQMD (Concluded)	Regulation 8, Rule 13, Section 308	The VOC emission limit for off-line coatings is 0.34 kg/l (2.8 lb/gal) of coating as applied, excluding water, unless the emissions are controlled by use of an air pollution abatement device with a control efficiency of at least 90%.	X	This additional requirement is not specified in the Federal CTG and will reduce air pollution resulting from such processes.
South Coast Air Quality Management District	Rule 1115, Section b.1.A	The VOC content of electrophoretic applied primer must meet a standard of 0.145 kg/l (1.2 lb/gal), excluding water.	X	The District emission limit is lower than that for primers stated in the Federal CTG (0.23 kg VOC/l or 1.9 lb VOC/gal coating).

SURFACE COATING OF AUTOMOBILES AND LIGHT-DUTY TRUCKS
CA DISTRICT RACT RULES
(Continued)

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
South Coast AQMD (Continued)	Rule 1115, Section b.1.A	The District specifies emission standards for primer surfacer (air atomized and manual spray), spray primer (air atomized and automatic spray), basecoat (air atomized spray), and clearcoat rigid coating by manual electrostatic method.	X	This requirement is not specified in the Federal CTG.
	Section a	The District specifies certain transfer efficiencies for different methods of coating application.	X	The EPA "Blue Book" sets a baseline of 60% to determine final compliance. The guidance also indicates that, in most cases, use of 30% transfer efficiency (TE) as baseline for auto surfacer and topcoat waterborne equivalence should be accepted. The District specified TEs are higher than the CTG.

SURFACE COATING OF AUTOMOBILES AND LIGHT-DUTY TRUCKS
CA DISTRICT RACT RULES
(Concluded)

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
South Coast AQMD (Concluded)	Section d	Exemptions: a. Other coating operations not associated with applying body primer and topcoats to exterior sheet metal and body are exempt from the requirements of this regulation. b. Wheel topcoat applications, anti-rust coatings, trunk coatings, interior coatings, flexible coatings, sealers and deadeners, plastic parts, and accent and stripe coatings are exempt from the requirements of this regulation. c. Any house car assembly line shall not be required to comply with this rule.	*	These exemptions are not provided in the Federal CTG.

* This is an applicability issue.

SURFACE COATING OF CANS
FEDERAL RACT EMISSION LIMIT AS DEFINED BY THE CTG

Affected Units	Recommended Limitation[a]
Sheet basecoat and over-varnish; two-piece can exterior	0.34 kg VOC/l of coating (2.8 lb VOC/gal of coating) [minus water]
Two and three-piece can interior body spray, two-piece can exterior end	0.51 kg VOC/l of coating (4.2 lb VOC/gal of coating) [minus water]
Three-piece can side-seam spray	0.66 kg VOC/l of coating (5.5 lb VOC/gal of coating) [minus water]
End sealing compound	0.44 kg VOC/l of coating (3.7 lb VOC/gal of coating) [minus water]

[a]The CTG does not mention "exempt" solvents. However, exempt solvents are treated as water according to EPA guidance (Blue Book).

For the few industries where stack gas treatment is a more feasible option, it may be appropriate to state emission limits in terms of control efficiency across control devices, such as incinerators or carbon adsorbers. Catalytic and non-catalytic incinerators and carbon adsorbers are expected to achieve 90% reduction.

SURFACE COATING OF CANS
CA DISTRICT RACT RULES

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
Bay Area Air Quality Management District	Regulation 8, Rule 11, Section 301	Can Coating - Sheet basecoat: 0.225 kg VOC/l (1.9 lb VOC/gal) of coating, excluding water.	X	The District emission limits are lower than the limits stated in the Federal CTG.
		- Two-piece can exterior basecoat and overvarnish: 0.25 kg VOC/l (2.1 lb VOC/gal) of coating, excluding water.	X	The District emission limits are lower than the limits stated in the Federal CTG.
South Coast Air Quality Management District	Regulation XI, Rule 1125, Section b.1	Can Coating - Three-piece base-coat: 0.225 kg VOC/l (1.9 lb VOC/gal) of coating, excluding water.	X	The District emission limit for three-piece basecoat is lower than the limit stated in the Federal CTG.
		- Two-piece exterior basecoat and overvarnish: 0.25 kg VOC/l (2.1 lb VOC/gal) of coating, excluding water.	X	The District emission limit for two-piece exterior basecoat and overvarnish is lower than the limit stated in the Federal CTG.

SURFACE COATING OF CANS
CA DISTRICT RACT RULES
(Continued)

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
South Coast AQMD (Continued)	Rule 1125, Section b.1	Can Coating -Two-piece interior body spray: 0.44 kg VOC/l (3.7 lb VOC/gal) of coating, excluding water.	X	The District emission limit is lower than the limit stated in the Federal CTG.
		End Sealing Compound for Non-Food Cans: 0 kg VOC/l, excluding water (after March 1, 1991).	X	The Federal CTG sets an emission limit for end sealing compounds. However, it does not distinguish between food and non-food cans as the District does. Therefore, the CTG emission limit is applicable to both food and non-food cans.
		The District gives emission limits for a) drums, pails, and lids; and b) necker lubricants.		The Federal CTG does not specify these limits.
	Section b.3	An approved air pollution control device may be used to comply with the VOC emission limit for cans by	X	The Federal CTG specifies that control devices are expected to achieve 90% reduction.

SURFACE COATING OF CANS
CA DISTRICT RACT RULES
(Concluded)

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
South Coast AQMD (Concluded)		reducing emissions by 95% by mass and collecting at least 90% by mass of emissions generated by can coating operations.	X	However, it does not specify the required capture efficiency. The capture efficiency can be lower than that required by the South Coast. Therefore, the South Coast regulation is considered more stringent than the Federal CTG.
	Section h.1	The provisions of this rule shall not apply to the spray coating of 1 gal per day or less of coatings at a single facility.	*	The Federal CTG does not specify any exemptions.

* This is an issue of applicability.

SURFACE COATING OF FABRICS
FEDERAL RACT EMISSION LIMIT AS DEFINED BY THE CTG

Affected Units	Recommended Limitation[a]
Fabric Coating Line	0.35 kg VOC/1 of coating (2.9 lb VOC/gal of coating) [minus water]
Vinyl Coating Line	0.45 kg VOC/1 of coating (3.8 lb VOC/gal of coating) [minus water]

[a] The CTG does not mention "exempt" solvents. However, exempt solvents are treated as water according to EPA guidance (Blue Book).

The above limitations reflect use of an add-on control device where 90% of the VOC is captured and delivered to the control device, which also must have a reduction efficiency of 90%.

SURFACE COATING OF FABRICS
CA DISTRICT RACT RULES

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
Bay Area Air Quality Management District	Regulation 8, Rule 12, Section 301	Emission limit for a fabric coating line: 0.265 kg VOC/l (2.2 lb VOC/gal) of coating as applied, excluding water.	X	The District emission limit for a fabric coating line is lower than the Federal CTG.
	Section 110	The rule exempts any fabric coating line that emits less than 6.5 kg (14.3 lb) of VOC per day.	*	The Federal CTG does not specify any cutoff points.
South Coast Air Quality Management District	Regulation XI, Rule 1128, Section c.2.A	Emission limit for a fabric coating process; 0.265 kg VOC/l of coating, less water and exempt compounds, as applied, and applied with a minimum transfer efficiency of 95%.	X	The South Coast regulation has a more stringent emission limit and requires a higher transfer efficiency than the Federal CTG. (The Blue Book sets the baseline transfer efficiency at 60%.)

* Relative stringency cannot be determined.

SURFACE COATING OF FABRICS
CA DISTRICT RACT RULES
(Continued)

STATE	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
South Coast AQMD (Continued)	Section c.3	Plastisols applied to a fabric must contain less than 0.20 kg of VOC/l of coating, less water and exempt compounds, as applied.	X	The Federal CTG does not set a specific emission limit. The limit for plastisol would therefore be 0.35 kg VOC/l of coating, less water and exempt compounds.
	Section c.5	Wash primer applied to a fabric must contain less than 0.265 kg VOC/l of material used.	X	Since a wash primer is used in fabric coating operations, the emission limit would also be 0.35 kg VOC/l of coating, less water and exempt compounds.

SURFACE COATING OF FABRICS
CA DISTRICT RACT RULES
(Continued)

STATE	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
South Coast AQMD (Continued)	Section c.8	A person shall not: a) use VOC-containing materials for the cleaning of application equipment used in fabric coating operations, excluding hand wiping, unless 85% of the VOCs are collected and properly disposed of, or the cleaning materials contain 15% or less by mass of VOC; b) use other than closed containers for disposal of cloth or paper used for surface preparation, cleaning, or the removal of uncured coatings that are impregnated with solvent containing VOC;	**	These operating requirements are not specified in the Federal CTG.

** Although this provision of the District's regulation may not necessarily result in a quantifiable reduction in emissions, it does enhance the pollution prevention aspects of the rule.

SURFACE COATING OF FABRICS
CA DISTRICT RACT RULES
(Concluded)

STATE	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
South Coast AQMD (Concluded)		c) use other than closed containers for disposal of cloth or paper used in stripping cured coating, that are impregnated with solvent containing VOC.		
	Section d	A person may comply with the provisions by using an emission control system for reducing emissions consisting of collection and control devices that are approved, in writing, by the Executive Officer and operated subject to the following provisions: a) collect at least 90%, by mass. b) reduce emissions from an emission collection system by at least 95%, by mass, or the output of the control device is 50 ppm, by volume, calculated as carbon.	X	The Federal CTG requires lower emission reduction (90%) than the South Coast. Therefore, the South Coast regulation is considered more stringent than the CTG.

SURFACE COATING OF LARGE APPLIANCES
FEDERAL RACT EMISSION LIMIT AS DEFINED BY THE CTG

Affected Units	Recommended Limitation[a]
Prime, single, or topcoat application area, flashoff area, and oven	0.34 kg VOC/1 of coating (2.8 lb VOC/gal of coating) [minus water]

The Federal CTG states that the emission limit is based on use of low organic solvent coatings containing at least 62 volume percent solids or any other waterborne equivalent. An equivalent reduction can also be achieved by use of add-on control devices such as incinerators or carbon adsorbers which would result in approximately 80% (by mass) reduction in VOC emissions over conventional organic-borne coatings which contain about 25 volume percent solids.

[a]The CTG does not mention "exempt" solvents. However, exempt solvents are treated as water according to EPA guidance (Blue Book).

SURFACE COATING OF LARGE APPLIANCES
CA DISTRICT RACT RULES

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
Bay Area Air Quality Management District	Regulation 8, Rule 14, Section 302	Emission limit for baked coatings: 0.275 kg VOC/l (2.3 lb VOC/gal) of coating as applied, excluding water. An equivalent reduction can also be achieved using air pollution abatement equipment with an efficiency of at least 85 percent.	X	The District regulation requires a lower emission limit for baked coatings and requires a higher abatement control efficiency than specified in the Federal CTG.

