EPA-453/R-95-015b

# NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS PETROLEUM REFINERIES - BACKGROUND INFORMATION FOR FINAL STANDARDS

Summary of Public Comments and Responses

Emission Standards Division

U.S. Environmental Protection Agency
Office of Air and Radiation
Office of Air Quality Planning and Standards
Research Triangle Park, North Carolina 27711

EPA-453/R-95-015b

July 1995

## DISCLAIMER

TABLE OF CONTENTS

TABLE OF CONTENTS (CONTINUED)

Page

TABLE OF CONTENTS (CONTINUED)

TABLE OF CONTENTS (CONTINUED)

Page

TABLE OF CONTENTS (CONTINUED)

Page

LIST OF TABLES

ACRONYM AND ABBREVIATION LIST

| ACRONYM | TERM |
|---|---|
| Act | Clean Air Act |
| ANSI | American National Standards Institute |
| API | American Petroleum Institute |
| ASTM | American Society for Testing and Materials |
| AQMD | Air Quality Management District |
| BACT | best available control technology |
| BWOM | Benzene Waste Operations NESHAP |
| CEM | continuous emissions monitoring |
| CFR | Code of Federal Regulations |
| COTU | crude oil topping unit |
| DoE | Department of Energy |
| E.O. | Executive Order |
| EPA | Environmental Protection Agency |
| FCC | fluidized catalytic cracking |
| FCCU | fluidized catalytic cracking unit |
| HAP | hazardous air pollutant |
| HEM | Human Exposure Model |
| HON | hazardous organic national emission |
| I&M | inspection and maintenance |
| ICR | Information Collection Request |
| LDAR | leak detection and repair |
| MACT | maximum achievable control technology |
| MTBE | methyl tert butyl ether |
| NCS | Notification of Compliance Status |
| NESHAP | national emission standards for hazardous air pollutants |
| NSPS | new source performance standards |
| OPAR | Office of Policy Analysis and Review |
| OTA | Office of Technology Assessment |
| QIP | quality improvement program |
| RACT | reasonably available control technology |
| RCT | reference control technology |
| RFG | reformulated gasoline |

ACRONYM AND ABBREVIATION LIST
(CONTINUED)

| ACRONYM | TERM |
|---|---|
| RIA | Regulatory Impact Analysis |
| SCAQD | South Coast Air Quality District |
| SIC | Standard Industrial Classification |
| SIP | State Implementation Plan |
| SOCMI | synthetic organic chemical |
| SRU | sulfur recovery unit |
| TRE | total resource effectiveness |
| TRI | toxics release inventory |
| TSDF | treatment, storage, and disposal facility |
| VOC | volatile organic compound(s) |

| ABBREVIATION | UNIT OF MEASURE |
|---|---|
| bbl | barrel |
| bbl/sd | barrels per stream day |
| $^oC$ | degrees Celsius |
| cm | centimeter |
| $^oF$ | degrees Fahrenheit |
| gal | gallon |
| Kg | kilogram |
| kPa | kilopascals |
| lb | pound |
| gal | gallons |
| Mg | megagrams |
| MMBtu | million british thermal units |
| MW | megawatts |
| ppm | parts per million |
| ppmv | parts per million by volume |
| ppmw | parts per million by weight |
| psia | pounds per square inch absolute |
| psig | pounds per square inch (gauge) |

# 1.0 SUMMARY

On July 15, 1994, the U.S. Environmental Protection Agency (EPA) proposed national emission standards for hazardous air pollutants (NESHAP) for petroleum refineries (59 FR 36130) under authority of section 112 on the Clean Air Act (Act). Public comments were requested on the proposal in the Federal Register. There were 62 comment letters received from industry representatives, governmental entities, environmental groups, and private citizens during the public comment period.

One public hearing was held in Research Triangle Park (RTP), North Carolina, on August 5, 1994. The hearing was open to the public and four persons presented oral testimony on the proposed NESHAP.

The written comments that were submitted and verbal comments made at the public hearing regarding the technical and policy issues associated with the proposed rule, along with responses to these comments, are summarized in the following chapters. The summary of comments and responses serves as the basis for the revisions made to the NESHAP between proposal and promulgation.

## 1.1 SIGNIFICANT COMMENTS AND CHANGES SINCE PROPOSAL

In response to comments received on the proposed standards, several changes have been made to the final rule. While several of these changes are clarifications designed to make the Agency's intent clearer, a number of them are significant changes to the proposed standard requirements. A summary of the substantive comments and/or changes made since the proposal are described in the following sections.

Detailed Agency responses to public comments and the revised analysis for the final rule are contained in the body of this document and the docket for this rule (Docket No. A-93-48). The docket for the final rule is available for public inspection between 8:00 a.m. and 4:00 p.m., Monday through Friday except for Federal holidays, at the following address: U.S. Environmental Protection Agency, Air and Radiation Docket and Information Center (MC-6102), 401 M Street SW, Washington DC 20460; telephone: (202) 260-7548.

### 1.1.1 Process Vents Group Determination

The proposed NESHAP would have required control of all miscellaneous process vents with HAP concentrations over 20 ppmv. This level was based on the fact that combustion control technologies can reduce organic emissions by 98 percent or to 20 ppmv, but cannot necessarily achieve lower concentrations. Several commenters suggested that other applicability criteria were needed to determine which process vents are required to apply control. They pointed out that the HON and State regulations use a total resource effectiveness (TRE) or emission rate cutoff to exclude small vents that have low emission potential and high costs from control requirements. The commenters contended that the MACT floor does not include control of such vents.

In response to these comments, the EPA examined potential control applicability criteria. The EPA reevaluated the miscellaneous process vents data base. The EPA's information on miscellaneous process vent streams was insufficient to establish an emission rate cutoff. This was because industry did not have sufficient information on the HAP and VOC content of vent streams requested by the section 114 questionnaires and ICR's and it would have been impractical to obtain this information. Therefore, as suggested by a number of commenters, and after consultations with industry and others, the EPA decided to use State regulations.

The EPA evaluated the current level of control for miscellaneous process vents in eight States and two air districts that contain the majority of refineries and were expected to have the most stringent regulations. Of the refineries in the United States, the 12 percent that are subject to the most stringent regulations are located in three States. In these three States, miscellaneous process vents emitting greater than 6.8 to 45 kilograms per day (kg/d) (15 to 100 lb/day) of VOC are required to be controlled. The median applicability cutoff level for the 12 percent of U.S. refineries subject to the most stringent regulations is 33 kg/d (72 lb/day VOC). Thus, control of vents with VOC emissions greater than 33 kg/d (72 lb/day) is the MACT floor for existing sources, and control of vents with VOC emissions greater than 6.8 kg/day (15 lb/day) is the MACT level of control for new sources. The primary organic HAP's at refineries are also VOC. Additionally, a VOC-based applicability criteria is most reflective of the current level of control required for miscellaneous process vents as the majority of State regulations are expressed in terms of VOC. Therefore, the EPA has adopted these emission levels in the final rule to distinguish Group 1 from Group 2 vents. Group 1 vents, those that emit over 33 kg/day (72 lb/day) for existing sources and over 6.8 kg/day (15 lb/day) for new sources, must be controlled, whereas Group 2 vents (which emit less than 33 kg/day (72 lb/day) for existing sources and less than 6.8 kg/day (15 lb/day) for new sources) are not required to apply controls under the final rule. The 33 kg/day (72 lb/day) and 6.8 kg/day (15 lb/day) applicability limits are to be determined as the gases exit from process unit equipment and not downstream from an emission control device.

### 1.1.2 Process Vent Impacts

At proposal, the EPA estimated that the baseline HAP and VOC emissions from process vents were 9,800 Mg/yr (10,780 tpy) and 190,000 Mg/yr (209,000 tpy), respectively. Several commenters contended that the impacts analysis for process vents should be redone because: (1) The data base used in the analysis contained several errors, and (2) the emission estimation methodology was incorrect. The commenters asserted that these inaccuracies resulted in overestimates of emissions. Some of the commenters asserted that the data base flaws included: (1) A lack of data concerning the number, flowrates, and HAP concentrations of miscellaneous process vents, and (2) an erroneously high percentage of controlled vents because many uncontrolled vents were not reported. Some of the commenters contended that the emission estimation methodology was flawed because (1) It included wastewater and maintenance emissions, (2) emission factors were calculated from a HAP-to-VOC ratio that included reformer emissions, and (3) alkylation emissions and crude unit emissions were based on one refinery where vents were uncontrolled at the time of the questionnaire and are now controlled.

The EPA agrees with the commenters that the process vents emission impacts estimate has several assumptions that needed to be reanalyzed. The EPA also agrees that the data base used at proposal should be reevaluated to consider the commenters' concerns. Therefore, the EPA has reestimated the emissions and cost impacts of the process vents provisions using the commenters' recommendations.

The emissions at proposal were estimated using responses from only the section 114 questionnaires extrapolated to the entire refining industry. Because the section 114 questionnaires were sent to the largest companies, the data obtained from them skewed the results based on what the largest refineries did. The revised emissions were estimated using data from both the section 114 and ICR responses. The ICR questionnaires were sent to refineries not receiving the section 114 questionnaires. This additional data increased the number of vents in the data base by 1,300. The increase in vents resulted in a decrease in controlled vents from 40 percent to 24 percent. However, information on the HAP and VOC content of vent streams remained limited as no new data was provided by the ICR respondents. Additionally, no new HAP information was provided by industry after proposal of the rule.

Additionally, errors in the data base were corrected and non-miscellaneous process vents were removed from the data base (e.g., vents from wastewater, maintenance, catalytic reformer regeneration vents, etc). In the revised emission estimates, emissions from alkylation and crude units were estimated from a number of different data points (not just one, as the commenters have stated). Additionally, the one data point the commenters have referred to has been changed to reflect the change in control status. The revised baseline miscellaneous process vents HAP and VOC emissions are 10,000 Mg/yr (11,000 tpy) and 109,000 Mg/yr (119,900 tpy), respectively.

The EPA agrees that the data on HAP concentrations is limited. However, no new data was supplied by the commenters. The EPA's revised emission estimates are based on technically sound methods and the best available information.

1.1.3 Equipment Leaks Compliance Requirements

The proposed rule for equipment leaks at existing sources was an above-the-floor option modeled after the HON negotiated rule for equipment leaks. The floor level of control for equipment leaks from existing sources was determined to be control equal to the petroleum refinery NSPS. The modified negotiated rule was chosen as an above-the-floor option because it was estimated to be cost effective. The option chosen in the proposed rule differed from the HON in that: (1) Existing sources were not required to monitor connectors, and (2) the leak definitions were higher to reflect the different volatility of materials found in refinery process lines as opposed to SOCMI process lines. The proposed rule required one-third of the refinery to be in compliance 6 months after promulgation of the rule, two-thirds of the refinery to be in compliance 1 year after promulgation of the rule, and the entire refinery to be in compliance 18 months after promulgation of the rule.

Several commenters contended that the emissions and cost information used to determine the cost effectiveness of going from the floor level of control to the modified negotiated rule were inaccurate and did not consider recent changes to the equipment leak correlation equations for petroleum refineries. The commenters concluded that using the most recent information for refineries would show that it is not cost effective to go beyond the floor level of control.

The cost information used in the analysis was the best data available, and is based on surveys of vendors and established costs presented in previous projects. No new cost information was submitted by the industry. The equipment leak emission factors that are being used to estimate the emissions and emission reductions of the rule were developed in 1980. These are the only complete and accurate emission factors available for this purpose. To accurately estimate emissions from equipment leaks, two sets of information are needed. These include the amount of emissions generated per piece of equipment leaking at a given concentration and the percent of equipment that are actually leaking at these concentrations. The 1980 study that was used to estimate the impacts of the refinery MACT rule used a consistent sampling methodology to address both of these factors based on sampling at uncontrolled refineries. The 1993 API study developed new information only on emissions per piece of leaking equipment using a different methodology. As stated in API's report, this information was developed from refineries in California for use with other information to estimate facility-specific equipment leak emissions. Thus, this study was not designed to provide information on industry average percent leaking equipment. Therefore, it was not possible to redefine average emission factors. To actually use this information, however, EPA would need corresponding new information on the percent of equipment leaking. The EPA does not believe that it would be appropriate to combine 1993 information with the 1980 data to develop new emission factors because sampling methodologies were different and because the 1993 study collected information from well-controlled facilities while the 1980 study collected information from uncontrolled facilities. However, the EPA agrees that new correlation equations developed for the refining industry indicate that the refinery factors may overestimate emissions by as much as a factor of two, which may make the modified negotiated rule option less cost effective. This cannot be accurately determined because the appropriate information to update average emission factors is not available. The EPA recognizes that enough uncertainty exists in the emission and cost estimates to question the results of the cost-effectiveness analysis.

In recognition of this uncertainty and to provide compliance flexibility, the EPA has changed the final rule to provide each existing refinery with a choice of complying with either: (1) The equipment leaks NSPS requirements (40 CFR part 60, subpart VV) or (2) a modified version of the negotiated rule (40 CFR part 63, subpart H). The NSPS represents the MACT floor for existing sources. The modified negotiated regulation is the same as what was contained in the proposed petroleum refinery NESHAP except that the compliance dates have been extended for reasons described below.

Although not required in the final rule, the EPA promotes use of the modified negotiated rule option because it is believed to provide considerable product, emissions, and cost savings to a refinery.

Under either option, existing refineries will be required to implement an LDAR program with the same leak definitions (10,000 ppm) and the same leak frequencies as contained in the NSPS by 3 years after promulgation. A refinery may opt to remain at this level of control and do the monitoring, recordkeeping, and reporting specified in the NSPS. This option allows refineries that are familiar with the NSPS to continue to implement that standard without needing to change their procedures.

Alternatively, a refinery may choose to comply with Phase I of the negotiated rule (10,000 ppm leak definition) 3 years after promulgation, comply with Phase II 4 years after promulgation, and comply with Phase III 5 ½ years after promulgation. Each phase has lower leak definitions for pumps and valves. In Phase III, monitoring frequencies for valves are dependent on performance (percent leakers), providing an incentive (less frequent monitoring and reduced monitoring costs) for good performance. Refineries choosing to comply with the modified negotiated rule are subject to monitoring, recordkeeping, and reporting requirements of subpart H. The EPA has included this compliance alternative to add flexibility and opportunities for adjustment for differences among facilities.

The compliance dates for equipment leaks were revised to address commenter concerns that contended that small refineries and refineries in ozone attainment areas would be at a disadvantage if they were required to comply with the proposed equipment leak regulations because they would not have the experience to implement an equipment leaks control program within 6 to 18 months.

The EPA agrees that small refineries may not have the experience to implement an LDAR program for equipment leaks in a short timeframe without significant expense. The EPA also contends that other refineries that do not currently have LDAR programs may also have trouble implementing the rule in 6 to 18 months. In response to these comments, the EPA has changed the final rule to require that existing and new refineries, regardless of size, comply with an LDAR program with the same leak definitions (10,000 ppm) and monitoring frequencies as the petroleum refinery NSPS within 3 years of promulgation of the rule. At the end of the third year, the entire refinery must be in compliance with the petroleum refinery NSPS level of control; there will not be interim deadlines during the 3-year period by which portions of the refinery are required to comply during this time. A refinery owner or operator who chooses to comply with the modified negotiated rule must then implement Phase II within 4 years and Phase III within 5 ½ years of promulgation. The total annual cost estimates for the rule have been revised in accordance with the changes made to the equipment leak requirements.

### 1.1.4 Storage Vessels

The proposed rule required existing storage vessels containing liquids with vapor pressures greater than or equal to 8 kPa (1.2 psia) to comply with storage vessel requirements within 3 years. For tanks that were already controlled with internal or external floating roofs, the proposed rule allowed operators to defer upgrading of seals until the next scheduled maintenance with the following exceptions: (1) Fixed roof tanks, (2) EFR tanks with only a vapor-mounted primary seal, and (3) all tanks storing a liquid with a true vapor pressure greater than 34 kPa (5.0 psia).

Commenters to the proposed rule maintained that before additional emission controls (e.g., secondary seals) can be installed, tanks must be removed from service, degassed, and cleaned. Storage tanks are currently emptied and cleaned roughly every 10 years for inspection and maintenance. The commenters contended that removing storage tanks that already have floating roofs from service before scheduled maintenance would have adverse environmental impacts that could not be overcome by the emissions reductions from upgrading the seals on the tank. The commenters further stated that tank owners or operators would incur substantial costs as a result of degassing and cleaning a tank before scheduled maintenance. The commenters contended that a 3-year compliance schedule could not be met because there would not be enough trained and capable fabricators and contractors to support the tank modification work. Commenters stated that the reason was that the refinery rule compliance period overlaps with the implementation of other EPA rules and that a 10-year compliance schedule would be consistent with other EPA rulemakings such as the HON and the benzene storage NESHAP.

The EPA agrees with the commenters that the HON and the benzene storage NESHAP allow floating roof tanks to achieve compliance in 10 years or at the time of the next scheduled degassing. Most existing floating roof storage vessels at refineries also fall under the 10-year compliance schedule. Therefore, these storage vessels will be inspected within 5 to 10 years after promulgation of the rule. This is consistent with industry practice.

In response to these comments, the EPA analyzed the emissions resulting from degassing and cleaning storage vessels using empirical mass-transfer models. The analysis indicated that degassing and cleaning of floating roof vessels generally results in substantial volatilization of HAP's to the air. These emissions could not be balanced in less than 5 years by the emission reductions achieved by controlling the tank to the requirements in the rule. Additionally, the degassing and cleaning information submitted by the refining industry indicated substantial costs for each degassing and cleaning activity if required within 3 years after promulgation of the rule.  Based on information provided by industry and the EPA's empirical analysis, the EPA determined that the proposed storage vessel provisions were not cost effective and would, in many cases, result in increased overall emissions because of the extra degassing emissions.

The final rule allows owners or operators of storage vessels subject to the rule to defer installation of better seals on floating roof tanks storing any liquid until the next scheduled maintenance or within 10 years, whichever comes first.  This change addresses the commenters' concerns about emissions and costs as well as their concern about the availability of trained fabricators and contractors to modify the tanks within a 3-year period.  The final rule maintains the requirement to retrofit IFR tanks at existing sources with secondary seals that meet 40 CFR part 60 subpart Kb requirements because it is the MACT floor for IFR vessels.

Based on the EPA's analysis, the emissions from degassing and cleaning fixed roof tanks can be balanced within 1 year (justifying a 3-year compliance date) by the emission reductions achieved by controlling the tank to the requirements in the rule.  Therefore, the final rule maintains the proposed compliance times (within 3 years) for fixed roof tanks.  The EPA believes that in certain situations, such as when replacement of a tank is required, it would be reasonable for States to grant an additional year to comply as authorized under section 112(i)(3)(B) of the Act.  The additional year would provide time to design and construct the tanks without disrupting refinery operations which could cause additional emissions.  The EPA will work with the industry and States to find ways to use the emissions averaging program to deal with cases where tanks have to replaced or where it is extremely difficult or costly to install the required controls.

Several commenters contended that the Group 1 definition of 8 kPa (1.2 psia) in the proposed NESHAP was based on data requests in section 114 and ICR questionnaires that were misinterpreted by respondents. The commenters stated that the questionnaires did not specify whether respondents were to provide maximum true vapor pressures or average annual true vapor pressures. The commenters elaborated that because other data were provided to estimate emissions on an annual basis, it was reasonable to assume that respondents provided average annual true vapor pressures instead of maximum true vapor pressures. The commenters concluded that vapor pressures based on the maximum monthly temperatures may be 0.3 psia higher than the average annual true vapor pressure. The commenters recommended that the EPA either change the applicability cutoff to 10 kPa (1.5 psia) maximum true vapor pressure to account for this difference or specify that the 8 kPa (1.2 psia) cutoff is the average annual true vapor pressure instead of the maximum true vapor pressure.

The EPA agrees with the commenters that because the questionnaires did not specify the type of vapor pressure, the respondents may have provided annual average true vapor pressures instead of maximum true vapor pressures. In order to reflect the uncertainty of the type of vapor pressure provided in the questionnaires, the EPA has decided to change the storage vessel applicability cutoff in the final rule from a maximum true vapor pressure of 8 kPa (1.2 psia) to 10 kPa (1.5 psia). An analysis of the storage vessel data base indicated that a change from 8.3 kPa (1.2 psia) to 10 kPa (1.5 psia) will not affect the impacts analysis.

Several commenters requested that a minimum HAP content be considered as well as a vapor pressure cut-off for storage vessels because some liquids may have very low HAP concentrations and high vapor pressures due to the volatility of non-HAP compounds in the material. The EPA agrees that several products, such as asphalt, have minimal HAP's that may have vapor pressures greater than 10 kPa (1.5 psia) if stored at elevated temperatures. To determine HAP weight percent applicability criteria, the EPA reviewed the MACT floor analysis for storage vessels to determine the HAP weight percents in controlled storage vessels at the best-controlled sources. The MACT floor for new sources is based on the best-controlled source, while the floor for existing sources is the average of the best-controlled 12 percent of sources (or 16 refineries). The HAP weight percent applicability criterion was determined using the same population of storage tanks used to determine the vapor pressure applicability cut-off (i.e., the best-controlled 16 refineries). The minimum HAP concentrations for materials stored in the tanks meeting subpart Kb at the 16 best-controlled sources ranged from 2 weight percent to 22 weight percent. The average HAP weight percent in the liquids stored in these tanks is 4 percent. The best-controlled tanks contain liquids with a HAP weight percent in the liquid of 2 percent. Therefore, the HAP weight percent criterion for existing sources is 4 percent HAP in the liquid; the HAP weight percent for new sources is 2 percent HAP in the liquid.

### 1.1.5 Overlapping Regulations

Several commenters contended that the petroleum refinery NESHAP will lead to overlap with other existing and future regulations such as the 40 CFR part 60 NSPS, 40 CFR parts 61 and 63 NESHAP, and State and local regulations. Commenters stated that the overlap between regulations will lead to confusion, uncertainty, and frustration for sources and regulators.

The EPA has clarified the applicability of subpart CC as it relates to other NSPS and parts 61 and 63 NESHAP that apply to the same source in § 63.640 of the final rule.

The final rule clarifies the applicability of 40 CFR part 63, subpart CC storage vessel provisions to storage vessels at existing and new petroleum refinery sources subject to 40 CFR part 60, subparts K, Ka, or Kb. The specific provisions are structured such that each vessel is subject to only the more stringent rule. For example, a Group 1 storage vessel at an existing refinery that is also subject to subpart K or Ka is required only to comply with the petroleum refinery NESHAP storage vessel provisions.

The final rule clarifies the applicability of 40 CFR part 63, subpart CC wastewater provisions by stating that a Group 1 wastewater stream managed in a piece of equipment that is also subject to the provisions of 40 CFR part 60, subpart QQQ is required only to comply with 40 CFR part 63, subpart CC. The final rule also clarifies that a Group 2 wastewater stream managed in equipment that is also subject to the provisions of 40 CFR part 60, subpart QQQ is required only to comply with subpart QQQ. Clarification of the applicable provisions for a wastewater stream that is conveyed, stored, or treated in a wastewater stream management unit that also receives streams subject to the provisions of 40 CFR part 63, subpart F has also been included in the final rule.

There should not be any process vent applicability overlap between subpart CC and any other Federal rule. Process vents regulated under the HON are not subject to the petroleum refinery NESHAP.

The EPA clarifies the applicability of subpart CC equipment leak provisions in the final rule by stating that petroleum refinery sources subject to 40 CFR parts 60 or 61 equipment leaks regulations are required to comply only with the petroleum refinery NESHAP equipment leak provisions.

The EPA has also included a Standard Industrial Classification (SIC) code definition for petroleum refining (2911) to the petroleum refinery process units definition in the final rule in order to clarify which provisions of the rule apply to storage vessels and equipment leaks. The EPA believes that the inclusion of the SIC code reference in the definition of refinery process unit will alleviate confusion about applicability of this rule (reducing potential confusion regarding process unit regulatory overlap) and other source categories scheduled for the development of NESHAP under the Act. The EPA has also added a list of pollutants covered under the rule to assist facilities in the determination of whether emission points are covered under the rule.

Another issue raised by several commenters was the potential for overlap between the petroleum refinery MACT and other MACT standards such as the HON. These commenters requested that the EPA clarify the distinction between process units subject to the HON or other MACT standards and process units subject to the petroleum refinery MACT standard. These commenters thought that the description of refinery process units was too general and could include chemical processes subject to the HON or other MACT standards.

The final rule provides that 40 CFR part 63, subpart CC does not apply to units that are also subject to the provisions of the HON. The applicability of subpart CC versus the HON or other MACT standard to an emission point is determined by the primary product produced in the unit. The primary product is the product that is produced in the greatest mass or volume that the unit produces. For example, if a refinery operates a unit that produces upgraded feedstock for the alkylation unit and this unit also produces a small quantity (less than 20 percent) of the chemical MTBE, that unit is considered to be subject to the petroleum refinery MACT standard and not to the HON. In contrast, if a facility operated a process unit that produced MTBE as the primary product and also produced small quantities of a mixed hydrocarbon stream, the unit would be subject to the HON because the unit produces MTBE as the primary product and the HON applies to chemical manufacturing units that produce MTBE. The distinction between the units is the difference in the primary product produced in the different units. In the first case, the unit is integral to the petroleum refinery's operations and the MTBE is a by-product of the unit. In the second case, the unit's operation could be replaced by purchased MTBE and the operation is not integral to the petroleum refinery's operations.

The EPA believes that by specifying the applicability determination procedures for a process unit in addition to including the applicable process unit definitions clarifies the applicability of the petroleum refinery MACT standard and other MACT standards for the same emission point and pollutant to the same process unit. The EPA also believes that by directly stating that units subject to the HON are also subject to this rule, the commenter's concerns over applicability issues have been addressed.

### 1.1.6 Source Category Definition

In the July 1994 notice of proposed rulemaking, the proposed rule preamble provided notice of and sought comment on the issues of a broad affected source definition and source category; source-wide averaging; and the relationship between the gasoline distribution affected source definition and source category and refineries. In the preamble of the proposed refinery rule, the EPA noted that it did not intend to include emission points that are subject to the gasoline distribution standard in the refinery source category, that all emission points within the refinery source category would be treated as one stationary source for purposes of the refinery standard, and that the EPA intended to permit averaging among all emission points within the source category except for equipment leaks.

Comments on both the gasoline distribution rule and the refinery proposal indicated that the Agency needed to clarify which rule applied to which emissions points and whether averaging would apply to collocated emission points. Both proposed rules addressed similar emission points; for example, both proposed rules addressed storage tanks and equipment leaks where refineries were collocated with gasoline distribution operations. In the preamble accompanying the final gasoline distribution rule, the EPA indicated the intent to rely on SIC codes to distinguish between emission points at refineries covered by the gasoline distribution standard and those covered by the refinery standard. The Agency noted that the SIC code for particular equipment would indicate the department with managerial oversight responsibility for each emission point. However, the EPA specifically provided that this rule, if appropriate, would modify the gasoline distribution standard to incorporate SIC code limits.

The final rule identifies petroleum refinery process units and the gasoline loading rack emission points by SIC code for purposes of identifying the appropriate control requirements. A broad source category and affected source definition increases the opportunity to use flexible compliance options such as emissions averaging. Because the control technology under today's rule for gasoline loading racks is the same as the requirements under the gasoline distribution NESHAP, the required emissions reductions from gasoline loading racks would be at least as great as would have been required had gasoline loading racks been excluded from the petroleum refinery source category and affected source; due to the credit discount factors, overall emissions may be less than otherwise would be required if gasoline loading racks are included in an emissions averaging plan.

### 1.1.7 Emissions Averaging

The preamble to the proposed petroleum refinery rule requested comments on whether marine loading operations at refineries should be included in emissions averaging. The EPA also reopened the comment period for the proposed NESHAP for marine tank vessel loading operations (59 FR 44955) to request comment on whether marine terminals collocated at refineries should be moved to the petroleum refinery source category. In addition, as noted above, issues related to including gasoline distribution emissions in averaging at refineries were also raised in the proposed rule preamble.

