

MAY 18, 2006

NOTE

SUBJECT: RACT Qs & As – Reasonably Available Control Technology (RACT):
Questions and Answers

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TO: Regional Air Division Directors

The attached Reasonably Available Control Technology (RACT) Questions and Answers (Q&A) document addresses issues we have received from the Regional Offices and States. The document provides additional clarification that will be helpful for the RACT State implementation plans (SIPs) which are due September 15, 2006. Please distribute this document to your States, local control agencies, and tribal governments. Regional Office staff may contact William Johnson at (919) 541-5246 or Johnson.WilliamL@epa.gov, with any questions.

May 18, 2006

Questions Related to RACT in 8-hour ozone implementation

A. What is RACT?

1. **Q:** Is the facility expected to perform the RACT analysis? Is this similar to a BACT analysis?

A: The State is responsible for the RACT determination but is likely to have considerable interaction with the affected facilities. States may rely on past EPA guidance, such as CTGs, for help and should also review other available information regarding the appropriate controls. BACT requires that new or modified sources adopt the best available controls and, as such, the analysis is a “top-down” analysis that first looks at the most stringent level of control available for a source. Industries applying for a construction permit list in their application what are the currently most stringent levels of control. The State verifies this by checking the application against other data sources including EPA’s RACT/BACT Clearinghouse. RACT requires that sources adopt controls that are reasonably available and thus they may not be the most stringent controls that have been adopted for other similar sources.

2. **Q:** If a State in or near the Ozone Transport Region failed to adopt one of the model rules which the Ozone Transport Commission developed to help meet the ozone standard in that region, would this mean that a rule the State may have for that source is no longer considered to be RACT?

A: No, not necessarily. The model rules developed for the Ozone Transport Region were for the purpose of bringing areas in the OTR into attainment with the 1-hour NAAQS and thus may be more stringent than what would be considered RACT. In performing a RACT analysis, States should look at available controls, such as those that were the basis for the model rules developed by the OTR, to conclude whether they are reasonably available for a specific source or source category. However, the fact that another similar source has such controls in place does not mean that such a control is reasonably available for all other similar sources across the country.

3. **Q:** Some moderate 8-hour areas were severe 1-hour nonattainment areas. As such, the “major source” threshold for 1-hour RACT rules was 25 TPY potential emissions. For the purposes of certifying 1-hour RACT determinations, must the State address only down to the applicable 8-hour threshold [which is 100 TPY or in the Ozone Transport Region 50 TPY for VOC non-CTG major sources and the 100 TPY for all NO_x sources] or down to the 1-hour threshold of 25 TPY?

A: For purposes of meeting the 8-hour RACT requirement, the State’s RACT analysis only needs to include an evaluation of RACT for CTG sources and for non-CTG major sources based on the area’s 8-hour classification.

We note however, that under the anti-backsliding requirements, the State may not remove RACT requirements for sources that were subject to RACT for the 1-hour standard (but that would not be subject to RACT based on the area's 8-hour classification). Similarly, if the State has never met the RACT requirement for one or more sources for the 1-hour standard, the anti-backsliding requirements require the State to meet that obligation. The anti-backsliding provisions may be found at 40 CFR 51.905 and apply to all former 1-hour non-attainment areas.

4. **Q:** Where a State determines that sources subject to Federal rules, such as NESHAPs, the municipal waste incinerator rules under CAA section 111(d), and NSR/PSD settlement agreements, meet RACT by compliance with those requirements, how should those requirements be addressed as part of the SIP?

A: To rely on federal rules to meet the RACT requirement, the State must incorporate these requirements into the SIP. For example, a State could incorporate by reference the Federal requirement or could submit a permit that includes this provision as a SIP revision.

5. **Q:** Can a State rely for RACT determinations on control obligations in Federally enforceable permits issues under a State approved nonattainment new source review program (or a PSD program)?

A: Yes, a State may rely on control obligations required by federally enforceable permits. The State would need to submit the relevant portions of these permits (i.e., the portions establishing the VOC and NO_x obligations) as SIP revisions along with a demonstration that such controls are RACT.