SURFACE COATING OF METAL COILS
FEDERAL RACT EMISSION LIMIT AS DEFINED BY THE CTG

Affected Units	Recommended Limitation[a]
Prime and topcoat or single coat operation	0.31 kg VOC/l of coating (2.6 lb VOC/gal of coating) [minus water]

[a]The CTG does not mention "exempt" solvents. However, exempt solvents are treated as water according to EPA guidance (Blue Book).

Incinerators (thermal and catalytic), and waterborne and high-solids coatings are feasible control options that reduce organic vapor emissions from coil coating lines. A reduction of over 90% in organic emissions from a coil coating line is achievable using either catalytic or thermal incineration. A reduction of 70 to 95% in organic emissions is achievable using product substitution.

SURFACE COATING OF METAL COILS
CA DISTRICT RACT RULES

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
Bay Area Air Quality Management District	Regulation 8, Rule 11, Section 303	The emission limit for any coil coating operation is 0.20 kg VOC/l (1.7 lb VOC/gal) of coating, excluding water.	X	The District regulation is more stringent than the Federal CTG since its emission limit is lower than the one in the CTG.
South Coast Air Quality Area Management District	Regulation XI, Rule 1125, Section b.2	The District emission limit for coil coating is .20 kg VOC/l (1.7 lb VOC/gal) of coating, less water and exempt compounds.	X	The District emission limit is lower than the limit stated in the Federal CTG.
	Section b.3	An approved air pollution control device may be used that reduces VOC emissions by 95% by mass and collects at least 90% by mass of emissions generated by coil coating operations.	X	The Federal CTG specifies that 90 to 98% VOC emission reduction can be achieved using thermal incineration, 90% using catalytic incineration, and 70 to 95% using product substitution. The CTG recommends these devices for achieving emission reductions,

SURFACE COATING OF METAL COILS
CA DISTRICT RACT RULES
(Concluded)

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
South Coast AQMD (Concluded)				but does not specify a required collection efficiency. Therefore, the District limits, considering both collection and reduction efficiency, are considered more stringent.
	Section b.5	A person or facility shall not coat unless the coating is applied with properly operating equipment of one of the following types: electrostatic application, flow coat, roll coat, dip coat, high-volume, low pressure (HVLP) spray, or hand application methods or other coating application methods demonstrated to the Executive Officer to be capable of achieving at least 65% transfer efficiency.		The EPA "Blue Book" clarifies that a 60% default baseline TE is acceptable. The South Coast regulation requires a higher transfer efficiency than specified in EPA guidance.

SURFACE COATING OF METAL FURNITURE

FEDERAL RACT EMISSION LIMIT AS DEFINED BY THE CTG

Affected Units	Recommended limitation[a]
Metal Furniture Coating Line	0.36 kg VOC/l of coating (3 lb VOC/gal coating) [minus water]

[a] The CTG does not mention "exempt" solvents. However, exempt solvents are treated as water according to EPA guidance (Blue Book).

This emission limit can also be achieved by using waterborne coatings and is approximately equivalent (on a solids applied basis) to use of an add-on control device that collects or destroys about 80% of the solvent from a conventional high organic solvent coating.

SURFACE COATING OF METAL FURNITURE
CA DISTRICT RACT RULES

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
Bay Area Air Quality Management District	Regulation 8, Rule 14, Section 302	VOC emission limit for: a) Baked coatings is 0.275 kg/l (2.3 lb/gal) of coating as applied, excluding water. b) Air-dried coatings is 0.34 kg/l (2.8 lb/gal) of coating as applied, excluding water.	X	The District's VOC emission limit is lower than the Federal CTG.
		Equivalent emission reduction can also be achieved by abatement equipment with a control efficiency of at least 85%.	X	The Bay Area requires a slightly higher control efficiency than the Federal CTG (85% vs 81%).
	Section 304	The District requires that the method used to apply a coating have a transfer efficiency (TE) of 65% or greater.	X	The EPA "Blue Book" clarifies that a 60% default baseline TE is acceptable.

SURFACE COATING FOR INSULATION OF MAGNET WIRE
FEDERAL RACT EMISSION LIMIT AS DEFINED BY THE CTG

Affected Units	Recommended Limitation[a]
Wire Coating Oven	0.2 kg VOC/l of coating (1.7 lb VOC/gal of coating) [minus water]

The Federal CTG states that the emission limit can be met with application of high-solids coatings having greater than 77 volume percent of solids, powder coatings, and hot melt coatings. The emission limit can also be met with a waterborne coating that contains 29 volume percent solids, 8 volume percent organic solvent, and 63 volume percent water. The limit can also be met by a use of conventional coating, provided that 90% emission reduction by incineration is achieved.

[a] The CTG does not mention "exempt" solvents.

SURFACE COATING FOR INSULATION OF MAGNET WIRE
CA DISTRICT RACT RULES

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
South Coast Air Quality Management District	Regulation XI, Rule 1126, Section	Exemptions: 1. Magnet wire coating operations (not using aerosol containers) that emit less than 1 kg (2.2 lb) per hour, but not more than 5 kg (11 lb) per day of VOCs. 2. Coating of electrical machinery and equipment subassemblies, such as motor housings, is exempt from the standard. 3. Aerosol container applications.	*	The Federal CTG does not provide any exemptions.

* This is an applicability issue.

SURFACE COATING OF PAPER
FEDERAL RACT EMISSION LIMIT AS DEFINED BY THE CTG

Affected Units	Recommended Limitation[a]
Paper Coating Line	0.35 kg VOC/1 of coating (2.9 lb VOC/gal of coating) [minus water]

[a] The CTG does not mention "exempt" solvents. However, exempt solvents are treated as water according to EPA guidance (Blue Book).

This limit can be achieved in all cases using incinerators and in many cases with coatings that contain low fractions of organic solvents. Both catalytic and thermal incinerators can destroy 95% of the organic emissions introduced to them. Since the effectiveness of the capture and containment system varies from plant to plant, the overall reduction in the coating plant emissions may be less than 90%.

SURFACE COATING OF PAPER
CA DISTRICT RACT RULES

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
Bay Area Air Quality Management District	Regulation 8, Rule 12, Section 301	Emission limit for a paper coating line: 0.265 kg VOC/l (2.2 lb VOC/gallon) of coating as applied, excluding water.	X	The District emission limit for a paper coating line is lower than the Federal CTG.
	Section 110	The rule exempts any paper coating line that emits less than 6.5 kg (14.3 lb) of VOC per day.	*	The Federal CTG does not specify any exemptions.
South Coast Air Quality Management District	Regulation XI, Rule 1128, Section c.2.A	Emission limit for a paper coating process: 0.265 kg VOC/l of coating, less water and exempt compounds, as applied, and applied with a minimum transfer efficiency of 95%.	X	The South Coast regulation has a more stringent emission limit and requires a higher transfer efficiency than the Federal CTG. (The EPA "Blue Book" sets the baseline transfer efficiency at 60%.)

* This is an applicability issue.

SURFACE COATING OF PAPER
CA DISTRICT RACT RULES
(Continued)

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
South Coast AQMD (Continued)	Section c.3	Plastisols applied to paper must contain less than 20 grams of VOC/l of coating, less water and exempt compounds, as applied.	X	The Federal CTG does not set an emission limit for plastisol. However, since it is used in paper coating, the CTG emission limit of 0.35 kg/l of coating (minus water) would apply.
	Section c.5	Wash primer applied to paper must contain less than 0.265 kg VOC/l of material used.	X	The CTG emission limit of 0.35 kg/l of coating (minus water) would apply for wash primers.

SURFACE COATING OF PAPER
CA DISTRICT RACT RULES
(Continued)

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
South Coast AQMD (Continued)	Section c.8	A person shall not: a) use VOC-containing materials for the cleaning of application equipment used in paper coating operations, excluding hand wiping, unless 85% of the VOCs are collected and properly disposed of; or the materials used for cleaning contains 15% or less by mass of VOC. b) use other than closed containers for disposal of cloth or paper used for surface preparation, cleaning, and the removal of uncured coatings that are impregnated with solvent containing VOC.	**	These operating requirements are not provided in the Federal CTG. These requirements will result in reducing VOC emissions.

** Although this provision of the District's regulation may not necessarily result in a quantifiable reduction in emissions, it does enhance the pollution prevention aspects of the rule.

SURFACE COATING OF PAPER
CA DISTRICT RACT RULES
(Concluded)

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
South Coast AQMD (Concluded)		c) use other than closed containers for disposal of cloth or paper used in stripping cured coatings impregnated with solvent containing VOC.		
	Section d	A person may comply with the provisions by using an emission control system for reducing emissions consisting of collection and control devices which are approved, in writing, by the Executive Officer and operated subject to the following provisions: a) collect at least 90%, by mass. b) reduce emissions from emission collection system by at least 95%, by mass, or the output of the control device is 50 ppm, by volume, calculated as carbon.	X	The Federal CTG specifies a lower emission reduction (90%) than the South Coast. Therefore, the South Coast regulation is more stringent than the CTG.

EXTERNAL FLOATING ROOF PETROLEUM TANKS
FEDERAL RACT EMISSION LIMIT AS DEFINED BY THE CTG

This CTG is applicable to external floating roof tanks (EFRTs) larger than 150,000 liters (40,000 gal) storing petroleum liquids with a true vapor pressure (TVP) greater than 10.5 kPa (1.5 psi).

A continuous (rim mounted) secondary seal or equivalent closure must be installed on all affected storage tanks, plus certain inspection and recordkeeping requirements, if the tank is:

a) a welded EFRT, equipped with a primary metallic shoe or liquid-mounted seals, and the TVP of the stored liquid is 27.6 kPa (4 psi) or greater;

b) a riveted EFRT, equipped with a primary metallic shoe or liquid-mounted seal and the TVP of the stored liquid is 10.5 kPa (1.5 psi) or greater; or

c) a welded or riveted EFRT, equipped with primary vapor-mounted seal and the TVP of the stored liquid is 10.5 kPa (1.5 psi) or greater.

Exemptions:

1) EFRT with storage capacities less than 1,600,000 liters (420,000 gal) used to store produced crude oil and condensate prior to custody transfer;

2) fixed-roof tanks with or without internal floating roofs, or small production tanks;

3) welded tanks with a primary metallic-type shoe seal which has a secondary seal from the top of the shoe seal to the tank wall;

4) external floating roof tanks storing waxy, heavy pour crudes;

EXTERNAL FLOATING ROOF PETROLEUM TANKS
FEDERAL RACT EMISSION LIMIT AS DEFINED BY THE CTG
(Concluded)

Exemptions: (Concluded)

5) petroleum liquid storage vessels:

   a) containing petroleum liquid with a TVP less than 10.5 kPa (1.5 psia), and

   b) containing petroleum liquid with a TVP less than 27.6 kPa (4.0 psia) that are of welded construction and presently possess a metallic-type shoe seal, a liquid-mounted or liquid-filled type seal, or other approved closure device of demonstrated equivalence; and

6) horizontal underground storage tanks storing JP-4 jet fuel.