During the comment period for the gasoline distribution NESHAP, commenters requested that gasoline bulk terminals contiguous to a refinery be regulated by the petroleum refinery NESHAP. Several commenters on the proposed petroleum refinery NESHAP and proposed marine tank vessel loading operations NESHAP supported averaging of refinery process unit emissions with emissions from marine terminals and gasoline distribution operations that are located at refineries. The commenters cited more cost-effective emission reduction as the advantage of including these emission points in emissions averaging, and specifically commented that the costs per megagram emission reduction of the marine loading controls are high. These commenters also claimed that emission calculation procedures for loading are well established and that adding marine loading to the averaging provisions will not appreciably increase the complexity of enforcement. Other commenters opposed including marine loading and gasoline distribution emission points in emissions averaging. Some commenters claimed that these are separate source categories and that the Act does not permit averaging across source categories. Other commenters were of the opinion that the EPA has the flexibility to allow trading within a facility that includes units in different source categories. These commenters argued that it is unnecessary to redefine the source category to include marine loading operations and gasoline distribution operations colocated at refineries.

In the final rule, the definitions of the petroleum refinery source category and affected source have been changed to include gasoline loading racks classified under SIC code 2911 (Petroleum Refineries) and marine tank vessel loading operations that are located at refinery plant sites. Because marine loading operations and bulk gasoline transfer operations located at refineries are supplying raw materials to, or transferring products from, petroleum refinery process units, they are logically considered to be part of the same source as the petroleum refinery process units. The EPA considers this definition to be the most appropriate definition and, as noted by several commenters, to present fewer implementation problems.

A gasoline loading rack classified under SIC code 2911 or a marine tank vessel loading operation that is located at a petroleum refinery may be included in an emissions average with other refinery process unit emission points. Because these operations are included as part of a single source within one source category intersource averaging is not an issue.

In keeping with the EPA's stated goal of increasing flexibility in rulemakings, this decision has been made to provide more opportunities to average. This increases the opportunities for refiners to find cost-effective emission reductions from overall facility operations onsite. Costs and cost effectiveness of controlling a particular kind of emission point, such as marine loading, will vary depending on many site-specific factors. Emissions averaging allows the owner and operator to find the optimal control strategy for their particular situation.

The EPA is presently reviewing the emission averaging policy and considering whether any more flexibility can be provided while maintaining environmental protection. The issue of intersource averaging will be considered along with other aspects of the emissions averaging policy. The EPA believes that any decision to provide additional flexibility must be based on careful consideration of enforcement issues as well as equity in environmental protection. Given the complexity of these issues, the EPA does not believe that the Refinery MACT standard is the appropriate place to address these issues. The EPA plans to examine the issue independently of any specific rulemaking. In this, the EPA plans to work closely with both the refining and chemical industries and other interested parties to determine if there are opportunities for increasing flexibility and reducing the burden associated with demonstrating compliance with the MACT rules while remaining within the law.

The EPA would like to clarify that the emissions averaging program was designed to result in equal or greater environmental protection while providing sources flexibility to reduce emissions in the most cost-effective manner. Specifically, allowing marine loading operations, and gasoline loading racks classified under SIC code 2911, located at a refinery to be included in emissions averages will result in equivalent or greater overall HAP emission reduction at each refinery. The averaging provisions are structured such that "debits" generated by not controlling an emission point that otherwise would require control must be balanced by achieving extra control at other refinery emission points covered by the NESHAP. The averaging provisions also require that a source demonstrate that compliance through averaging will not result in greater risk or hazard than compliance without averaging.

Some commenters were concerned that including marine loading in averages could result in uncontrolled peak emissions. With regard to the commenters' concerns about peak emissions, the quarterly cap on the ratio of debits to credits is intended to limit the possibility of exposure peaks. Furthermore, because loading occurs fairly frequently, and emissions from an individual vessel filling or loading event are relatively small, such emissions are not expected to cause significant exposure peaks. Moreover, no evidence has been presented that emissions averaging would permit a very different mix of emissions to occur than would point-by-point compliance. That is, peaks of exposures from batch streams, storage, and loading operations should be equally likely under point-by-point compliance as under emissions averaging, so emissions averaging does not represent a less effective control strategy. Furthermore, in order to receive approval for an emissions average, the owner or operator is required to demonstrate that the emissions average does not increase the risk or hazard relative to compliance without averaging.

### 1.1.8 Monitoring, Recordkeeping, and Reporting

Several commenters alleged that the recordkeeping and reporting requirements of the proposed rule were extremely burdensome. The commenters requested that the EPA reduce the monitoring, recordkeeping, and reporting burden associated with the proposed rule. Commenters also requested that provisions be added to the final rule to avoid duplicative reporting for equipment subject to multiple NESHAP and NSPS. Other commenters requested that flexibility to allow alternative monitoring, recordkeeping, and reporting be incorporated into the final rule.

The EPA recognizes that unnecessary monitoring, recordkeeping, and reporting requirements would burden both the source and enforcement agencies. Prior to proposal, the EPA attempted to reduce the amount of monitoring, recordkeeping, and reporting to only that which is necessary to demonstrate compliance. For example, at proposal almost all reports were consolidated into the Notification of Compliance Status, and the Periodic Reports. This was done to simplify and reduce the frequency of reporting. Sources also have the option of retaining records either in paper copy or in computer-readable formats, whichever is less burdensome. If multiple performance tests are conducted for the same kind of emission point using the same test method, only one complete test report is submitted along with summaries of the results of other tests. This reduces the number of lengthy test reports to be copied, reviewed, and submitted.

Site-specific test plans describing quality assurance in § 63.7(c) of 40 CFR part 63, subpart A are not required because the test methods cited in subpart CC already contain applicable quality assurance protocols. The quality assurance provisions in the individual test methods remain applicable and are not superseded by the nonapplicability of § 63.7(c) of subpart A. For continuously monitored parameters, periodic reporting is limited to excursions outside the established ranges and the in-range values are not required to be reported.

In response to the commenters, the EPA reevaluated whether monitoring, recordkeeping, and reporting requirements could be further reduced while maintaining the enforceability of the rule. The EPA has made the following changes in the promulgated rule to further reduce the monitoring, recordkeeping, and reporting burden:

(1) The requirement to submit an Initial Notification has been eliminated;

(2) periodic reports are required to be submitted semiannually for all facilities that do not use emissions averaging (the proposal required quarterly reports if monitored parameters were out of range more than a specified percentage of the time);

(3) a reduction in the frequency for parameter monitoring and recording. The proposal required values of monitored parameters to be recorded every 15 minutes and all 15-minute records had to be retained for those days when excess emissions occurred. The final rule allows hourly monitoring and recording;

(4) recordkeeping and reporting provisions that eliminate duplicate reporting for equipment subject to multiple NESHAP and NSPS were added to the applicability section (§ 63.640) of the final rule. The additions specify which rule applies and overrides the less stringent NSPS or NESHAP. For State and local regulation applicability determination, the final rule has been amended to state that the local regulatory authority (e.g., State or permitting authority) can decide how monitoring, recordkeeping, and reporting requirements can be consolidated, and can approve alternative monitoring, recordkeeping, and reporting requirements.

These reductions reduce the proposal monitoring, recordkeeping, and reporting burden by 25 percent. The EPA plans to continue to work with the industry as well as with other interested parties to identify further opportunities for reduction of the monitoring, recordkeeping, and reporting burden of the rule. The EPA will consider ways to eliminate overlapping requirements and to address any inconsistencies among the rules. The EPA will investigate the possibility of consolidating and simplifying the various rules while maintaining the same level of environmental protection. Assuming that the pilot project with the chemical industry is successful, the EPA expects to be able to complete the review of the Refinery rule monitoring, recordkeeping, and reporting requirements before the compliance date.

### 1.1.9 Subcategorization

Several commenters to the proposed petroleum refinery NESHAP requested that the EPA subcategorize refineries by size and/or location in an ozone attainment area. Other commenters stated that subcategorizing small refineries because of an arbitrary size exemption can result in an unfair competitive advantage. These commenters further elaborated that large refineries should not be penalized for an economy of scale achieved through its own effective competitiveness.

In response to these comments, the refinery data bases were subcategorized based on crude charge capacity. The refineries were also subcategorized by ozone attainment status and by refineries containing processes that are used to produce gasoline (such as catalytic cracking, coking, and catalytic reforming). Within each subcategory, the process vents, storage vessels, and equipment leaks data bases were sorted from most stringent control to least stringent. The MACT floor (average of the top 12 percent of sources) for each subcategory was identified.

The MACT floors for small refineries are not significantly different from the industry as a whole. The floor for process vents is the same for small refiners as for the entire industry. The floor for storage tanks would increase the materials vapor pressure cutoff from 10 kPa (1.5 psia) to 11 kPa (1.7 psia), which would result in a minimal cost savings since there are few petroleum liquids in this volatility range. The floor for equipment leaks would reduce the monitoring frequency; however, small refiners would still incur the cost of setting up and implementing an LDAR program.

Based on the EPA's analysis and the comments received during the public comment period, a separate subcategory for small refineries has not been included in the final rule.

This decision was based on there being no clear relationship between refinery size or design and emission potential.

### 1.1.10 Economic Analysis

Comments were received on both the methodology of the economic analysis and the potential impacts of the analysis results. The EPA's economic model focused on estimating changes in product price and quantity of production for several petroleum products. Once the effects on price and quantity were evaluated, other impacts were estimated. The model the EPA used is predicated on neoclassical microeconomic theory.

The model assumed that those refineries with the highest per-unit control are marginal (i.e., near the margin between shutdown and continuing operation) in the post-control markets, and that they also have the highest underlying per-unit cost of production. This assumption may result in an overstatement of the adverse impacts, such as closure, since the assumed relationship between per-unit control cost and per-unit production cost may not hold for all refineries. For more information, consult the "Economic Impact Analysis for the Petroleum Refinery NESHAP" in the docket.

Most of the comments about the economic analyses methodology were focused on possible impacts on other parts of the petroleum industry other than refineries. The economic analysis for this rule, like most of the EPA's economic analyses, focuses on the impacts on the industry being regulated and does not calculate impacts to other industries indirectly affected unless those impacts are significant. In this case, the impacts indirectly affected industries were not calculated since the impacts estimated for the petroleum refinery industry were not significant, impacts to indirectly affected industries would likely be insignificant also.

### 1.1.11 Benefits Analysis

Comments noted that naphthalene is classified as a possible carcinogen, not a known carcinogen, and therefore should not be included in the risk analysis. Commenters also argued that the estimates for monetized VOC benefits were too high, since the VOC reductions claimed in the regulation would occur as a result of SIP's required by the Act. Other commenters wrote that the level of benefits from HAP emissions reduction was not of sufficient justification for pursuing the regulation.

When the rule was proposed, naphthalene was classified as a possible human carcinogen. Naphthalene is no longer classified as a possible human carcinogen and is not included in the risk analysis for the final rule.

To estimate the benefits of reducing VOC, the EPA used a 1989 study conducted by the OTA. The study examined a variety of acute health impacts related to ozone exposure as well as the benefits of reduced ozone concentrations for selected agricultural crops. However, two factors not considered in the analysis suggest that higher benefits may be realized than were estimated. First, chronic health effects, including leukemia, craniofacial and limb abnormalities in newborns, nausea, dizziness, headaches, and irritation of upper respiratory track and eyes, are difficult to quantify and consequently were not monetized. Second, health impacts in the OTA study were estimated for nonattainment areas only. The potential impacts of this second factor are likely to be underestimated due to recent evidence suggesting acute health effects may also be experienced at ozone concentrations below the current national ambient air quality standards.

As to the comment about some of the benefits being attributable to VOC emission reductions brought about by implementing SIP's, the EPA attempted to include all impacts possible from SIP implementation in the regulatory baseline.

Control of VOC in this rule will be incorporated into future SIP's by affecting their baselines, thus making the emission reductions needed to meet them less, and leading to lower costs for petroleum refineries to meet those SIP's. Therefore, control of VOC emissions in this rule will lead to lower costs to future SIP implementation. Also, the emission streams from petroleum refineries are primarily VOC, with a small fraction of VOC being HAP. Control of any petroleum refinery emission stream involves control of VOC as well as HAP. Thus, any benefits estimated to occur from a rule that controls VOC, though their control is of secondary importance, should be included as benefits of the rule.

1.1.12 Emissions Data

Commenters raised concerns about the amount and quality of the data on HAP emissions, and the uncertainties in the emission estimates. Throughout the rulemaking, the EPA has been aware of these concerns. During the course of this rulemaking, the EPA requested information from the petroleum refining industry on emissions and emission control technologies. The industry provided sufficient information on the emission control technologies to determine the best controlled facilities, as required by section 112 of the Act. However, the information received on existing emission control levels was limited because it was not available. Thus, there is uncertainty in the refinery baseline emission estimates, and emission reductions and other benefits achieved from the emission controls required to comply with the rule. The EPA and the petroleum refinery industry are unable to reduce this uncertainty at this time. The Agency has characterized the costs and emission reductions of the requirements of this rule as accurately as possible. While there is a great deal of qualitative information on the benefits of this rule, the uncertainty in the emission estimates and the monetary value that can be placed on the emission reductions limits the

Agency's ability to directly quantify all the benefits of the refinery MACT rule. The EPA does know, however, that the controls required in this rulemaking are in widespread use in the refining industry and that they provide substantial emission reductions.

Under section 112(f) of the Act, the EPA must determine whether further control of refinery emissions is necessary to protect the health of the general public. This determination will require more accurate emission estimates than currently exist. The EPA has made a commitment to work cooperatively with industry to identify the data needed to improve the emission estimates and any other information that is required to determine the health risks that may remain after implementation of the refinery MACT rule.

## 1.2 SUMMARY OF IMPACTS OF PROMULGATED ACTION

The impacts presented in this section include process vents, storage vessels, equipment leaks, and wastewater streams from petroleum refinery process units. Impacts for control of marine tank vessel loading operations and gasoline loading rack operations classified under SIC code 2911 located at refineries are presented in the background documentation for 40 CFR part 63, subparts Y and R.

These standards will reduce nationwide emissions of HAP from petroleum refineries by 48,000 Mg/yr (53,000 tpy), or 59 percent by 1998 compared to the emissions that would result in the absence of standards. No adverse secondary air impacts, water or solid waste impacts are anticipated from the promulgation of these standards.

The national electric usage required to comply with the rule is expected to increase by 48 million kilowatt-hours per year, which is equivalent to approximately 77,500 barrels of oil.

The implementation of this regulation is expected to result in an overall annual national cost of $79 million.

This includes a cost of $59 million from operation of control devices, and a monitoring, recordkeeping, and reporting cost of $20 million.  The monitoring, reporting, and recordkeeping cost has been reduced by 25 percent from proposal.  Table

TABLE 1. NATIONAL CONTROL COST IMPACTS IN THE FIFTH YEAR

| Source | Total[a] capital costs[b] ($$10^6$) | Total[a] annual costs ($$10^6$/yr) | Average HAP cost effectiveness ($/Mg HAP) | Average VOC cost effectiveness ($/Mg VOC) |
|---|---|---|---|---|
| Miscellaneous process vents | 21 (2) | 12 (1) | 1,800 | 140 |
| Equipment leaks | 142 (16) | 58 (17) | 1,500 | 400 |
| Storage vessels | 48 (1) | 8 (1) | 6,100 | 380 |
| Wastewater collection and treatment | c | c | c | c |
| Other recordkeeping and reporting | 2 | 1 | d | d |
| Total | 213 (21) | 79 (20) | 1,600 | 310 |

[a] Numbers in parentheses are recordkeeping and reporting costs included in total annual cost and total capital cost estimates. For equipment leaks, activities associated with setting up and operating a LDAR program (e.g., tagging and identifying, monitoring, data entry, setting up a data management system, etc.) are not reflected in the equipment leak recordkeeping and reporting costs, but are included in the equipment leak total annual cost and total capital cost estimate.

[b] Total capital costs incurred in the 5-year period.

[c] The MACT level of control is no additional control.

[d] Not applicable.

1 presents the national control cost impacts for petroleum refinery process vents, storage vessels, wastewater, and equipment leaks. The control costs for gasoline loading racks and marine vessel loading operations are discussed in supporting material for the Gasoline Distribution (Stage I) and the Marine Vessel Loading Operations rules.

The EPA estimates that changes in the compliance times for storage vessels with floating roofs and changes to the existing and new process vents Group 1 applicability cutoffs will provide substantial cost savings and emissions reductions for refineries. Estimates of degassing and cleaning storage tank costs provided by the refining industry indicate that premature (within 3 years of promulgation) degassing and cleaning activities would cost between $34,000 and $213,000 per floating roof tank depending on the type of material stored. If extrapolated to the entire refining industry for floating roof tanks, the cost savings from allowing floating roofs to comply at the next scheduled maintenance would be $6.6 million per year.

The EPA determined that substantial HAP emissions occur when storage vessels are degassed and cleaned. Typically, storage vessels are inspected and maintained on a 10-year schedule, at which time tanks are degassed and cleaned. If a 3-year compliance schedule were required, storage vessels would be degassed and cleaned prematurely, resulting in substantial HAP emissions caused by the rule. These HAP emissions could not be balanced in less than 5 years for floating roof tanks by the emission reduction achieved from complying with the rule. By changing the proposed rule to allow floating roof tanks to comply with the storage vessel requirements 10 years after promulgation of the rule or at the next scheduled inspection, the EPA estimates that 3,000 Mg/yr (2,700 tpy) of HAP, or 8,000 Mg (7,200 tpy) of HAP over 3 years, would be prevented from being emitted.

The process vent applicability cutoff (33 kg/VOC/day (72 lb/VOC/day)) per vent will exclude 3,000 vents from requiring control at a total annual cost savings of $4.5 million. The new process vent applicability cutoff (6.8 kg/VOC/day (15 lb/VOC/day)) per vent will exclude 35 vents from requiring control at a total annual cost savings of $25,000. The total annual cost reduction of these changes in the rule is a reduction of approximately $11 million.

The economic impact analysis for the selected regulatory alternatives shows that the estimated price increases for affected products range from 0.24 percent for residual fuel oil to 0.53 percent for jet fuel. Estimated decreases in product output range from 0.13 percent for jet fuel to 0.50 percent for residual fuel oil. Annual net exports (exports minus imports) are predicted to decrease by 2.3 million barrels, with the range of reductions varying from 0.21 million barrels for liquid petroleum gas to 0.91 million barrels for residual fuel oil.

Between zero and seven refineries, all of which are classified as small, may close due to the regulation. For more information, consult the "Economic Impact Analysis for the Petroleum Refinery NESHAP" in the docket for this rule (Docket No. A-93-48). The docket for the final rule is available for public inspection between 8:00 a.m. and

4:00 p.m., Monday through Friday except for Federal holidays, at the following address: U.S. Environmental Protection Agency, Air and Radiation Docket and Information Center (MC-6102), 401 M Street SW, Washington DC 20460; telephone: (202) 260-7548.

## 2.0 SUMMARY OF PUBLIC COMMENTS

A total of 62 written and 4 verbal comments were received on the proposed standards. A list of the commenters, their affiliations, and the EPA docket number assigned to their correspondence is given in table 2-1.

For the purpose of orderly presentation, the comments have been categorized under the following topics:

- Applicability.
- Selection of MACT floor and MACT-general procedures.
- Process vent emissions.
- Storage vessel provisions.
- Equipment leaks provisions.
- General monitoring, recordkeeping, and reporting comments.
- Provisions on emissions averaging.
- Economics and benefits analysis.
- General policy issues.

TABLE 2-1. LIST OF COMMENTERS ON PROPOSED NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS

| Docket number[a] | Commenter and affiliation |
|---|---|
| IV-D-01 | Mr. David C. Copeland<br>Environmental Specialist<br>Occidental Chemical Corporation<br>Post Office Box 728<br>Niagra Falls, New York 14302-0728 |
| IV-D-02 | Mr. Jim Veach<br>Senior Attorney<br>Fina Oil and Chemical Company<br>Post Office Box 2159<br>Dallas, Texas 75221 |
| IV-D-03 | Mr. Alan J. Cabodi<br>Vice President<br>U.S. Oil and Refining Company<br>Post Office Box 2255<br>Tacoma, Washington 98401 |
| IV-D-04 | Mr. D Sibert<br>Director, Safety, Health and Environmental Affairs<br>Witco Corporation<br>One American Lane<br>Greenwich, Connecticut 06831-2559 |
| IV-D-05 | Mr. Norman L. Morrow<br>Environmental Affairs Department<br>Post Office Box 3272<br>Houston, Texas 77253-3272 |
| IV-D-06 | Mr. John B. Krider<br>General Manager, Technical<br>Chevron U.S.A. Products Company<br>575 Market Street<br>San Francisco, California 94105 |
| IV-D-08 | Ms. Sandra M. Alofs<br>Regulatory Affairs Analyst<br>Giant Industries, Inc.<br>237333 North Scottsdale Road<br>Scottsdale, Arizona 85255 |
| IV-D-09 | Mr. Walter R. Quanstrom<br>Environmental Health and Safety Department<br>Amoco Corporation<br>Post Office Box 87703<br>Chicago, Illinois 60680-0703 |

TABLE 2-1. LIST OF COMMENTERS ON PROPOSED NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS (CONTINUED)

| Docket number[a] | Commenter and affiliation |
|---|---|
| IV-D-10 | Mr. Arthur Lee<br>Texaco Incorporated<br>Post Office Box 509<br>Beacon, New York 12508 |
| IV-D-11 | Mr. E. F. Kondis<br>Vice President, Manufacturing<br>Mobil Oil Corporation<br>3225 Gallows Road<br>Fairfax, Virginia 22037-0001 |
| IV-D-12 | Mr. C. A. Moyer<br>Western Independent Refiners Association<br>801 South Grand Avenue, Tenth Floor<br>Los angeles, California 90017 |
| IV-D-13 | Mr. Pat Leyden<br>Deputy Executive Officer<br>Stationary Source Compliance<br>21865 E. Coply Drive<br>Diamond Bar, California 91765-4182 |
| IV-D-14 | Ms. Denise A. Bode<br>President<br>Independent Petroleum Association of America<br>1101 Sixteenth Street, NW<br>Washington, DC 20036 |
| IV-D-15 | Mr. Stephen P. Piatek<br>Environmental Health and Safety Manager<br>Post Office Box 1257<br>Wilmington, California 90748-1257 |
| IV-D-16 | Mr. James Randles<br>Assistant Control Officer<br>Northwest Air Pollution Authority<br>302 Pine Street, No. 207<br>Mount Vernon, Washington 98273-3852 |
| IV-D-17 | Mr. Dale L. McKinnon<br>Technical Director<br>Manufacturers of Emission Controls Association<br>1707 L Street, NW<br>Suite 570<br>Washington, DC 20036-4201 |

TABLE 2-1. LIST OF COMMENTERS ON PROPOSED NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS (CONTINUED)

| Docket number[a] | Commenter and affiliation |
|---|---|
| IV-D-18 | Mr. David W. Gustafson<br>Environmental and Health Regulatory Affairs, and<br>Mr. Toby A Treet<br>Legal Department<br>The Dow Chemical Company<br>2030 Dow Center<br>Midland, Michigan 48674 |
| IV-D-19 | Mr. John W. Cassey<br>Environmental Support<br>Shell Oil Company<br>One Shell Plaza<br>Post Office Box 4320<br>Houston, Texas 77210 |
| IV-D-20 | Ms. Barbara J. Price<br>Vice President<br>Health, Environmental and Safety<br>Phillips Petroleum Company<br>Bartlesville, Oklahoma 74004 |
| IV-D-21 | Mr. Brent D. Patterson<br>Exxon Company, U.S.A.<br>Post Office Box 2180<br>Houston, Texas 77252-2180 |
| IV-D-22 | Mr. Norbert Dee, Ph.D.<br>Director, Environmental Affairs<br>National Petroleum Refiners Association<br>Suite 1000, 1899 L. Street, NW<br>Washington, DC 20036 |
| IV-D-23 | Mr. John L. Wittenburn<br>Mrs. LeAnn M. Johnson<br>Counsel to the Somerset Refinery, Inc.<br>Collier, Shannol, Rill, and Scott<br>3050 K Street, NW<br>Suite 400<br>Washington, DC 20007 |

TABLE 2-1. LIST OF COMMENTERS ON PROPOSED NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS (CONTINUED)

| Docket number[a] | Commenter and affiliation |
|---|---|
| IV-D-24 | Mr. R. T. Columbus<br>Mr. Gregory M. Scott<br>Council to the Society of Independent Gasoline Marketers of America<br>Collier, Shannon, Rill, and Scott<br>3050 K Street, NW<br>Suite 400<br>Washington, DC 20007 |
| IV-D-25 | Mr. Paul C. Bailey<br>American Petroleum Institute<br>1220 L Street, NW<br>Washington, DC 20005 |
| IV-D-26 | Mr. M. L. Mullins<br>Vice President, Regulatory Affairs<br>Chemical Manufacturers Association<br>2501 M Street, NW<br>Washington, DC 20037 |
| IV-D-27 | Mr. Chuck Tilbrook<br>Environmental and Quality Control Manager<br>Pride Refinery, Inc.<br>Post Office Box 3237<br>Abilene, Texas 79604 |
| IV-D-28 | Mr. Richard L. Charter<br>General Manager, Safety and Environmental Services<br>Fina Oil and Chemical Company<br>Post Office Box 2159<br>Dallas, Texas 75221 |
| IV-D-29 | Caufield Enterprises<br>1904 Kathryn Court<br>Bakersfield, California 93312 |
| IV-D-30 | Mr. William J. Doyle, Ph.D.<br>Manager, HES Policy and Analysis<br>539 South Main Street<br>Findlay, Ohio 45840-3295 |

TABLE 2-1. LIST OF COMMENTERS ON PROPOSED NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS (CONTINUED)

| Docket number[a] | Commenter and affiliation |
|---|---|
| IV-D-31 | Mr. Richard T. Metcalf<br>Health, Safety and Environmental Coordinator<br>Louisiana Mid-Continent Oil and Gas Association<br>801 North Boulevard<br>Suite 201<br>Baton Rouge, Louisiana 70802-5727 |
| IV-D-32 | Mr. Charles D. Malloch<br>Director, Regulatory Management<br>800 North Lindbergh Boulevard<br>St. Louis, Missouri 63167 |
| IV-D-33 | Ms. Nancy A. Wildeboer<br>Manager, Health, Environmental, and Safety Policy<br>Sun Company, Inc.<br>Ten Penn Center<br>1801 Market Street<br>Philadelphia, Pennsylvania 19103-1699 |
| IV-D-34 | Mr. Robert D. Fletcher<br>Chief, Toxic Air Contaminant Control Branch<br>Air Resources Board<br>Post Office Box 2815<br>Sacramento, California 95814-2815 |
| IV-D-35 | Ms. Ellen Silbergeld, Ph.D.<br>Senior Toxicologist<br>Ms. Jenna Roberts<br>Staff Scientist<br>Mr. Lois Epstein, PE<br>Staff Engineer<br>1875 connecticut Avenue, NW<br>Washington, DC 20009 |
| IV-D-36 | Ms. Ann Farner<br>Director, Government Relations<br>Toxco Refining Company<br>2300 Clayton Road<br>Suite 1100<br>Concord, California 94520-2100 |

TABLE 2-1. LIST OF COMMENTERS ON PROPOSED NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS (CONTINUED)

| Docket number[a] | Commenter and affiliation |
|---|---|
| IV-D-37 | Mr. A. S. Anderson<br>Executive Vice President<br>Texas Independent Producers and Royalty Owners Association<br>515 Congress Avenue<br>Suite 1910<br>Austin, Texas 78701 |
| IV-D-38 | Mr. Allen Ellett<br>Environmental Consultant<br>BP Oil Company<br>200 Public Square<br>Cleveland, Ohio 44114-2375 |
| IV-D-39 | Mr. Ray F. Bragg, Jr.<br>Director<br>American Independent Refiners Association<br>Suite 330<br>One Massachusetts Avenue, NW<br>Washington, DC 20001 |
| IV-D-40 | Mr. John A,. Dege<br>Manager, Air Programs<br>Dupont SHE Excellence Center<br>1007 Market Street<br>Wilmington, Delaware 19898 |
| IV-D-41 | Mr. Michael J. Wax, Ph.D.<br>Deputy Director<br>Institute of Clean Air Companies<br>1707 L Street NW<br>Sutie 570<br>Washington, DC 20036-4201 |
| IV-D-42 | Mr. Sarosh J. Mariekshaw<br>Director-Environmental, Safety and Health Affairs<br>Penzoil Company<br>Penzoil Place<br>Post Office Box 2967<br>Houston, Texas 77252-2967 |