6. **Q:** For NO_x RACT for stationary source categories, other than wall and tangentially fired electric utility boilers, EPA guidelines in 1994 indicate States should consider in their RACT determinations technologies that achieve 30-50 percent reduction within a cost range of \$160-1300 per ton of NO_x removed. Do EPA VOC guidance documents, CTGs and ACTs, give percentage reductions and cost per ton removed guidelines for VOC?

A. The VOC CTGs and ACTs usually do not give percent reductions. The emission levels are typically expressed as weight of VOC emitted per some unit of production. For example, for coatings the units are often pounds of VOC emitted per gallon of coating. However in calculating the emission limits, EPA made an assumption of 90% capture of emissions and 90% control of these captured emission for an 81% overall control in many cases. Some of the CTGs, such as for degreasers and storage tanks, define RACT as certain types of equipment, rather than an emission limit.

EPA has never issued a general cost of control guideline for VOC, but costs of control in the CTGs generally ranged around \$2000/ton in 1980s dollars. However, EPA never published this figure as a cut-point that had should not be exceeded.

7. **Q:** What is the primary difference between an ACT and a CTG?

A: The ACTs give percent reductions that can be achieved with various controls at various levels of stringency and the costs per ton to achieve those levels of control. The ACTs do not recommend a particular level as being RACT. The CTGs do specify a particular level of control as being presumptive RACT.

8. **Q:** Does EPA maintain a website containing all the RACT Control Techniques Guidelines and Alternative Control Techniques documents for both NO_x and VOC?

A: The EPA web site http://www.epa.gov/ttn/atw/ctg_act.html contains a list of all published CTGs. This web site also contains a partial list of ACTs, although this ACT list is missing the ACTs for bakeries, organic waste process vents and polyester foam manufacture. The following website includes two updates to NO_x ACTs (see items J.3-4): <http://www.epa.gov/ttn/naaqs/ozone/ozonetech/#nox> . A list of CTGs and ACTs is also attached to this list of Qs & As.

9. **Q:** Does a RACT analysis need to be done for source categories for which an Alternative Control Techniques (ACT) document has been published?

A: Yes. A RACT analysis needs to be done for all CTG sources and all major non-CTG sources. While the CTGs and ACTs provide a starting point for such an analysis, RACT can change over time as new technology becomes available or the cost of existing technology adjusts. States are encouraged to use the latest information available in making RACT determinations, whether that information is in CTGs, ACTs, other guidance that is available or through information submitted during the public review process.

10. **Q:** Would EPA's "Beyond VOC RACT CTG Requirements" guidance (EPA-53/R-010, April 1995) found at <http://www.epa.gov/ttn/catc/dir1/byndract.pdf> be of help in determining RACT? How about documents such as "Control Techniques for Volatile Organic Emissions from Stationary Sources," EPA-450/2-78-022, May 1978, or "Fugitive Emission Sources of Organic Compounds –Additional information on Emission, Emissions Reductions, and Costs," EPA-450/3-82-010, April 1982?

A: The "Beyond RACT" document could be a source to evaluate in performing a RACT analysis. We note that this document was originally written primarily for States that needed to get reductions beyond RACT in order to attain and maintain the ozone NAAQS. However, in the ten years since that document was issued these controls may have become more economically feasible and thus it is possible that controls considered beyond RACT in that document could be considered RACT for certain sources. The second two documents are somewhat analogous to ACT documents which describe various control techniques that can be applied to various industry sectors but do not identify a presumptive RACT-level of control. Some of the industry sectors addressed in these documents are also covered by a CTG, while others are not.

11. **Q:** For source categories for which an NSPS has been adopted, would a statement that there are no sources that preexisted the NSPS be an acceptable RACT analysis? In other words, does the fact that all existing sources meet the NSPS mean that they also meet RACT?

A: The NSPS and RACT requirements are separate obligations under the Act and both must be met. So the fact that a source meets a NSPS does not necessarily mean that it also meets RACT. A State should evaluate the control obligation required through NSPS to determine whether the source is currently meeting the RACT obligation or whether additional control is necessary for RACT.

B. Certifications

12. **Q:** If a source is subject to a rule that is beyond 1-hour RACT, can a State give a certification that this source meets RACT?