The seal closure devices shall meet the following requirements:

a. there shall be no visible holes, tears, or other openings in the seals or seal fabric.
b. the seal(s) must be intact and uniformly in place around the circumference of the floating roof between the floating roof and the tank wall.
c. the area of gaps exceeding 0.32 cm (1/8 inch) in width between the secondary seal and the tank wall shall not exceed 6.5 cm^2 per 0.3 m of tank diameter (1.0 in^2 per foot of tank diameter). tank tank

EXTERNAL FLOATING ROOF PETROLEUM TANKS
CA DISTRICT RACT RULES

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
Bay Area Air Quality Management District	Regulation 8, Rule 5, Section 304	A person shall not store organic liquid in any storage tank with a capacity greater than 75,000 l (19,813 gal) unless such tank meets the following conditions: 1. Storage tanks with a capacity greater than 75,000 l (19,813 gal) but less than 150,000 l (39,626 gal) storing an organic liquid with a true vapor pressure (TVP) greater than 1.5 psia must meet the requirement in Section 311. 2. Storage tanks with a capacity of 150,000 l (39,626 gal) or greater storing an organic liquid with a TVP greater than 0.5 psia must meet the requirements of Section 311.	X*	The Bay Area regulation has a lower cutoff level than the Federal CTG. Therefore, more tanks will be subject to the rule.

* More sources are subject to the rule.

EXTERNAL FLOATING ROOF PETROLEUM TANKS
CA DISTRICT RACT RULES
(Continued)

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
Bay Area AQMD (Continued)	Section 311.3	An approved emission control system that collects and processes all organic vapors and gases and has an abatement efficiency of at least 95% by mass.	X	The Federal CTG does not specify a required control efficiency. However, it is assumed that this CTG would have been worded in a similar way to the CTG for fixed-roof tanks.
	Section 320	Floating roofs must meet certain fitting requirements.	**	These requirements are not specified in the Federal CTG.
	Section 321	The Bay Area provides additional operating conditions for tanks equipped with primary seals (metallic shoe type and resilient-toroid seals).	**	The Federal CTG does not specify any operating conditions.

** Although this provision of the District's regulation may not necessarily result in a quantifiable reduction in emissions, it does enhance the pollution prevention aspects of the rule.

EXTERNAL FLOATING ROOF PETROLEUM TANKS
CA DISTRICT RACT RULES
(Continued)

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
Bay Area AQMD (Concluded)	Section 322.5	For welded external floating roofs with seals installed after September 4, 1985, no gap between the tank shell and the secondary seal shall exceed 1.5 mm (0.06 in). The cumulative length of all secondary seal gaps exceeding 0.5 mm (0.02 in) shall not be more than 5% of the circumference of the tank, excluding gaps less than 5 cm from vertical weld seams.	X	The Federal CTG allows a larger seal gap (0.125 in) than the Bay Area rule.

EXTERNAL FLOATING ROOF PETROLEUM TANKS
CA DISTRICT RACT RULES
(Continued)

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
South Coast Air Quality Management District	Regulation IV, Rule 463, Section b.1	No person shall place, store, or hold in any stationary tank, reservoir, or other container of 150,000 l (39,630 gal) or greater capacity, any organic liquid having true vapor pressure of 0.5 psi absolute or greater under actual storage conditions, and in any above ground stationary tank or other above ground container of more than 75,000 l (19,815 gal) but less than 150,000 l (39,630 gal) capacity, any organic liquid having a true vapor pressure of 1.5 psi absolute or greater under actual storage conditions, unless such tank is a pressure tank maintaining working pressures sufficient at all times to prevent organic	X*	The Federal CTG applies to external floating roof tanks larger than 150,000 liters storing petroleum liquids. The South Coast regulation has a lower vapor pressure cutoff level for the same size of tank than the CTG. Therefore, the South Coast regulation is more stringent and it will apply to more tanks than the CTG.

* The rule applies to more sources.

EXTERNAL FLOATING ROOF PETROLEUM TANKS
CA DISTRICT RACT RULES
(Continued)

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
South Coast AQMD (Continued)		vapor loss, or is designed and equipped with one of the following control devices:		
	Section b.1.B.i	For a closure device on a welded tank shell that uses a metallic shoe-type seal as its primary seal: Gaps between the tank shell and the primary seal shall not exceed 3.8 cm for a cumulative length of 10%, 1.3 cm for another 30%, and 0.32 cm for the remaining 60% of the circumference of the tank. No continuous gap greater than 0.32 cm shall exceed 10% of the circumference of the tank.	**	The Federal CTG does not specify any gap requirement for the primary seal.

** Although this provision of the District's regulation may not necessarily result in a quantifiable reduction in emissions, it does enhance the pollution prevention aspects of the rule.

EXTERNAL FLOATING ROOF PETROLEUM TANKS
CA DISTRICT RACT RULES
(Concluded)

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
South Coast AQMD (Concluded)	Section b.1.G	Additional requirements: 1. All openings in the roof except pressure-vacuum valves, which shall be set to within 10% of the maximum allowable working pressure of the roof, shall provide a projection below the liquid surface to prevent belching of liquid and to prevent entrained or formed organic vapor from escaping.	**	These additional requirements are not specified in the Federal CTG.
	Section b.1.H	2. Any emergency roof shall be provided with a slotted membrane fabric cover, or equivalent, that covers at least 90% of the area of the opening.	**	This requirement is not found in the Federal CTG.
	Section b.4.e	No crude oil containing in excess of 70 ppm(m) of hydrogen sulfide shall be stored in a floating roof tank.		This prohibition is not found in the Federal CTG.

** Although this provision of the District's regulation may not necessarily result in a quantifiable reduction in emissions, it does enhance the pollution prevention aspects of the rule.

GRAPHIC ARTS

FEDERAL RACT EMISSION LIMIT AS DEFINED BY THE CTG

The Federal CTG RACT is applicable to packaging rotogravure, publication rotogravure, or flexographic printing. The CTG does not address letterpress printing or offset lithography. The rules apply to any packaging rotogravure, publication rotogravure, or flexographic printing facility whose maximum theoretical emissions of VOC (including solvents used to clean each of these printing presses) without control devices from all printing presses are greater than or equal to 90.7 megagrams (100 tons) per year with design capacity and 8,760 operating hours or maximum production (this cutoff is stated in the "Blue Book"). The Federal CTG does not specify an emission limit for this category. RACT is defined in terms of emission reduction efficiencies by application of add-on control devices or by product substitution. The following are the specifications stated in the Federal CTG:

1. RACT requires installation of the best practicable capture systems to assure that VOC is directed to the control device.
2. Publication rotogravure operations controlled by carbon adsorption systems can achieve an overall reduction efficiency of 75%.
3. Packaging rotogravure presses operations controlled by either adsorption or incineration systems can achieve an overall reduction efficiency of 65%.
4. Flexographic printing operations controlled by incineration systems can achieve an overall reduction efficiency of 60%.
5. Waterborne inks achieving 70 volume percent overall reduction of solvent usage can be considered equivalent to the exhaust treatment systems described above.
6. A waterborne ink whose volatile portion consists of 75 volume percent water and 25 volume percent organic solvent (or a lower VOC content) is considered equivalent to the exhaust treatment systems.
7. It is recommended that inks containing 60% or more non-volatile material be exempt from emission limitations.
8. The "Blue Book" adds an alternative emission limit 0.5 kg VOC/kg solids (0.5 lb VOC/lb solids) on a per-line basis.

GRAPHIC ARTS
CA DISTRICT RACT RULES

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
Bay Area Air Quality Management District	Regulation 8, Rule 20, Section 301.1 Section 301.2	A person shall not operate a publication gravure process unless one or more of the following conditions is satisfied: 1) the process uses inks and coatings that contain less than 0.3 kg VOC/l of product, less water; or 2) emissions of VOC from the printing and drying operation are controlled by an emission control system that meets the requirements of Regulation 2, Rule 1, and which has an overall collection and control efficiency of at least 85% on a mass basis.	X	The District requires higher overall control efficiency than the Federal CTG. The Bay Area equivalent emission limit in terms of mass VOC/mass solids is 0.24 lb VOC/lb solids (see discussion). Therefore, the Bay Area emission limit is more stringent than the one in the CTG.

GRAPHIC ARTS
CA DISTRICT RACT RULES
(Continued)

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
Bay Area AQMD (Concluded)	Regulation 8, Rule 20, Section 302	A person shall not operate a flexographic, gravure, letterpress, or lithographic related printing or coating operation unless the following conditions are met: 1) content limit in terms of VOC per unit of product as applied, less water for ink, coating, adhesives, and web splicing adhesive is 0.3 kg/l (2.5 lb/gal). Effective 1/1/95, the limit for adhesive will be reduced to 1.5 kg/l (1.25 lb/gal). 2) content limit for fountain solution is 15% VOC by mass (effective 4/19/89), 10% VOC by mass (effective 1/1/95), and 8% VOC by mass (effective 1/1/97).	X	The Federal CTG does not provide emission limits for coating adhesive and web splicing adhesive.

GRAPHIC ARTS
CA DISTRICT RACT RULES
(Continued)

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
South Coast Air Quality Management District	Rule 1130, Section b.1	Effective January 1, 1991, a person shall not apply to graphic arts substrates any printing ink, including VOC-containing materials added to the original ink supplied by the manufacturer, that contains total VOC in excess of 0.3 kg/l (2.5 lb/gal) of coating, less water and exempt compounds.	X	Using the procedure in Appendix F, the calculated emission limit is 0.2 lb VOC/lb solids. Therefore, it is more stringent than the Federal CTG.
	Section b.2	Effective January 1, 1991, a person shall not use in any graphic arts operation any fountain solution, including VOC-containing materials added to the original fountain solution supplied by the manufacturer, that contains total VOC in excess of 100 g/l (0.8 lb/gal) of material.	X	This prohibition is not specified in the Federal CTG.

GRAPHIC ARTS
CA DISTRICT RACT RULES
(Continued)

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
South Coast AQMD (Continued)	Section b.3	A person shall not use VOC-containing materials for cleaning purposes unless such material contains 0.2 kg or less of VOC per liter of material or has a composite vapor pressure of 45 mm Hg or less at 20°C.	X	No solvent requirement is specified in the Federal CTG.
	Section b.5	Owners and operators may comply with the provisions by using an approved VOC emission control system consisting of collection and control devices approved by the Executive Officer or his	X	The Federal CTG requires overall reduction efficiencies for packaging rotogravure and flexographic printing of 65 and 60%,

GRAPHIC ARTS
CA DISTRICT RACT RULES
(Concluded)

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
South Coast AQMD (Concluded)		designee and which satisfy the following conditions: - the control device shall reduce emissions from an emission collection system by at least 95%, by mass; - the owner/operator shall demonstrate that the emission collection system achieves at least 70%, by mass, collection of the generated emissions; and - the VOC content of the inks, adhesives, and/or coatings does not exceed 0.5 kg/l, less water and exempt compounds.		respectively. The South Coast regulation requires an overall reduction efficiency of 67%. Therefore, the South Coast regulation is more stringent than the Federal CTG for these two graphic arts operations.