TABLE 2-1. LIST OF COMMENTERS ON PROPOSED NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS (CONTINUED)

| Docket number[a] | Commenter and affiliation |
|---|---|
| IV-D-43 | Mr. Joseph A. Tiernan<br>Vice President-Corporate Affairs<br>Baltimore Gas and Electric Company<br>39 West Lexington Street<br>19th Floor<br>Baltimore, Maryland 21201 |
| IV-D-44 | Ms. Melanie S. Kelly<br>Vice President-Environment, Safety and Public Affairs<br>Post Office Box 500<br>Denver, Colorado 80202-2523 |
| IV-D-45 | Mr. George R. Snodgrass<br>Staff Engineer, Air Sciences<br>ARCO Alaska, Incorporated<br>Post Office Box 100360<br>Anchorage, Alaska 99510-0360 |
| IV-D-46 | Ms. Beverly Hartsock<br>Deputy Executive Director<br>Office of Air Quality<br>Texas Natural Resource Conservation<br>Post Office Box 13087<br>Austin, Texas 78711-3087 |
| IV-D-47 | Mr. Patrick Dolan<br>Vice President<br>Adsitor Technology Incorporated<br>Post Office Box 51160<br>Seattle, Washington 98115 |
| IV-D-48 | Natural Resources Defense Council<br>1350 New York Ave., NW<br>Washington, DC 20005 |
| IV-D-49 | Ms. Deborah W. Gates<br>Vice President, Environment and Health<br>Ashland Petroleum Company<br>Post Office Box 391<br>Ashland, Kentucky 41114 |
| IV-D-50 | Mr. Clint W. Ensign<br>Manager, Government Relations<br>Small Refiners Coalition<br>550 E. South Temple<br>Post Office Box 30825<br>Salt Lake City, Utah 84130-0825 |

TABLE 2-1. LIST OF COMMENTERS ON PROPOSED NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS (CONTINUED)

| Docket number[a] | Commenter and affiliation |
|---|---|
| IV-D-51 | Mr. George A. Walker<br>Vice President, Health, Environment and Safety<br>Unocal Corporation<br>Post Office Box 7600<br>Los Angeles, California 6683(No. missing) |
| IV-D-52 | Mr. William O'Sullivan, P.E.<br>Administrator<br>Air Quality Regulation Program<br>State of New Jersey<br>Department of Environmental Protection |
| IV-D-53 | Mr. Donald F. Thieler, Director<br>Bureau of Air Management<br>State of Wisconsin/Department of Natural Resources<br>101 South Webster Street Box 7921<br>Madison, Wisconsin 53707 |
| IV-D-54 | Sierra Club<br>Lone Star Chapter<br>Post Office Box 1931<br>Austin, Texas 78767 |
| IV-D-55 | Mr. S.W. Becker<br>State and Territorial Air Pollution<br>Program Administrators<br>Association of Local Air Pollution<br>Central Officials<br>444 Capitol Street, N.W.<br>Washington, DC 20001 |
| IV-D-56 | Mr. John W. Walton, P.E.<br>Technical Secretary<br>Tennessee Air Pollution Control Board<br>401 Church Street<br>L and C Annex, 9th Floor<br>Nashville, Tennessee 37243-1531 |
| IV-D-57 | Mr. Milton Feldstein<br>Air Pollution Control Officer<br>Bay Area Air Quality Management District<br>939 Ellis Street<br>San Francisco, California 94109 |

TABLE 2-1. LIST OF COMMENTERS ON PROPOSED NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS (CONTINUED)

| Docket number[a] | Commenter and affiliation |
|---|---|
| IV-D-58 | Mr. Harry A. Spannaus<br>Executive Vice President<br>Permian Basin Petroleum Association<br>Post Office Box 132<br>Midland, Texas 79702 |
| IV-D-59 | Mr. David M. Driesen<br>Senior Project Attorney<br>Natural Resource Defense Council<br>1350 New York Ave., NW<br>Washington, DC 20005 |
| IV-D-60 | Mr. Donald P. Schnacke<br>Kansas Independent Oil and Gas Association<br>105 South Broadway<br>Suite 500<br>Wichita, Kansas 67202-4262 |
| IV-D-61 | Mr. Matthew L. Kuryla<br>Jones, Day, Reavis, and Pogue<br>North Point<br>901 Lakeside Avenue<br>Cleveland, Ohio 44114 |
| IV-D-62 | Ms. Susan Tierney<br>Assistant Secretary<br>Office of Policy, Planning and Program Evaluation<br>Department of Energy<br>Washington, DC 20585 |
| IV-F-1 | Public Hearing in the Matter of:<br>Proposed Petroleum Refinery NESHAP.<br>Transcript of Hearing held in the<br>ERC Auditorium, Research Triangle Park,<br>North Carolina.<br>August 15, 1994 |
| IV-G-03 | Mr. Norbert Dee, Ph.D.<br>Director, Environmental Affairs<br>National Petroleum Refiners Association<br>Suite 1000, 1899 L. Street, N.W.<br>Washington, DC 20036 |

TABLE 2-1. LIST OF COMMENTERS ON PROPOSED NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS (CONTINUED)

| Docket number[a] | Commenter and affiliation |
|---|---|
| IV-G-04 | Mr. Clint W. Ensign<br>Coordinator<br>Small Refineries Coalition<br>P.O. Box 30825<br>Salt Lake City, UT  84130 |
| IV-G-05 | Ms. Kelly A Sakir<br>Demetriou, Del Guercio, Springer and Moyer<br>Attorneys at Law<br>801 South Grand Avenue, 10th Floor<br>Los Angeles, CA  90017 |
| IV-G-06 | Ms. Melanie S. Kelley<br>Vice President<br>Environment, Safety and Public Affairs<br>Total Petroleum, Incorporated<br>Total Tower<br>Post Office Box 500<br>Denver, Colorado  80202 |
| IV-G-08 | Mr. Gary E. Goodman<br>Assistant Plant Manager<br>Tosco Northwest Company<br>Ferndale Refinery<br>3901 Unick Road<br>Post Office Box 8<br>Ferndale, WA  98248 |
| IV-G-09 | Ms. Lois N. Epsteine, P.E., Engineer<br>Environmental Defense Fund<br>and Mr. David Driesen, Attorney<br>Natural Resources Defense Council<br>1875 Connecticut Ave., N.W.<br>Washington, DC  20009 |

[a] The docket number for the petroleum refinery docket is A-93-48.

# 3.0 APPLICABILITY

## 3.1 DEFINITION OF SOURCE CATEGORY

### 3.1.1 General Source Category Definition Comments

Comment: One commenter (IV-D-50) stated that the Act [section 112(c)(9)] allows the EPA to not impose toxic air rules in instances where the public air is not threatened. The commenter (IV-D-50) contended that petroleum refineries, especially those facilities located in attainment areas, may qualify as a source category for the delisting criteria contained in section 112(c)(9).

Response: To be delisted under 112(c)(9), the cancer risk to the maximum exposed individual for every source in the source category must be less than 1-in-1-million, and emissions of pollutants with other toxic effects must be low enough to provide an "ample margin of safety and no adverse environmental effect." The EPA's cancer risk analysis indicates that the maximum exposed individual for every source in the source category is greater than 1-in-1-million. Additionally, a number of other adverse acute and chronic health effects, and ecological effects can be attributed to HAP emissions from petroleum refineries. Therefore, based on available information the petroleum refinery source category does not qualify for delisting under section 112(c)(9).

Comment: One commenter (IV-D-42) objected to the EPA combining two categories of sources for petroleum refineries and listing requirements for a single petroleum refinery category that is not listed on the original source category list. The commenter (IV-D-42) added that the EPA should have proposed the change in the description of the source category for refineries with this rule so that comments could be made in conjunction with the refinery MACT standard.

Response: The EPA recognized when the initial list of source categories and descriptions was published in the Federal Register (July 16, 1992, 57 FR 31590) that the source category descriptions and list may be revised from time to time as better information becomes available. The Agency stated that it would revise these descriptions as part of the process of establishing standards for each category. As stated in the July 16, 1992 notice, it was never the EPA's intent that the descriptions limit what may be included under each category for the purposes of establishing emission standards or for purposes relating to other parts of section 112 involving the definition of source or category of sources. Therefore, in establishing emission standards for the petroleum refinery source category, the EPA defined the petroleum refinery source category for regulation within the rule to include those emission points for which sufficient information was available to establish standards at this time.

The EPA did request comment on the redefinition of the source category in the July 15, 1994 Federal Register notice proposing the petroleum refinery MACT standard. Therefore, the EPA believes that the commenter's concern has been addressed.

Comment: One commenter (IV-D-57) asserted that the refinery MACT rule should cover transfer operations of all refinery raw materials, byproducts, and products. The commenter (IV-D-57) stated that the EPA may not have included transfer operations on the assumption that the marine vessel loading NESHAP, the stage I gasoline distribution NESHAP, and future rulemakings will control all otherwise subject sources. The commenter (IV-D-57) contended that these rules would not regulate non-gasoline refinery products and it was unclear what sources would be regulated under the Organic Liquids Distribution source category, for which a standard is due in 2000.

Another commenter (IV-D-34) requested that non-gasoline transfer operations be included in the petroleum refinery NESHAP, instead of regulating them in the year 2000 as they are scheduled. The commenter stated that the standards contained in the California regulations constitute the MACT floor for these operations.

Response: The petroleum refinery "affected source" category is defined to include equipment specifically used to produce fuels, heating oils, or lubricants by separating, cracking, or reforming unfinished petroleum derivatives. The final rule also includes marine vessel loading at refineries and gasoline loading racks at refineries classified under SIC 2911. (The gasoline distribution NESHAP covers gasoline terminals classified under other SIC's.) The EPA did not assume that the marine vessel loading and unloading or the stage I gasoline distribution NESHAP would control non-gasoline refinery products. However, as one commenter (IV-D-34) noted, these operations will be covered under the Organic Liquids Distribution source category, for which a NESHAP is scheduled to be promulgated in the year 2000. As stated in the preamble, the Organic Liquids Distribution NESHAP regulation of non-gasoline refinery products will evaluate and control emissions from organic liquids distribution (non-gasoline) in the liquids distribution industry, which includes transfer emissions of non-gasoline refinery products.

In determining the MACT floor for a source, the EPA cannot assume that the MACT floor is at the level established by existing regulations. Under the Act, the EPA is required to determine the floor based on the average emission limitation achieved by the best performing 12 percent of existing sources. The EPA will not cover transfer operations of non-gasoline refinery products under this NESHAP because they will be covered under the Organic Liquids Distribution NESHAP where the MACT floor for the organic liquids distribution industry can be evaluated as required under the Act.

3.1.2 Marine Vessel Loading

Comment: Four commenters (IV-D-16, IV-D-46, IV-D-48, IV-D-55) opposed the inclusion of marine tank vessel loading operations in the petroleum refineries source category. One of the commenters (IV-D-55) stated that including marine tank vessel loading operations in the source category adds complexity to the regulation because of differences in dispersion characteristics, control technologies, and recordkeeping and reporting requirements. One commenter (IV-D-46) predicted that additional regulatory and enforcement complexities would result if the source category was redefined to include marine tank vessel loading operations. The commenter (IV-D-46) stated that, though the Act allows for changes in the definition of source categories, if the petroleum refinery source category is defined to include marine tank vessel loading operations, a precedent may be set, unduly complicating the process of establishing source categories. The commenter (IV-D-46) further stated that the Coast Guard is required to approve any equipment that impacts the safety of a vessel or its occupants. The commenter (IV-D-46) elaborated that if the "affected source" was redefined to include marine tank vessel loading operations, the Coast Guard could decide that land emissions affect marine safety and refineries could require Coast Guard approval.

Two commenters (IV-D-48, IV-D-55) expressed opposition to the inclusion of marine tank vessel loading operations in the petroleum refineries source category in order to allow emissions averaging. One commenter (IV-D-55) alleged that adding these operations to the source category would allow emissions from marine tank vessel loading operations to go uncontrolled due to emissions averaging. These commenters (IV-D-48, IV-D-55) asserted that marine tank vessel loading operations and petroleum refineries are separate source categories and emissions cannot be averaged across the two unless it is determined that keeping them apart is impracticable. The commenter (IV-D-48) stated that the Act allows the EPA to adjust source categories by distinguishing among different types of sources within an already defined source category during promulgation of regulation, but does not allow for redefinition of the source category. One of the commenters (IV-D-48) stated that if the source category is redefined to include marine tank vessel loading, promulgation of the petroleum refinery MACT standard would have to be accelerated.

Response: The EPA has redefined the petroleum refinery source category and the "affected source" covered by this rule to permit averaging among co-located operations subject to the refinery MACT. In particular, the EPA permits gasoline loading racks classified under SIC 2911 and marine tank vessel loading operations co-located at refineries subject to the petroleum refinery MACT rule to average emissions with other refinery process unit emission points (process vents, storage, wastewater) to demonstrate compliance. The EPA has done this to provide a facility the flexibility to comply with the MACT standards in the least costly manner while maintaining a regulation that is effective in achieving emission reductions.

Averaging across co-located refinery process units, and marine tank vessel loading and gasoline loading racks operations will not result in less emission reductions. If emissions from one emission point are not controlled, then greater emission reductions will need to be required of other refinery emission points. Total emission reductions will be the same or greater. The emissions averaging provisions require a demonstration that the emissions average will not increase risk or hazard relative to compliance without emissions averaging. Furthermore, the EPA does not agree that Coast Guard approval would be required on other refinery equipment because marine vessel loading operations are included in the definition of "affected source." See chapter 9.0 for further discussion of emissions averaging.

3.1.3 Crude Oil Topping Units

Comment: Two commenters (IV-D-25, IV-D-38) suggested an exemption for "crude oil topping units associated with a crude oil pipeline that do not produce fuels for consumption external to the operation of the pipeline." One commenter (IV-D-38) explained that COTU's are generally located in oil fields adjacent to refineries. The COTU's distill a slipstream of crude oil to power pumps in the field, where a source of electricity is not convenient. The commenter (IV-D-38) suggested that these units be covered by the MACT rule for organic liquid distribution.

One commenter (IV-D-45) requested that the EPA either (1) create a subcategory for their two COTU's that are totally enclosed in buildings, or (2) specifically exempt their two COTU's. The commenter (IV-D-45) stated that their units have been previously evaluated by the EPA and received an exemption from the NSPS subpart GGG LDAR requirements. The commenter (IV-D-45) stated that their COTU's operate in a very remote attainment area and are not major sources of HAP's. The commenter (IV-D-45) asserted that their in-place state-of-the-art hydrocarbon gas detection systems and standard procedures for maintenance and repair reduce emissions without costly federally mandated controls.

Response: The EPA has clarified that process units covered under the petroleum refinery NESHAP are those used in an establishment primarily engaged in petroleum refining, as defined in the SIC code for petroleum refining (2911). Under this new definition the exemption language suggested by the commenters (IV-D-25, IV-D-38) is unnecessary as the COTU's associated with a crude oil pipeline that does not produce fuels for consumption external to the operation of the pipeline would not be included as a covered process unit.

## 3.2 SUBCATEGORIZATION

### 3.2.1 Small Refineries

Comment: Several commenters (IV-D-08, IV-D-23, IV-D-24, IV-D-27, IV-D-28, IV-D-37, IV-D-50, IV-F-1, IV-D-58, IV-D-60) urged the EPA to withdraw the proposed petroleum refinery NESHAP, and reissue it after taking small refineries into consideration.

Many commenters (IV-D-07, IV-D-08, IV-D-12, IV-D-14, IV-D-19, IV-D-22, IV-D-23, IV-D-24, IV-D-27, IV-D-28, IV-D-29, IV-D-36, IV-D-37, IV-D-39, IV-D-44, IV-D-50, IV-D-58, IV-D-60, IV-F-1) supported subcategorization of the NESHAP based on refinery size. Several commenters (IV-D-12, IV-D-22, IV-D-23, IV-D-28, IV-D-29, IV-D-39, IV-D-50 and IV-F-1, IV-D-58, IV-D-60) maintained that small refineries would be more affected by the proposed rule than large refineries and therefore should be given separate regulatory consideration (subcategorization), instead of adopting a single standard applicable to all refineries. Reasons provided for not adopting a single standard were that it: (1) fails to meet the EPA's own criteria for defining a category of sources to which a MACT standard should apply, (2) violates President Clinton's Executive Order directing Federal agencies to adopt cost-beneficial policies; (3) violates the "Common Sense Initiative" approach enunciated by the EPA Administrator, and (4) fails to meet the statutory requirement of section 112(d)(1) of the Act, which stipulates that MACT standards must be cost-effective. Several commenters (IV-D-28, IV-D-50, IV-D-58) stated that by failing to differentiate among refineries based on size and location, the EPA threatens to impose disproportionate costs, without environmental benefits, on small refineries located in attainment areas. These sources are the smallest contributor to overall air quality problems.

Seven commenters (IV-D-06, IV-D-09, IV-D-10, IV-D-25, IV-D-30, IV-D-38, IV-D-53) opposed subcategorizing small refineries. One commenter (IV-D-09) opposed subcategorizing refineries based on size (crude running capacity). The commenter (IV-D-09) cited that it is not the nature of the processes that changes with crude run, but the number and capacity of the individual process units that changes. One commenter (IV-D-30) asserted that refinery size does have a bearing on "major source" thresholds. However, the commenter (IV-D-30) contended that vapor pressure and HAP content are not dependent on refinery size or location. One commenter (IV-D-38) expressed opposition to exemptions based on crude throughput. Another commenter (IV-D-38) recommended that the wastewater provision of the proposed rule be maintained as is, without subcategorization regarding small refineries. The commenter (IV-D-38) contended that the cutoff of 10 metric tons of benzene containing waste included in the BWON provides an adequate exemption. The commenter (IV-D-38) supported exemptions from rules or parts of rules for facilities that are not major sources of emissions or for facilities that have reduced their emissions to low levels, regardless of size. The commenter (IV-D-38) argued that these exemptions would reward better-controlled or lower-emitting facilities. Another commenter (IV-D-06) also asserted that any refinery throughput exemption would be arbitrary because the application of controls is not based on throughput.

One commenter (IV-D-25) stated that there is no simple basis for subcategorizing small refineries when considering available data on the wastewater MACT floor and control costs. The commenter (IV-D-25) asserted that refinery size does not show a strong correlation with HAP emissions from wastewater or applicability of the BWON. Furthermore, the commenter (IV-D-25) stated that data gathered on the cost-effectiveness of wastewater controls (see section 7.3.2) not correlate with refinery size. The commenter (IV-D-25) stated that the refinery NESHAP will not cause any additional wastewater controls at refineries over what is already required by the BWON.

Two commenters (IV-D-06, IV-D-10) asserted that an exemption for small refineries would not be justified because it is not supported by differences in toxic emissions between refineries of various sizes. One commenter (IV-D-10) stated that small refineries produce sufficient HAP's to trigger the 9.1/22.7 Mg (10/25 tpy) major source requirements.

Two commenters (IV-D-06, IV-D-10) opposed subcategorizing small refineries because an arbitrary size exemption could result in unfair competitive advantages. One commenter

(IV-D-10) stated that large refineries should not be penalized for an economy of scale achieved through their own effective competitiveness.

Nine commenters (IV-D-14, IV-D-22, IV-D-27, IV-D-30, IV-D-42, IV-D-44, IV-D-49, IV-D-50, IV-F-1) recommended that the EPA subcategorize based on the definition of a small refinery as having a crude throughput of 75,000 barrels a day, which is contained in the Small Business Association and Acid Rain provisions of the Act [42 U.S.C. 7651(i)(h)(3)]. Some commenters (IV-D-27, IV-D-49, IV-D-50, IV-F-1) stated that the definition should not contain any ownership or employment restrictions. The commenters (IV-D-50, IV-F-1) requested that the small refinery size definition be defined in terms of crude oil throughput as reported to DOE each month, rather than rated capacity.

Other commenters (IV-D-29, IV-D-39, IV-D-45, IV-D-46, IV-D-58) recommended definitions of small refinery that ranged from 20,000 to 50,000 barrels per day of throughput or actual operation. One commenter (IV-D-45) supported the creation of a subcategory for refineries with a 20,000 barrels per day or less throughput, that are totally enclosed within a building. The commenter (IV-D-45) stated that then the commenter's refineries would be covered, and they would establish the MACT floor for such plants and therefore no additional controls would be required. One commenter (IV-D-46) suggested that refineries with large capacities be recognized as small refineries if they take a federally enforced capacity limit of 50,000 barrels per day. Two commenters (IV-D-39, IV-D-58) recommended the EPA subcategorize using a 50,000 barrels per day or less throughput as the definition of small refinery, which is the same definition used to define a small refinery under section 410(h) in Title IV of the Act.

Response: Information on small refineries supplied by commenters did not provide a sufficient basis for withdrawing the proposed petroleum refinery NESHAP. Information indicated that many small refineries are major sources of HAP emissions. Therefore, the final determination of the MACT floor, MACT, and estimates of impacts include small refineries. The EPA evaluated whether small refineries should be given separate regulatory consideration (subcategorization), instead of adopting a single standard applicable to all refineries. Upon evaluation, it was found that refinery design and emissions do not correlate well with size and that the MACT floor for a small refinery subcategory would not be significantly different from the source category as a whole. Therefore, a separate subcategory for small refineries has not been included in the final rule.

No information was submitted to refute the EPA's conclusion that the cutoff of 10 metric tons of benzene in the wastewater provisions (included in the BWON) provides an adequate applicability exemption from the rule for small sources. Therefore, this applicability exemption for wastewater has been maintained in the final rule. In addition, an emission rate cutoff for small process vents has also been added (see chapter 5).

Comment: One commenter (IV-D-29) stated that the EPA needs to consider the financial impacts of other regulations in regards to small refineries when establishing compliance periods. Two commenters (IV-D-10, IV-D-25), however, claimed that there is no basis in the Act to grant entities relief from compliance or even an established schedule of compliance based on size of the owner or operator. One commenter (IV-D-25) stated that any changes to the rule, such as an extension of the time allowed for the equipment leaks compliance, should apply to all refineries regardless of size.

Response: The EPA considered the additional financial impacts of this regulation across the source category, regardless of size, when establishing compliance periods. The EPA decided that there is no basis for an extension of time for compliance based on size. However, the EPA has concluded that all refineries (especially small refineries) would benefit from additional time to comply with the equipment leak provisions of the petroleum refinery NESHAP. The EPA decided that small refineries as well as a number of large refineries may not have the experience to implement a LDAR program for equipment leaks in a short time frame without significant expense. Therefore, an extension of time for equipment leak compliance has been included in the final rule for all refineries. The EPA has increased the equipment leak compliance time to a full three years to meet Phase I leak definition requirements for LDAR control (equivalent to the NSPS requirements), and another 2.5 years, which is 5.5 years total for a refinery to meet Phase III leak definition requirements for LDAR control (equivalent to the HON requirements). This change lessens the burden on all affected sources equitably.

Comment: In response to the EPA's request for information from small refineries, one commenter (IV-D-42) provided the following information: (1) small refineries would be considered major sources; (2) the HAP content of process vents is not below 20 ppmv; (3) the HAP content of petroleum liquids in the processing lines is above the 5 percent by weight applicability level in the equipment leak provisions; (4) the true vapor pressures of the petroleum liquids in storage vessels are above the 8.3 kPa (1.2 psia) applicability level and (5) the cost of production for many small refiners is approaching, or exceeds, the average selling price of base oils. The commenter (IV-D-42) contended that small refineries should meet the NSPS requirement for equipment leaks rather than the proposed refinery MACT and that small refineries should be given 36 months to achieve the equipment leak requirement rather than 18 months.

Another commenter (IV-D-57) provided the following information: (1) the Bay Area District has one refinery that is considered an area source, (2) refineries processing 10,000 to 20,000 barrels per day of crude oil should be considered major sources, (3) the HAP content of process streams is not below the applicability limits for the leak provisions, and (4) the vapor pressure of stored liquids should depend on the source of the crude oil processed.

Response: The information supplied by commenters was considered along with other information in the selection of the final requirements in the petroleum refinery rule. As discussed in the previous response, the EPA decided, based on provided information and analysis, that subcategorizing based on refinery size or location was not warranted.

3.2.2 Subcategorization by Ozone Attainment Status.

Comment: Many commenters (IV-D-07, IV-D-14, IV-D-23, IV-D-24, IV-D-27, IV-D-28, IV-D-30, IV-D-36, IV-D-37, IV-D-39, IV-D-49, IV-D-50, IV-D-58, IV-D-60) supported subcategorization based on current ozone attainment status. Two commenters (IV-D-23, IV-D-24) urged the EPA to revise the proposal so that the more stringent provisions do not apply to refineries located in ozone attainment areas. The commenters (IV-D-23, IV-D-24) stated that refineries in ozone attainment areas should not be forced to undertake high investments to reduce ozone-forming emissions when ozone is not a problem in their area. The commenters (IV-D-23, IV-D-24) asserted that requiring refineries in ozone attainment areas to adopt the same emission control standards as refineries in non-attainment areas is a wasteful use of limited industry resources. One of the commenters (IV-D-23) was specifically concerned about small refineries within attainment areas.

One commenter (IV-D-24) maintained that the various emissions control mandates contained in the Act are directed at non-attainment areas. The commenter (IV-D-24) asserted that unless the EPA quantified the risk from these emissions in attainment areas, the agency will be hard pressed to defend a final rule treating refineries in both attainment and non-attainment areas equally.

One commenter (IV-D-24) recommended that the EPA withdraw the proposal for further study and limit its scope by exempting refineries in ozone attainment areas from the provisions of the final rule. The commenter (IV-D-24) maintained that the risk of harm from emissions in ozone attainment areas is low.

One commenter (IV-D-50) stated that small refineries are predominantly located in rural areas that are in compliance with Federal ozone standards and have not implemented programs and procedures, such as LDAR programs, that have been started by large refineries to control VOC in ozone nonattainment areas.

Two commenters (IV-D-07, IV-D-30) recommended that varying degrees of control similar to VOC control in non-attainment areas be developed for refineries. One commenter (IV-D-44) claimed that to require small refineries to comply with the same standards as large refineries located in nonattainment areas would be unnecessary, overly rigid, and wasteful of limited financial resources.

One commenter (IV-D-50 and IV-F-1) stated that the refineries located in attainment areas will be confronted with extremely high compliance costs as a result of this rule. The commenter (IV-D-50) suggested subcategorizing based on ozone attainment/nonattainment status because nonattainment areas are usually associated with large industrialized urban areas where a large number of people are exposed to HAP emissions from refineries.

One commenter (IV-D-37) stated that over half of the nation's refineries are located in attainment areas and that it is not sensible to cause these refineries to close. In addition, two commenters (IV-D-14, IV-D-27) stated that refineries located in nonattainment areas are already required to have many of the proposed controls to meet VOC reduction requirements.

Four commenters (IV-D-14, IV-D-27, IV-D-28, IV-D-58) explained that attainment areas are largely comprised of small rural communities containing small refineries which usually serve niche markets that could be adversely affected by the proposed NESHAP and be forced to go out of business. One commenter (IV-D-28) stated that the proposed rule may actually increase human exposure to HAP's, as refineries in nonattainment areas increase throughput to make up for the lost refinery capacity in attainment areas.

One commenter (IV-D-28) presented a table showing that significant capital and operating costs will be incurred to comply with the proposed rule by one of their 60,000 bpd refineries located in an attainment area. The commenter (IV-D-28) related capital costs of over $4 million in the first year, with annual operating expenditures around $2 million in subsequent years. The commenter (IV-D-28) contended that these estimated compliance costs are illustrative of the burden other small refineries in attainment areas will be faced with under the proposed rule. The commenter (IV-D-28) explained that their larger 150,000 bpd facility located in a non-attainment area already must comply with State nonattainment rules and regulations which are similar to, and in some cases more stringent than, the proposed rules. The commenter (IV-D-28) included a table (Attachment I of their comments) comparing the requirements of the proposed rule to requirements already imposed on them for being in a nonattainment area. The commenter (IV-D-28) explained that under the proposed rule, the only additional requirements the 150,000 bpd refinery located in the nonattainment area would only incur were the administrative, monitoring, recordkeeping and reporting costs.

Two commenters (IV-D-28, IV-D-39) stated that costs incurred by small refineries would not be shared by larger refineries, and that small refineries in attainment areas would be unable to recover the costs by raising prices, creating a disparity in compliance costs that will increase when the other petroleum refinery NESHAP is promulgated.