A: Even though a source may have been subject to control that was beyond RACT for the 1-hour standard, the State needs to evaluate whether that requirement is, at a minimum, RACT based on the current information that is available.

13. **Q:** Would a certification need to include a commitment to upgrade rules in the future if/when we determine that RACT levels of control have become more stringent?

A: No. The RACT analysis needs to be performed at the time the RACT SIP is being developed and once the RACT SIP is approved there is no additional duty to reconsider this control obligation for a source.

14. **Q:** By what date does a facility need to have a federally enforceable permit to meet requirements for RACT?

A: A RACT SIP is due by September 15, 2006 for subpart 2 areas and with submission of an attainment demonstration request for subpart 1 areas seeking an attainment date more than 5 years after designation. RACT must be implemented no later than the beginning of the first ozone season or portion thereof that occurs 30 months after the required submission date. States should have enforceable measures in place by that date. If a source has or is required to have a Title V operating permit, the provisions of Title V program would govern when the RACT requirement must be incorporated into the SIP and a facility should consult with the permitting authority regarding that issue.

15. **Q:** Must RACT based emission limits, and associated monitoring, record keeping and reporting be included in a Federally enforceable permit (Title V operating permit)?

A: For purposes of meeting the requirements of Title I of the Act (i.e., the nonattainment area provisions), RACT needs to be adopted and approved into the SIP. This can be accomplished in a variety of ways. Typically, States have adopted regulations.

However, the State could first specify the obligation in an enforceable permit and submit the permit (or portions of the permit) for inclusion into the SIP. In some cases, States have also submitted enforceable consent orders as SIP revisions. In general, the RACT requirement for a specific source or source category would include a requirement for a specific control measure or for a specific level of reduction and, as appropriate, monitoring, recordkeeping and reporting requirements.

16. **Q:** Does EPA intend to issue guidance on how States should reassess their rules in light of currently available technologies to determine if their rules incorporate RACT?

A: At this time, EPA is not working on further RACT guidance. States should consult with the appropriate EPA Regional office if they have questions regarding how the analysis for a specific source or source category should be performed.

17. **Q:** What should a State do if it concludes that for a specific source or source category no additional controls are necessary beyond what was required by the RACT analysis under the 1-hour standard?

A: Where a State concludes that the no control is required beyond what was required for purposes of the 1-hour NAAQS, the State should submit its analysis justifying such a conclusion as part of its RACT SIP.

18. **Q:** What is required in a RACT analysis in order for a State to give a certification that previously required RACT controls or newly applied controls represent RACT for 8-hour implementation purposes?

A: A State should evaluate RACT for a source or source category by examining existing EPA guidance as well as other available information such as that identified in the responses above. To conclude that the existing level of control is RACT for a source or source category, the State's analysis should demonstrate that more effective controls are not economically or technically feasible.

C. Relationship between RACT and the Clean Air Interstate Rule (CAIR) and the NO_x SIP Call

19. **Q:** Can a State rely on its participation in the CAIR trading programs to demonstrate that certain source categories meet RACT?

A: EPA has received a petition for reconsideration asking it to reconsider and reopen for public comment its determination that certain sources in States participating in the EPA-administered CAIR NO_x trading program meet ozone NO_x RACT requirements. EPA intends to grant the petition for reconsideration on this issue. If necessary, EPA will provide further guidance on this subject after the reconsideration process is complete.

20. **Q:** Do all sources subject to a State's NO_x SIP call trading program presumptively meet RACT even if the trading program covers non-EGU sources?

A: Yes, EPA believes that the NO_x SIP Call constitutes RACT for those sources covered by the NO_x SIP Call. However, whether our judgment that non-EGU sources subject to the NO_x SIP Call trading system meet RACT will continue to apply in the future depends upon how the State chooses to make the transition from the NO_x SIP Call trading system to the CAIR trading system. This issue is discussed in greater detail in the preamble to the November 29, 2005 8-hour implementation rule at 70 Fed. Reg. 71657.

21. Q: If electrical generating units (EGU) in a State are covered by the NO_x SIP Call trading program, would any EGU be presumed to have met the requirements of NO_x 8-hour ozone RACT even though the source just buys additional needed allocations to comply? Or does the State need to look to see if combustion modifications (e.g. adding low NO_x burners or over fire air) are RACT?