LEAKS FROM PETROLEUM REFINERY EQUIPMENT
RACT EMISSION LIMIT AS DEFINED BY THE CTG

The owner or operator of a petroleum refinery complex shall develop and conduct a VOC monitoring program as defined in the CTG. The recommended monitoring intervals are: annual (pump seals, pipeline valves in liquid service, and process drains); quarterly (compressor seals, pipeline valves in gas service, and pressure relief valves in gas service); weekly (visual inspection of pump seals), and no individual monitoring (pipeline flanges and other connections, and pressure relief valves in liquid service).

Whenever a liquid leak from a pump seal is observed during the visual inspection and whenever a relief valve vents to atmosphere, the operator must immediately monitor the measured VOC concentration. If a leak (greater than 10,000 ppm) is detected, the leak should be repaired within 15 days. The refinery operator should report quarterly leaks that cannot be repaired in 15 days, and arrange for repairs to be made during the next scheduled turnaround or, if unable to bring a component into compliance, apply for a variance on an individual basis.

Three types of monitoring are mentioned; they include individual source monitoring, unit walk-through monitoring, and multiple fixed-point monitoring. The CTG only details individual source monitoring.

LEAKS FROM PETROLEUM REFINERY EQUIPMENT
CA DISTRICT RACT RULES

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
Bay Area Air Quality Management District	Regulation 8, Rule 18, Section 302	Effective January 1, 1993, any valve or connector that leaks in excess of 500 ppm is in violation of this rule unless a leak discovered by the operator has been minimized within 24 hours and repaired within 7 days, or a leak discovered by the APCO has been repaired within 24 hours. Effective January 1, 1997, the standard will be reduced to 100 ppm.	X	The Bay Area definition of a leak is more stringent than the Federal CTG (500 ppm vs 10,000 ppm). The Bay Area also requires a shorter timeframe for repair of leaks.

LEAKS FROM PETROLEUM REFINERY EQUIPMENT
CA DISTRICT RACT RULES
(Continued)

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
Bay Area AQMD (Continued)	Regulation 8, Rule 25, Section 302	Effective January 1, 1993, any pump or compressor that leaks in excess of 1,000 ppm is in violation of this rule unless a leak discovered by the operator has been minimized within 24 hours and repaired within 7 days, or a leak discovered by the APCO has been repaired within 24 hours. Effective January 1, 1997, the standard will be reduced to 500 ppm.	X	The Bay Area definition of a leak is more stringent than the Federal CTG (500 ppm vs 10,000 ppm). The Bay Area also requires leaks to be repaired in a shorter timeframe.

LEAKS FROM PETROLEUM REFINERY EQUIPMENT
CA DISTRICT RACT RULES
(Concluded)

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
Bay Area AQMD (Concluded)	Rule 28, Section 301	A person shall not use a pressure relief valve on any equipment if the concentration of organic compounds, measured 1 cm or less from any such valve exceeds 10,000 ppm (expressed as methane), unless: - the emission is vented to a vapor recovery or disposal system that is at least 95% efficient, or - the pressure relief valve is protected by a rupture disc, or - the static upstream pressure exceeds the setpoint of the pressure relief valve, or - the pressure relief valve leak has been identified by the operator and is minimized within 15 days and repaired at the next scheduled turnaround.	**	The Federal CTG does not specify these requirements.

** Although this provision of the District's regulation may not necessarily result in a quantifiable reduction in emissions, it does enhance the pollution prevention aspects of the rule.

SURFACE COATING OF MISCELLANEOUS METAL PARTS AND PRODUCTS FEDERAL RACT EMISSION LIMIT AS DEFINED BY THE CTG

Coating Category	Recommended Limitation[a]
Air or forced air-dried items	0.42 kg VOC/l coating (3.5 lb/gal) [minus water]
Clear Coat	0.52 kg VOC/l coating (4.3 lb/gal) [minus water]
No or infrequent color changes or small number of colors applied	
1. Powder Coatings	0.05 kg VOC/l of coating (0.4 lb/gal) [minus water]
2. Other	0.36 kg VOC/l of coating (3.0 lb/gal) [minus water]
Outdoor, harsh exposure, or extreme performance characteristics	0.42 kg VOC/l of coating (3.5 lb/gal) [minus water]
Frequent color changes, large number of colors applied, or first coat on untreated ferrous substrate	0.36 kg VOC/l of coating (3.0 lb/gal) [minus water]

[a] The CTG does not mention "exempt" solvents. However, exempt solvents are treated as water according to EPA guidance (Blue Book).

SURFACE COATING OF MISCELLANEOUS METAL PARTS AND PRODUCTS
CA DISTRICT RACT RULES

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
Bay Area Air Quality Management District	Regulation 8, Rule 19, Section 302.2	Emission limit for air-dried coating: 0.34 kg VOC/l (2.8 lb VOC/gal) of coating as applied, excluding water.	X	The District emission limit is lower than the Federal CTG; therefore, it is more stringent.
South Coast Air Quality Management District	Regulation XI, Rule 1107, Section b.1	The South Coast requires coating application methods (such as HVLP spray) to be capable of achieving at least 65% transfer efficiency.	X	The EPA "Blue Book" indicates that a default baseline of 60% transfer efficiency is acceptable for miscellaneous metal coating operations.
	Section b.2	Emission limit for air-dried items: 0.34 kg VOC/l (2.8 lb/gal) of coating, less water and exempt solvents.	X	The District's emission limit is lower than the Federal CTG; therefore, it is more stringent.

SURFACE COATING OF MISCELLANEOUS METAL PARTS AND PRODUCTS
CA DISTRICT RACT RULES
(Continued)

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
South Coast AQMD (Continued)	Section b.2	In addition to this emission limit, the South Coast has additional emission limits for coatings that are not specified in the Federal CTG, such as: metallic, extreme high-gloss, heat resistant, solar absorbent, etc.	X	The South Coast has more specific requirements than the Federal CTG. Also, more facilities are subject to the standards.
	Section b.3	A person shall not use VOC-containing materials that have a VOC content of more than 200 grams/l of material for surface preparation or cleanup, excluding cleaning of coating application equipment.	X	This requirement is not specified in the Federal CTG.

SURFACE COATING OF MISCELLANEOUS METAL PARTS AND PRODUCTS
CA DISTRICT RACT RULES
(Continued)

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
South Coast AQMD (Continued)	Section b.4	VOC-containing materials used for stripping any coating governed by this rule shall not contain more than 0.2 kg VOC/l of material.	X	This requirement is not specified in the Federal CTG.
	Section b.10	A person may apply to metal parts and products any coating used to match the existing coating of motor vehicles (including any VOC-containing materials added to the original coating as supplied by the manufacturer) if such coating does not contain in excess of: - 0.52 kg VOC/l of coating, less water and exempt solvents, for general coatings; or - 0.6 kg VOC/l of coating, less water and exempt solvents, for metallic coatings; and	X	These additional coating requirements are not specified in the Federal CTG.

SURFACE COATING OF MISCELLANEOUS METAL PARTS AND PRODUCTS
CA DISTRICT RACT RULES
(Continued)

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
South Coast AQMD (Continued)		provided that the person submits a written request to the Executive Officer demonstrating to the Executive Officer's satisfaction the need to apply such coating and the person receives from the Executive Officer written approval to use the coating.		

SURFACE COATING OF MISCELLANEOUS METAL PARTS AND PRODUCTS
CA DISTRICT RACT RULES
(Continued)

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
South Coast AQMD (Continued)	Section b.11	Owners and operators may comply with the emission limits stated in b.2 by using approved air pollution control equipment, provided that the VOC emissions from such operations and materials are reduced as follows: - the control device shall reduce emissions from an emission collection system by at least 95% by mass or the output of the air pollution control device is 50 ppm by volume, calculated as carbon with no dilution. - the owner/operator demonstrates that the system collects at least 90% by mass of the generated emissions.	X	The "Blue Book" indicates that the exhaust gas treatment should achieve at least 90% reduction. No capture efficiency is specified in the Federal CTG.

SURFACE COATING OF MISCELLANEOUS METAL PARTS AND PRODUCTS
CA DISTRICT RACT RULES
(Concluded)

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
South Coast AQMD (Concluded)	Section f.1.b	The provisions exempt a facility that uses a total of less than 1 gallon of coating, including any VOC-containing materials added to the original coating as supplied by the manufacturer, subject to this rule, in any one day, excluding aerosol coatings from the gallon usage determination after 1/1/92.	X	The "Blue Book" clarifies that the Federal CTG exempts 3 lb VOC/hr or 15 lb/day actual emissions before add-on control. Using an average VOC density of 7.36 lb/gal, the calculated cutoff point specified in the South Coast regulation is lower than the CTG.
	f.1.d and e	Exempts pretreatment coatings and safety-indicating coatings.	*	These exemptions are not specified in the Federal CTG.

* This is an applicability issue.

PNEUMATIC RUBBER TIRE MANUFACTURING
FEDERAL RACT EMISSION LIMIT AS DEFINED BY THE CTG

The CTG addresses four major operations (undertread cementing, tread end cementing, bead preparation, and green tire spraying) within tire manufacturing. The following is a summary of control technology for the four operations.

Affected Unit	Control System	Expected Capture Efficiency (%)	Control Efficiency (%)
Undertread cementing	Carbon adsorption	65 - 85	95
	Incineration	65 - 85	90
Tread-end cementing	Carbon adsorption	65 - 85	95
	Incineration	65 - 85	90
Bead dipping	Carbon adsorption	75 - 85	95
	Incineration	75 - 85	90
Green tire spraying	Water-based coating	NA	NA
	Carbon adsorption	80 - 90	95
	Incineration	80 - 90	90

Exemptions:

Production of specialty tires for "antique or other vehicles" when produced on an irregular basis or with short production runs only if these tires are produced on equipment separate from normal production lines for passenger type tires. (This exemption is not specified in the CTG, but is described in the Blue Book.)

PNEUMATIC RUBBER TIRE MANUFACTURING
CA DISTRICT RACT RULES

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
Bay Area Air Quality Management District	Regulation 8, Rule 21, Section 301	A person shall not operate any undertread cementing, tread-end cementing, or bead dipping operation unless they: 1) install and operate an approved emission collection system (collects at least 85%); and 2) install and operate a control device that reduces emissions from the collection system by at least 95% on a mass basis.	X	The Bay Area requires higher collection and control efficiencies than the Federal CTG.
	Section 302	A person shall use only water-based coatings in green tire coating operations unless they: 1) install and operate an emission collection system that collects and transports to the control device at least 90% (on a mass basis) of the VOC emitted; and 2) install and operate a control device which reduces emissions from the collection system by at least 95% on a mass basis.	X	The Bay Area requires higher collection and control efficiencies than the Federal CTG.