Response: The EPA agrees that refineries located in attainment areas will have higher compliance costs as a result of this rule when compared to refineries located in nonattainment areas. However, as noted by a number of commenters, the basis for the difference in costs is HAP emissions control already in place due to VOC emissions control in ozone nonattainment areas. Refineries in attainment areas may be uncontrolled, and have greater emissions than refineries in non-attainment areas. The HAP emissions in ozone attainments areas will cause similar health hazards as in nonattainment areas. The cancer and other health risk to the most exposed individuals near the refinery are based on emission rate, dispersion, and how close an individual lives to the refinery; and does not depend on the area's population density. Thus, there are health and environmental concerns regarding uncontrolled refineries in rural attainment areas. In order to control HAP emissions equitably across the nation (as required under the Act), it is not feasible to control HAP to a lesser degree in one area than another.

Subcategorization of a source, under the Act, can be employed among classes, types, and sizes of sources within a category or subcategory. This would not include subcategorization based on the location of a source. Measures to reduce the burden for the entire petroleum refinery source category have been incorporated in the final rule to address the commenter's concerns. Measures include extended compliance times, and reduction in monitoring, reporting, and recordkeeping requirements.

3.2.3 Subcategorization for Equipment Leaks.

Comment: Two commenters (IV-D-46, IV-D-44) supported the equipment leaks option proposed for small refineries. One commenter (IV-D-44) asserted that small refineries with modest LDAR programs need additional time to comply with the proposed regulation.

One commenter (IV-D-53) claimed that Wisconsin's only refinery is in an attainment area. The commenter (IV-D-53) stated that the refinery has a throughput of 35,000 bpd and has had a LDAR program in place since the early 1980's. The commenter (IV-D-53) stated that the LDAR program was not too burdensome and provided a copy of their LDAR program.

One commenter (IV-D-50) believed that the small refinery LDAR requirements should not be based on the negotiated rule, which requires a 2,000 ppm level of control. The commenter

(IV-D-50) stated that this level of control would be difficult and costly to achieve. The commenter (IV-D-50) stated that if the EPA were to establish an equipment leak subcategory for small refineries, the best LDAR controls would be found at small facilities producing light liquid products in moderate ozone nonattainment areas.

One commenter (IV-D-36) suggested that a separate compliance schedule for the equipment leaks provision be established for refineries in attainment areas. The commenter (IV-D-36) pointed out that the reason the EPA requested comment on allowing small refineries a full 18 months to comply with the equipment leaks provision was that many are located in attainment areas and have never been required to implement an LDAR program. Thus they might require more time to establish and implement an LDAR program. The commenter (IV-D-36) submitted that all facilities in attainment areas will require additional time to institute a comprehensive LDAR program, regardless of size.

One commenter (IV-D-30) stated that special exemptions or delays for small refineries in rural areas that have not been required to implement LDAR are not appropriate. The commenter (IV-D-30) asserted that special exemptions or delays for specific refineries may be appropriate if reasonable justification is given. The commenter (IV-D-30) also pointed out that a discussion on the savings that would occur from LDAR exemptions was not provided. Another commenter (IV-D-38) suggested that if more time is allowed for small refineries that do not have a LDAR program, it should also be allowed for other refineries (regardless of size) in the same situation.

Response: The EPA has concluded that special exemptions or delays for small refineries in rural areas are not appropriate. As noted in previous responses, there is no basis for regulating HAP sources in ozone attainment areas differently than in ozone nonattainment areas. However, the EPA concurs that refineries (especially small refineries) located in attainment areas could benefit from additional time to comply with the equipment leak provisions of the petroleum refinery NESHAP. Therefore, as requested by a commenter (IV-D-38), the EPA has increased the compliance time for all facilities to a full 3 years from 6 months, to meet Phase I requirements for LDAR control. Sources choosing to comply with the modified HON negotiated rule must phase in the more stringent leak definitions between 3 and 5.5 years after promulgation.

## 3.3 SELECTION/DEFINITION OF SOURCE

### 3.3.1 Petroleum Refinery Process Units

Comment: One commenter (IV-D-48) disagreed with the proposed regulation's definition of an affected source. The commenter (IV-D-48) contended that the definition of stationary source for petroleum refineries has always meant a type of emissions unit. The commenter (IV-D-48) cited several Act references to support this conclusion. The commenter (IV-D-48) provided that the definition of an affected source in the proposed regulation describes several unrelated parts of a plant, a set of emission points involved in carrying out a certain process that are not necessarily part of the same process or located in a contiguous part of the plant. The commenter (IV-D-48) asserted that this definition is inconsistent with the definition in section 111(a)(3) of the Act which defines a stationary source as a "building, structure, facility or installation." Four commenters (IV-D-10, IV-D-11, IV-D-21, IV-D-25) supported the proposed broad definition of an "affected source."

Response: The EPA does not agree with the commenter's

(IV-D-48) interpretation of previous rules or of the Act. The EPA has not set a universal practice of a narrow definition for an "affected facility" or "affected source." For example, under the NESHAP for Benzene Waste Operations, chemical manufacturing plants, petroleum refineries, coke by-product recovery plants, and TSDF's that treat wastes from these industries are the "affected facilities." The Benzene NESHAP for Transfer Operations also has a broad definition of source, which includes all of the loading racks at a site, including loading racks where benzene is loaded into marine vessels, railcars, or tank trucks. There are also NSPS's where the "affected facility" is broad. For example, the Coal Preparation Plant NSPS's definition of "affected facility" includes thermal dryers, pneumatic coal cleaning equipment, processing and conveying equipment, storage systems, and transfer and loading systems. There are also NSPS's that define the "affected facility" as a process unit. Reasons for selection of a broad definition of source for petroleum refineries were stated in the proposal preamble (59 FR 36130). The EPA has maintained this broad definition of "source" in the final rule. In fact, the definition of "source" has been revised to also include gasoline loading racks classified under SIC 2911 and marine loading operations at refineries. These operations are closely associated with refinery process units because they include the storage and transfer of refinery products.

Comment: One commenter (IV-D-29) stated that the provisions associating storage vessels with process units is confusing. The commenter (IV-D-29) maintained that refineries must remain flexible in their tank usage and suggested that all tanks of the same type require the same controls.

Response: The purpose of the storage tank assignment procedures in § 63.640 is to determine whether the storage vessels are associated with petroleum refinery process units covered by subpart CC or other types of process units (such as chemical manufacturing process units) that are covered by other NESHAP. This avoids conflicting requirements for the same vessel as only one NESHAP would apply to the storage vessel. Provisions are included for storage vessels that can be used by different process units. If a storage vessel is assigned to any petroleum refinery process unit, it is subject to the storage control requirements in subpart CC. If the vessel is assigned to a chemical process unit, it will be subject to the HON (40 CFR part 60, subparts F and G) instead of subpart CC.

Comment: One commenter (IV-D-57) asserted that the definition of source should be clarified for new source MACT requirements. The commenter (IV-D-57) recommended that the definition of source be consistent with the proposed 112(g) rule, i.e., that a new source be any emission unit or aggregation thereof, with a potential to emit at least 9.1 Mg/yr (10 tpy) of any single HAP or 22.7 Mg/yr (25 tpy) of any combination of HAP.

Response: The petroleum refinery NESHAP definition of source does not need to be consistent with 112(g)'s definition since each are developed for a different purpose. For this reason, provisions developed under 112(d) and (h) rulemaking supersedes 112(g). This rule (§ § 63.640 (i) and (j)) elaborates on the criteria for determining whether an addition to an existing source qualifies as a new source. These provisions were developed after consideration of the specific characteristics of this industry. The EPA has concluded that further clarification to assist owners or operators in determining new source MACT applicability is unnecessary.

Comment: One commenter (IV-D-25) stated that there are several types of emission sources that are not easily categorized as miscellaneous process vents, storage vessels, wastewater, or equipment leaks. In particular, the commenter (IV-D-25) requested clarification of which, if any, provisions are applicable to sumps and sulfur pits. The commenter (IV-D-25) recommended that sumps not be covered because of their small capacity (usually less than 10 barrels). The commenter (IV-D-25) also requested exclusion of sulfur pits used for underground storage that vent small amounts of hydrogen sulfide to the atmosphere.

Response: Hydrogen sulfide emissions are not covered under the NESHAP. Therefore, sulfur pits are not covered under the NESHAP. Insufficient information regarding the sumps that the commenter refers to was supplied to determine where and whether the sumps are covered by the NESHAP. However, if the sump does not emit any of the listed HAP's, as with the sulfur pits, it would not be covered under the NESHAP. In general, emission points that do not meet the definitions of either miscellaneous process vent, storage vessel, or equipment leaks, and are not subject to the benzene wastewater NESHAP, are not covered by subpart CC. The EPA has also added a list of pollutants covered under the rule to assist facilities in the determination of whether a process unit is covered under the rule. Furthermore, process units that do not meet the definition of a "petroleum refining process unit" in § 63.641 are not covered by the rule.

Comment: One commenter (IV-D-57) contended that new transfer operations and transfer of organic HAP from new processes at petroleum refineries should be required to meet the most stringent emission limitations achieved in practice.

Response: Marine loading at refineries and gasoline loading racks classified under SIC code 2911 at refineries are subject to the petroleum refinery NESHAP. Loading operations at new sources must be controlled to the new source MACT level of control determined under the gasoline distribution and marine vessel loading NESHAP's. Organic liquid distribution (non-gasoline) loading emissions will be covered under a separate MACT standard to be developed by the year 2000. The EPA listed organic liquid distribution (non-gasoline) sources for regulation at a later date because more time is necessary to assess the MACT floor and MACT for this source. The new source MACT level of control for new loading racks for organic liquid distribution (non-gasoline) will be determined under that rulemaking.

Comment: One commenter (IV-D-42) objected to the refinery MACT regulating several types of facilities that are not typical refineries, such as specialty plants that produce white oils and waxes. The commenter (IV-D-42) argued that these facilities do not process crude, and do not fall under the OMB's SIC code for refineries, but are classified as facilities that process "Product of Petroleum and Coal, not elsewhere classified." The commenter (IV-D-42) asserted that based on the wording of petroleum refining process units, any processes that separate petroleum and/or separate, crack, react or reform intermediate petroleum streams could be subject to the rule. The commenter (IV-D-42) stated that specialty plants are currently exempt from the refinery MACT because they are not major sources, but the commenter (IV-D-42) expressed concern that they could be included under future expansions. The commenter (IV-D-42) suggested only referencing facilities that meet the SIC code in the definition of refinery process units.

One commenter (IV-D-42) stated that the language of the definition could also be interpreted to include oil and gas facilities. The commenter (IV-D-42) explained that tanks that separate water from crude oil via gravity could be misconstrued as a separation process. The commenter (IV-D-42) recommended that in order to alleviate any confusion, the EPA should clearly state that oil and gas facilities are not intended to be covered in the rule.

One commenter (IV-D-26) was concerned with overlap of the refinery NESHAP and other sources categories. The commenter (IV-D-26) maintained that the broad petroleum refining process unit definition, which gives isomerization, polymerization and thermal processes as examples, could be interpreted to cover chemical operations that are to be regulated under other source categories in the future. The commenter (IV-D-26) cited processes to produce butyl rubber and phthalate plasticizers as examples. The commenter (IV-D-26) suggested that the word "react" be deleted from subparagraph 3 of the proposed definition, and "isomerization" and "polymerization" deleted from the examples in the definition. The commenter (IV-D-26) also requested that the EPA provide preamble language clarifying that the petroleum refinery process unit does not include those units that may feed material originally produced in a refinery.

One commenter (IV-D-05) contended that the proposed definition of petroleum refining process unit is broad enough to cover many processes that are chemical processes and may be covered by the HON. The commenter (IV-D-05) recommended excluding facilities covered under the HON and that paragraph 3 of the definition should be modified to clarify that units whose primary product is a chemical are not petroleum refining process units.

One commenter (IV-D-61) requested that instead of applying to "petroleum refinery process units" at all major source facilities, the proposed rule should apply to selected "process units" at "petroleum refineries," as defined in the NSPS rules. The commenter (IV-D-61) stated that this approach would eliminate interpretive issues regarding the rule's applicability to non-refinery facilities. Specifically, the commenter (IV-D-61) requested that major source facilities producing "lubricants" not be subject to the rule because they do not refine, distill or process crude oil or unfinished petroleum derivatives.

One commenter (IV-D-20) supported the exclusion of natural gas liquid processing Units from the proposed rule; however, the commenter (IV-D-20) stated that the applicability criteria listed in the regulation were vague in defining the differences between a natural gas liquid process unit and a petroleum refining process unit. The commenter (IV-D-20) requested that the promulgation preamble explain these differences and that a definition of a natural gas liquid process unit be put in the definition section of the rule.

One commenter (IV-D-21) asserted that the existing definition of a process unit may leave some refinery process units out or overlap with other source categories. The commenter (IV-D-21) explained that some refinery units that contain HAP's produce solvents. The commenter (IV-D-21) expressed concern that these units will not be regulated because they produce highly aromatic compounds not on the list of common refinery products and are not subject to HON because they are flexible operation units. The commenter (IV-D-21) stated that these units should be included because their operations are similar to those of refinery units. The commenter (IV-D-21) asserted that these units should not be regulated by section 112(g) of the Act.

Response: In the final rule the EPA has incorporated the SIC code definition for petroleum refining (2911) into the petroleum refinery process units definition in order to clarify the process units covered by the rule. This clarification excludes those facilities that manufacture lubricating oils and greases by blending and compounding purchased materials, and those facilities that re-refine used lubricating oils. Based upon this definition, oils and waxes produced in a petroleum refinery will be covered under the petroleum refineries NESHAP and those establishments that blend oils or waxes from purchased materials will not be covered under the NESHAP. Under the new definition, it is clear that natural gas liquid processing units would not be covered by the rule because they are classified under mining industries (a different SIC code). The list of example process units has been expanded to include petroleum-based solvent units, to avoid any potential ambiguity regarding these units. Thus, it should be clear that solvents produced in petroleum refineries and their production units are covered under the rule.

The EPA believes that the inclusion of the SIC code reference in the definition of refinery process unit will alleviate most of the confusion about overlap with other source categories scheduled for regulation under the Act. The EPA has also explicitly excluded units subject to the HON, ethylene processes, shale oil extraction units, and other units where there may be confusion from applicability of the rule. Therefore deleting the words "react," "polymerization," and "isomerization" from the definition is unnecessary. These process unit examples are for those units that process crude oil, which would eliminate butyl rubber and phthalate plasticizer production process units as "polymerization" or "isomerization" refinery process units subject to the rule. Furthermore, the inclusion of the SIC code reference in the definition should sufficiently clarify that the petroleum refinery process unit does not include those units that may feed material originally produced in a refinery.

The EPA has also added a list of pollutants covered under the rule to assist facilities in the determination of whether a processing unit or a specific emission point is covered under the rule. It is important to understand that the HAP list is not the only consideration in determining if a process unit is subject. The first consideration is to determine if the process unit meets the definition of a petroleum refining process unit in the rule (including the SIC code wording that was added). The next step is to determine if the process unit could emit one of the listed organic HAP's. If none of the listed HAP's are present in the process unit, it is not subject. It should be stressed that a process unit may emit a listed HAP and still not be covered by the petroleum refinery NESHAP if the process unit does not meet the definition of a petroleum refining process unit. For example, a chemical unit that emits HAP's located at a refinery may be subject to the HON or another source category standard and not the petroleum refinery NESHAP.

Comment: One commenter (IV-D-21) suggested that "blending" and "sweetening or treating" be added to the list of examples of refinery process units. The commenter (IV-D-21) explained that the sweetening process converts methyl mercaptans to disulfides to reduce odor.

The commenter (IV-D-21) requested that "petroleum-based solvent production units" be added to the list of examples of process units.

Response: The list of example refinery process units in the proposed rule was not meant to be all-inclusive. It would not be feasible, and is not necessary, to provide a complete list due to the many variations among refinery plants, and differences in terminology. However, "blending" and "sweetening or treating" and "petroleum-based solvent production units" would be covered under the petroleum refinery process unit definition when "production" and "blending or sweetening" is done in a petroleum refinery and crude oil or petroleum derivatives are involved in the process.

Comment: One commenter (IV-D-20) suggested that the current wording of the rule in § 63.640(f)(3), which stated that any distillation unit that ever receives a refinery stream is subject to the rule, even if the stream is a minor part of its feed or is only processed on one occasion should exclude: (1) any distillation unit that receives less than 40 percent of its feed on an annual basis from a petroleum process unit, and (2) any distillation unit that sends less than 40 percent of output on an annual basis to a petroleum process unit.

One commenter (IV-D-20) contended that a distillation unit should not have its applicability determined forever due to the previous year's service. The commenter (IV-D-20) stated that notification that a distillation unit will not process petroleum products should allow a unit to be exempted from the rule [63.640(f)(5)].

Response: The EPA has not included the commenter's (IV-D-20) suggested exclusions in the final rule. The commenter (IV-D-20) misinterpreted § 63.640(f)(3). It is not true that any distillation unit that ever receives a refinery stream is subject to the rule. The rule only applies to those units for which the predominant use is from a petroleum refining process unit (e.g., if the distillation unit is fed by multiple on-site process units, it is assigned to the process unit that contributes the greatest amount). The EPA proposed to determine the applicability of a distillation unit to the NESHAP based on the previous year's service when there is no single predominant use because there needs to be a clear basis as to where the unit will be permitted. When a distillation unit receives its feed from off-site, the rule assigns the distillation unit to the process unit that receives the greatest amount of material from the distillation unit. This is also based on usage during the previous year when there is no single predominant use of the distillation unit. The distillation unit applicability determination needs to be made, and predominant use is the most logical determining factor. If the predominant use is, for example, a chemical manufacturing process unit instead of a refinery process unit, the distillation column would be subject to the HON rather than the refineries NESHAP. This approach also avoids overlapping MACT standards since there can only be one predominant use.

### 3.3.2 Area Source Designation

Comment: Three commenters (IV-D-20, IV-D-22, IV-D-44) stated that all limits under EPA-approved programs should be considered in determining potential to emit, not just emissions that have federally enforceable controls. One commenter (IV-D-44) claimed that including only federally enforceable emissions controls exceeds the intent of the 1990 Amendments. The commenter (IV-D-22) claimed that this was inconsistent with the statute and Congressional intent because section 112(a)(1) makes no mention of Federal enforceability. One commenter (IV-D-20) contended that to require additional paperwork simply to meet the definition of "federally enforceable" overburdens the system without contributing any benefit to the environment.

Response: The definition for a petroleum refineries' "potential to emit" is consistent with the NESHAP General Provisions (40 CFR part 63, subpart A). The EPA has consistently interpreted section 112(a)(1) to allow the use of only "federally enforceable" emissions controls in determining a source's potential to emit. These controls are the only controls that EPA would have the authority to require the use of. The reader is referred to the General Provisions preamble (59 FR 12413) for the promulgated rule for more information.

Comment: In response to the request for comments on whether area sources are within the petroleum refinery source category, one commenter (IV-D-46) requested that permitting of area sources as per 40 CFR part 70.3 (b)(1) and (b)(2) be deferred.

Response: States can override the 40 CFR part 70.3 area source permitting deferral or any deferral that may be written into individual NESHAP developed under the Act. The EPA does not want to mislead area source facilities into believing they have a deference when the State requires a permit. Therefore, the EPA has not included a deference of permitting requirements of area sources within the petroleum refinery source category in the final rule. However, the NESHAP does not apply to the area sources.

Comment: In response to the EPA's request for comment on whether small refineries are major sources, one commenter (IV-D-23) stated that based on 40 years of operation, the HAP emissions from their 3,000 barrel per day refinery would be over 9.1 Mg/yr (10 tpy) of a single HAP or 22.7 Mg/yr (25 tpy) of a combination of HAP's.

One commenter (IV-D-50) believed that many small refineries currently emit less than 22.7 Mg/yr (25 tpy) of HAP's. The commenter (IV-D-50) also believed that the 9.1 Mg/yr (10 tpy) limitation per HAP in section 112 will cause most small refineries to be considered a "major source," but that the classification will ultimately depend on how the EPA requires facilities to calculate and estimate HAP emissions.

One commenter (IV-D-45) provided emissions information demonstrating that they were not a major source, and contended that since their plants are located in remote nonattainment areas there is no reason to evaluate them for regulation as an area source. The commenter's (IV-D-45) evaluation of emissions from their COTU's was conducted using EPA AP-42 emissions factors for tanks, flares, heaters and emergency generators. The commenter's (IV-D-45) fugitive emissions were calculated from actual plant tests included in an appendix to their comments. The commenter (IV-D-45) included Arctic heating fuel vapor pressures. The commenter (IV-D-45) explained that the small volume throughput to tankage and the low vapor pressure resulting from operation in the arctic, where the average temperature for nine months of the year is zero degrees Fahrenheit and the other three months of the year it is fifty degrees Fahrenheit, results in small HAP emissions from tanks and transfer operations. The commenter (IV-D-45) stated that the COTU's have no process vents to the atmosphere, all gas produced in the refining operations is either recycled for recompression and reuse or is routed to a flare, and all pressure safety valves relieve to a flare system.

Response: The EPA requires facilities to calculate and estimate HAP emissions based on a facility's potential to emit HAP, considering controls, from all activities at the plant site. Area HAP sources located in a remote nonattainment area would need to be evaluated for regulation along with other attainment or nonattainment area HAP sources. The commenter's (IV-D-45) contention that their petroleum refinery area HAP source should not be evaluated for regulation along with other area HAP sources implies that industries located in remote areas should not have to control their HAP emissions.

If the commenter's (IV-D-45) plant is demonstrated to be an area source, it would not be subject to the petroleum refinery rule. Furthermore, with the inclusion of the SIC code definition 2911 for petroleum refineries in the definition of a "petroleum refinery process unit," the commenter's COTU's may be excluded from coverage under this rule.

Comment: Two commenters (IV-D-12, IV-D-15) contended that the 9.1/22.7 Mg/yr (10/25 tpy) HAP limit should be expanded to 10/35 tons per year and be based on actual emissions instead of potential emissions. One commenter (IV-D-15) stated that small facilities may barely meet the 22.7 Mg/yr (25 tpy) cutoff, but potential expansions to the HAP list may occur which would increase a facility's combined HAP emissions resulting in more small refineries exceeding the 22.7 Mg/yr (25 tpy) limit. Another commenter (IV-D-12) objected to the 9.1/22.7 Mg/yr (10/25 tpy) limit because some HAP's are double counted, once as a generic chemical pollutant for State requirements, and again for each hazardous constituent contained in the generic pollutant for Federal MACT standards.

Response: The Act establishes the 9.1/22.7 Mg/yr (10/25 tpy) major source determination limit criteria based on a source's potential to emit. The individual NESHAP, developed under the Act, cannot change these major source determination limit criteria.

Comment: One commenter (IV-D-11) stated that in the HON and proposed refinery MACT, the EPA states that a facility may have more than one HAP emission source, and that marine or gasoline loading operations by virtue of their co-location at a refinery, could qualify the refinery as a major source. One commenter (IV-D-22) objected to the rule regulating co-located emission sources based on their location at a facility that qualifies as a major HAP source rather than the emissions that occur from the co-located emission source. The commenter (IV-D-22) stated that gasoline loading terminals should be subject to the MACT only when they have the same environmental impact as other "free standing" terminals.

Response: The Act requires the EPA to regulate major HAP sources. A major HAP source is defined as "any stationary source or group of stationary sources located within a contiguous area and under common control that emits or has the potential to emit considering controls..." This means that the EPA is obligated to consider the whole site when determining if a source is major and to regulate co-located emission sources (e.g., marine or gasoline loading operations), when applicable.

### 3.3.3 Process Changes and Additions

Comment: One commenter (IV-D-21) disagreed with the use of the phrase "the new or reconstructed source" in reference to additions or changes subject to new source requirements.

The commenter (IV-D-21) contended that changes to a process unit should not trigger new source requirements unless they meet the criteria for "reconstruction." The commenter (IV-D-21) recommended that in § 63.640(k)(1), (2) and (2)(ii), "new or reconstructed source" should be replaced with "reconstructed source, addition or change." The commenter (IV-D-21) suggested that the entire proposal be searched for similar phrases that could cause a misinterpretation, subjecting an entire refinery to new source MACT requirements.

Three commenters (IV-D-21, IV-D-42, IV-D-44) supported the proposal in § 63.640(i) that additional process units and additional emissions points or deliberate operational changes at a process unit should be subject to existing source MACT provisions instead of new source MACT unless they meet the criteria in § 63.640(i) or (j).

Two commenters (IV-D-10, IV-D-11) agreed with the EPA's definition of source. The commenters (IV-D-10, IV-D-11) also stated that any determination of new source control requirements must be based on the application of the criteria to the refinery as a whole (e.g., 50 percent of the fixed capital cost that would be required to construct a comparable new refinery).

<u>Response</u>: The EPA evaluated the commenter's (IV-D-21) request and determined that the commenter's (IV-D-21) proposed editorial changes met with the intended requirements of the rule [that additional process units and additional emissions points or deliberate operational changes at a process unit should be subject to existing source MACT provisions instead of new source MACT unless they meet the criteria in §§ 63.640(i) or (j)]. The EPA determined that the proposed changes would not change the integrity of the rule and had the potential to reduce misinterpretation of the rule. Therefore,

the EPA incorporated the commenter's (IV-D-21) proposed editorial changes in the final rule.

Comment: One commenter (IV-D-21) suggested that the proposed § 63.640(e)(2)(iv) be deleted. The commenter (IV-D-21) agreed that if the material in a vessel is changed, the vessel should become subject to any applicable regulations. The commenter (IV-D-21) stated that this is covered under § 63.640(l), therefore 63.640(e)(2)(iv) is unnecessary. If § 63.640(e)(2)(iv) is not deleted, the commenter (IV-D-21) requested that the term "reevaluate" be defined. The commenter (IV-D-21) suggested that the evaluation be through engineering judgment, and that no special notification beyond the Notification of Compliance Status be required. The commenter (IV-D-21) also requested that if § 63.640(e)(2)(iv) is not deleted, provisions be added stating that storage vessels that already have the required control technology do not require reevaluation. The commenter (IV-D-21) also requested that provisions be added that reevaluation is not required if the new material to be stored is of a group of materials previously determined to be storable in a vessel without triggering additional controls.

Response: The EPA concurs that the requirements cited under § 63.640(e)(2)(iv) are already covered under § 63.640(l). The EPA has deleted § 63.640(e)(2)(iv) from the final rule.

Comment: One commenter (IV-D-21) requested that "material" be defined as "common classes of liquids, such as gasoline, naphtha, distillate, solvent and lubricating oil." The commenter (IV-D-21) requested that material changes not include changes in product grades or specifications.

Response: The EPA intended for "material changes" to be changes in wholesale materials and not changes in product grades or specifications. A definition for "material" has been added to the final rule for clarification of the rule's intent.

Comment: One commenter (IV-D-09) stated that the provisions in § 63.460(l) were confusing because the terms Group 1 and Group 2 emission points were not defined.

Response: Group 1 and Group 2 emission point definitions were included in § 63.641 of the proposed rule. The EPA has maintained these definitions in § 63.641 and has added a reference to these definitions in § 63.460(1) of the final rule.

## 3.4 REGULATED POLLUTANTS

Comment: One commenter (IV-D-07) claimed that VOC are regulated by this rule as much as HAP's are. The commenter (IV-D-07) contended that VOC are sufficiently regulated under Title I of the Act. The commenter (IV-D-07) recommended that the EPA find a way to reduce HAP's without infringing on Title I requirements.

Response: The EPA agrees that VOC, as well as HAP, would be controlled by the technologies utilized to comply with this rule. Over 85 percent of the listed HAP's are VOC, therefore, control measures for HAP will often end up controlling VOC. However, under the Act, the EPA is required to establish MACT for major HAP sources. If MACT requires greater control than what exists through Title I requirements, it needs to be instituted. If controls installed to meet Title I requirements are sufficient to meet MACT requirements, further control is unnecessary. Hazardous air pollutants are controlled under MACT to protect human health, welfare, and environment.

Comment: Two commenters (IV-D-21, IV-D-25) noted that refineries emit fewer than 40 of the chemicals on the HAP list in the Act and suggested that testing would be less costly and the regulation would be more consistently interpreted if the rule regulated only the organic HAP's applicable to refineries rather than all "organic HAP's." One commenter (IV-D-21), explained that polycyclic organic matter (POM) was not included on their proposed list because, although POM does exist in petroleum refineries, the emission levels are insignificant. One commenter (IV-D-21), provided a table of these 40 HAP's and requested that a table of organic HAP's be included in the rule. The commenter (IV-D-21) expressed concern over the phrase "organic chemical" not being defined. The commenter, (IV-D-21), provided a table indicating which pollutants they believe are organic HAP's.