A: As stated in the preamble to the November 29, 2005 8-hour implementation rule, the NO_x SIP Call is estimated to achieve a beyond-RACT degree of control regionally, and sources were required to install any controls needed for compliance no later than May 2004. Under these circumstances, EPA believes that the NO_x SIP call constitutes RACT for those sources covered by the NO_x SIP Call, regardless of the manner of compliance of individual sources (e.g., control equipment installation or purchase of allowances from other sources).

22. Q: Does a source that came into existence after the State's NO_x SIP call rule was adopted meet RACT if it is subject to the State's SIP call rule?

A: Yes, if that source is covered by the NO_x SIP Call trading program. A large EGU will automatically become part of the NO_x SIP Call trading program and thus will be considered to meet ozone NO_x RACT requirements. If the source is a cement kiln or stationary internal combustion engine, a control level of at least a 30 percent or 82 percent reduction respectively from uncontrolled levels would be considered RACT.

23. Q: May a State rely on its compliance with the NO_x SIP Call to show that cement kilns and stationary internal combustion engines are meeting the RACT requirements?

A: Yes, if the cement kilns and stationary internal combustion engines are subject to a SIP approved as meeting the NO_x SIP Call obligation to install and operate controls that are expected to achieve at least a 30 percent and 82 percent reduction, respectively, from uncontrolled levels.

24. Q: The November 29, 2005 preamble to the 8-hour ozone implementation rule says, at page 71656, that: "...a State need not perform a NO_x RACT analysis for non-EGU sources that after 2008 continue to be subject to a SIP that regulates those non-EGU sources equally or more stringently than the State's current rules meeting the NO_x SIP call." Does this apply to the whole facility or just to the unit that is subject to the NO_x SIP call?

A: The State need not perform such an analysis (and may instead rely on the analysis performed by EPA) only for the unit covered by the NO_x SIP call.

D. Negative Declarations

25. **Q:** Are negative declarations required? That is, must a State certify that it has no sources in a particular CTG category if the State does not adopt a RACT rule for this category?

A: A negative declaration that there are no sources in a specific CTG category or no major non-CTG sources would need to be included as part of the RACT SIP submittal. As part of the RACT submission, the negative declaration and the information supporting the declaration would be subject to the SIP public hearing at the State level.

26. **Q:** If the State area believes that there are no major non-CTG sources located in the nonattainment area, would the area need to submit a negative declaration?

A: Yes, the negative declaration would need to assert that there are no major non-CTG sources in the area, and the accompanying analysis would need to support that conclusion.

E. Other Issues

27. **Q:** Can the State calculate the potential to emit (PTE) for an emission unit based on emissions after a control device if the operation and installation of the control device are federally enforceable, e.g., a NSPS or MACT standard requires the control device to be installed and operated?

A: Yes. Where a source has a federally enforceable limit on emissions or a federally enforceable restriction on the hours of operation, then the analysis of whether the source is subject to RACT would be based on emissions considering those restrictions.

28. **Q:** What must a State do for sources in a subpart 2 area not subject to 1-hour RACT SIP regulation?

A: The State must perform a RACT analysis for all CTG and major non-CTG sources in the nonattainment area. Where a source is currently not regulated, the State could start its analysis by considering EPA guidance documents (e.g., CTGs and ACTs). After considering these documents as well other available information, the State would need to submit a SIP revision providing for RACT for all CTG and major non-CTG sources in the area, and a negative declaration where no sources within a category are located in the area. Additionally, section §182(f) provides for an exemption from NO_x RACT if certain criteria are met.

29. **Q:** What must a State do for sources which were subject solely to 1-hour RACT rules in their SIP (excluding sources covered by certain NO_x SIP call/CAIR trading programs)?

A: For sources subject to 1-hour RACT, the State should review available EPA guidance and other available information to determine whether additional control is needed to meet 8-hour RACT. If no additional control is needed, the State may submit a certification with an accompanying analysis demonstrating that the current level of control is RACT. The State need not resubmit the existing SIP-approved 1-hour RACT rules. If additional control is needed, the State would need to make that obligation federally enforceable through a SIP revision.