SURFACE COATING OF FLAT WOOD PANELING
FEDERAL RACT EMISSION LIMITS AS DEFINED BY THE CTG[a]

1)	Printed hardwood, plywood, and particleboard	2.9 kg VOC/100 m^2 or 6.0 lb VOC/1,000 ft^2 (equivalent to an average coating with a VOC content of 0.20 kg/l [1.7 lb VOC/gal] - [minus water])	SOLIDS BASIS[b] 0.51 kg VOC/l (4.25 lb VOC/gal solids) (assume 40% solids)
2)	Natural finished hardwood plywood	5.8 kg VOC/100 m^2 or 12.0 lb VOC/1,000 ft^2 (equivalent to an average coating with a VOC content of 0.38 kg/l [3.2 lb VOC/gal] [minus water])	0.73 kg VOC/l (6.0 lb VOC/gal solids) (assume 55% solids)

SURFACE COATING OF FLAT WOOD PANELING
FEDERAL RACT EMISSION LIMITS AS DEFINED BY THE CTG[a]
(Concluded)

3)	Class II finishes for hardboard paneling	4.8 kg VOC/100 m^2 or 10.0 lb VOC/1,000 ft^2 (equivalent to an average coating with a VOC content of 0.32 kg/l [2.7 lb VOC/gal] [minus water])	0.84 kg VOC/l (7.0 lb VOC/gal solids) (assume 40% solids)

[a] The CTG emission limit does not mention "exempt" solvents. However, exempt solvents are treated as water according to EPA guidance (Blue Book).

[b] All assumptions are based on the values provided in the CTG.

SURFACE COATING OF FLAT WOOD PANELING
FEDERAL RACT EMISSION LIMITS AS DEFINED BY THE CTG[a]
(Concluded)

SURFACE COATING OF FLAT WOOD PANELING
CA DISTRICT RACT RULES

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
Bay Area Air Quality Management District	Regulation 8, Rule 23, Section 301	Emission limit for wood flat stock coatings: 0.25 kg VOC/l (2.1 lb/gal) coating used, excluding water.	X	The District's emission limit is lower than the Federal CTG.
South Coast Air Quality Management District	Regulation 1104, Section c.1.A	Emission limit for wood flat stock coatings for wood panels: 0.25 kg VOC/l (2.1 lb/gal) of coating, less water and exempt compounds.	X	The District's emission limit is lower than the Federal CTG.
	Section c.4	Any person owning or operating a control system, in association with a wood flat stock coating operation, may comply by using an approved system such that the VOC emissions are reduced in accordance with the following provisions:	X	The Federal CTG does not specify RACT for control devices. It states that afterburners may achieve over 90%

SURFACE COATING OF FLAT WOOD PANELING
CA DISTRICT RACT RULES
(Concluded)

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
South Coast AQMD (Continued)		a) the control device shall reduce emissions from an emission collection system by at least 95%, by mass, or the output of the air pollutant control device is less than 50 ppm calculated as carbon; b) the emission collection system shall collect at least 90%, by mass, of the generated emissions.		control of the vapor captured, but it does not specify an overall control system efficiency. The South Coast requires a higher minimum control efficiency and an overall efficiency of over 85%.

SYNTHESIZED PHARMACEUTICAL PRODUCTS
FEDERAL RACT EMISSION LIMIT AS DEFINED BY THE CTG

1. (a) For each vent from reactors, distillation operations, crystallizers, centrifuges, and vacuum dryers that emit 6.8 kg/day (15 lb/day) or more of VOC, require surface condensers or equivalent controls.

   (b) If surface condensers are used, the condenser outlet gas temperature should not exceed:
   - (i) -25°C* when condensing VOC of vapor pressure greater than 40 kPa (5.8 psi),
   - (ii) -15°C* when condensing VOC of vapor pressure greater than 20 kPa (2.9 psi),
   - (iii) 0°C* when condensing VOC of vapor pressure greater than 10 kPa (1.5 psi),
   - (iv) 10°C* when condensing VOC of vapor pressure greater than 7 kPa (1.0 psi), and
   - (v) 25°C* when condensing VOC of vapor pressure greater tan 3.5 kPa (0.5 psi).

   (c) Equivalent control results when emissions are reduced at least as much as they would have been by using a surface condenser according to 1(b).

*Vapor pressures as measured at 20°C.

2. (a) For air dryers and production equipment exhaust systems that emit 150 kg/day (330 lb/day) or more of VOC, require 90% emission reduction.

   (b) For air dryers and production equipment exhaust systems that emit less than 150 kg/day (330 lb/day), require emission reduction to 15 kg/day (33 lb/day).

SYNTHESIZED PHARMACEUTICAL PRODUCTS
FEDERAL RACT EMISSION LIMIT AS DEFINED BY THE CTG
(Concluded)

3. (a) For storage tanks storing VOC with a vapor pressure greater than 28 kPa (4.1 psi) at 20°C, allow 1 liter of displaced vapor to be released to atmosphere for every 10 liters transferred (i.e., a 90% effective vapor balance or equivalent), on truck/rail car delivery to all tanks greater than 7,500 liters (2,000 gal) capacity except where tanks are equipped with floating roofs, vapor recovery, or equivalent. This guideline does not apply to transfer of VOC from one in-plant location to another.

   (b) For tanks storing VOC with a vapor pressure greater than 10 kPa (1.5 psi) at 20°C, require pressure/vacuum conservation vents set at ± 0.2 kPa, except where more effective air pollution control is used.

4. Enclose all centrifuges containing VOC, rotary vacuum filters processing liquid containing VOC, and any other filters having an exposed liquid surface where the liquid contains VOC. This applies to liquids exerting a total VOC vapor pressure of 3.5 kPa (0.5 psi) or more at 20°C.

5. All in-process tanks must have covers. Covers should be closed when possible.

6. For liquids containing VOC, all leaks in which liquid can be observed to be running or dripping from vessels and equipment (for example: pumps, valves, flanges) should be repaired as soon as is practical.

SYNTHESIZED PHARMACEUTICAL PRODUCTS
CA DISTRICT RACT RULES

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
Bay Area Air Quality Management District	Regulation 8, Rule 24, Section 303	Any chemical sterilizer using gaseous organic compounds shall not be operated unless emissions of organic compounds do not exceed 15 kg (33 lb) per day or such emissions are reduced by at least 75% on a mass basis.	X	The Federal CTG does not provide any specifications for chemical sterilizers.
	Section 302	A rotary vacuum filter or any other filter or separation device having an exposed liquid surface where the liquid contains organic compounds with a combined vapor pressure of 26 mm Hg (0.5 psia) or more at 20°C (68°F), shall not emit more than 15 kg (33 lb) of organic compounds per day unless such emissions are reduced by 90% on a mass basis. are	X	The Federal CTG does not specify a VOC cutoff point.

SYNTHESIZED PHARMACEUTICAL PRODUCTS
CA DISTRICT RACT RULES
(Concluded)

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
South Coast Air Quality Management District	Regulation XI, Rule 1103, Section c.2	An operator shall not use centrifuges, rotary vacuum filters, or other filters, or devices having an exposed liquid surface where the liquid contains VOCs having a total vapor pressure of 0.5 psi or more at 20°C unless such devices incorporate a hood or enclosure with a delivery system or ductwork to collect VOC emissions, exhausting to a carbon absorber or equivalent control method approved by the Executive Officer.	X	The Federal CTG requires that all centrifuges and rotary vacuum filters processing VOCs be enclosed, but does not specify use of a control system to collect VOC emissions.

EQUIPMENT LEAKS FROM NATURAL GAS/GASOLINE PROCESSING PLANTS RACT AS DEFINED BY THE CTG

This CTG applies to equipment in VOC service within a process unit in on-shore natural gas processing plants. Natural gas processing plants are defined as facilities engaged in the separation of natural gas liquids from field gas and/or fractionation of the liquids into natural gas products, such as ethane, propane, butane, and natural gasoline. The regulation affects only those pumps, compressors, valves, pressure relief devices, open-ended lines, flanges, and connections containing or contacting process streams with a VOC concentration of 1.0 percent by mass or more.

A leak is defined as a VOC concentration greater than 10,000 ppm. Any leaking component that has a VOC concentration over 10,000 ppm shall be tagged and repaired within 15 days or at the next shutdown.

Affected facilities shall implement a leak detection and repair (LDAR) program. This program will involve the use of a portable hydrocarbon detection device meeting the specifications and performance criteria set forth in EPA Method 21 (40 CFR 60, appendix A). Affected pumps, valves, compressors, and pressure relief devices shall be monitored with a frequency interval of no less than quarterly. Difficult-to-monitor components (the monitoring of which require the use of scaffolding or require monitoring personnel to be elevated higher than 2 meters above permanent support) may be monitored with a frequency of no less than annually. Any component that appears to be leaking on the basis of sight, smell, or sound, including flanges and connections that need not be monitored regularly, should be tagged for repair. Leaking components shall be repaired within 15 days from detection of the leak; however, if repair is not technically feasible without shutting down the process unit, repair may be delayed until the equipment can be isolated for repair or during the next scheduled process unit turnaround.

Open-ended lines shall be controlled by installation of a cap, plug, flange, or second valve on the open end of the line.

Exempted:

1. Facilities that do not fractionate the mixed natural gas liquids and that have design throughput less than 10 million standard cubic feet per day.
2. Components operating under vacuum service and equipment at underground storage facilities.

EQUIPMENT LEAKS FROM NATURAL GAS/GASOLINE PROCESSING PLANTS
CA DISTRICT RACT RULES

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
Bay area Air Quality Management District	Regulation 8, Rule 37, Section 301	A person shall not use any valve, flange, choke, pump, compressor, or component handling organic compounds in a natural gas or crude oil production facility if the concentration of organic compounds, measured 1 cm from any leak source in such equipment exceeds 10,000 ppm (expressed as methane), unless the following requirements are satisfied: a) if the equipment is not essential, the leak shall be repaired within 24 hours; b) if the equipment is essential, the leak shall be minimized within 24 hours; and	**	The Federal CTG does not explain where the concentration should be measured. The District requirement is more specific and requires the leak detector to be placed 1 cm from any leak. This, however, cannot be used to compare stringency. The CTG requires all leaks greater than 10,000 ppm to be repaired within 15 days or at next shutdown. The Bay Area provides two timeframes for repair based on the type of leaking equipment. The Bay Area regulation is considered more

** Although this provision of the District's regulation may not necessarily result in a quantifiable reduction in emissions, it does enhance the pollution prevention aspects of the rule.

EQUIPMENT LEAKS FROM NATURAL GAS/GASOLINE PROCESSING PLANTS
CA DISTRICT RACT RULES
(Continued)

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
Bay Area AQMD (Continued)		c) if the equipment leak which has been minimized as required still exceeds the limitations, that equipment shall be repaired at the next scheduled maintenance of the well head. Any such equipment shall not be operated longer than 3 months before repairs are conducted.		specific in one case (for nonessential equipment) and less specific in the other case (for essential equipment).
	Section 302	There shall be no open liquid pools of crude oil or condensate in the lease area.	**	This requirement is not specified in the Federal CTG.
	Section 303	No open or uncovered vessels of crude material larger than 250 ml shall be kept in the lease area. The well cellar shall be kept covered.	**	This requirement is not specified in the Federal CTG.