One commenter (IV-D-29) suggested that all refineries that do not have light hydrocarbons be exempt from the proposed regulation. The commenter (IV-D-29) stated that some small California refiners exclusively handle heavy crude oil and do not have fuel gas systems or flares as they do not contain volatile compounds. The commenter (IV-D-29) stated that some refineries do not produce any products lighter than kerosene.

One commenter (IV-D-52) urged the EPA to consider that petroleum refineries emit pollutants other than organic HAP's, such as hydrogen chloride, an inorganic HAP. The commenter stated that focusing on a limited list of pollutants may underestimate the cost effectiveness of the control options being proposed for this rule.

One commenter (IV-D-51) concurred with the EPA that the proposed rule should only address emissions of organic HAP's and that metal HAP's, hydrogen chloride, carbonyl sulfide and carbon disulfide emitted from FCCU catalyst regeneration vents, catalytic reformer catalyst regeneration vents, and sulfur plant vents be considered separately. The commenter (IV-D-51) stated that these pollutants will be regulated under a separate source category that has a 1997 promulgation date.

Response: The petroleum refinery process units regulated by subpart CC emit organic rather than inorganic HAP's. Inorganic HAP's are emitted from catalytic cracking catalyst regeneration vents, sulfur plant vents, and catalytic reformer catalyst regeneration vents, which will be evaluated for regulation in the future.

The definition of "miscellaneous process vents" in both the proposed and final rule specifically excludes the vents mentioned by the commenters. The EPA has also added a list of pollutants covered under the rule to assist facilities in the determination of whether a processing unit or emission point is covered under the rule and to simplify compliance determination. Refineries only emit a subset of the organic HAP's listed in the Act. Those organic HAP's emitted by refineries are included in the list of regulated HAP's. There is no need for the rule to cover organic HAP's that refineries do not emit.

Comment: One commenter (IV-D-21) stated that the exemption from subpart CC for equipment containing no HAP's is too restrictive. The commenter (IV-D-21) recommended setting a de minimis concentration of 0.1 weight percent total carcinogens and 1.0 weight percent total HAP's. The commenter (IV-D-21) requested that the de minimis level be no lower than 20 ppmv for total organic HAP's. The commenter (IV-D-21) recommended that § 63.640(g)(2) be modified to read: "Equipment containing organic HAP's in any liquid and vapor at concentrations below 0.1 weight percent total carcinogens and below 1.0 weight percent total."

Response: Section 112 of the Act requires technology-based standards and not health-based standards. Therefore, a health-based de minimis (i.e., 0.1 weight percent total carcinogens) would be inappropriate under a NESHAP. However, the refineries rule includes applicability criteria to determine if controls must be applied to individual emission points. For example, there are size and vapor pressure criteria to determine if storage vessels must apply control. As explained in chapter 4 of this document, the final rule also includes criteria for determining which process vents require control.

Comment: One commenter (IV-D-21) requested that, when determining the applicability of a process vent [§ 63.640(f)(4)], engineering judgement be allowed to determine if a process vent's organic HAP emissions exceed 20 ppmv in lieu of EPA Method 18 (unless the engineering judgement is not accepted by the permitting authority).

Response: Miscellaneous process vents are defined to include only vents with concentrations above 20 ppmv. Those with concentrations below this level are not subject to any requirements of the rule. This determination can be based on testing or process knowledge/engineering assessment. As explained in Chapter 4 of this document, an emission rate cut-off of 33 kg/day (72 lbs/day) for existing sources and 6.8 kg/day (15 lb/day) for new sources has been added to distinguish Group 1 from Group 2 vents. Only Group 1 vents with emissions greater than 33 kg/day (72 lbs/day) for existing sources and 6.8 kg/day (15 lb/day) for new sources, are required to apply controls. The determination of whether a vent is Group 1 or Group 2 can also be based on either Method 18 or Method 25A testing or process knowledge/engineering assessment. Specific language has been added to the process vent provisions to clarify what constitutes an "engineering assessment."

## 3.5 COORDINATION/OVERLAP WITH OTHER RULES

### 3.5.1 Overlap With Other NESHAP and NSPS

Comment: Two commenters (IV-D-25, IV-D-33) suggested that the petroleum refinery NESHAP rule supersede the HON for wastewater streams from chemical manufacturing process units that are treated within refinery wastewater systems. (The petroleum refineries NESHAP requires compliance with the BWON, which is different from the HON.) Two commenters (IV-D-25, IV-D-33) stated that wastewater streams from chemical process units are mixed with other refinery wastewater streams for treatment and benzene could be used as a surrogate for other HAP's in chemical process wastewater streams at refineries. One of the commenters (IV-D-25) asserted that the section 114 responses include chemical process unit wastewater. The commenters (IV-D-25, IV-D-33) stated that the BWON and HON wastewater requirements for biodegradation units conflict, in that the benzene waste NESHAP allows operation within general guidelines, whereas the HON requires a specific HAP removal demonstration that includes all streams treated in the unit. One commenter (IV-D-25) stated that it would be burdensome to test all the refinery streams as well as HON streams that are treated in biounits.

One commenter (IV-D-10) supported streamlining refinery MACT wastewater and HON wastewater applicability using the section 114 data. Two commenters (IV-D-06, IV-D-10) contended that chemical and refinery wastewater streams are co-mingled. Additionally, the commenters (IV-D-06; IV-D-10) asserted that benzene could still be used as a surrogate because it would still be the largest HAP contributor. The commenters (IV-D-06, IV-D-10) stated that the HON wastewater standards applicable to a refinery's chemical manufacturing process units should be superseded by the refinery MACT standard once they are promulgated. One commenter (IV-D-06) emphasized that this was especially important for mixed streams entering biodegradation units because the BWON regulation allows operation within general guidelines and the HON requires specific HAP removal efficiencies.

Response: Any conflicts that may exist between the BWON and the HON wastewater provisions need to be addressed within the context of those rules. The EPA is currently working to eliminate true conflicts in the requirements. However, the BWON cannot override the HON because the HON covers 112 organic HAP's whereas the BWON only covers emissions of benzene because the potential for good biodegradation versus loss is dependent on the chemical, and because the BWON applies to waste and wastewater and the HON only applies to wastewater. The EPA does not believe that demonstration of control of benzene can equate to sufficient control of all organic HAP's. For petroleum refinery sources, benzene is a good surrogate for all organic HAP's because it is the largest HAP contributor from this source.

The final rule clarifies that a petroleum refinery wastewater stream that is conveyed, stored, or treated in a wastewater stream management unit that also receives streams subject to the provisions of the HON, §§ 63.133 through 63.147 of subpart G shall comply with the provisions in §§ 63.133 through 63.137 and § 63.140 of subpart G for all equipment used in the storage and conveyance of the Group 1 or Group 2 wastewater stream, the provisions in both 40 CFR part 61, subpart FF (BWON) and in §§ 63.138 and 63.139 of subpart G for the treatment and control of the Group 1 or Group 2 wastewater stream, and the provisions in §§ 63.143 through 63.148 of subpart G for monitoring and inspections of equipment and for recordkeeping and reporting requirements. The final rule also clarifies that the owner or operator of a wastewater stream subject to both the BWON and HON is not required to comply with the monitoring, recordkeeping, and reporting requirements associated with the treatment and control requirements in 40 CFR part 61, subpart FF.

Comment: One commenter (IV-D-06) stated that there are several provisions in the refinery wastewater NSPS that conflict with the BWON, and therefore, conflict with the proposed refinery rule. The commenter (IV-D-06) recommended modifying the NSPS by specifying that compliance with monitoring, recordkeeping, and reporting requirements be identical to those in the BWON.

Three commenters (IV-D-19, IV-D-21, IV-D-25), in regard to wastewater monitoring, recordkeeping and reporting, requested a statement be included in the rule indicating that the NESHAP supersedes the NSPS, when both are applicable. The commenter (IV-D-19) contended that this regulation, combined with the BWON, SOCMI HON and NSPS will be very confusing to facilities that must comply with all four, especially in regard to part 70 operating permits. One commenter (IV-D-38) suggested that the EPA coordinate the recordkeeping and reporting requirements that effect petroleum refinery wastewater systems. The commenter recommended that the requirements of the petroleum refinery rule take precedence. Another commenter (IV-D-20) urged the EPA to state that compliance with the BWON overrides the requirements of NSPS QQQ so that a source only has one set of compliance and reporting duties.

Response: The EPA agrees that, combined with other rulemakings that may apply to a petroleum refinery wastewater stream and/or wastewater stream managed in a piece of equipment, there may be some confusion and overlapping requirements. In order to address the commenters' (IV-D-06, IV-D-19, IV-D-20, IV-D-21, IV-D-25) concern regarding the potential confusion when a petroleum refinery wastewater stream and/or wastewater stream managed in a piece of equipment is subject to multiple regulations, the final rule clarifies the wastewater provisions that would apply to a petroleum refinery wastewater stream and/or wastewater stream managed in a piece of equipment subject to multiple rules.

The final rule clarifies the applicability of 40 CFR part 63, subpart CC wastewater provisions by stating that a Group 1 wastewater stream managed in a piece of equipment that is also subject to the provisions of 40 CFR part 60, subpart QQQ is required only to comply with 40 CFR part 63, subpart CC. The final rule also clarifies that a Group 2 wastewater stream managed in equipment that is also subject to the provisions of 40 CFR part 60, subpart QQQ is required only to comply with subpart QQQ. Clarification of the applicable provisions for a wastewater stream that is conveyed, stored, or treated in a wastewater stream management unit that also receives streams subject to the provisions of 40 CFR part 63, subpart F has been included in the final rule.

Comment: Two commenters (IV-D-21, IV-D-25) suggested that, similar to the HON, the refinery NESHAP should specify that the equipment leaks provisions of the refinery NESHAP over-ride other NSPS and NESHAP that apply to the same equipment.

Response: The EPA has clarified the applicability of 40 CFR part 63, subpart CC equipment leak provisions in the final rule. The final rule clarifies that petroleum refinery sources subject to 40 CFR parts 60 and 61 regulations are required to comply only with the petroleum refinery NESHAP equipment leak provisions. This clarification is consistent with what was done in the HON. Petroleum refinery process unit equipment leak emission points are distinguished from SOCMI process unit equipment leak emission points by the inclusion of SIC code 2911 definition in the petroleum refinery process unit definition in the final rule. Therefore, there should not be any applicability conflicts between 40 CFR part 63, subpart CC, petroleum refinery equipment leak provisions and 40 CFR part 63, subpart H HON equipment leak provisions.

Comment: One commenter (IV-D-25) requested that the EPA clarify the relationship between the proposed refinery NESHAP and the gasoline distribution NESHAP currently under development. The commenter (IV-D-25) recommended that the gasoline distribution rule apply only to loading racks at marketing terminals and pipeline breakout stations classified under SIC codes 5171 and 4613 whereas the refinery NESHAP storage and fugitive provisions apply to operations at refineries (SIC Code 2911).

Response: The final rule has been clarified after consideration of this comment. The NESHAP for Gasoline Distribution Facilities (40 CFR part 63, subpart R) covers bulk gasoline terminals and pipeline breakout stations in SIC codes 5171 and 4613 that may be co-located at a petroleum refinery in addition to independently located facilities. The petroleum refinery "affected source" has been clarified in the final rule to include gasoline loading racks located at petroleum refineries if they are classified under the petroleum refineries SIC code (2911). The gasoline loading rack emission points in SIC 2911 at refineries may be included in emissions averages. The EPA has done this to encourage the use of flexible compliance approaches (i.e., averaging) where they can be properly monitored and enforced. Furthermore, gasoline loading operations classified under 2911 receive their products directly from refinery process units and are operated by the same entity, so their operation is closely tied to refinery process units. It is logical to regulate them under the same rule as part of the same source.

The EPA has also referenced the SIC code (2911) in the petroleum refinery process units definition in order to clarify the process units covered by the rule.

Comment: One commenter (IV-D-21), suggested that the cost to refineries of complying with similar regulations could be reduced if the refineries were allowed to comply with only the most stringent. The commenter (IV-D-21) suggested that compliance with subpart CC of this regulation should exempt refineries from less stringent NSPS and NESHAP regulations. The commenter (IV-D-21) suggested that process vents subject to subpart CC of this rule be exempt from 40 CFR part 60, subparts III, NNN, and RRR. The commenter (IV-D-21) also suggested that storage vessels subject to subpart CC of this rule be exempt from 40 CFR 60, subparts K and Ka and 40 CFR 61, subpart Y. Conversely, the commenter (IV-D-21) suggested that storage vessels subject to 40 CFR 60, subpart Kb be exempt from subpart CC of this rule, because subpart Kb is more stringent.

Response: The EPA agrees with the commenter (IV-D-21) that the cost to refineries of complying with similar regulations could be reduced if the refineries were allowed to comply with only the most stringent. Section 63.640 of the final rule (40 CFR part 63, subpart CC) has been amended (as stated in the previous response) to clarify the provisions that apply to petroleum refinery emission points that may be subject to multiple regulations. Petroleum refinery process unit emission points are distinguished from SOCMI process unit emission points by the inclusion of SIC code 2911 in the petroleum refinery process unit definition in the final rule. Therefore, there should be no regulatory overlap between process vents subject to 40 CFR part 63, subpart CC and 40 CFR part 60, subpart III, NNN, and RRR.

The final rule clarifies the applicability of 40 CFR part 63, subpart CC storage vessel provisions to storage vessels at existing and new petroleum refinery sources subject to 40 CFR part 60, subparts K, Ka, or Kb. The specific provisions are structured such that each vessel is subject to only the more stringent rule. For example, a Group 1 storage vessel at an existing refinery that is also subject to subpart K or Ka is required only to comply with the petroleum refinery NESHAP storage vessel provisions. The benzene storage vessel NESHAP (40 CFR part 60, subpart Y) would apply to a SOCMI process unit storage vessel and not a petroleum refinery process unit storage vessel; therefore, clarification of applicability in the final rule was unnecessary.

Comment: One commenter (IV-D-36) suggested that when the EPA applies existing emission standards to HAP sources in this regulation, such as 40 CFR part 60, subpart Kb for storage tanks, BWON for Wastewater and SOCMI HON to equipment leaks, that it be clearly stated that compliance with the requirements under those rules is sufficient to comply with this rule. The commenter (IV-D-36) also requested that the EPA clearly state any new standards and where they apply.

Response: The petroleum refinery NESHAP rule, in referencing the provisions of other regulations, clearly specifies those sections of the referenced rules that do and do not apply. Subpart CC also clearly specifies any additional provisions that are not included in the cross-referenced rules. Subpart CC does not impose any requirements beyond the benzene waste operations NESHAP for wastewater. Subpart CC does not reference 40 CFR part 60, subpart Kb for storage vessels in refinery process units. Instead it references HON storage vessel provisions without certain fitting requirements. The equipment leaks section of subpart CC lists which parts of 40 CFR part 60, subpart VV or HON apply and which have been changed.

Comment: One commenter (IV-D-19) recommended that it be made clear that certain provisions supersede other Federal rulemakings in the applicability section (§ 63.640) of the final rule. Two commenters (IV-D-19, IV-D-21) suggested that a table be provided delineating the applicability of overlapping regulations to a petroleum refinery source subject to the petroleum refinery NESHAP.

One commenter (IV-D-10) contended that conflicts exist between existing NSPS requirements and NESHAP's (under the old section 112) requirements. The commenter (IV-D-10) requested that the EPA establish whether the NSPS or the NESHAP requirements supersede in this rulemaking.

Response: As suggested by the commenter (IV-D-19), the EPA has clarified the applicability of the petroleum refinery NESHAP as it relates to other Federal regulations affecting the same source in § 63.640 of the final rule. The text cites specific overlaps and clarifies which rule the source must comply with in each case. The EPA did not use a table format, as suggested by the commenters (IV-D-19, IV-D-21), because of the level of specific detail that had to be included in a table would be more confusing than clarifying.

Comment: One commenter (IV-D-21), stated that a process unit should not be regulated by both subpart CC of this regulation and HON or the Gasoline Distribution MACT. The commenter (IV-D-21), requested that the following exemption be added to § 63.640(g): "(7) Process units and emission points subject to subparts F, G, H, I, and R of this subpart."

One commenter (IV-D-24) was concerned with overlap with the HON and the proposed petroleum refinery NESHAP. The commenter specifically mentioned MTBE, benzene, toluene, and xylene units that are clearly subject to HON and in the broad petroleum refinery process unit definition. The commenter suggested that units and emission permits subject to subparts F, G or H be specifically exempted. The commenter provided specific regulatory language.

One commenter (IV-D-01) requested that the applicability section of the proposed rule be clarified to state that a manufacturing process unit that is subject to the SOCMI source category, and thus the HON, is exempt from the proposed petroleum refinery NESHAP. The commenter stated that this would reflect the wording of section VI(A)(1)(a) of the proposal preamble.

Response: The EPA agrees that if a process unit is subject to the HON, 40 CFR part 63, subpart CC should not apply. The applicability provisions of the refineries rule were structured to avoid overlapping regulations. Petroleum refinery process unit emission points are distinguished from SOCMI process unit emission points by the inclusion of SIC code 2911 definition for petroleum refining in the petroleum refinery process unit definition in the final rule. The inclusion of the SIC code for petroleum refinery in the definition of a petroleum refinery process unit should alleviate any applicability conflicts between a SOCMI and petroleum refinery process unit. The definition of the "affected source" has also been changed in the refineries rule to clarify that gasoline loading racks at refineries are subject to 40 CFR part 63, subpart CC rather than the gasoline distribution NESHAP if the transfer operation is classified under SIC code 2911. If the transfer operation has an SIC code other than 2911, it is covered by 40 CFR part 63, subpart R.

Comment: Two commenters (IV-D-20, IV-D-49) contended that the applicability of this rule overlaps the proposed Stage I Gasoline Distribution NESHAP and that the EPA should clarify which rule applies for gasoline tanks and waste operations located at petroleum refineries. One of the commenters (IV-D-20) suggested that the EPA allow refinery sources the option of subjecting their gasoline storage tanks to either the Gasoline Distribution NESHAP or the Petroleum Refinery NESHAP. The commenter (IV-D-20) suggested notifying the EPA of the choice through the Initial Notification Requirements.

Response: The EPA has not included the commenter's (IV-D-20) suggestion to allow petroleum refineries the option of subjecting their gasoline storage tanks to either the Gasoline Distribution NESHAP or the Petroleum Refinery NESHAP. Clarification of the applicability of the rule regarding storage vessels covered by the Petroleum Refinery NESHAP has been included in the final rule. If a storage vessel can be classified as a petroleum refining process unit, as defined in the final rule and is classified under SIC code 2911, then the storage vessel is subject to the petroleum refinery NESHAP. If the storage vessel is part of a gasoline terminal classified under an SIC code other than 2911 it is not subject to the petroleum refinery NESHAP.

The definition of a "petroleum refining process unit" has been clarified in the final rule as being a process unit used in an establishment primarily engaged in petroleum refining, as defined in the SIC for petroleum refining (2911). Standard Industrial Classification codes are assigned and used by facilities to distinguish between equipment. The incorporation of the SIC code definition for petroleum refining to the definition keeps the management of air pollution control equipment under the same management structure as the surrounding process equipment.

3.5.2 Overlap With Title V

Comment: Three commenters (IV-D-22, IV-D-42, IV-D-51) supported streamlining the Act regulations by coordinating requirements in the Title V program, SOCMI, HON, and NESHAP standards. One commenter (IV-D-42) contended that refineries were already heavily regulated and before any new regulations are issued, the EPA should consider these existing regulations and focus their efforts on what additional regulations are needed.

Response: Existing regulations were considered in developing the petroleum refineries NESHAP. The HON affects only certain chemical manufacturing units at refineries. Applicability provisions of the refineries rule were structured to avoid overlapping with HON. The refineries NESHAP wastewater rule refers to the BWON, to avoid placing additional burden on refineries. The NSPS were considered in developing the NESHAP. Because the NSPS apply only to new sources and only to VOC's, there are many HAP emission points at refineries that are not regulated by the NSPS. The petroleum refineries NESHAP is necessary to regulate these HAP emissions as mandated by the Act. Title V does not impose any new control requirements, so will not conflict with the NESHAP in terms of control requirements. The recordkeeping and reporting requirements of the refineries NESHAP have been structured to be consistent with Title V and avoid duplicative reporting.

Comment: One commenter (IV-D-21) pointed out that section 63.642(a) of subpart CC requires sources affected by the proposed regulation to obtain a title V operating permit or submit an implementation plan as a temporary alternative to comply with the regulation. The commenter (IV-D-21) suggested that section 63.642(a) of subpart CC be deleted or it be made clear that the part 70 or 71 application is not required until the deadline required by those permits. The commenter (IV-D-21) pointed out that where there are references to an operating permit in the proposal, there are good alternatives to the operating permit, such as submitting information in a separate "submittal."

Response: The EPA agrees with the commenter (IV-D-21) that a part 70 or 71 application is not required until the deadline required by those permits. However, the EPA does not agree that clarification of this is necessary in the rule. As written, § 63.642(a) of subpart CC simply requires sources to obtain part 70 or part 71 permits. It does not specify a date and it does not mention an "implementation plan". The only time an implementation plan is needed is if a source chooses to comply by using emissions averaging. The provisions in § 63.653(d) of subpart CC state that the required information "may be submitted in an operating permit application, in an amendment to an operating permit application, in a separate submittal, or in any combination of the three". A deadline for submittal is provided. Where the proposal gives alternatives such as the notification of compliance status. The use of the word "or" reflects an option, not a sole requirement.

Comment: One commenter (IV-D-21) suggested that if acquiring a Title V permit is a requirement of the proposed regulation, that it be made clear that the rule requires the application for a Title V permit. The commenter (IV-D-21) suggested that the word "apply" replace "obtain" since obtaining a permit is not wholly within the control of the owner/operator.

Response: The EPA concurs that obtaining a title V operating permit is not wholly within the owner or operator's power, and that it is required as a result of this rulemaking. Therefore, the EPA has made the commenter's suggested change to the final rule.

3.5.3 NESHAP General Provisions Comments

Comment: One commenter (IV-D-05) expressed concern that the potential overlap between MACT regulations will be an ongoing issue and the EPA should consider ways of addressing the issues in more general ways such as amending the General Provisions to specify that no emission point will be subject to more than one MACT standard. Another commenter (IV-D-21) stated that no emissions unit should be regulated under more than one part 63 source category standard. The commenter (IV-D-21) asserted that if a emission unit was regulated by more than one, it is likely that they would conflict. The commenter (IV-D-21) urged the EPA to add "No emissions unit shall be regulated under more than one source category under part 63" to subpart A of the proposed regulation. The commenter (IV-D-21) provided an explanation of how certain rules, including the HON, the Gasoline Distribution MACT, and Non-SOCMI chemical MACT standards may overlap with the petroleum refinery NESHAP.

One commenter requested that the EPA consider amending the part 63 "General Provisions" to specifically state that no emission point is subject to more than one part 63 subpart.

Response: The General Provisions (40 CFR part 63, subpart A) were promulgated on March 16, 1994 (59 FR 12408). These provisions codify general procedures and criteria to implement emission standards. It is up to the individual standards under part 63 to discern the applicability of a standard to an emission point. The EPA has amended § 63.640 of the final rule to address the applicability of the petroleum refinery NESHAP when there is potential for overlap among different MACT standards. The EPA has also made changes to the applicability and definition sections to avoid overlap.

3.5.4 Overlap With State and Local Rules

Comment: Two commenters (IV-D-21, IV-D-25) suggested that, as allowed by § 63.102(b) of the HON, refineries subject to State or local requirements that provide comparable HAP emission reductions to the refineries NESHAP should be allowed to comply with the existing State or local requirements. The commenter (IV-D-25) further requested that, if a facility can demonstrate that the recordkeeping and reporting requirements of a State or local rule would be sufficient to demonstrate compliance with the refinery NESHAP, then they should be allowed to use the State or local paperwork requirements.

Response: The EPA has amended § 63.640 of subpart CC to state that the permitting authority for the affected facility may allow consolidation of the monitoring, recordkeeping, and reporting requirements under this subpart with the monitoring, recordkeeping, and reporting requirements under other applicable requirements in 40 CFR part 60, 61, or 63, and in any 40 CFR part 52 approved State implementation plan provided the implementation plan allows for approval of alternative monitoring, recordkeeping, and reporting requirements and provided that the permit contains an equivalent degree of compliance and control. This would allow an affected source to submit one set of compliance reports for the source.

Comment: One commenter (IV-D-12) complained that the proposed rule will threaten the survival of small refineries by imposing additional compliance, reporting and recordkeeping requirements, which in many cases duplicate State and local provisions. Another commenter (IV-D-15) expressed concern that the proposed rule, by specifying HAP's would result in significant data collection burdens. The commenter (IV-D-12) stated that this was because many States require generic information on pollutants in addition to the Federal HAP list. Therefore, the commenter contended, many HAP's would be double counted.

One commenter (IV-D-12) supported the EPA's assertion that the HAP's emitted from refineries are all VOC's. Therefore, the commenter (IV-D-12) stated that any regulation which generally controls VOC's will control HAP's. The commenter (IV-D-12) asserted that there are existing State and local regulations more stringent than those proposed. The commenter (IV-D-12) stated that the EPA should either rescind the rule or provide an exemption for sources already subject to State and local measures that result in HAP reduction or control as effectively as the proposed NESHAP, or include provisions for the EPA approval of more stringent State and local measures to take the place of the Federal rule in approved air quality control jurisdiction. The commenter (IV-D-12) stated that refineries in the SCAQMD should be exempt from the requirements of the rule.

Response: As noted in a previous response, the EPA has amended § 63.640 of subpart CC to state that the permitting authority for the source may allow consolidation of the monitoring, recordkeeping, and reporting requirements under 40 CFR part 63, subpart CC with the monitoring, recordkeeping, and reporting requirements under other applicable requirements in 40 CFR part 60, 61, or 63, and in any 40 CFR part 52 approved State implementation plan provided the implementation plan allows for approval of alternative monitoring, recordkeeping, and reporting requirements and provided that the permit contains an equivalent degree of compliance and control. This would allow an affected source to submit one set of compliance reports for the source.

3.5.5 Relationship to Section 112(g)

Comment: One commenter (IV-D-20) requested clarification as to whether 40 CFR 63, subpart B [112(g)] applies to changes at a refinery after promulgation of this rule. The commenter (IV-D-20) requested that explicit exclusions of sources subject to this rule from subpart B requirements be noted in the rule.

Response: The petroleum refinery NESHAP (subpart CC) overrides 40 CFR part 63, subpart B (under the proposed subpart B) when changes at a petroleum refinery occur to a process unit emission point covered under 40 CFR part 63, subpart CC. However, 40 CFR part 63, subpart B would apply to those process unit emission points that are not covered under 40 CFR part 63, subpart CC and are located at a refinery. The petroleum refinery rule includes specific provisions to determine if additions or changes are subject to the new or existing source provisions under 40 CFR part 63, subpart CC.

3.6 OTHER APPLICABILITY ISSUES

Comment: One commenter (IV-D-20) recommended including definitions for the following terms within the proposed rule:

natural gas liquid, natural gas liquid process, petroleum, and petroleum refinery.

Response: The EPA has included the SIC code 2911 definition for petroleum refining in the definition of "petroleum refinery process unit," which clarifies the applicability of the petroleum refinery NESHAP. Natural liquid gas processes are classified under a different SIC code. Therefore, clarifying definitions, as suggested by the commenter (IV-D-20), were unnecessary in the final rule.

Comment: One commenter (IV-D-21) agreed with the exclusions in the definitions of "process changes." The commenter (IV-D-21) suggested that the exclusions be extended to include startup and shutdown and temporary process changes made to protect human life, the environment or property from serious harm.

Response: The proposed rule never intended for "process changes" to include startup and shutdown and temporary process changes. The "process change" definition in the final rule clarifies that a "process change would not include a change or modification of an emission point." Requirements for startup, shutdown, or malfunction of an affected source are dictated by the General Provisions for part 63 (40 CFR part 63, subpart A).

Comment: One commenter (IV-D-21) recommended that in the list of refinery products, the "residual" in "residual fuel oil" be deleted because home heating oil and other heating oils are often called "fuel oils." The commenter (IV-D-21) also requested that asphalt be added to the list of refinery products.