30. **Q:** What must a State do for sources (excluding sources covered by certain NO_x SIP call/CAIR trading programs) subject to 1-hour RACT rule in the SIP, but subsequently subject to a more stringent regulation (“beyond 1-hour RACT rule”) in State rule which is already in the approved SIP where such rule was adopted as necessary for ROP/attainment?

A: See previous answer to question 29.

31. **Q:** Would the units covered by EPA’s January 1, 1995 memorandum “De Minimis Values for NO_x RACT” also fall into the category where the State used this guidance/policy to set cut-offs for small emissions units?

A: The purpose of the January 1, 1995 memorandum is to provide technical data that may be used to evaluate de minimis NO_x for various categories of sources. EPA does not recommend specific de minimis values, but presents factors as a guide in the development and review of State de minimis rules. Similar to other RACT guidance issued for the 1-hour ozone standard, a State may continue to use this guidance--along with any other relevant information--for purposes of the 8-hour ozone RACT SIP.

32. **Q:** Subpart 1 areas must demonstrate they will attain the 8-hour standard within 5 years of designation, or submit RACT rules with their attainment date extension request. A State/Air District in a subpart 1 nonattainment area plans to submit an extension request and will need to adopt RACT rules for EGUs. In the meantime, a facility has shutdown an old EGU. They submitted a package to bank the shutdown emissions as emission reduction credits (ERCs). Do the calculated ERCs in the facility's submittal need to be reduced to account for the future RACT rule the State/Air District needs to adopt?

A: If the State plans to ask for an attainment date extension for a subpart 1 area beyond 5 years, RACT rules must be submitted. The ERCs must be discounted to the extent that emissions must be reduced to meet the new RACT rule. That is, the ERCs only continue to exist to the extent that the emissions reductions in the ERC represent lower emissions than those which would have been allowed under the new RACT rule if the rule had existed when the ERCs were generated.

Additional guidance on the issue of ERCs and RACT may be found in the 1994 memo, “Response to Request for Guidance on Use of Pre-1990 ERC’s and Adjusting for RACT at Time of Use,” dated August 26, 1994 from John S. Seitz, Director Office of Air Quality Planning and Standards to David Howekamp, Director Region IX Air and Toxics Division. This memo may be found at this web site:
<http://www.epa.gov/Region7/programs/artd/air/nsr/nsrmemos/pre-1990.pdf>

33. **Q:** Is there any option for using Title V permits as the means of complying with the non-CTG major stationary source obligation – either submitting the permits for SIP approval or pulling the salient pieces from them and submitting these components, rather than going to the trouble of adopting a prohibitory rule for the source category?

A: Because Title V permits must be renewed every 5 years, the permits themselves should not be submitted as RACT rules because they are not permanent. However, if State law allows, the State may submit components of the permit as requirements that would remain enforceable until such time as the SIP is revised.

34. **Q:** May a State’s RACT submission include commitments to adopt one or more RACT rules in the future?

A: A RACT submission that does not address RACT for all CTG and non-CTG sources would not be a complete official submission as required by the RACT provisions of the CAA. The State may address RACT through adoption of rules or submission of permits or consent orders; through one or more negative declarations; or through a request for a NO_x RACT exemption. In addition, for non-CTG sources, some states have taken the approach of submitting a RACT rule that provides a process for the source-specific adoption of RACT through a future process. However, such a rule must also provide a backstop control obligation that would apply no later than the RACT compliance date if a source-specific rule had not been adopted, approved and implemented by that date.

35. **Q:** If a state includes its RACT SIP with its 8-hr ozone attainment demonstration as a submittal sometime after September 15, 2006, would that State’s compliance date remain the same, or be adjusted to correspond with the actual submittal date?

A: The RACT compliance date would not change where a State chooses to delay submission of its RACT SIP beyond the required submission date.

36. **Q:** When are RACT SIPs due?

A: Subpart 2 moderate and above areas must submit RACT SIPs no later than September 15, 2006. Subpart 1 areas that seek an attainment date later than five years following designation are required to submit their RACT SIP at the time they request the attainment date extension, which can be no later than the time required for submission of the attainment demonstration – i.e., June 15, 2007. Subpart 1 areas that do not request an extension of the attainment date would meet RACT through submission of an attainment demonstration that demonstrates attainment as expeditiously as practicable. Thus, the

area's attainment demonstration, which is due June 15, 2007, would also be the RACT submission for such area.