** Although this provision of the District's regulation may not necessarily result in a quantifiable reduction in emissions, it does enhance the pollution prevention aspects of the rule.

EQUIPMENT LEAKS FROM NATURAL GAS/GASOLINE PROCESSING PLANTS
CA DISTRICT RACT RULES
(Continued)

DISTRICT	REGULATION NUMBER	STATE/LOCAL REQUIREMENTS	MORE STRINGENT?	COMMENTS
Bay Area AQMD (Concluded)	Section 303	All spills of crude oil and condensate that cause a liquid pool shall be cleaned up within 24 hours.	**	This work practice requirement is not specified in the Federal CTG.
South Coast Air Quality Management District	Regulation XI, Rule 1173, Section e	Operator inspection requirements 1. All accessible pumps, compressors, and pressure relief devices shall be audio-visually inspected once during every 8-hour operating period, except for unmanned oil and gas production fields, and unmanned pipeline transfer stations. 2. A pressure relief device shall be inspected within 14 calendar days after every functional pressure relief.	**	These additional requirements are not specified in the Federal CTG.

** Although this provision of the District's regulation may not necessarily result in a quantifiable reduction in emissions, it does enhance the pollution prevention aspects of the rule.

EQUIPMENT LEAKS FROM NATURAL GAS/GASOLINE PROCESSING PLANTS
CA DISTRICT RACT RULES
(Continued)

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
South Coast AQMD (Continued)	Section f.1	A component shall be repaired or replaced within the following time period after detection of a leak: - Minor gas leak (in excess of 1,000 ppm but no more than 10,000 ppm), 14 calendar days. - Major gas leak (in excess of 10,000 ppm as methane), 5 calendar days. - Gas leak >50,000 ppm, 1 calendar day. - Liquid leak, 1 calendar day.	X	The South Coast regulation sets different time periods for repairing leaks. For any leak with VOC concentration over 10,000 ppm, the South Coast requires the leak to be repaired within 5 calendar days instead of 15 days as stated in the Federal CTG. The South Coast regulation also requires a shorter time period for repair for any gas leak greater than 50,000 ppm or any liquid leak.

EQUIPMENT LEAKS FROM NATURAL GAS/GASOLINE PROCESSING PLANTS
CA DISTRICT RACT RULES
(Concluded)

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
South Coast AQMD (Concluded)	Section f.2	The repaired or replaced component shall be subjected to operator inspection within 30 days of the repair or replacement.	**	This requirement is not specified in the Federal CTG.
	Section k	The South Coast regulation states several exemptions from the provisions of the rule.	*	These exemptions are not specified in the Federal CTG.

** Although this provision of the District's regulation may not necessarily result in a quantifiable reduction in emissions, it does enhance the pollution prevention aspects of the rule.

* This is an applicability issue.

LARGE PETROLEUM DRY CLEANERS
FEDERAL RACT EMISSION LIMIT AS DEFINED BY THE CTG

Each owner or operator of a petroleum solvent dry cleaning facility that consumes 123,000 liters or more of petroleum solvent annually shall either:

(1) limit VOC emissions to the atmosphere to an average of 3.5 kg of VOC per 100 kg dry mass of articles dry cleaned; or

(2) install and operate a solvent recovery dryer in a manner such that the dryer remains closed and the recovery phase continues until a final recovered solvent flow rate of 50 milliliters per minute is attained.

Each owner or operator of a petroleum solvent dry cleaning facility with a solvent filtration system shall either:

(1) reduce the VOC content in all filtration wastes to 1.0 kg or less per 100 kg dry mass of articles dry cleaned, before disposal, and exposure to the atmosphere; or

(2) install and operate a cartridge filtration system, and drain the filter cartridges in their sealed housings for 8 hours or more before their removal.

Each owner or operator shall repair all petroleum solvent vapor and liquid leaks within 3 working days after identifying the sources of the leaks. If necessary repair parts are not on hand, the owner or operator shall order these parts within 3 working days, and repair the leaks no later than 3 working days following the arrival of the necessary parts.

No State regulations concerning large petroleum dry cleaners were provided through the Work Group; however, New York State, Pennsylvania, and Texas laws were consulted and only addressed perchloroethylene dry cleaners.

LARGE PETROLEUM DRY CLEANERS
CA DISTRICT RACT RULES

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
Bay Area Air Quality Management District	Regulation 8, Rule 17, Section 301 Section 301.1	A person shall not operate any petroleum dry cleaning facility unless all of the following requirements are satisfied: - there is no solvent liquid or vapor leaking from any portion of the equipment or the leaking equipment shall not be operated.	**	The Federal CTG indicates that leaks should be repaired within 3 days after identifying the sources of the leaks. It does not state that the system should be shut down when a leak is detected.
	Section 301.4	- Cartridge filters are drained in the filter housing for at least 12 hours or placed in an enclosed device including a solvent recovery dryer until dry before being discarded.	X	The Federal CTG requires that cartridge filters be drained in the filter housing for only 8 hours before being discarded. The District requires a longer draining time; therefore, the rule is more stringent than the CTG.

** Although this provision of the District's regulation may not necessarily result in a quantifiable reduction in emissions, it does enhance the pollution prevention aspects of the rule.

LARGE PETROLEUM DRY CLEANERS
CA DISTRICT RACT RULES
(Continued)

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
Bay Area AQMD (Continued)	Section 301.6	- Articles that have been cleaned must be transferred to the dryer within 5 minutes after they are removed from the washer, or shall be stored in closed transfer carts.	*	This is an additional requirement that is not specified in the Federal CTG.
	Section 302.2	A solvent recovery dryer that recovers at least 85% of petroleum solvent by mass shall be installed. For the purpose of determining compliance with the 85% recovery efficiency, 3 kg of petroleum solvent emitted/100 kg dry mass of articles cleaned shall be deemed to be in compliance. In addition, the petroleum solvent flow rate from the water separator of the recovery dryer shall not exceed 15 milliliters/minute at the termination of the recovery cycle.	X	The Federal CTG does not specify the required control efficiency of a solvent recovery dryer. In addition, the Federal CTG emission limit for determining compliance is higher than the emission limit stated in the Bay Area regulation. Moreover, the required solvent flow rate from the water separator of such a

* This provision of the District's regulation involves work practices that will result in quantifiable emission reductions.

LARGE PETROLEUM DRY CLEANERS
CA DISTRICT RACT RULES
(Continued)

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
Bay Area AQMD (Concluded)				recovery dryer is three times as much as the flow rate required by the Bay Area. Thus, the Bay Area regulation is more stringent than the Federal CTG.
	Section 303	A person shall not operate any solvent filtration system unless one of the following requirements is satisfied: a) The total VOC content in all filtration wastes is reduced to: - 1 kg or less per 100 kg dry mass or articles cleaned, before disposal and exposure to the atmosphere, or - no more than 0.25 kg of solvent per kg of solvent still or filter waste. b) A cartridge filter system is installed and operated.	X	The Federal CTG specifies the same requirements as the Bay Area. However, it does not provide an alternative emission limit in terms of mass of solvent per mass of solvent still or filter waste.

LARGE PETROLEUM DRY CLEANERS
CA DISTRICT RACT RULES
(Continued)

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
South Coast Air Quality Management District	Rule 1102, Section b.4	The dry cleaning facility equipped with cartridge filters containing paper or carbon or a combination thereof, are required to be fully drained in the filter housing for at least 12 hours before removal.	X	The Federal CTG specifies only 8 hours of draining time.
	Section b.5	Articles which have been dry cleaned are to be transferred to the dryer within 5 minutes after they are removed from the washer, or are stored in closed transfer carts.	*	This additional operating requirement is not specified in the Federal CTG.

* This provision of the District's regulation involves work practices that will result in emission reductions.

LARGE PETROLEUM DRY CLEANERS
CA DISTRICT RACT RULES
(Concluded)

DISTRICT	REGULATION NUMBER	DISTRICT REQUIREMENTS	MORE STRINGENT?	COMMENTS
South Coast AQMD (Concluded)	Section b.7	The solvent recovery dryer shall remain closed and the recovery phase shall continue until there is no visible flow in the sight glass of the condenser for at least 1 minute or until a final recorded flow rate of 15 ml/min is attained.	X	The Federal CTG specifies similar requirements for solvent recovery dryers, but it allows opening of the dryer when a solvent flow rate of 50 ml/min is attained.

APPENDIX E.

ESTIMATING THE AMOUNT OF THINNING SOLVENT ALLOWED

APPENDIX E[5]

DETERMINING THE AMOUNT OF THINNING SOLVENT ALLOWED

This may be achieved in two steps:

1. Estimating volume of nonvolatile matter (solids) - Part A.

2. Calculating the volume of thinning solvent allowed - Part B.

The allowed amount of thinning solvent is any volume that is less than the thinner volume calculated based on the given equation. The equation can be represented in graphical form and used for rapidly estimating thinning allowances pertaining to a VOC emission limitation. The curve in Figure E.1 was generated assuming that the VOC limit is 571 g/L of nonvolatiles (solids)[6], the thinning solvent density is 1,200 g/L, and the solvent is 100% VOCs.

A procedure for converting an emission limit from one set of units to another is also illustrated:

from mass of volatiles/unit volume of coating **or** mass of volatiles/unit volume of coating (less water and 'exempt'[7] solvents)

to mass of volatiles per volume of nonvolatile matter (solids) in a coating.

M. Serageldin, EPA, to Project File. Procedure for Determining Nonvolatiles (Solids), Equivalent Paint VOC or VOHAP Limits, and Allowed Amount of Thinning Solvent - NESHAP for Shipbuilding and Ship Repair Facilities (Surface Coating), June 30, 1994. (Docket No. A-92-11, Document No. II-B-26).

[6]The terms "nonvolatiles" and "solids" are used interchangeably to refer to the film forming material of a coating.

[7]An 'exempt' compound (solvent) is an organic compound that would be considered a VOC if it were not classified by EPA as having negligible photochemical reactivity. These compounds are listed in 40 CFR 51.100(s).

Part A

ESTIMATING VOLUME OF NONVOLATILE MATTER (SOLIDS)

The amount of film forming material or nonvolatiles (solids) in a coating is usually calculated from formulation data. Some paint companies, however, report the percentage of nonvolatiles using methods which are based on those developed by ASTM (American Society for Testing and Materials). Since there is presently no approved EPA method for measuring the amount of film forming material, the discussion will focus only on the procedure for calculating what may be termed the theoretical volume of nonvolatiles (solids).

CASE 1: Coatings containing no exempt solvents or water

An example calculation (in standard international units) follows for a coating where the volatiles are all VOCs:

$$\text{Coating volume (Liter)} = V_{NV}\ \text{(Liter)} + V_{VOC}\ \text{(Liter)} \qquad \text{E.1}$$

where V_{NV} stands for volume of nonvolatile matter and V_{VOC} for volume of volatile organic compounds, VOCs. In the above representation, it is assumed that the volumes of the different components in a coating are additive, which is not necessarily true.