Response: The EPA agrees with the commenter (IV-D-21) that "residual" should be deleted from "residual fuel oil" in the list of refinery products regulated by 40 CFR part 63, subpart CC. Therefore, the EPA has deleted the word "residual" from the definition of "residual fuel oil" in the final rule. The final rule has not added "asphalt" to the list of refinery products regulated by 40 CFR part 63, subpart CC because "asphalt processing" is scheduled for development of a MACT standard in the year 2000.

# 4.0 SELECTION OF MACT FLOOR AND MACT - GENERAL PROCEDURES

## 4.1 SELECTION OF MACT FLOOR

Comment: Several commenters (IV-D-09, IV-D-21, IV-D-22, IV-D-25, IV-D-42, IV-D-44) objected to setting the MACT standard based on the 94th percentile as opposed to the 88th percentile. One commenter (IV-D-25) reasoned that a 94th percentile interpretation leads to more stringent requirements with poor cost-effectiveness. The commenter (IV-D-25) cited pulp and paper, refinery storage tanks, and HON storage tanks as examples of poor cost-effectiveness. Another commenter (IV-D-09) opposed the higher floor method because it leads to application of California style controls nationwide because the higher floor method requires control at the level equivalent to the 94th percentile. The commenter (IV-D-09) also contended that this makes the MACT floor for existing sources identical to the floor for new sources, and results in half of the top 12 percent of existing sources being out of compliance with the controls specified. The commenter (IV-D-09) concluded that adoption of the 94th percentile undermines productive work by industry, States, environmental organizations, and the EPA.

One commenter (IV-D-42) contended that the EPA had already established a precedent for the 88th percentile in the HON. The commenter (IV-D-42) stated that the EPA interpretation is contrary to Congressional intent and severely restricts the EPA's ability and requirement to take into consideration other factors such as the cost of achieving emission reductions or/and nonair quality health and environmental impacts. The commenter (IV-D-42) noted that the EPA may always set the standard on a case-by-case basis at greater than the 88th percentile.

One commenter (IV-D-09) specifically suggested that the lower floor (88th percentile) method is more appropriate for storage vessels. The commenter (IV-D-09) agreed that the EPA has discretion to adopt the lower floor interpretation method.

Response: Section 112(d)(3)(A) requires that standards be no less stringent than "the average emission limitation achieved by the best performing 12 percent of existing sources." The EPA has interpreted this language to mean that EPA first determines the emission limitations achieved by sources within the best performing 12 percent, and then averages those limitations (See 59 FR 29196, 6/6/94). The EPA interprets the word "average" in section 112(d)(3) to authorize the Agency to use any reasonable method, in a particular factual context, of determining the central tendency of a data set. In most cases, "average" was interpreted to be the arithmetic mean or the median. For example, the "floor" for storage vessels is based upon the average vapor pressure of the top 12 percent (arithmetic mean) while the process vent "floor" is based upon the 94th percentile (median). The choice between using the median value or mean value depends on which value the EPA determines best represents the central tendency of the data.

Comment: One commenter (IV-D-21) disagreed with the procedure used in selecting MACT floor level of controls because cost effectiveness was not included in the determinations. The commenter (IV-D-21), cited examples from API of the cost effectiveness for some miscellaneous process vents. The commenter (IV-D-21) claimed that the EPA inappropriately interpreted the Act to require that cost of achieving emissions reductions can only be considered when setting a level of control more stringent than the MACT floor. The commenter (IV-D-21) contended that Congress did not intend cost effectiveness only to be considered in setting a level of control more stringent than the MACT floor.

One commenter (IV-D-21) stated that the EPA's interpretation of the Act regarding establishing the MACT floor does not allow non-air quality health impacts to be taken into consideration. The commenter (IV-D-21) claimed that this interpretation could prevent the MACT floor from being lowered, no matter how detrimental the non-air quality health impacts of controls are. The commenter (IV-D-21) contended that Congress did not intend non-air quality health impacts only to be considered in setting a level of control more stringent than the MACT floor.

Response: Section 112(a)(3)(A) of the Act states that the MACT floor shall be based on the average emissions limitation achieved by the best performing 12 percent of sources. Under the Act, a MACT standard can be no less stringent than the MACT floor. Therefore, additional criteria are not a legal means to evaluate and set the MACT floor. The cost of control and cost effectiveness of control beyond the floor are evaluated to determine if control beyond the floor is feasible. The benefits at the floor and control options beyond the floor, including non-air quality health impacts, are evaluated and presented in the preamble. The commenter did not provide any details specifically regarding non-air quality impacts or other benefits of the proposed rule.

Comment: Several commenters (IV-D-48, IV-D-49, IV-D-55, IV-D-57) alleged that the EPA did not determine the MACT floor for existing sources from the average of the limitations achieved by the best performing 12 percent of existing sources as required by the Act. One commenter (IV-D-48) claimed that the calculation of existing source MACT floor would be simplified if a narrow source definition was used. The commenter (IV-D-48) suggested that the emission reductions achieved at the best controlled sources be compared and the average of the best performing 12 percent of vents, wastewater streams, storage tanks, and equipment leaks, respectively, be calculated and emission limits set for each component. The commenter (IV-D-48) stated that calculating a floor from an abstraction, such as a collection of process vents, in each refinery is more difficult. The commenter (IV-D-48) requested a numerical value for the MACT floor and if the EPA cannot arrive at a numerical value, a more narrow source definition is necessary. The commenter (IV-D-48) requested that the EPA provide an explanation, with supporting facts, that shows how the proposed MACT floors for individual types of sources correspond to a proper floor for petroleum refineries as a whole. The commenter (IV-D-48) stated that if this is not possible, a more narrow source definition be used.

Three commenters (IV-D-55, IV-D-34, IV-D-16) suggested that the EPA evaluate current information provided by the California State and local agencies and recalculate MACT for new and existing sources. Two commenters (IV-D-55, IV-D-57) stated that the Bay Area and South Coast Area Districts of California have over 12 percent of the affected sources in the nation in terms of volume of crude oil processed and the number of facilities. Two commenters (IV-D-55, IV-D-57) also stated that the two regions have some of the most stringent air regulations, which are more stringent than the proposed new source MACT. Therefore, the commenter (IV-D-57) contended that the programs implemented in these regions constitute MACT for the refinery industry.

Response: The average emissions limitation determined as the MACT floor for existing sources was developed based on the best available data, which was the data provided in the section 114 and ICR questionnaire responses. These responses included facilities located in California. The California rules are based on a narrow definition of affected source, not the whole facility. While the narrow definition of affected source approach may seem to make determining the floor "simpler", it is not necessarily the best or correct approach to determine the average emissions limitation achieved by the best performing sources.

The Act does not define "affected source." An affected source may be a facility, a kind of emission point, or a collection of emission points. The definition chosen for each MACT standard is dependent on the characteristics of the industry being regulated and the information available to characterize the source category. As discussed in the preamble to the proposed regulation, the standard defines affected source as the collection of emission points in HAP-emitting petroleum refinery processes within the source category that are part of a major source. This broad definition of affected source was chosen because it (1) provides the flexibility to achieve the emission reductions in a more efficient and cost-effective manner, (2) is compatible with the BWON definition of affected source, and (3) provides more flexibility to replace or modify equipment without triggering the regulatory provisions governing reconstruction.

The EPA recognizes that State and local air pollution control standards may have different requirements for controlling emissions than Federal standards. Many of the State and local requirements, such as in California, are not directly comparable to Federal requirements due to differences in format, applicability, definitions, test methods, and intent. In addition, many State and local standards, such as in California, require emission controls or techniques for which the EPA does not have adequate control effectiveness information. Without data, such as VOC or HAP control efficiency of equipment and controls, the EPA cannot determine if the State or local standard are equal to or more stringent than Federal standards. Therefore, the EPA does not agree that control requirements for storage vessels, wastewater, or equipment leaks are necessarily more stringent in the Bay Area or South Coast Air Pollution Control District. The EPA re-evaluated some aspects of the MACT floor after proposal and these changes are discussed in sections 3.2 and 5.4.1 of this document.

Comment: One commenter (IV-D-49) suggested that the EPA reevaluate the best performing 12 percent of existing sources because the EPA's methodology is too stringent. The commenter (IV-D-49) asserted that the EPA's methodology has produced results which may be more stringent and costly than any actually achieved and which has resulted in a hypothetical refinery based on the best performing emission points located within the source and not the best performing refineries.

Response: Due to the limitations of the data available for each kind of emission point, the MACT floor analysis for the affected source was based on the combination of control levels for the collection of emission points rather than the overall facility. The EPA approximated the source-wide floor by the combinations of point-by-point determined control levels (i.e., the combinations of the miscellaneous process vents "floor", storage vessels "floor", equipment leaks "floor", and wastewater "floor").

The approximation of the source-wide floor by combinations of point-by-point determined control levels was based on the paucity of data for all three kinds of emission points and the modeling of wastewater emissions and control characteristics. The EPA considered whether to aggregate the available information by facility, and therefore estimate the source-wide level of control for each facility to determine the best performing refineries. However, the EPA rejected that approach to determine the floor as introducing additional assumptions and such large uncertainties as to render the analysis meaningless.

The EPA believes that the approach it used for developing point-by-point approximations of the source-wide floor level of control was the most appropriate use of the available data base to determine the floor. Moreover, the EPA does not believe that its methodology, when all aspects are considered, overstated the floor. The choice of methodology was reasonable since it provided additional assurance that, notwithstanding the uncertainties inherent in the data base, the floor determined by the EPA would be no less stringent than the actual source-wide floor.

Comment: One commenter (IV-D-48) requested an explanation of why a percentage reduction requirement constitutes an emissions limitation for the purposes of a floor calculation. The commenter (IV-D-48) stated that the law requires consistency between the floor and the emission limitation required in the statute.

Response: The emissions limitation achieved at the floor was based on the application of control technologies to control specific emission points. The performance of these technologies was documented under several other regulatory efforts, such as the SOCMI NSPS for Air Oxidation Processes, Distillation Operations, and Reactor Processes (40 CFR part 60, subparts III, NNN, and RRR) and in the HON. Therefore, since a direct correlation can be made between the emissions reduction via the documented performance of the reference control technology, the percent reduction is equivalent to the emissions limitation achieved.

Comment: Two commenters (IV-D-48, IV-D-55) alleged that the EPA did not determine the emissions limitations achieved by the best performing source to determine the new source limitations.

Response: Evaluation of the MACT floor for new sources was based on the best available information, including section 114 questionnaires and ICR responses and evaluation of regulations. This information was used to determine the best controls in use at any refinery, and the characteristics of emission points that are controlled using the best controls. Based on this evaluation, the applicability criteria and achievable control levels (percent reduction or control equipment/work practices) that comprise the new source MACT floor were determined. An emission rate limitation (e.g., lb/yr) was not used to determine the MACT floor because the achievable emission level depends on the size, types of process units, specific products and other factors that vary greatly among refineries. See chapters 5, 6, 7, and 8 for specific comments and responses on the floor level of control for miscellaneous PV, ST, WW, and EL.

Comment: Two commenters (IV-D-46, IV-D-48) stated that if marine loading operations are to be included in the source category, the MACT floor for marine loading operations will have to be recalculated for refinery marine loading operations since the current floor does not distinguish between refinery and non-refinery marine loading operations. Two commenters (IV-D-46, IV-D-48) insisted that the rule must be reproposed to determine the maximum achievable emission reduction for petroleum refineries and marine loading operations combined. One commenter (IV-D-46) estimated that establishing a new MACT floor will result in a delay of promulgation of the refinery MACT standards of 2-3 years. One commenter (IV-D-46) predicted that the floor for non-refinery marine loading would become less stringent if refinery marine loading operations are excluded from the determination. The commenter (IV-D-46) contended that it is inappropriate to make a distinction between refinery-linked marine vessel loading operations and other marine vessel loading operations.

Response: At proposal, the MACT floor for refinery marine loading operations was determined separately from the rest of the refinery but as part of marine loading operations. The same controls are applicable to marine loading at refineries as other marine loading operations. Therefore, there is no reason to believe the floor would be different for marine loading at refineries.

The commenter did not provide any specific reasons to support why reproposal would be needed or why the promulgation would be delayed 2 to 3 years. The refineries proposal clearly stated that EPA may include marine loading in the refineries source category and gave ample opportunity for comment.

Comment: Two commenters (IV-D-52, IV-D-54) said that the total mass emission rates have not been adequately evaluated. One commenter (IV-D-52) was concerned that the EPA did not have sufficient data on actual emissions from petroleum refineries to determine the MACT floors, and that they had used MACT floors based on the applicable NSPS and NESHAPs and other limited data collected from existing petroleum refineries. The commenter (IV-D-52) recommended that the EPA request additional actual emissions data from the best-controlled refineries, review State regulations, and reevaluate all the regulated emission points before promulgating the rule. One commenter (IV-D-54) expressed concern that total mass emission rates from refineries were not being studied, and high emissions were being permitted to save industry money.

Response: The total mass emissions from applicable sources within the refineries have been evaluated using the best available data in the determination of the MACT floor and in estimating impacts of going beyond the floor for MACT. These emissions and reductions were presented in the proposed rule and have been revised in the promulgated rule and in the memorandum "Revised Impacts from Controlling Emissions from Petroleum Refineries" (June 28, 1995). The emission estimates and reductions are based on applying the best control technologies. The regulation uses percent reduction and equipment/work practice formats instead of limiting the total mass of emissions because the same emission limit is not achievable at all refineries given differences in size, types of process units, products, and other factors. It is not the intent of the rule to limit production (i.e., penalizing large facilities).

Prior to proposal, available data were collected through section 114 and ICR's for a majority of refineries, and State and Federal regulations were reviewed as a further source of information on control levels. The commenter stated that more data should be evaluated, however, the commenter did not provide any additional data. The preamble to the proposed regulation requested additional data in numerous places. Since no additional data were provided by this or other commenters, it has been judged that additional emissions data from commenters are not available. As described in chapter 5 of this document, some additional information on State regulations of process vent and emissions has been evaluated since proposal and used to revise the floor analyses.

Comment: One commenter (IV-D-42) contended that facilities that do not produce typical refinery products, such as white oils and waxes, were not included during development of the refinery MACT floors, although they may be regulated by the proposed rule.

Response: As discussed in section 3.3, the regulation has been clarified to be applicable to SIC Code 2911. If those facilities are included in that SIC code, they would be subject to the regulation. If not, then they would not be subject to the rule.

4.2 SELECTION OF MACT

Comment: One commenter (IV-D-49) contended that the EPA cannot justify going beyond floor controls because the overly conservative analysis used already results in control levels beyond any likely to be found in an actual refinery.

Response: As stated earlier, the MACT floor analysis was based on section 112(d)(3)(A) which requires that the standards be based on "the average emissions limitation achieved by the best performing 12 percent of existing sources." The approach used to determine the level of performance for each emission source is discussed in each section and has been demonstrated as reasonable under the statute. Additionally, the impacts for going beyond the floor were considered, but options beyond the floor were not selected.

Comment: One commenter (IV-D-55) alleged that, according to the preamble, the EPA used a cost-benefit analysis to determine MACT. The commenter (IV-D-55) claimed that subjecting MACT decisions to a cost-benefit analysis is inappropriate and illegal. The commenter (IV-D-55) cited Senate Report 101-228 as not supporting the use of cost-benefit analysis in determining MACT due to the uncertainty associated with quantifying the benefits and costs of controls. Two commenters (IV-D-55, IV-D-16) stated that the EPA should not include cost-benefit analysis in the MACT standards of the proposed regulation.

One commenter (IV-D-48) stated that the EPA may consider cost effectiveness in determining MACT but can not determine maximum reductions achievable excluding known existing technology. The commenter (IV-D-48) requested that the EPA not convert the program from technology-based to cost-benefit based but that the EPA find a way to take cost into consideration and establish standards that realize the maximum emission reductions achievable. The commenter (IV-D-48) suggested that this may be accomplished by determining the level of maximum emission reductions achieved with existing techniques. The commenter (IV-D-48) contended that the fact that these controls have been applied in practice proves that they are achievable considering cost. The commenter (IV-D-48) cited S. Rep. 101-228 at 168-169 to support this conclusion. The commenter (IV-D-48) claimed that the Act requires the maximum degree of reduction achievable. The commenter (IV-D-48) cited the 101st Cong. 2d Sess., H. Rep. 101-952 at 339 (1990) (Conference Report) as an example of legislative history reflecting an emphasis on maximum reductions. The commenter (IV-D-48) stated that the report states that MACT standards would generally be stricter than NSPS and stricter than RACT. The commenter (IV-D-48) claimed that the Act indicated that MACT standards would often be stricter than LAER and BACT standards by allowing some sources subject to all three to delay compliance with MACT standards for five years to avoid retrofitting.

Response: The MACT floor was determined as discussed in section 4.1. The cost-benefit analysis is to determine if it is feasible to set MACT at a level higher than the MACT floor. The options above the floor that were examined are technologically feasible, and are based on technologies in use at some refineries, but would be more costly than the floor. Section 112(d) of the Act specifically states that MACT decisions are to consider costs of achieving the emissions reductions, non-air quality health and environmental impacts, and energy requirements. Thus, costs and benefits of options above the floor can be considered.

Comment: One commenter (IV-D-59) contended that if the EPA defines source broadly and cost effectiveness determines MACT, the cost effectiveness of the source-wide reductions for the broader source definition, not the cost effectiveness of individual pieces of equipment, must be the basis for MACT.

Response: Typically, different controls are applied to process vents, storage, wastewater, and equipment leak emission sources. Thus, the only way to determine costs and costs effectiveness is to calculate costs for each emission point. Costs determined for individual emission points would simply be summed to get total source costs and cost effectiveness. Cost effectiveness for each kind of emission point can, therefore, be used in selecting MACT alternatives above the floor. Also, by evaluating the emission points separately, the most cost effective, or optimum, control option can be selected for each source type. (For example, if process vents Option 1 is much more cost effective to control than equipment leaks Option 1, the method used by EPA would allow this determination to be made and the process vents option would be selected while the equipment leaks option would not. If the analysis were made on a refinery basis, as has been suggested, MACT floor results would be overly influenced by the process vent results and a cost-ineffective option for equipment leaks might be chosen because it would be overshadowed by the process vents numbers.) There would only be a difference in the overall cost effective results if control combinations of equipment at a refinery are different than typical combinations. Otherwise, the approach will not have an impact.

Comment: One commenter (IV-D-46) supported the use of criteria such as pollution prevention, environmental equity, affordability and technological innovation in determining the MACT level of control because it will make the regulation more equitable. The commenter (IV-D-46) recommended that the criteria be distinctly defined and the reasons for including them prove that their inclusion is for the betterment of the regulation. The commenter (IV-D-46) suggested that it be made apparent how the criteria are to be implemented and the degree of influence they have on the MACT floor. The commenter (IV-D-46) stated that this will make the process effective, as opposed to complicated.

Response: The benefits of the standard are evaluated as part of evaluating MACT. Emissions reductions, non-air quality impacts, including health impacts, and cost and economic impacts were considered in selecting MACT. The format of the rules allows for pollution prevention techniques. The rationale for the MACT decisions, considering these factors, is discussed in the proposal and promulgation preambles. MACT, however, cannot be less stringent than the MACT floor. The MACT floor decision is based only on the current level of control in the industry and the Act does not allow for consideration of benefits and costs in determining the floor.

Comment: One commenter (IV-D-54) requested that the wastewater provisions be tightened up since HAP's will be emitted from wastewater streams also.

Response: Control of wastewater streams is required by the rule. These provisions are based on the floor level of control. Control beyond the floor was determined to be cost prohibitive.

Comment: One commenter (IV-D-40) suggested providing more incentive beyond the current philosophy of merely meeting TRE's or concentration limits by allowing measures such as a lower percent reduction or higher concentration limits for pollution prevention instead of end-of-pipe controls.

Response: The proposed regulation encourages pollution prevention several ways. While the applicability for control is based on emission or concentration levels, the means of control is left for the facility to determine. For example, a condenser instead of a combustion device could be used to recover product in a process vent stream if it can reduce emission rate or concentration to below the applicability level. The storage controls (floating roofs) and equipment leak controls (leak detection and repair) are pollution prevention techniques.

Emissions averaging also encourages pollution prevention. Averaging allows facilities the flexibility to control different emission points and potentially use pollution prevention technology.

Comment: One commenter (IV-D-59) contended that using the marginal cost effectiveness of controls as the criteria for setting MACT is unacceptable if the standard is based on averaging. The commenter (IV-D-59) stated that averaging allows sources to forego the relatively high marginal costs of control at certain emission points in exchange for, presumably, cheaper reductions elsewhere. The commenter (IV-D-59) urged that the EPA must require the maximum achievable reductions from sources.

Response: The standard is based on maximum achievable emission reductions, considering cost and other factors as required by the Act. The purpose of averaging is to allow facilities the flexibility to select the most cost-effective emission points to achieve the maximum achievable reductions required by the standard. The incremental costs estimated by EPA reflect the typical costs of control for each kind of emission point, and are appropriate to use in considering alternatives above the floor. In most cases, the estimated cost impacts are representative of the costs that refineries will incur in complying with the standard. Many refineries are expected to comply with the standards for each kind of emission point without using emissions averaging. It is expected that emissions averaging will be used mainly in cases where site-specific factors make costs of control for an emission point higher than those estimated by the EPA.

# 5.0 PROCESS VENT PROVISIONS

## 5.1 DEFINITION OF MISCELLANEOUS PROCESS VENTS

Comment: One commenter (IV-D-21) offered support for identifying process vents by name, rather than a partial list of examples, to simplify interpretation. The commenter (IV-D-21) claimed that difficulty would result because some emissions could be considered process vents, but are better regulated with their associated equipment.

Response: The miscellaneous vent definition was developed to be a comprehensive definition to allow all process vents emitting a significant quantity of HAP's to be regulated. Listing vents by name may cause vents that should be controlled, according to the MACT floor analysis, to be excluded. Vents of the same name may have significantly different HAP emissions in different refineries. Additionally, the absence of a vent may suggest that it is excluded, while it may have been omitted as an oversight or included under another name. Listing every possible process vent would be a time-consuming task that would provide little benefit. The EPA contends that the existing definition is sufficient in this regard.

Comment: Several commenters (IV-D-09, IV-D-10, IV-D-21, IV-D-22, IV-D-25, IV-D-38, IV-D-51) supported expanding the definition of miscellaneous process vents to include a pressure threshold, below which delayed coker decoking emissions may be vented to the atmosphere without control.

Three commenters (IV-D-21, IV-D-38, IV-D-51) suggested that "depressuring at or below a coke drum outlet pressure of 10 psig" or similar wording be added to the final sentence of the proposed definition along with the other coker operations that are not considered process vents. The commenters (IV-D-21, IV-D-38) explained the typical coker operations prior to coke drum unheading, including venting the drum to the atmosphere once the drum pressure is approximately 10 psig. One commenter (IV-D-21) estimated HAP emissions vented during coker operation to be five pounds per year for a 95,000 bpcd coker. Four commenters (IV-D-09, IV-D-21, IV-D-25, IV-D-38) asserted that a MACT floor analysis would support that there is no incentive for controlling emissions from coke drums depressured to 10 psig or less prior to deheading.

One commenter (IV-D-38) suggested that "repressuring operations at or below 10 psig" also be added to the coker operations that are not considered a process vent. The commenter (IV-D-38) suggested further wording changes to the definition.

One commenter (IV-D-10) added that ducting or compressing the steam vapors from the coke drum into a quench system would allow air to enter the fuel gas system and potentially create an explosion hazard, and other systems may create back pressure at the coke drum and compromise safety during the deheading process.

Response: The portion of the definition of miscellaneous process vents that exclude specific coker operations has been amended to read as follows: "Coking unit vents associated with coke drum depressuring at or below a coke drum outlet pressure of 15 psig, deheading, draining or decoking (Coke cutting)." The EPA has elected to set the pressure at or below which emissions from coke drum depressuring do not require control at 15 psig to encourage vapor recovery. Many cokers have vapor recovery systems in which overhead vapors from coke drums are cooled and condensed. Uncondensed gases are recycled to the main fractionator or flared. According to information received subsequent to the formal comment period, the threshold of 10 psig suggested by several commenters applies to older vapor recovery systems which depend on flaring. Newly constructed, state-of-the-art design cokers have efficient closed collection systems that operate at up to 15 psig and recycle vapors to the fractionator. These systems minimize flaring and maximize vapor recovery. Operating such a system at 10 psig would mean more flaring, which is contrary to the design purpose of maximum vapor recovery.

Comment: Several commenters (IV-D-21, IV-D-25, IV-D-38, IV-D-53) supported the proposed definition of miscellaneous process vents, which exempts FCC regeneration vents. One commenter (IV-D-53) disagreed with the exclusion of catalyst regeneration vents from fluid catalyst cracking units in the definition of miscellaneous process vents. The commenter (IV-D-53) suggested that vents that exhaust from the control device of a FCC also be included in the definition of miscellaneous process vents. The commenter (IV-D-53) argued that exhausts from FCC units are not exclusively metallic and particulate. The commenter (IV-D-53) contended that FCC units that use low temperature catalyst regeneration without the use of a CO boiler have significant hazardous organic emissions. The commenter (IV-D-53) provided emission factors to compare emissions controlled by a CO boiler to emissions that are uncontrolled. The commenter (IV-D-53) suggested a basis for determining the MACT floor for existing sources as well as new sources. The commenter (IV-D-53) also suggested ways that older units can control their hazardous gaseous and particulate emissions and cited an FCC unit in Wisconsin as an example of a successful retrofit on emission-controlling equipment.

Response: FCC catalyst regeneration vents are not included in the definition of miscellaneous process vents because emissions from FCC regeneration vents and control technologies for FCC regeneration vents are significantly different from miscellaneous process vents. While emissions from FCC catalyst regeneration vents are not exclusively metallic or particulate, the HAP's emitted are primarily metal HAP's. The petroleum refineries NESHAP specifically regulates organic HAP emissions. FCC catalyst regeneration vents will be addressed in a future regulation.

Comment: Two commenters (IV-D-36, IV-G-08) urged that catalyst regeneration vents from Thermofor Catalytic Cracking (TCC) units be added to the list of exemptions under the definition of miscellaneous process vents. One commenter (IV-D-36) claimed that the rationale for excluding FCC catalyst regeneration vents, that the emitted HAP's are significantly different and would be controlled differently compared to other refinery emissions, is applicable to TCC catalyst regeneration vents. The commenters (IV-D-36, IV-G-08) explained that while TCC's and FCC's differ in design, they perform the same function. Another commenter (IV-D-20) explained that most TCC's are found in smaller refineries which are expected to bear the heaviest economic burden from the proposed rule. One commenter (IV-G-08) included a diagram and a process description of a TCC.

Two commenters (IV-D-20, IV-D-36) pointed out that TCC's were included in the preamble among examples of units which should be exempted from this rulemaking. Two commenters (IV-D-36, IV-G-08) stated that the EPA has previously indicated that the exclusion of TCC's from the exemption list in the definition was an oversight.

One commenter (IV-D-36) provided that some information concerning TCC catalyst regeneration vent emissions, control technology and achievable control does not exist. The commenter (IV-D-36) predicted that if TCC's catalyst regeneration vents are included, data acquisition would be a problem for the EPA and operator of these units.

One commenter (IV-D-20) contended that if the EPA does **not** exclude non-fluidized bed catalytic cracking units, then they should recognize that, unlike all the other miscellaneous process vents, these units involve combustion. The commenter (IV-D-20) recommended requiring non-fluidized bed catalytic cracking units to add on a combustion device only if the CO levels in the exit stream of the regenerator exceed 500 ppm, a good indicator of complete combustion, taken from the subpart J NSPS for Refineries.

Two commenters (IV-D-20, IV-D-25) suggested that the exclusion for "fluidized catalytic cracking units catalyst regeneration vents" be changed to "catalytic cracking unit regeneration vents" because this is the more generic term for such vents.

One commenter (IV-D-36) requested an extension of the comment period for 120 days if catalyst regeneration vents for TCC's are not included in the exemptions in the definition of miscellaneous process vents. The commenter (IV-D-36) stated that this time is required to acquire and submit data on the emissions characteristics of TCC's, the available control technology and the level of control achieved by existing TCC's.