37. **Q:** For an area with a year-long ozone season, such as California, when does the implementation date for RACT begin?

A: Areas are required to implement RACT no later than the first ozone season or part thereof that occurs 30 months after the RACT SIP is due. Thus areas with a year-long ozone season would be required to implement RACT 30 months after the SIP submission is required – i.e., March 15, 2009.

38. **Q:** The maximum attainment date for a moderate 8-hour nonattainment area is June 15, 2010. All reductions needed for attainment are supposed to be achieved by the beginning of the ozone season prior to the attainment date. For areas with full year ozone seasons (such as California), the final full ozone season prior to the required attainment date would be the ozone season beginning January 1, 2009. RACT requirements must be implemented by 30 months after SIP submittal, which would be March 15, 2009. When must the RACT requirements be implemented – by January 1, 2009 or by March 15, 2009?

A: Where a State is relying on RACT reductions as part of its attainment demonstration, then those reductions would need to be achieved by the beginning of the final full ozone season prior to the area's attainment date. For some areas, that may mean that RACT requirements will need to be implemented earlier than required under the RACT provisions of the Act and our regulations.

39. **Q:** What is the reference size cut-offs for major non-CTG source categories?

A: RACT applies to CTG sources and to major non-CTG stationary sources of VOC and/or NO_x. The major-source threshold is based on the classification of the nonattainment area and are specified in Clean Air Act section 182(d) for VOC and 182(f)(1) for NO_x. For example, for a severe 8-hour ozone non-attainment area, such as South Coast, "major source" means 25 tpy or more of VOCs or NO_x.

40. **Q:** Does a VOC or NO_x stationary source cut-off (e.g. 25 tpy for NO_x or 25 tpy for VOC in any severe nonattainment area) represent an uncontrolled or controlled level?

A: In general, RACT applicability is based on the source's potential to emit – i.e., uncontrolled emissions. However, if the source has a federally enforceable restriction on the emission level or on the hours of operation, those restrictions would be considered in determining whether the source is a major source (see, e.g., Blue Book pages 2-3 at http://www.epa.gov/ttn/naaqs/ozone/ozonetech/voc_bluebook.pdf). The emissions restriction cannot be solely on the emissions, but must be on the operation of the source so that the potential to emit is below the applicability threshold.

41. **Q:** Does "major source" in the context of a RACT determination represent "equipment" or "facility."

A: EPA guidance provides that when assessing whether a source is "major" for purposes of non-CTG RACT, the State should consider the building, structure, facility or installation. See the Blue Book at:

(http://www.epa.gov/ttn/naaqs/ozone/ozonetech/voc_bluebook.pdf). As provided in the guidance, the State should consider the emissions from all sources that were not required to install RACT (e.g., the source emissions are below those that would be subject to RACT under the applicable CTG) as well as any other sources at the facility. For purposes of determining whether a facility is subject to RACT pursuant to a CTG, the State should examine the aggregate of all emissions from sources in that particular CTG category at the facility.

42. **Q.** May States adopt generic RACT provisions in their 8-hour RACT SIP rules for VOC and/or NO_x?

A. On November 7, 1996, EPA issued a policy memorandum providing additional guidance for approving regulations that contains these generic provisions (Sally Shaver, Director, Air Quality Strategies and Standards Division, memorandum to EPA Division Directors, "Approval Options for Generic RACT Rules Submitted to Meet the non-CTG VOC RACT Requirement and Certain NO_x RACT Requirements"). A State may adopt generic RACT rules as part of its SIP. EPA encourages States to follow the provisions of the November 7, 1996 memorandum.

43. **Q:** Can you provide a complete list of CTGs and ACTs?

A: Here is as complete a listing as we have been able to compile. The CTG list is complete. We believe the ACT list is complete:

Pre 1990 CTGs

1. Design Criteria for Stage I Vapor Control Systems - Gasoline Service Stations, November 1975. [Note – this document is regarded as a CTG although it was never published with an EPA document number.]
2. Control of Volatile Organic Emissions from Existing Stationary Sources, Volume I: Control Methods for Surface Coating Operations, EPA-450/2-76-028, November 1976 [Note – although often listed with the CTGs for historical reasons, this document does not define RACT for any source. It is a compilation of control techniques.]
3. 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, May 1977.