Basis 1 Liter of coating:

$$V_{NV}\ (L) = 1\ (L\ \text{coating}) - V_{VOC}\ (L) \qquad \text{E.2}$$

Divide by total liters of coating:

$$\frac{V_{NV}\ (L)}{1\ L\ \text{coating}} = 1 - \frac{V_{voc}\ (L)}{L\ \text{coating}}$$

$$V_{NV}\ (\text{by vol.}) = \left[1 - \frac{V_{voc}\ (L)}{L\ \text{coating}}\right] \qquad \text{E.3}$$

$$V_{NV} \text{ (by vol.)} = \left[1 - \frac{\text{VOC content of coating (g VOC/L coating)}}{\text{average density of solvents (g VOC/L VOC)}} \right]$$

If the average density of the VOCs in this paint is 839 g/L, and the VOC content is 340 g VOC/L, then:

$$V_{NV} \text{ (vol.)} = \left[1 - \frac{340 \text{ g VOC}}{\text{L coating}} \times \frac{1 \text{ L VOC}}{839 \text{ g VOC}} \right]$$

$$V_{NV} \text{ (vol.)} = [\, 1 - .405 \,] = 0.595 \text{ (59.5 percent)}$$

The VOC content in terms of nonvolatiles is:

$$\frac{340 \textit{ g VOC /L coating}}{0.595 \textit{ L NV /L coating}}$$

which is equal to 571 g VOC/L of nonvolatiles.

<u>CASE 2. Coatings containing VOC, water, and exempt compounds</u>

To calculate the ratio of VOCs to nonvolatiles (solids) in a coating, the facility has to account for the volume of water and 'exempt' compounds in determining the volume of nonvolatiles (solids). We therefore need to rewrite equation E.2 as follows:

$$V_{NV} = 1 - [V_{VOC} + V_{ex} + V_w] \qquad \text{E.4}$$

where:

V_{VOC} = VOC volume (fraction) in the coating as supplied (L VOC/L of coating);

V_{ex} = 'exempt' solvent volume (fraction) in the coating as supplied (L exempt solvents/L of coating);

V_w = water volume (fraction) in the coating as supplied (L water/L of coating).

<u>NOTE</u>: Cure volatiles (those released due to chemical reactions in

some coating films) will be dealt with at the end of this document.

Example:

If a coating having a VOC content of 208 g/L is made up of three volatile components [25% (vol.) VOC solvent, 10% (vol.) 'exempt' solvent, and 15% (vol.) water], one can determine the nonvolatile volume to 3 significant figures as follows:

$$V_{NV} = 1 - [0.250 + 0.100 + 0.150] = 0.500 \text{ L } (50.0 \text{ percent})$$

The VOC content of this paint can be expressed in several ways:

- 208 g VOC/L of coating
- (208/0.750) or 277 g VOC/L of coating less water and exempt solvents
- (208/0.500) or 416 g VOC/L of nonvolatiles (solids).

Part B

CALCULATION OF THINNING ALLOWED

Paint manufacturers or users add solvents to modify the flowing properties of a coating. To determine the amount of thinning solvent allowed, the user should know how much VOC is already in the coating and the emission limit for that coating category. To be in compliance, the total mass of VOCs in a coating must be less than that set by the appropriate limit as indicated by the first ratio in equation E.5.

$$\frac{m_{VOC1}}{V_{NV1}} = \frac{M_{VOC2} + aD_{th}\ V_{th}}{V_{NV2}} \qquad \text{E.5}$$

One can rewrite equation E.5 to determine V_{th},
where:

V_{th} = maximum volume of thinner permitted, L/L of coating;

a = the volume fraction of VOCs in the thinner, equal to 1 if 100% VOC;

D_{th} = average density of thinning solvent (thinner), g/L solvent;

m = mass of VOCs in the coating, g/L coating;

VOC = volatile organic compound;

V_{NV} = volume of nonvolatiles (solids), L/L coating;

$VOC1/V_{NV1}$ = mass of VOC in limiting coating over volume of nonvolatiles, g/L.

$$V_{th} = \frac{1}{a\ D}\left[\frac{M_{VOC1}}{V_{NV1}}\ V_{NV2} - M_{VOC_2}\right] \qquad \text{E.6}$$

The subscript 1 stands for the limits of a compliant coating and 2 for the as-supplied coating (paint received from the paint manufacturer) that needs to be thinned before application. The maximum amount of thinner allowed should be less than V_{th} determined

above for a given coating limit.

Scenario: Coating does not contain water, exempt solvents, or cure volatiles

Problem: The user needs to determine the maximum amount of solvent thinner that can be added to a coating. The VOC content of the coating is 300 g/L of coating and the average density of the VOC portion is 850 g/L of solvent. The thinner has a density of 900 g/L. Assume that the VOC limit for a coating category in a rule is 340 g VOC/L of coating (minus water and exempt solvents); this is equivalent to 571 g VOC/L of nonvolatiles (see Part A, CASE 1).

Solution Steps:

1. Record the applicable limit for the coating category: 571 g VOC/L of nonvolatiles.

2. Record the mass of VOC in a liter of coating: 300 g VOC/L of coating (minus water and exempt solvents).

3. Calculate the (theoretical) volume of nonvolatiles V_{NV2} using equation E.3.

$$\begin{aligned} V_{NV2} &= 1 - (VOC) \\ &= 1 - 0.353 \\ &= 0.647 \text{ L/L coating.} \end{aligned}$$

4. Record the density of thinning solvent D_{th} and the fraction of VOC in the thinner: D_{th}= 900 g/L and a = 0.8.

5. Determine V_{th} using equation E.6.

$$V_{th} = \frac{1}{(0.8)\ (900)} \left[\left(\frac{571 \text{ g VOC}}{1 \text{ L NV1}} \right) (0.647 \text{ L NV2}) - (300 \text{ g VOC2}) \right]$$

$$V_{th} = 0.096 \textit{ L thinner/L of coating.}$$

As a rule, the amount of thinning that is allowed for a coating decreases with an increase in solvent density. Figure E.1 provides a rapid method for estimating the amount of thinning that is allowed. For a coating with the same VOC content as in the previous example (300 g/L of coating), the volume of thinner when D_{th}= 900 g/L is around 0.08 L of thinner/L coating.

<u>General Equation</u>:

$$V_{th} = \frac{1}{a\ D_{th}} \left[\frac{m_{VOC1}}{1\ L_{NV1}} V_{NV2} - m_{VOC2} - m_c \right] \qquad \text{E.7}$$

where, as given before V_{th} is the maximum volume of thinner permitted, L/L coating; a is the volume fraction of VOCs in the thinner, equal to 1 if 100% VOC; D_{th} is the average density of thinning solvent (thinner), g/L solvent; m is the mass of VOCs in the coating, g/L coating; VOC = volatile organic compound; V_{NV} is the volume of nonvolatiles (solids), L/L coating; and VOC1/V_{NV1} is the mass of VOC in limiting coating over volume of 2nonvolatiles, g/L. The term m_c stands for mass of cure volatiles that are VOCs (e.g., formaldehyde). When a coating does not release cure volatiles, m_c should be deleted from equation E.7. The maximum amount of thinner added should be less than V_{th} determined above for a given coating limit.

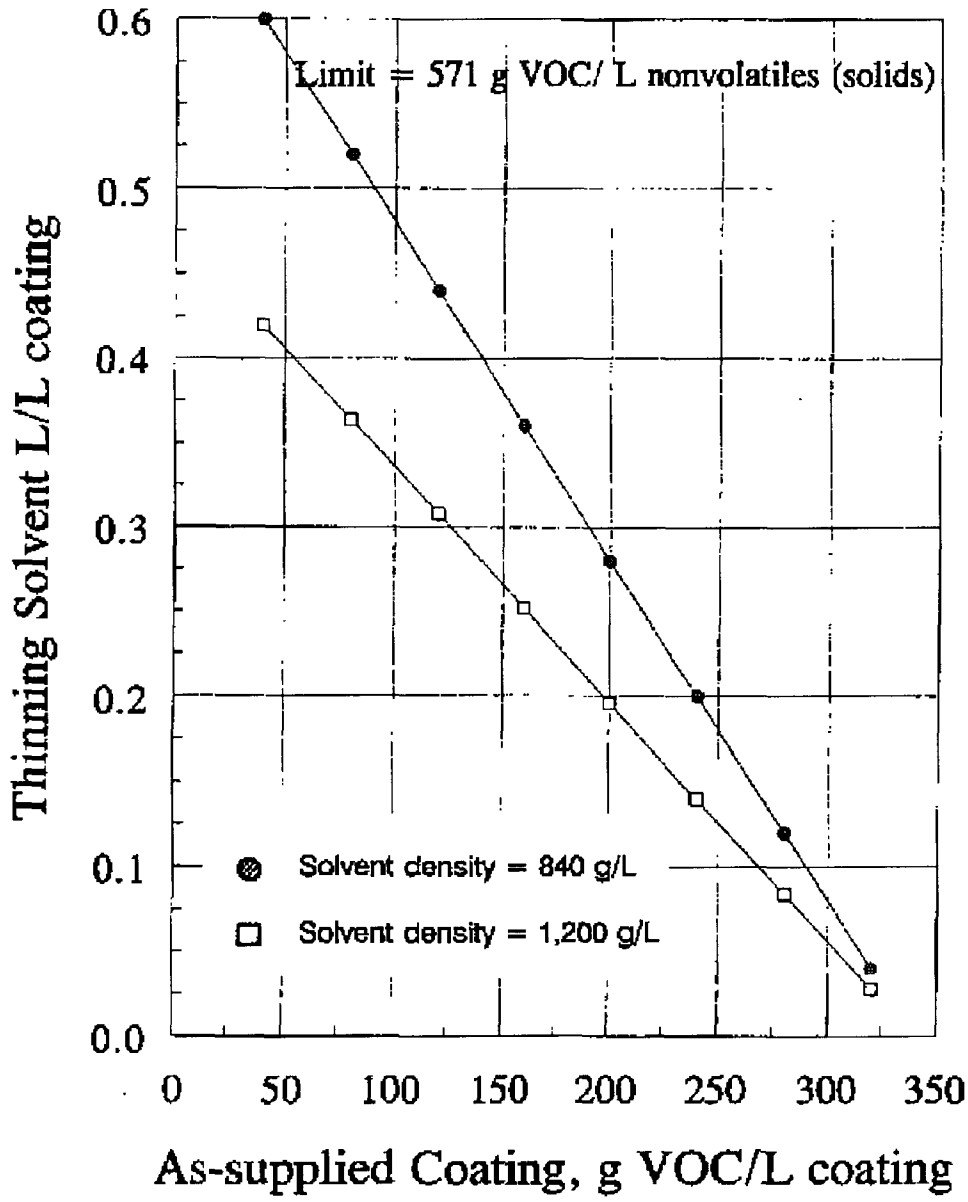

Figure E.1. Estimating Maximum Thinning Allowance

(NOTE: This figure applies when all the volatiles in the coating are VOCs. The av. density of the volatiles in a coating was assumed equal to 840 g

solvent/L solvent.