Response: The EPA agrees that TCC's are similar in operation and emissions characteristics to FCC units and therefore should be similarly regulated. All references to catalytic cracking in the definition of miscellaneous process vents have been amended from "fluidized catalytic cracking" to "catalytic cracking" to allow the same exemptions for TCC units as FCC units. Emissions from TCC unit catalyst regeneration vents will be addressed with FCC unit catalyst regeneration vents in a future regulation scheduled for development in 1997.

Comment: One commenter (IV-D-36) suggested that emissions from combustion devices be specifically excluded since MACT for process vents is combustion.

Response: Combustion devices such as boilers and heaters are not addressed by this regulation. Therefore, it is not necessary to specifically exclude vents from combustion devices from the definition of miscellaneous process vents. The vent definition already excludes vents routed to refinery fuel gas systems.

Comment: One commenter (IV-D-29) requested that refineries that do not have fuel gas systems due to lack of vapors be exempt from process vent provisions.

Response: Routing miscellaneous process vents to refinery fuel gas system is not the only means of control allowed by this regulation. Miscellaneous process vents requiring control may be combusted in a refinery flare. Any combustion device or other non-recovery control device that reduces HAP's in a miscellaneous process vent stream by 98 percent reduction or to 20 ppmv is an acceptable control technology. Pollution prevention or recovery devices can also be used to reduce emissions below the cutoff level, and thereby avoid need for add-on control.

Comment: Two commenters (IV-D-25, IV-D-38) suggested clarifying the vents definition to exclude storage tank vents. One commenter (IV-D-21) stated that PV or conservation vents found on fixed roof storage vessels should not be considered process vents, as long as they are not required to have a closed vent system and control device by subpart CC. The commenter (IV-D-21) requested confirmation of this interpretation.

Response: The following was added to the exemptions in the definition of miscellaneous process vents: "Vents from storage vessels". Storage vessel vents are regulated under a separate section of the proposed regulation. This change was made to provide clarity for the definition of miscellaneous process vents.

Comment: One commenter (IV-D-20) requested clarification of whether scrubbers are included or excluded from the definition of "miscellaneous process vents."

Response: Miscellaneous process vents are defined as "a gas stream containing greater than 20 parts per million by volume organic hazardous air pollutant that are continuously or periodically discharged during normal operation of a petroleum refining unit..." with some exceptions. One of these exceptions is "vents from control devices such as scrubbers, boilers, incinerators, and electrostatic precipitators applied to catalytic cracking unit catalyst regeneration vents, catalytic reformer regeneration vents, and sulfur plant vents." A gas stream from a scrubber is a miscellaneous process vent unless it contains less than 20 parts per million by volume organic hazardous air pollutants or is a control device for one of the vents described above.

Comment: One commenter (IV-D-09) stated that the EPA should exclude all vents from sulfur recovery plant operations from the rule, including vents not from the "process", such as sulfur storage pits, and from SRU tail gas units. The commenter (IV-D-09) contended that the EPA should treat SRU's as a whole in its next phase of refinery MACT rulemaking.

Response: The definition of miscellaneous process vents excludes sulfur plant vents. All vents from sulfur plants will be addressed in a future regulations scheduled for development in 1997. This regulation will address all vents from sulfur recovery units, both process and non-process, as suggested by the commenter. The current definition does not differentiate between process and non-process vents from sulfur plants, but exempts "Sulfur Plant vents". The EPA intends this exemption to be inclusive of all vents from sulfur plants and contends that it is not necessary to revise the current definition.

Comment: One commenter (IV-D-06) stated that process vent provisions should specifically exempt wastewater systems, tanks, Merox Treaters, Perco Treaters, and Hydrogen plant vents because these vents are either covered in another section of the regulation or are a negligible source of HAP's. The commenter (IV-D-06) asserted that emissions from tanks and wastewater systems are already regulated by the sections of the rule concerning storage tanks and wastewater. The commenter (IV-D-06) added that Merox treaters and Perco treaters are catalytic processes used to remove mercaptans from gaseous and light liquid streams. The commenter (IV-D-06) stated that the only process stream vented to the atmosphere is labeled excess air and is only vented during startup and malfunction. The commenter (IV-D-06) compared the vents operation to a pressure relief valve. The commenter (IV-D-06) contended that the only emissions from hydrogen plants are $CO_2$ vents which do not contain any HAP. Therefore, the commenter (IV-D-06) suggested that in order to reduce administrative burden, the $CO_2$ process vent from steam reforming processes used to produce hydrogen be exempt from requirements of the rule.

Response: Releases due to start up, shutdown and malfunction are not required to meet the process vent emission standards. This exemption is provided in § 63.6(f) of subpart A (the NESHAP General Provisions). Vents with a HAP concentration of 20 parts per million by volume or less are not considered miscellaneous process vent as specified in the definition of "miscellaneous process vents" in § 63.641 of subpart CC. Such vents were excluded because they are typically not controlled and because the combustion control technologies that are the basis of the MACT standards cannot consistently reduce emissions to less than 20 ppmv. The vents described by the commenter are exempt from the miscellaneous process vents provision by definition. However, sufficient data has not been provided to categorically exempt all vents from all Merox units, Perco units, and Hydrogen Plants.

## 5.2 EMISSION CONTROL TECHNOLOGY

Comment: One commenter (IV-D-35) suggested that advanced distillation processes be examined as an alternate control strategy for miscellaneous process vents. The commenter

(IV-D-35) alleged that advanced distillation can reduce furnace energy for distillation units by as much as 65 percent with corresponding reductions in HAP's and VOC's. The commenter (IV-D-35) claimed that advanced distillation could result in a VOC reduction of 2 million Mg/yr nation-wide. The commenter (IV-D-35) provided a paper further detailing advanced distillation. The commenter (IV-D-35) suggested that distillation units be separated from miscellaneous process vents to utilize the full potential of this new technology.

Response: The commenter suggested that advanced distillation would reduce furnace energy and therefore the HAP and VOC emissions. According to the paper provided, the HAP and VOC reduction would be a result of decreased fuel consumption in the furnace and the reduction would be in the furnace emissions. Advanced distillation would not reduce emissions vented from the distillation unit itself and this regulation does not apply to emissions from furnaces. Combustion devices (e.g., furnaces) are a possible control device to reduce organic HAP emissions from vents, not a miscellaneous process vent to be controlled. Furthermore, the paper provided did not indicate that any refineries in the United States were using advanced distillation. For these reasons, advanced distillation was not considered as a control strategy in determining the new or existing source MACT floor, or in selecting MACT.

Comment: One commenter (IV-D-17) stated that catalytic incineration should be identified in the rule as an available strategy for controlling HAP. The commenter (IV-D-17) contends that catalyst technology has been proven to be advantageous because, unlike flares, the effectiveness of the technology can be measured. Additionally, the commenter (IV-D-17) claims the catalytic incineration technology has been proven in other applications to control VOC to greater than 98 percent efficiency, whereas, destruction of VOC's in process heaters or boilers may or may not reduce HAP by 98 percent or to 20 ppmv, depending on conditions. The commenter (IV-D-17) gave no further details on catalytic incineration technology.

One commenter (IV-D-41) suggested that the definition of incinerator be modified to avoid discouraging the use of catalytic incinerators. The commenter (IV-D-41) recommended that the word "oxidation" be substituted for the word "combustion" wherever it appears in the definition of an incinerator.

Response: This regulation does not exclude the use of catalytic incineration as a control device. The regulation requires that the HAP's in a process vent stream be reduced by 98 percent or to 20 parts per million by volume. Catalytic incineration is specifically mentioned as a possible control option in § 63.644(ii).

## 5.3 IMPACTS ANALYSIS

### 5.3.1 Database

Comment: One commenter (IV-D-29) asserted that the process vents provision should be withdrawn until the number of vents that would be covered by this rule and their current emission rates are determined. One commenter (IV-D-50) urged the EPA to gain a clearer understanding of miscellaneous process vents before proceeding with the rule because miscellaneous process vent configurations differ significantly from refinery to refinery and it is somewhat difficult to standardize controls for the industry.

Response: The EPA provided several opportunities for industry to provide data through two questionnaires and with the proposal of this regulation. The EPA contends that any information to be gained from industry regarding the number and characteristics of miscellaneous process vents has been obtained. The MACT floor and cost and emission impacts of controlling miscellaneous process vents were reanalyzed after proposal considering all available information, and the final rule was revised considering the reanalysis. The process vents provisions will not be withdrawn as promulgation of this regulation is mandated by the statute schedule and subsequent court order.

Comment: One commenter (IV-D-25) stated that the database developed from the section 114 survey overstates the percentage of process vents controlled because facilities tended to report vents which were already identified because they are controlled. Small vents for which the facility had no data were less likely to be reported. Two commenters (IV-D-10, IV-D-22) contended that the respondents to the MACT floor survey did not fully understand the questionnaire and may have only reported those vents that are controlled or that a vent might have been so small that it was exempt under State regulations and was not reported in the questionnaire at all. The commenters (IV-D-10, IV-D-22) asserted that many facilities could not report flow rates or compositions because of a lack of data. One commenter (IV-D-21) estimated that the number of vents reported was deficient by 100 vents per refinery, most of them uncontrolled. One commenter (IV-D-22) stated that the effect of underreporting was that average emission factors are grossly overstated. Because of this bias, two commenters (IV-D-10, IV-D-22) requested the EPA to recognize that miscellaneous process vents are not likely controlled by the best performing 12 percent of the process vents in the refinery source category. One commenter

(IV-D-21) does not believe that any refinery controls 100 percent of their miscellaneous process vents.

Response: The EPA recognizes that the percentage of controlled vents in the database used to estimate emissions may not have been representative of all refineries. The database has been revised to include additional data received concerning the number and control status of miscellaneous process vents. The addition of these data has decreased the percentage of controlled vents from approximately 40 percent to approximately 24 percent. Additionally, the EPA has surveyed existing State regulations to provide information on which miscellaneous process vents require control. The survey indicated that the most stringent State regulations (in States where refineries are located) do not require control of vents with VOC or HAP emissions below a cutoff flowrate. The EPA has developed an applicability criteria for the final rule from the existing State regulations to define vents that require control. The State regulations were used because the database does not contain sufficient information on vent characteristics to allow determination of the cutoff included in the miscellaneous process vent component of the source-wide MACT floor. Thus, the control requirement for miscellaneous process vents is no longer based on the previous MACT floor analysis.

### 5.3.2 Cost Impacts

Comment: One commenter (IV-D-22) contended that the EPA significantly underestimated the cost-effectiveness and emission reduction of controlling miscellaneous process vents because it did not include necessary revisions to the database. One commenter (IV-D-50) stated that the cost-effectiveness of controlling miscellaneous process vents contained in the proposed rule for existing sources of

$1,700/Mg of HAP controlled is incorrect. The commenter (IV-D-50) stated that once the emission estimates are revised, it is likely that few controls will be needed or will be cost-effective.

Response: No specific cost effectiveness estimates or cost data were provided by these commenters. The cost and emission reduction impacts analyses have been revised for process vents to reflect the changes made to the process vents database. The database has been revised to exclude emissions from vents that do not fit the definition of miscellaneous process vents and to include additional data on the number and control status of process vents. Additionally, the method for estimating emissions was revised such that data from process units with relatively high VOC or HAP emissions are no longer used to estimate emissions from process units for which insufficient data was provided. Instead, more typical values are used, as further described in other responses in this section. Additional changes have been made to the emissions estimate to allow the applicability criteria developed from State regulations to be applied in estimating the emission reduction. Using the revised database and estimating method, VOC and HAP emission reductions and the cost effectiveness did not change significantly compared to the estimates provided at proposal.

Comment: One commenter (IV-D-50) cautioned the EPA that the cost of process vent emission controls are higher for a small refinery than a large refinery on a per barrel basis and that the expense of controlling some single emission points in this area was as much as one-half million dollars. For these reasons, the commenter (IV-D-50), who referred to cost information previously supplied to the EPA on vent emissions controls for the FCCU regenerator, the sulfur recovery unit vent, the CCR vent, and one miscellaneous process unit, urged the EPA to explore and discuss the most cost-effective control measures before establishing requirements.

Response: The Clean Air Act does not allow cost effectiveness to be taken into consideration in the determination of the MACT floor. Cost effectiveness can be considered in establishing standards more stringent than the MACT floor. However, for the miscellaneous process vents component of the source-wide MACT, the floor level of control has been selected as MACT and the cost effectiveness of these controls is not an issue.

5.3.3 Emissions Impact

Comment: One commenter (IV-D-44) claimed that wastewater emissions and maintenance activities were improperly included in the miscellaneous process vents determination. The commenter (IV-D-44) alleged that the inclusion resulted in higher than actual benefits estimates and over regulation of the refining industry.

Response: The database used to estimate emissions has been revised to exclude emissions from vents that do not meet the definition of miscellaneous process vents. This includes emissions from catalytic cracking catalyst regeneration, catalytic reforming catalyst regeneration, coke drum deheading and decoking, maintenance activities and wastewater. Several changes have been made to the database and the method used to estimate emissions. The HAP emissions estimate increased slightly and cost effectiveness did not change significantly as a result of the reanalysis. The revised estimate of emission reduction from miscellaneous process vents is 6,412 Mg/yr (7,068 ton/yr) HAP.

The EPA would like to point out that the effect of emissions from process vents on the benefits analysis is small. The benefits analysis was most affected by data regarding emissions from equipment leaks. The equipment leaks data provided the speciation of HAP compounds used in the benefits analysis. The only information included regarding process vents was the total estimated HAP emissions. The speciation of HAP compounds from equipment leaks was applied to the total HAP emissions from process vents to determine the emissions of individual compounds. The small percentage of process vent emissions that may have been associated with wastewater and maintenance activities is an even smaller percentage of all emissions from refineries with little effect on the overall benefits analysis.

Comment: Four commenters (IV-D-10, IV-D-22, IV-D-25, IV-D-50) disagreed with the emissions extrapolation methodology using reformer emissions, and stated that the HAP to other hydrocarbon ratio is different for reformer vents than for other vents. Three of the commenters (IV-D-10, IV-D-22, IV-D-50) urged the EPA to correct nationwide HAP emission estimates. Two commenters (IV-D-10, IV-D-22) asserted that HAP and VOC survey data from a catalytic reformer should not be used in the calculation to estimate HAP and VOC emissions from alkylation and vacuum distillation units because these vents are significantly different. One commenter (IV-D-46) provided that methods for emissions estimation from vacuum distillation units include material balance, monitoring and parameter factoring, and the permitted industry chooses from these for emissions reporting. The commenter (IV-D-46) recommended that the EPA use these methods consistently, in close consultation with industry and that they apply extrapolation and assumptions correctly in the future to avoid disagreement over emissions estimates. One commenter (IV-D-22) objected to the EPA utilizing refinery wide averages to estimate emissions when none was available instead of estimating emissions factors on the types of compounds present within the various units.

Response: The EPA agrees that using an average HAP to VOC ratio, which included reformer emissions, did not provide an accurate estimate of emissions from process units for which HAP or VOC data was not provided. The revised method for estimating emissions significantly decreases the amount of data extrapolated from one unit to another. In the few cases where sufficient data is not available for a process unit, it is either derived from a similar process unit or from the median value for all process units. Using the median value as opposed to the average value decreases the impact that one unit, with relatively high or low emissions, can have on the extrapolated data. Further details on the revised methodology and results of the analysis are contained in a memorandum in docket No. A-93-48.

## 5.4 SELECTION OF MACT AND MACT FLOOR FOR PROCESS VENTS

### 5.4.1 Selection of MACT Floor for Process Vents

Comment: Two commenters (IV-D-21, IV-D-38) asserted that the data used in performing the MACT floor analysis was incomplete due to lack of information on process vents. One commenter (IV-D-21) recommended that the MACT floor be reevaluated, using technical judgment and considering cost effectiveness.

Response: The EPA agrees that the data provided by industry for miscellaneous process vents, on which the process vent component of the source-wide MACT floor analysis was performed, was limited and may have incorrectly represented the percentage of miscellaneous process vents controlled at the best performing 12 percent of refineries. For this reason, the EPA elected to survey existing State regulations that are applicable to miscellaneous process vents at petroleum refineries to gain additional information. The EPA found that there are enough refineries subject to State regulations for miscellaneous process vents that a conclusion can be drawn regarding the requirements that the best performing 12 percent of refineries must meet. The provisions for the miscellaneous process vent component of the source-wide MACT floor have been revised to reflect the current level of control, required by State regulation, of the best performing 12 percent of refineries. The EPA evaluated the current level of control for miscellaneous process vents in eight States and two air districts that contain the majority of refineries and were expected to have the most stringent regulations. Of the refineries in the U.S., the 12 percent that are subject to the most stringent regulations are located in three States. In these three States, miscellaneous process vents emitting greater than 6.8 to 45 kg/day (15 to 100 lb/day) of VOC are required to be controlled. The median applicability cutoff level for the 12-percent of U.S. refineries subject to the most stringent regulations is 33 kg/day VOC (72 lb/day VOC). Thus, control of vents with VOC emissions greater than 33 kg/day VOC (72 lb/day) is the miscellaneous process vent component of the source-wide MACT floor for existing sources. The miscellaneous process vents component of the source-wide MACT floor for new sources is 98 percent control of HAP's, or to 20 ppmv, for vents with VOC emissions greater than 6.8 kg/day (15 lb/day), based on the most stringent State regulation. The revised analysis is documented in docket No. A-93-48.

Comment: Three commenters (IV-D-09, IV-D-10, IV-D-51) recommended developing a TRE for refinery process vent emissions as a mechanism for not applying MACT to individual miscellaneous process vents that would otherwise be required to install controls to meet the MACT floor criteria. One commenter (IV-D-10) stated that a TRE option would recognize the floor as a type of control device reported at the top 12 percent level and would also recognize the diversity in the characteristics of miscellaneous process vent streams. Several commenters (IV-D-19, IV-D-25, IV-D-29, IV-D-38) suggested that a methodology similar to the TRE in the SOCMI HON should be used to segregate vents requiring control. One commenter (IV-D-19) stated that this would insure those with greatest potential HAP emissions are controlled. The commenter (IV-D-19) cited section 112(d) of the Act as allowing the EPA to consider characteristics of sources in establishing MACT standards, and requiring that cost and energy be taken into consideration. The commenter (IV-D-19) asserted that the EPA has the authority to limit control of process vents to those for which an economic justification is made for control.

Three commenters (IV-D-10, IV-D-25, IV-D-51) suggested using the TRE equations from the HON with a cost-effectiveness criteria of $5,000/Mg HAP reduction. Two commenters (IV-D-10, IV-D-25) reasoned that the HON equations were appropriate because the process vent controls, flaring and incineration, are the same. One of the commenters (IV-D-25) compared vent characteristics and control costs for 3 refinery process vents and found them to be within the parameters of the 680 vents EPA used to develop the HON TRE. Two commenters (IV-D-10, IV-D-25) stated that a common approach makes sense because refinery and chemical units are often located at the same site, and vents are routed to a common control system and some States make no distinction in control requirements. Another commenter (IV-D-38) asserted that there are similarities between petroleum refinery vents and SOCMI vents, especially regarding control technology. One commenter (IV-D-19) does not agree that the same equations should be used, as refineries and chemical plants are entirely different.

Two commenters (IV-D-10, IV-D-25) asserted that, based on an analysis of vents in the section 114 database, a $5,000/Mg TRE cutoff would result in an increase in the number of controlled vents from 48 percent to 66 percent, and an increase in total process vent HAP emissions control from the current 17 percent to 94 percent. One commenter (IV-D-19) recommended that the methodology developed be published in the Federal Register for comment.

One commenter (IV-D-25) used the EPA's process vent database to perform a MACT floor analysis they claimed was similar to the approach EPA used for the HON. The commenter (IV-D-25) used detailed data available for 17 vents to characterize 190 vents in the database, and then used the HON flare TRE equation to calculate cost effectiveness for the 190 vents. The commenter (IV-D-25) then defined the control status of each vent by assuming that vents located outside ozone classification areas were not controlled (regardless of control status information in the database). The actual reported control status was used for vents in ozone classification areas 1-6. The commenter (IV-D-25) claimed this was similar to the EPA's modeling approach for the HON. The commenter then ranked the vents by ascending HAP emissions and plotted HAP emissions and flare TRE cost effectiveness against the cumulative percent of vents assumed to be controlled. The commenter (IV-D-25) claimed that, using this ranking, 12 percent of the vents are controlled (cumulative) at an incremental cost effectiveness level of $5,000/Mg. The commenter (IV-D-25) found higher cost effectiveness values if the median or average cost effectiveness at the 12 percent point was used or if the top 6 percent point was used. The commenter (IV-D-25) stated that a MACT floor in the range of $3,000 to $5,000/Mg would result in control of 94 percent of HAP emissions.

Response: As stated in the preamble to the proposed regulation, sufficient data was not provided to develop a TRE equation for miscellaneous process vents. This finding is confirmed by the fact that sufficient data to characterize the vents were available for only 17 out of 190 vents. In particular, information would be needed on vent stream characteristics, such as flow rate, heating value, and VOC and HAP content. Given that such information is not available, the EPA contends that the HON flare TRE equation may not be appropriate for miscellaneous process vents and that a cost effectiveness estimate derived using the HON flare TRE equation may not be accurate for miscellaneous process vents. Rather than including a TRE in the rule, the miscellaneous process vent component of the source-wide MACT floor has been reassessed to include an emission rate cutoff. The cost estimate and cost effectiveness of the regulation have been recalculated to include the emissions cutoff. Directionally, the cutoff decreases the number of vents that will be required to be controlled and therefore decreases the cost of this regulation. However, the database used for estimating emissions has been revised based on comments and data received regarding the number of vents that are uncontrolled and were previously not reported. Consequently, the number of uncontrolled vents nationwide has increased significantly. The combination of increasing the number of uncontrolled vents nationwide and adding the applicability criteria cutoff results in a decrease in the number of vents that will be required to be controlled. Additional revisions made to the database resulted in slightly lower emissions estimates for VOC and slightly higher estimates of HAP emissions. The cost effectiveness of this regulation for VOC increased by approximately 63 percent compared to the cost effectiveness presented at proposal. The cost per megagram of HAP reduction decreased by approximately 7 percent.

Comment: One commenter (IV-D-42) requested the development of a separate MACT floor for miscellaneous process vents for small refineries.

Response: The EPA examined the question of whether subcategorization would result in a different floor for small refineries. The EPA has elected to base the miscellaneous process vent component of the source-wide MACT floor on existing State regulations for miscellaneous process vents. Of the regulations included in the analysis, none provided requirements that varied according to the size of the refinery. Using State regulations, it is not possible to justify less stringent requirements for small refineries. Furthermore, the database indicates that combustion controls are in use at a substantial number of vents at small refineries, which also indicates that the floor would not be significantly different. However, using the State regulations has resulted in an applicability criteria for process vents based on the mass flowrate of emissions. Vents emitting less than 33 kg/day of VOC (72 lb/day of VOC) from existing sources and vents emitting less than 6.8 kg/day (15 lb/day) from new sources will not be required to be controlled. These criteria may allow more vents in small refineries to remain uncontrolled as emissions are generally related to material throughput.

Comment: One commenter (IV-D-59) maintained that a floor control level based on TRE is illegal under the Act because it is a cost effectiveness criteria and not an emissions level. The commenter (IV-D-59) stated that it does not make sense to use TRE in either case.

Response: The EPA has elected to base the determination of the miscellaneous process vent component of the source-wide MACT floor on State regulations and has not adopted a TRE approach. However, the EPA would like to point out that a TRE approach, had it been used, would have been legal as long as it was used correctly. Process vents could be ranked using cost effectiveness of control (or TRE) as a criteria. TRE reflects several factors that effect emission rates and likelihood of current control (flow rate, HAP concentration, net heating value, and corrosion properties). Using one parameter, such as TRE, simplifies the comparison. Once ranked by TRE, the average of the best performing 12 percent would be determined. The TRE is simply used to characterize which vents are controlled by the top 12 percent of sources. No judgement on whether the cost is reasonable would enter into the floor decision. The reader is referred to the preamble and supporting documentation for the Hazardous Organic NESHAP (promulgated April 22, 1994, 59 FR 19402).

5.4.2 Selection of MACT for Process Vents

Comment: One commenter (IV-D-09) suggested that the EPA adopt a control requirement of 95 percent rather than 98 percent to encourage adoption of recovery methods and promote pollution prevention.

Response: The requirement to control HAP emissions to 98 percent was based on the miscellaneous process vent component of the source-wide MACT Floor and MACT analysis. Control of HAP's to 98 percent is consistent with available technology. Requiring control to 95 percent would be below the level established as part of the MACT floor.

Comment: One commenter (IV-D-54) supported the provisions to require controls on all miscellaneous process vents. The commenter (IV-D-54) also supported the 20 ppm cutoff and the 98 percent control efficiency requirements.

Response: The EPA thanks the commenter for their support, but notes that for reasons previously described, an emission cutoff has also been added to the process vent provisions.

5.4.2.1 Selection of Vents Requiring Control.

Comment: One commenter (IV-D-38) supported adding a regulatory "stopping point" to exempt vents that emit less than a certain de minimis level of HAP from control. The commenter suggested a de minimis level of 15 pounds of HAP per day. Another commenter (IV-D-21) proposed a de minimis rate of 100 lb HAP/day. One commenter (IV-D-09) stated that a de minimis rate has the advantage of simplicity and is consistent with Group 1/Group 2 distinctions drawn by the EPA for the HON and with approaches taken by various States. The commenter (IV-D-09) stated that if a de minimis rate approach is taken, it should be consistent with the cutoff between Group 1 and Group 2 vents in the HON.

Response: As stated in the preamble to the proposed regulation, the data provided with which to develop the miscellaneous process vent component of the source-wide MACT floor was limited. The EPA requested additional data at proposal; few responses containing data that could be incorporated into the MACT floor analysis were received. The EPA elected to survey existing State regulations as an alternative method of determining the current level of control of process vents. The most stringent regulations in States with refineries did not require control of miscellaneous process vents emitting less than a specified rate of VOC*s or HAP*s. In order to determine which vents must be controlled, as required by State regulations, at the best performing 12 percent of refineries, the refineries with miscellaneous process vents subject to regulation were ranked by the stringency of the applicable regulation. The regulations were compared according to the maximum rate of VOC or HAP emissions that was allowed without control. The best controlled refinery and the median of the best performing 12 percent of refineries were then determined to determine the process vent component of the MACT floor for new and existing sources. The MACT floors were determined to include emission cutoffs, which were incorporated into the regulation. As suggested by the commenter, miscellaneous process vents will now be considered either Group 1 or Group 2 vents. For existing sources, miscellaneous process vents emitting 33 kg/day (72 lb/day) or more of VOC are Group 1 vents and will be required to be controlled. For new sources, miscellaneous process vents emitting 6.8 kg/day (15 lb/day) or more of VOC are Group 1 and will be required to be controlled. All other miscellaneous process vents will be considered Group 2 miscellaneous process vents and will not be required to be controlled.

Comment: Three commenters (IV-D-30, IV-D-36, IV-D-44) requested a minimum flow or pressure, below which process vents need not be controlled, be included in the definition of miscellaneous process vents. Two commenters (IV-D-30, IV-D-36) asserted that the standard is not cost effective without a flow component. One commenter, (IV-D-30), claimed that by limiting the definition to continuous streams with an organic HAP concentration greater than 0.005 weight percent (50 ppmv), the controls would be required where they would be most effective. One commenter (IV-D-10) supported a volumetric flow cutoff of 0.1 $m^3$/min. The commenter (IV-D-10) asserted that at these cut-offs, the amount of HAP emission is approximately 20 pounds/day. Another commenter (IV-D-22) suggested a cut-off of 0.005 $m^3$/min. Two commenters (IV-D-36, IV-D-44) expressed support for commenter IV-D-22's suggestion which would be consistent with the HON definition. One commenter (IV-D-44) claimed that the definition will allow for control of vents which may result in organic HAP emissions, but will eliminate regulation of vents of de minimis volumes and concentrations. Alternatively, two commenters (IV-D-10, IV-D-22) stated that the EPA could use a volumetric cut-off coupled with a de minimis concentration of 50 ppmv.