4. Control of Volatile Organic Emissions from Solvent Metal Cleaning, EPA-450/2-77-022, November 1977.
5. Control of Refinery Vacuum Producing Systems, Wastewater Separators, and Process Unit Turnarounds, EPA-450/2-77-025, October 1977.
6. Control of Hydrocarbons from Tank Truck Gasoline Loading Terminals, EPA-450/2-77-026, December 1977.
7. Control of Volatile Organic Emissions from Existing Stationary Sources, Volume III: Surface Coating of Metal Furniture, EPA-450/2-77-032, December 1977
8. Control of Volatile Organic Emissions from Existing Stationary Sources, Volume IV: Surface Coating for Insulation of Magnet Wire, EPA-450/2-77-033, December 1977
9. Control of Volatile Organic Emissions from Existing Stationary Sources, Volume V: Surface Coating of Large Appliances, EPA-450/2-77-034, December 1977.
10. Control of Volatile Organic Emissions from Bulk Gasoline Plants, EPA-450/2-77-035, December 1977
11. Control of Volatile Organic Emissions from Storage of Petroleum Liquids in Fixed Roof Tanks, EPA-450/2-77-036, December 1977.
12. Control of Volatile Organic Compounds from Use of Cutback Asphalt, EPA-450/2-77-037, December 1977
13. Control Techniques for Volatile Organic Emissions from Stationary Sources, EPA-450/2-78-022, May 1978. [Note – This document is often listed with CTGs, but it does not define RACT for any particular source.]
14. Control of Volatile Organic Emissions from Existing Stationary Sources, Volume VI: Surface Coating of Miscellaneous Metal Parts and Products, EPA-450/2-78-015, June 1978
15. Control of Volatile Organic Emissions from Existing Stationary Sources, Volume VII: Factory Surface Coating of Flat Wood Paneling, EPA-450/2-78-032, June 1978.
16. Control of Volatile Organic Compound Leaks from Petroleum Refinery Equipment, EPA-450/2-78-036, June 1978.
17. Control of Volatile Organic Emissions from Manufacture of Synthesized Pharmaceutical Products, 450/2-78-029, December 1978.

18. Control of Volatile Organic Emissions from Manufacture of Pneumatic Rubber Tires, EPA-450/2-78-030, December 1978.
19. Control of Volatile Organic Emissions from Existing Stationary Sources, Volume VIII: Graphic Arts - Rotogravure and Flexography, EPA-450/2-78-033, December 1978.
20. Control of Volatile Organic Emissions from Petroleum Liquid Storage in External Floating Roof Tanks, EPA-450/2-78-047, December 1978.
21. Control of Volatile Organic Emissions from Perchloroethylene Dry Cleaning Systems, EPA-450/2-78-050, December 1978. [Note – Perchloroethylene has been exempted as a VOC, so this CTG is no longer relevant. However, there is a MACT standard for perchloroethylene dry cleaners.]
22. Control of Volatile Organic Compound Leaks from Gasoline Tank Trucks and Vapor Collection Systems, EPA-450/2-78-051, December 1978.
23. Fugitive Emission Sources of Organic Compounds – Additional Information on Emissions, Emission Reductions, and Costs, EPA-450/3-82-010, April 1982. [Note – This document does not define RACT for any particular source.]
24. Control of Volatile Organic Compound Emissions from Large Petroleum Dry Cleaners, EPA-450/3-82-009, September 1982
25. Control of Volatile Organic Compound Emissions from Manufacture of High-Density Polyethylene, Polypropylene, and Polystyrene Resins, EPA-450/3-83-008, November 1983
26. Control of Volatile Organic Compound Equipment Leaks from Natural Gas/Gasoline Processing Plants, EPA-450/2-83-007, December 1983.
27. Control of Volatile Organic Compound Fugitive Emissions from Synthetic Organic Chemical Polymer and Resin Manufacturing Equipment, EPA-450/3-83-006, March 1984
28. Control of Volatile Organic Compound Emissions from Air Oxidation Processes in Synthetic Organic Chemical Manufacturing Industry, EPA-450/3-84-015, December 1984.