APPENDIX F.

CONVERTING EMISSION LIMIT UNITS FROM MASS VOC/VOL COATING TO MASS VOC/MASS SOLIDS (NONVOLATILES) IN COATING

APPENDIX F

CONVERTING EMISSION LIMIT UNITS FROM MASS VOC/VOL COATING TO MASS VOC/MASS SOLIDS (NONVOLATILES) IN COATING

Some of the rules reviewed presented their emission limits as VOC per unit mass of solids (nonvolatiles), whereas the VOC limits in these CTGs were presented in terms of coating volume. To compare these rules, the CTG limits were converted into these alternate limits using the steps outlined in the example below.

Given:

Emission limit: 0.3 kg VOC/L of coating (minus water and exempt solvents), VOC density: 883 g/L (7.36 lb VOC/gal) of solvent, assuming all volatiles are VOCs.

Solution Steps:

To perform this conversion, one needs to know the density of the solids (nonvolatiles) in the coating. Assume the density of nonvolatiles is 16 lb solids/gal solids.

Step 1: Convert the units of the emission limit to lb VOC/gal coating.

$$\frac{.3\ kg\ VOC}{L\ coating} * \frac{2.20\ lb}{1\ kg} * \frac{3.78\ L}{1\ gal\ coating} = \frac{2.49\ lb\ V}{1\ gal\ coat}$$

Step 2: Calculate volume of VOCs in a gallon.

$$\frac{0.660\ lb\ VOC}{1\ gal\ coating} * \frac{1\ gal\ VOC}{7.36\ lb\ VOC} = \frac{0.339\ gal\ VOC}{1\ gal\ coating}$$

Step 3: Determine the nonvolatiles volume.

The theoretical nonvolatiles volume can be calculated using equation E.3 (Appendix E).

Basis 1 gallon of coating:

$$1\ gal\ coating - V_{VOC} = V_{NV}$$

$$V_{NV} = 1 - 0.339 = 0.661 \text{ gal solids/gal coating}$$

Step 4: Calculate lb VOC/lb solids.

$$\frac{1 \textit{ gal coating}}{0.661 \textit{ gal solids}} * \frac{1 \textit{ gal solids}}{16 \textit{ lb solids}} * \frac{2.49 \textit{ lb VOC}}{1 \textit{ gal coating}}$$

$$= \frac{0.236 \textit{ lb VOC}}{1 \textit{ lb solids}}$$

APPENDIX G.

EPA VOC POLICY WORK GROUP

Anne Arnold
U.S. EPA Region I
Room 2203
JFK Federal Building
Boston, MA 02203-2211

Phone: (617) 565-3166
FAX: (617) 565-4939

Paul Truchan
U.S. EPA Region II
Room 1005
26 Federal Plaza
New York, NY 10278

Phone: (212) 264-2518
FAX: (212) 264-7613

Lisa Wild
U.S. EPA Region III
Air Enforcement Branch
841 Chestnut Building
Philadelphia, PA 19107

Phone: (215) 597-9318
FAX: (215) 597-7906

Cynthia Stahl
U.S. EPA Region III (3AM10)
Air Programs Branch
841 Chestnut Building
Philadelphia, PA 19107

Phone: (215) 597-9337
FAX: (215) 597-7906

Diane Altsman
U.S. EPA Region IV
Air Programs Branch
345 Courtland Street, NE
Atlanta, GA 30365

Phone: (404) 347-2864
FAX: (404) 347-5246

Steve Rosenthal
U.S. EPA Region V (5AR-26)
Air & Radiation Branch
77 West Jackson Street
Chicago, IL 60604

Phone: (312) 886-6052
FAX: (312) 886-5824

Guy Donaldson
U.S. EPA Region VI
Suite 1200
1445 Ross Avenue
Dallas, TX 75202-2733

Phone: (214) 655-7242
FAX: (214) 655-2164

Joshua Tapp
U.S. EPA Region VII
Air Branch
726 Minnesota Avenue
Kansas City, KS 66101

Phone: (913) 551-7606
FAX: (913) 551-7065

Tim Russ
U.S. EPA Region VIII (8ART-AP)
999 18th Street
Denver Place, Suite 500
Denver, CO 80202-2405

Phone: (303) 293-1814
FAX: (303) 293-1229

Dave Hodges
U.S. EPA Region IX
Air Programs Branch (A-2-3)
75 Hawthorne Street
San Francisco, CA 94105

Phone: (415) 744-1197
FAX: (415) 744-1076

Chris James
U.S. EPA Region X
Air & Radiation Branch (AT-092)
1200 Sixth Avenue
Seattle, WA 98101

Phone: (206) 553-1194
FAX: (206) 553-0110

Christine Lee
U.S. EPA Region X (AT-092)
Air & Radiation Branch
1200 Sixth Avenue
Seattle, WA 98101

Phone: (206) 553-1814
FAX: (206) 553-0110

APPENDIX H.

LIST OF GROUPS I, II, AND III CTGs

Group I CTGs (Pre-1978)

1. Control of Volatile Organic Compounds from Use of Cutback Asphalt. EPA-450/2-77-037. U.S. EPA, OAQPS. December 1977. OAQPS No. 1.2-090.

2. Control of Volatile Organic Emissions from Storage of Petroleum Liquids in Fixed-Roof Tanks. EPA-450/2-77-036. U.S. EPA, OAQPS. December 1977. OAQPS No. 1.2-089.

3. Control of Volatile Organic Emissions from Bulk Gasoline Plants. EPA-450/2-77-035. U.S. EPA, OAQPS. December 1977. OAQPS No. 1.2-085.

4. Control of Hydrocarbons from Tank Truck Gasoline Loading Terminals. EPA-450/2-77-026. U.S. EPA, OAQPS. October 1977. OAQPS No. 1.2-082.

5. Control of Refinery Vacuum Producing Systems, Wastewater Separators and Process Unit Turnarounds. EPA-450/2-77-025. U.S. EPA, OAQPS. October 1977. OAQPS No. 1.2-081.

6. Design Criteria for Stage I Vapor Control Systems--Gasoline Service Stations. U.S. EPA, OAQPS. November 1975. (Design Criteria Document.)

7. Control of Volatile Organic Emissions from Solvent Metal Cleaning. EPA-450/2-77-022. U.S. EPA, OAQPS. November 1977.

8. Control of Volatile Organic Emissions from Existing Stationary Sources - Volume II: Surface Coating of Cans, Coils, Paper, Fabrics, Automobiles, and Light-Duty Trucks. EPA-450/2-77-008. U.S. EPA, OAQPS. May 1977. OAQPS No. 1.2-073.

9. Control of Volatile Organic Emissions from Existing Stationary Sources - Volume V: Surface Coating of Large Appliances. EPA-450/2-77-034. U.S. EPA, OAQPS. December 1977. OAQPS No. 1.2-088.

10. Control of Volatile Organic Emissions from Existing Stationary Sources - Volume III: Surface Coating of Metal Furniture. EPA-450/2-77-032. U.S. EPA, OAQPS. December 1977. OAQPS No. 1.2-086.

11. Control of Volatile Organic Emissions from Existing Stationary Sources - Volume IV: Surface Coating of Insulation for Magnet Wire. EPA-450/2-77-033. U.S. EPA, OAQPS. December 1977. OAQPS No. 1.2-087.

Group II CTGs (1978)

1. Control of Volatile Organic Emissions from Petroleum Liquid Storage in External Floating Roof Tanks. EPA-450/2-78-047. U.S. EPA, OAQPS. December 1978. OAQPS No. 1.2-116.

2. Control of Volatile Organic Compound Leaks from Gasoline Tank Trucks and Vapor Collection Systems. EPA-450/2-78/051. U.S. EPA, OAQPS. December 1978. OAQPS No. 1.2-119.

3. Control of Volatile Organic Compounds from Existing Stationary Sources - Volume VIII: Graphic Arts - Rotogravure and Flexography. EPA-450/2-78-033. U.S. EPA, OAQPS. December 1978. OAQPS No. 1.2-109.

4. Control of Volatile Organic Leaks from Petroleum Refinery Equipment. EPA-450/2-78-036. U.S. EPA, OAQPS. June 1978. OAQPS No. 1.2-111.

5. Control of Volatile Organic Emissions from Existing Stationary Sources - Volume VI: Surface Coating of Miscellaneous Metal Parts and Products. EPA-450/2-78-015. U.S. EPA, OAQPS. June 1978. OAQPS No. 1.2-101.

6. Control of Volatile Organic Emissions from Manufacture of Pneumatic Rubber Tires. EPA-450/2-78-030. U.S. EPA, OAQPS. December 1978. OAQPS No. 1.2-106.

7. Control of Organic Emissions from Existing Stationary Sources - Volume VII: Factory Surface Coating of Flat Wood Paneling. EPA-450/2-78-032. U.S. EPA, OAQPS. June 1978. OAQPS No. 1.2-112.

8. Control of Volatile Organic Emissions from Manufacture of Synthesized Pharmaceutical Products. EPA-450/2-78-029. U.S. EPA, OAQPS. December 1978. OAQPS No. 1.2-105.

Group III CTGs (Post-1978)

1. Control Volatile Organic Compound Emissions from Air Oxidation Processes in Synthetic Chemical Manufacturing Industry. EPA-450/3-84-015. U.S. EPA, OAQPS. December 1984.

2. Control of Volatile Organic Compound Equipment Leaks from Natural Gas/Gasoline Processing Plants. EPA-450/3-83-007. U.S. EPA, OAQPS. December 1983.

Group III CTGs (Concluded)

3. Control of Volatile Organic Compound Emissions from Large Petroleum Dry Cleaners. EPA-450/3-82-009. U.S. EPA, OAQPS. September 1982.

4. Control of Volatile Organic Compound Emissions from Manufacture of High-Density Polyethylene, Polypropylene, and Polystyrene Resins. EPA-450/3-83-008. U.S. EPA, OAQPS. November 1983.

5. Control of Volatile Organic Compound Leaks from Synthetic Organic Chemical and Polymer Manufacturing Equipment. EPA-450/3-83-006. U.S. EPA, OAQPS. March 1984.

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EPA Project Manager: Mohamed Serageldin, Ph.D. (919) 541-2379

16. ABSTRACT
This document contains a comparison of State (and local) and Distict regulations with control techniques guideline (CTG) source categories. The purpose was to identify those State regulations that exceed the reasonably available control technology (RACT) requirements that are specified in the Federal CTGs. This study is limited to CTG groups I, II, and III only, which cover 28 source categories.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Air Pollution, Summary of State and District Air Regulations, Comparison of State Regulations with Federal Control Technique Guidelines (CTGs)	VOC, CTG, RACT Review Stringency Pollution Prevention, Regulations, Rules	

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