Post 1990 CTGs

1. SOCFI Distillation and Reactor Processes CTG (EPA 450/4-91-031, August 1993).

2. Wood Furniture (CTG-MACT) - draft MACT out 5-94; Final CTG, EPA-453/R-96-007, April 1996; see also 61 FR 25223, and, 61 FR 50823, September 27, 1996.
3. Shipbuilding/repair ACT (EPA 453/R-94-032, April 1994) and CTG, see 61 FR 44050, August 27, 1996.
4. Aerospace (CTG & MACT) (see 59 FR 29216, June 6, 1994); CTG (Final), EPA-453/R-97-004, December 1997.

The VOC Available Control Technology (ACTs) Documents

1. Control Techniques for Organic Emissions from Plywood Veneer Dryers, EPA-450/3-83-012. May 1983. [This document is labeled as a control technique document (CTD) rather than an ACT. However, the information is similar to that in an ACT.]
2. Reduction of Volatile Organic Compound Emissions from Application of Traffic Markings – EPA-450/3-88-007, August 1988. [Note – the Architectural and Industrial Maintenance coatings (AIM) national rule issued in 1998 includes limits for traffic coatings and superseded the ACT.]
3. Ethylene Oxide Sterilization ACT (EPA 450/3-89-007) March 1989.
4. Alternative Control Technology Document – Halogenated Solvent Cleaners – EPA-450/3-89-030. August 1989.
5. Alternative Control Technology Document – Organic Waste Process Vents – EPA-450/3-91-007, December 1990.
6. Polystyrene Foam Manufacturing – EPA-450/3-90-020, 1990.
7. Bakery Ovens ACT (EPA 453/R-92-017, December 1992)
8. Control Techniques for Volatile Organic Compound Emissions from Stationary Sources, EPA-453/R-92-018, December 1992
9. Industrial Wastewater CTG (draft) (EPA-453/D-93-056, September 1992); ACT: April 94 ACT consists of cover memo with option tables + CTG (draft).
10. Control of VOC Emissions from the Application of Agricultural Pesticides, EPA-450/R-92-011, March 1993.
11. Alternative Control Techniques Document: Volatile Organic Liquid Storage In Floating and Fixed Roof Tanks, EPA 453/R-94-001, January 1994.

12. Control of Volatile Organic Compound Emissions from Batch Processes ACT (EPA 453/R-93-017 or EPA 453/R-93-020, February 1994)
13. Alternative Control Techniques Document – Industrial Cleaning Solvents, EPA-453/R-94-015, February 1994
14. Business Machine Plastic Parts coating/Automobile Plastic Parts coating ACT (EPA 453/R-94-017, February 1994)
15. Automobile Body refinishing ACT (EPA 453/R-94-031, April 1994) [Note – a national rule for autobody refinishing was issued in 1998 after the ACT.]
16. Ship building coatings ACT, EPA 453/R-94-032, April 1994. [This was superseded by the Ship building CTG which was issued in August 1996.]
17. Offset Lithography ACT (EPA 453/R-94-054, June 1994)

The NOx ACT documents:

1. NOx Emissions from Nitric and Adipic Acid Manufacturing Plants (EPA-453/3-91-026- December 1991.
2. NOx Emissions from Stationary Combustion Turbines (EPA-453/R-93-007) - January 1993.
3. NOx Emissions from Process Heaters (EPA-453/R-93-034) - revised September 1993.
4. NOx Emissions from Stationary Internal Combustion Engines (EPA-453/R-93-032), July 1993 – [Updated September 2000.]
5. NOx Emissions from Utility Boilers - (EPA 453/R-94-023) March 1994.
6. NOx Emissions from Cement Manufacturing - (EPA 453/R-94-004) March 1994 – [Updated September 2000.]
7. NOx Emissions from Industrial, Commercial & Institutional Boilers - (EPA 453/R-94-022) March 1994.
8. NOx Emissions from Glass Manufacturing - (EPA 453/R-94-037), June 1994.
9. NOx Emissions from Iron and Steel - (EPA 453/R-94-065) September 1994.