Response: As stated in a previous response, the EPA has revised the miscellaneous process vents requirement to incorporate information from State regulations regarding which vents in refineries are currently required to be controlled. An applicability criteria has been added to the process vent provisions that will allow vents emitting less than 33 kg/day (72 lb/day) of VOC for existing sources [or less than 6.8 kg/day (15 lb/day) of VOC for new sources] not to be controlled. The State regulations involved in the analysis all include either VOC or HAP mass flowrate cutoffs. The mass flowrate cutoff has been retained so as to most accurately represent the existing requirements. To convert to a volumetric or concentration cutoff would require making assumptions about the vent stream characteristics that may not be accurate for all vents. The EPA contends that the mass flowrate cutoff developed satisfies the commenters* requests for a cutoff that allows vents with relatively low HAP concentrations to be excluded from the control requirement while most accurately reflecting the control requirements at the best performing 12 percent of facilities. The 20 ppmv cutoff has also been retained in the process vent definition. The 20 ppmv was included in the proposal because the available control technologies cannot consistently reduce emissions below 20 ppmv, therefore, it would be technically unreasonable to require control of such vents.

Comment: One commenter (IV-D-44) stated that the 20 ppmv benzene concentration is burdensome and not cost effective.

Response: The EPA assumes that the commenter was referring to the exclusion of process vents with a HAP concentration of less than 20 parts per million in the definition of miscellaneous process vents. This exclusion was based on the finding that combustion control, which represents MACT for the miscellaneous process vent component of the source-wide floor, is capable of reducing HAP concentration by 98 percent or to 20 ppmv. Reducing the HAP concentration of vent streams with concentrations less than 20 ppmv by incineration may not be possible. Therefore, these vents are not included in the definition of miscellaneous process vents. The miscellaneous process vents provisions have been revised so that vents emitting less than 33 kg/day (72 lb/day) of VOC for existing sources [6.8 kg/day (15 lb/day) for new sources] will not be required to be controlled. This revision is based on information obtained from State regulations for miscellaneous process vents. However, the State regulations surveyed required that those vents requiring control be incinerated or controlled to an equivalent level. Therefore, the there is no basis for increasing the 20 part per million exclusion from the definition of miscellaneous process vents.

Comment: One commenter (IV-D-30) supported a control cut-off based on cost effectiveness.

Response: The Clean Air Act requires that standards are not less stringent than the average emission limitation achieved by the best performing 12 percent of existing sources. The MACT floor is determined from this requirement. The Clean Air Act does not allow for the consideration of cost effectiveness in the determination of the MACT floor. Cost effectiveness can be taken into consideration in establishing standards more stringent than the floor. The provisions of this component of the source-wide MACT are not more stringent than the source-wide MACT floor, therefore, cost effectiveness was not considered in their development.

Comment: Two commenters (IV-D-09, IV-D-10) contended that if a TRE is not used then an alternative cut-off level should be used. One commenter (IV-D-10) stated the EPA should consider the regulations provided in Louisiana and Texas, because these States have more than 12 percent of all refinery miscellaneous process vent sources. Therefore the commenter (IV-D-10) contended that the cut-offs provided in these States should be used in the refinery rule (100 pounds of VOC/day or 15 pounds HAP/day). Another commenter (IV-D-25) suggested using State rules to determine which process vents require control. The commenter (IV-D-25) cited Texas and Louisiana rules which exempt vents emitting less than 100 lb VOC/day (16.6 Mg/yr) and San Francisco Bay Area rules which exempt vents emitting less than 15 lb VOC/day (2.5 Mg/yr). Based on these rules, the commenter (IV-D-25) suggested an exemption of at least 15 lb HAP/day.

Response: The EPA agrees that State regulations provide a good basis for determining a cutoff for miscellaneous process vents requiring control. The EPA has surveyed existing State regulations, including those applicable to refineries in Louisiana, Texas and the San Francisco Bay Area, and used this information to develop the applicability criteria to be included in the miscellaneous process vents provisions. For existing sources, miscellaneous process vents emitting less than 33 kg/day (72 lb/day) of VOC will not be required to be controlled. This cutoff corresponds to the cutoff that the median of the best performing 12 percent of facilities must comply with according to State regulations. For new sources, miscellaneous process vents emitting less than 6.8 kg/day (15 lb/day) of VOC will not be required to be controlled. This cutoff corresponds to the level the best performing facility must comply with according to State regulations.

Comment: One commenter (IV-D-46) stated that the applicability levels for HON appear suitable for miscellaneous process vents because they represent emissions of no more than the fugitive emissions from a valve subject to LDAR. The commenter (IV-D-46) contended that a stricter limit would have little benefit.

Response: As stated in previous responses, applicability criteria has been developed for miscellaneous process vents from existing State regulations. The regulations included in the analysis were all determined to be applicable to miscellaneous process vents at petroleum refineries. The EPA contends that using these State regulations as a basis is the most accurate method currently available for determining which vents are currently being controlled.

Comment: One commenter (IV-D-29) stated that the flow rate and concentration cutoffs are too low. The commenter (IV-D-29) stated that most of these streams are already recovered for their energy value or pollution control.

Response: The EPA assumes that the commenter is referring to the exclusion of vents with HAP concentrations of less than 20 ppmv from the definition of miscellaneous process vents. The EPA disagrees with the comment that the majority of miscellaneous process vent streams are currently being recovered. Based on data received from industry, it is estimated that approximately 24 percent of miscellaneous process vents are currently being controlled. It is estimated that the percent of controlled vents will be increased to approximately 40 percent by this regulation.

Comment: In response to the EPA's question of whether the HAP content of the process vents is below the 20 ppmv applicability level, one commenter (IV-D-45) stated that their COTU's do not have process vents going to the atmosphere and all gas produced in the refining operations is either recycled for recompression and reuse or is routed to a continuous flare. All pressure safety valves relieve to a continuous flare system. One commenter (IV-D-23) maintained that all of the process vents from their 3,000 barrel per day refinery contained greater than 20 ppmv of HAP.

Response: The EPA appreciates the information provided by the commenters. The EPA would like to point out that not all COTU's are covered by the proposed rule. The EPA suggests referencing SIC 2911 to determine applicability of this regulation to specific COTU's.

Comment: One commenter (IV-D-35) challenged that the proposed rule does not sufficiently promote pollution prevention over pollution control. The commenter (IV-D-35) suggested that a lower concentration limit be used for control devices than prevention strategies. The commenter recommended that the limit for the prevention-based concentration be no less than 20 ppmv. One commenter (IV-D-40) stated that the miscellaneous process vents controls should only be applicable above 50 ppm as in the HON rule definition for a Group 1 process vent, so as to encourage pollution prevention.

Response: The EPA has determined for existing sources that miscellaneous process vents emitting less than 33 kg/day (72 lb/day) of VOC are not required to be controlled. For new sources, the level is 6.8 kg/day (15 lb/day). This is the MACT floor level of control for the miscellaneous process vent component which is the minimum level of control allowed by the CAA. The EPA contends that with this cutoff pollution prevention is encouraged. If the concentration or emission rate of HAP's in a miscellaneous process vent stream is reduced to below the applicability cutoff, the vent stream is not required to be controlled.

Comment: One commenter (IV-D-40) requested that the rule state that where storage vessel or wastewater vents are routed through a recovery device that includes miscellaneous process vents, no controls are required if the exit stream is reduced to 50 ppm organic HAP's or less or if the exit stream meets the TRE requirements of the HON, § 63.115. The commenter (IV-D-40) stated that this would help encourage pollution prevention.

Response: If a recovery device is used to control emissions from storage or wastewater streams, it must meet the 95 percent control requirements included in those regulations. If emissions from process vents at the outlet of the recovery device are above the emission cutoff (33 kg/day or 72 lb/day of VOC for existing sources and 6.8 kg/day or 15 lb/day of VOC for new sources), additional control is required by the process vent provisions. The EPA contends that providing this cutoff encourages pollution prevention. If a miscellaneous process vent stream is reduced to below the applicability criteria, it is not required to be controlled.

As previously stated, sufficient data was not provided in response to requests for information regarding miscellaneous process vents to develop TRE equations. According to industry, additional data is not available. Therefore, the rule does not include TRE equations for miscellaneous process vents.

5.4.2.2 Selection of MACT Technology.

Comment: One commenter (IV-D-57) encouraged using product recovery before destruction as a means of better air management because it would reduce the quantity of secondary pollutants generated from combustion.

Response: The EPA contends that recovery is encouraged by these standards by providing a HAP emission rate cutoff below which miscellaneous process vent are not required to be controlled. A recovery device can be used to reduce emissions to below this cutoff.

Comment: One commenter (IV-D-36) supported combustion as the selected level of control. One commenter (IV-D-57) stated that there is a difference between control efficiency and environmental benefit between various control devices that can be used to meet the 98 percent control requirement in the process vent provisions. The commenter (IV-D-57) recommended for new sources that the rule should require the use of an incinerator rather than allowing the use of a flare because the firebox provides higher temperatures and longer residence times and therefore more complete combustion than a flare. Another commenter (IV-D-46) provided that Texas routinely requires new sources to route to flares but expressed concern about retrofitting existing sources. The commenter (IV-D-46) did not have cost data to provide.

Response: The Clean Air Act requires that standards for new sources are not less stringent than the emission control level achieved by the best controlled similar source. For existing sources, standards may not be less stringent than the emission limitation achieved by the average of the best performing 12 percent of existing sources. Numerical emission standards must be established unless it is not feasible to prescribe or enforce an emission standard. Only in such a case is a design, equipment, or work practice standard allowed (section 112(h) of the Act). Industry responses to ICR and section 114 questionnaires indicated that the best controlled source, and the best controlled 12 percent of sources achieve emission limitation through combustion control. In developing previous NSPS and the HON, it has been determined that combustion achieves at least a 98 percent reduction in organic HAP or a 20 ppmv outlet concentration. Thus, as required by the Act, the EPA has established a numerical emission standard of 98 percent HAP reduction or 20 ppmv outlet concentration. A flare, incinerator, boiler, or any other non-recovery control device that can achieve the required level of control can be used to comply with the emission standard.

Comment: One commenter (IV-D-29) claimed that controls should not be proposed based on reformer emissions since many small refiners do not have reformers.

Response: The EPA agrees that the VOC to HAP ratio from reformer emissions is not applicable to other units. The miscellaneous process vents provisions have been revised to include information obtained by surveying State regulations for miscellaneous process vents. The result is the inclusion of applicability criteria which will allow vents emitting less than the cutoff not to be controlled. Additionally, the method for estimating emissions, which was influenced by reformer emissions, has been revised. The revised method for estimating emissions significantly decreases the amount of data extrapolated from one unit to another. In the few cases where sufficient data is not available for a process unit, it is either derived from a similar process unit or from the median value for all process units. Using the median value as opposed to the average value decreases the impact that one unit, with relatively high or low emissions, can have on the extrapolated data.

The EPA examined the question of whether subcategorization would result in a different floor for small refineries. The EPA has elected to base the miscellaneous process vent component of the source-wide MACT floor on existing State regulations for miscellaneous process vents. Of the regulations included in the analysis, none provided requirements that varied according to the size of the refinery. Using State regulations, it is not possible to justify less stringent requirements for small refineries. Furthermore, the database indicates that combustion controls are in use at a substantial number of vents at small refineries, which also indicates that the floor would not be significantly different. However, use of the State regulations has resulted in applicability criteria for process vents based on the mass flowrate of emissions. Vents emitting less than 33 kg/day of VOC (72 lb/day of VOC) for existing sources or 6.8 kg/day (15 lb/day) for new sources will not be required to be controlled. These criteria may allow more vents in small refineries to remain uncontrolled as emissions are generally related to material throughput.

## 5.5 COMPLIANCE DEMONSTRATION FOR PROCESS VENTS

### 5.5.1 Testing

Comment: One commenter (IV-D-21) requested that Method 18 analysis not be required where engineering judgment can be used to determine if a process vent's emissions exceed

20 ppm organic HAP's, unless the permitting authority disagrees with the engineering judgment.

Response: The testing requirements of § 63.645 of the regulation are applicable only to miscellaneous process vents as defined in § 63.641. Vents with organic HAP concentrations less than 20 ppm are exempt from this definition and therefore, not subject to the requirements of § 63.645. This regulation does not include monitoring, testing, recordkeeping of reporting requirements for vents that are not, by definition, miscellaneous process vents. The owner/operator will need to determine which vents at a facility must comply with this regulation. The method used for this determination may be chosen based on the owner/operators discretion. Owner/operators are encouraged to retain records of the methods used in this determination in order to be able to show compliance with this regulation.

In addition, the EPA has allowed the use of Method 25A to measure TOC concentration. If the Method 25A results show that vent emissions are less than 33 kg VOC/day (72 lb/day) for existing sources and 6.8 kg/day (15 lb/day) for new sources, then the vent is a Group 2 vent and is exempt from control. If the TOC emissions are greater than the VOC cut-off, the owner or operator can use Method 18 to speciate the non-VOC compounds in order to determine if the VOC emissions are below the VOC cut-off.

Comment: One commenter (IV-D-59) recommended performance tests for all types of control devices used on vents, including boilers and process heaters larger than 44 MW, in order to make sure that the device remains in good repair and is being operated properly. Conversely, one commenter (IV-D-09) supported lowering the threshold for exemption from boiler/heater firebox temperature monitoring and performance tests from 44 MW to 2.9 MW. The commenter (IV-D-09) contended that there was no reason to believe that the combustion characteristics of smaller heaters/boilers are much different than larger ones. The commenter (IV-D-09) stated that lowering the threshold to 2.9 MW makes the provisions of this rule consistent with precedent set by the EPA in the NSPS for small industrial-commercial steam generating units.

Response: The EPA has re-examined the process vent requirements for boilers and process heaters, and revised the initial performance test requirements and monitoring requirements to reduce the recordkeeping and reporting burden, while maintaining appropriate control levels. The MACT floor analysis for process vents shows that 98 percent reduction of HAP's is the MACT floor level of control for the miscellaneous process vent component of the source-wide floor. This control level can be achieved using several types of combustion devices, such as flares and incinerators. The EPA's information shows that boilers or process heaters larger than 44 MW (150 million Btu/hr) typically operate at temperatures and residence times necessary to achieve 98 percent reduction or greater, while boilers or process heaters smaller than 44 MW are frequently not operated to achieve the 98 percent requirement. Analysis also shows that when vent streams are introduced into the flame zone, over a 98 percent reduction is achieved. The EPA references "Reactor Processes in the Synthetic Organic Chemical Manufacturing Industry--Background Information for Promulgated Standards," EPA-450/3-90-016b, March 1993 to support this conclusion. Therefore, the final rule does not require an initial performance test or monitoring of boilers or process heaters with a minimum heat input of 44 MW, or of boilers or process heaters smaller than 44 MW if the vent stream is introduced into the flame zone.

The flame zone is defined in the final rule as the portion of a combustion chamber of a boiler or process heater occupied by the flame envelope created by the primary fuel. If the vent stream is not introduced into the flame zone for boilers or process heaters less than 44 MW an initial performance test and continuous monitoring of temperature are required in order to ensure that the boiler or process heater is operating properly and at temperatures and residence times that would control HAP emissions by 98 percent. The EPA considers these requirements to effectively ensure the MACT floor level of control for all boilers is being met, while also reducing the burden on the industry.

Comment: One commenter (IV-D-13) generally supported the EPA's proposed test methods for process vents, and additionally added that the rule should: (1) include EPA Methods 3, 3A, and 4 for measuring vent stream flow rate to account for the moisture in the flow; (2) change the total organic compounds limits to reference the calibration gas (e.g., ppmv ethane or propane) used if Method 25A is allowed as an alternative to Method 18 for demonstrating compliance of control devices; and (3) provide the State or local agencies the flexibility to use alternative approved methods (e.g., Method 25) instead of prescribed methods without requiring a section 112(l) equivalency submittal.

Another commenter (IV-D-22) opposed EPA not allowing Method 25A for demonstrating compliance. The commenter (IV-D-22) stated that the EPA's rationale for not allowing it fails to recognize that all of the other pre-approved continuous compliance methods are concerned only with overall efficiency, and not with HAP specific controls.

Response: Methods 2, 2A, 2C or 2D were chosen as the preferred test method for determining vent flow rates in part because the regulation specifies that flows and concentrations be calculated on a dry basis. Other alternatives for demonstrating compliance with the process vents provision which do not include the use of Method 2 are available. Engineering assessment may be used to determine the TOC emission rate. Engineering assessment includes estimation of maximum flow based on physical equipment design such as pump or blower capacities. Additionally, alternate methods for measuring may be used if validated according to Method 301 of 40 CFR part 63, Appendix A.

The EPA has also decided to allow the use of Method 25A to determine TOC concentration of the vent stream. The EPA recognizes that Method 18 is useful if speciation of emissions is required, but that it is also a costly procedure. Because the refinery emission cut-off is on a VOC basis (33 kg VOC/day for existing sources and 6.8 kg/day for new sources), it is not necessary to determine speciated VOC emissions or to separate total HAP emissions. However, Method 25A only measures TOC concentration, including non-VOC compounds such as ethane. The EPA cannot increase the cut-off to a TOC cut-off in terms of parts per million ethane to incorporate non-VOC compounds because this adjustment would be less stringent than the floor. In addition, the EPA does not have data to make this adjustment in emission cut-off. Therefore, if Method 25A shows that emissions from a process vent are determined to be below the VOC cut-off (33 kg VOC/day for existing sources and 6.8 kg/day for new sources) the vent is a Group 2 vent and is exempt from control. However, if Method 25A shows that the vent VOC emissions are greater than 33 kg/day or 6.8 kg/day (as applicable), the owner or operator will be required to control the vent unless they can prove the VOC emissions are below the applicability criteria by speciating out the non-VOC compounds. The owner or operator may use Method 18 (or an alternative method if validated by Method 301 of 40 CFR part 63, Appendix A) to determine vent speciation.

5.5.2 Monitoring

Comment: One commenter (IV-D-30) requested that the threshold for boilers or process heaters required to install a temperature monitoring device with a continuous recorder be reduced from 150 MMBtu/hr to 40 MM Btu/hr or less. One commenter (IV-D-29) provided that oil field steam generators equal to or under 65 MMBtu/hr have been used in California to burn vapors without problems. Another commenter (IV-D-44) disagreed with the selection of 150 MMBtu/hr as heater size not to require monitoring. The commenter (IV-D-44) claimed that the size was selected from the HON, and that refinery HAP's are not as difficult to destruct as chlorinated solvents found in SOCMI units, nor are the flow rates as high. The commenter (IV-D-44) suggested that the minimum size be lowered to 50 MMBtu/hr.

Response: As discussed in responses to comments on test methods, the EPA has re-examined the process vent requirements for boilers and process heaters, and revised the initial performance test requirements and monitoring requirements to reduce the recordkeeping and reporting burden. The MACT floor analysis for process vents shows that 98 percent reduction of HAP's is the MACT floor level of control for the process vent component of the source-wide floor. This control level can be achieved using several types of combustion devices, such as flares and incinerators. For the reasons presented in the testing section (5.5.1), the final rule does not require an initial performance test or monitoring of boilers or process heaters with a minimum heat input of 44 MW, or for boilers or process heaters smaller than 44 MW if the vent stream is introduced into the flame zone. If the vent stream is not introduced into the flame zone for boilers or process heaters less than 44 MW an initial performance test and continuous monitoring of temperature are required in order to ensure that the boiler or process heater is operating properly and at temperatures and residence times that would reduce HAP emissions by 98 percent.

Comment: One commenter (IV-D-44) stated that any vent routed to a burner in a process heater or boiler should be exempt from monitoring. The commenter (IV-D-44) asserted that the requirement to mix waste gas with primary fuel gas prior to destruction is unnecessary. The commenter (IV-D-44) provided that boilers are designed for waste gas destruction without mixing.

Response: The final rule has been revised to require monitoring of temperature in boilers or process heaters less than 44 MW if the vent stream is not introduced into the flame envelope created by the primary fuel. The flame envelope generated by the primary fuel is at required temperatures to ensure 98 percent destruction of HAP's.

The EPA is concerned about situations in which vent streams represent a small percentage of the total fuel input to a boiler or process heater and are not mixed with the primary fuel or introduced into the flame envelope generated by the primary fuel to ensure destruction at sufficient temperatures. When vent gases are fed to the combustion system through a separate burner, the potential exists for a "flame-out." There is greater potential for this in smaller combustion systems. Large combustion systems use burner management systems that reduce the potential for an undetected flame out. Smaller combustion systems are less likely to have equipment, such as flame scanners, that automatically stops the flow of vent gases that are used as secondary fuel in the event of a burner flame out. Therefore, the EPA requires monitoring of vent streams being used as a secondary fuel if the vent stream is not introduced into the flame envelope created by the primary fuel in boilers and process heaters with heat inputs less than 44 MW.

5.6 RECORDKEEPING AND RECORDING FOR PROCESS VENTS

5.7 WORDING OF PROCESS VENT PROVISIONS

Comment: One commenter (IV-D-29) requested that requirements for combustion devices be stated in BTU's since equipment in the United States is rated in BTU's or horsepower as opposed to megawatts. The commenter (IV-D-29) stated that using megawatts confuses combustion with electrical generation.

Response: Megawatts are used in the regulation because it is a Federal government policy to use metric rather than english units in regulations. Megawatts have been used in several previous standards without causing confusion.

Comment: One commenter (IV-D-21) suggested that § 63.643(a)(2) be revised from "If a boiler or process heater is used..." to "If a combustion device ..." or "If a boiler, process heater, or gas turbine is used..." to be consistent with the commenter's proposed change to the definition of process controls. The commenter (IV-D-21) suggested that a similar revision be made to § 63.644(a)(4).

Response: The original wording of the proposed rule has been retained in the final rule. This section of the rule was intended to apply specifically to boilers and process heaters, not other combustion devices.

Comment: One commenter (IV-D-21) supported the parenthetical inclusion in § 63.644(a)(2) of typical devices for detecting the presence of a flare tip flame.

Response: The proposed wording has been retained.

Comment: One commenter (IV-D-21) stated that § 63.644(a)(3) and (4), describing different monitoring options for control devices for process vents, as they are written, appear to conflict. The commenter (IV-D-21) suggested that "and all vents that are not introduced with primary fuel" be added after "is used" in paragraph (4) to distinguish this option from the one in paragraph (3).

Response: The wording of § 63.644(a)(3) has been changed to exclude "any boiler or process heater with a design heat input capacity greater than or equal to 44 megawatts" and "any boiler or process heater in which all vent streams are introduced into the flame zone" from monitoring. The wording of § 63.644(a)(4) has been changed to require temperature monitoring for "any boiler or process heater less than 44 megawatts design heat input capacity where the vent stream is not introduced into the flame zone". "Flame zone" is defined in § 63.641 as "the portion of the combustion chamber of a boiler or process heater occupied by the flame envelope created by the primary fuel".

Comment: One commenter (IV-D-21) suggested that "open-ended valves or lines and pressure relief valves needed for safety reasons" be added to the list of equipment exempted from § 63.644(c)(1) and (2) to provide clarity and consistency with the HON.

Response: The EPA agrees with the commenter and has made the suggested change to provide clarity and consistency. Open-ended lines and pressure relief valves are covered under the equipment leak provisions in § 63.648.

Comment: One commenter (IV-D-21) found the first sentence of § 63.444(e) which requires an owner/operator to operate a control device in a manner consistent with the minimum or maximum operation parameter is unnecessary and troublesome. The commenter (IV-D-21) stated that the compliance range for an operation could have both a minimum and maximum, the sentence should say "minimum and/or maximum" or "minimum or maximum (as appropriate)."

Response: Depending on the type of device, the acceptable operating parameter range could have a maximum value, minimum value, or both. Therefore, the change suggested by the commenter has been made.

Comment: One commenter (IV-D-21) recommended that "an excess emission" in the last sentence of § 63.644(e) should be replaced with "a period of excess emissions" to avoid misinterpretation.

Response: This sentence has been revised according to the commenter's suggestion.

Comment: One commenter (IV-D-21) suggested that in table 5, in the requirement for incinerators, catalytic incinerators and boilers or process heater to "report all daily average temperatures that are outside the range established in the NCS," "outside the range" be changed to "below the minimum."

Response: The table uses "range" as a generic term. For combustors where temperature is monitored, the acceptable range will typically mean operating above a specified minimum temperature. For other devices and parameters, a maximum value or a range with both minimum and maximum values may be appropriate. The range must be established on a site-specific basis.

Comment: One commenter (IV-D-21) suggested that recordkeeping for flare pilot flames in table 5 should be simplified. The commenter (IV-D-21) stated that it is not necessary to record when one pilot flame is absent and when all pilot flames are absent since it should not be necessary to keep records as long as one pilot is working. The commenter (IV-D-21) suggested specific wording changes to table 5.

Response: The table (which is table 10 of the final rule) has been modified to require that the times and durations when all pilot flames are absent be recorded. This revision simplifies the recordkeeping requirement without changing its original intent.

Comment: One commenter (IV-D-25) suggested minor editorial changes to the flare monitoring requirement in § 63.644(a)(2).

Response: The original wording of the proposed regulation has been retained. The commenter did not provide a reason for making the changes. The EPA contends that the original wording is sufficiently clear and the suggested changes would not provide any additional clarity.

5.8 MISCELLANEOUS

Comment: One commenter (IV-D-05) requested that the EPA modify the definition of fuel gas system to address shared systems between chemical and refinery processes that are not necessarily physically located in refineries. The commenter (IV-D-05) expressed concern that the proposed definition would set a precedent by not recognizing chemical plant fuel gas systems as equivalent to identical systems which happen to be physically located in refineries.

Response: The definition of fuel gas system includes "offsite and onsite piping" which implies that systems that are not physically located in the refinery can be considered part of the fuel gas system. It is the EPA's intention to account for refineries and petrochemical plants with shared systems in the definition. The EPA contends that the existing definition does this and therefore has not been changed.

Comment: One commenter (IV-D-21) requested that gas turbines be added to the list of possible combustion devices and control devices in the definitions section. The commenter (IV-D-21) pointed out that combustion conditions can exceed 3000 $^{o}$F and exit temperatures are equal to or higher than for flares or incinerators. The commenter (IV-D-21) claimed that studies and experts have confirmed that gas turbines meet or exceed 98 percent organic HAP destruction.

Response: The specific devices listed in the definition of combustion device are provided as examples. The definition does not exclude gas turbines as combustion devices. According to the definition, a combustion device "means an individual unit of equipment...used for the combustion of organic hazardous air pollutant vapers." This definition has been retained.

Comment: One commenter (IV-D-21) requested that the definition of "flame zone" not be limited to boilers, but it be defined as "the portion of the combustion chamber of a combustion device occupied by the flame envelope."

Response: The definition applies to both boilers and process heaters. The EPA has decided not to expand the definition to other combustion devices. This section of the rule was intended to apply specifically to boilers and process heaters.

Comment: One commenter (IV-D-21) suggested that the underlined be deleted from the definition of fuel gas: "may blend them with external sources of natural gas or liquified petroleum gas." The commenter (IV-D-21) pointed out that other sources of gas are burned in a fuel gas system and gave examples. The commenter (IV-D-21) stated that petrochemical plants associated with and adjacent to refineries should not be considered external sources. The commenter (IV-D-21) predicted that if the word "external" is left in the definition, there could be confusion over whether an adjacent petrochemical plant is "external" or "internal." The commenter (IV-D-21) proposed that if "external" is left in the definition, the underlined be added "gaseous streams generated by refinery and associated petrochemical plant operations."

Response: The EPA agrees that refineries and petrochemical plants with a common fuel gas system should be accounted for in the definition of fuel gas system. The EPA contends that this is accomplished with the wording "offsite and onsite piping and control system". The reference to "external sources of natural gas or liquified petroleum gas" was meant to include in the definition other sources of gas, such as natural gas or liquified petroleum gas, supplied by a vendor. It is not intended as a reference to adjacent petrochemical plants. However, the words underlined by the commenter have been deleted to avoid confusion. The EPA contends that the definition does not exclude fuel gas systems associated with petrochemical plants.

Comment: One commenter (IV-D-21) requested that the following sentence be added to the fuel gas system definition: "There can be more than one fuel gas system" because, for a variety of reasons, it is not uncommon for a refinery to have more than one.

Response: The EPA does not agree that the definition requires revision to account for refineries with more than one fuel gas system. The word "system" in the definition refers to all piping that performs the functions described in the definition.

Comment: One commenter (IV-D-21) suggested that the following be added to the definition of fuel gas system: "The gaseous streams can contain a mixture of methane, light hydrocarbons, hydrogen, and other miscellaneous species (nitrogen, carbon dioxide, hydrogen sulfide, etc.)."

Response: The wording "the gaseous streams can contain a mixture of methane, light hydrocarbons, hydrogen, and other miscellaneous species" has been added to improve the clarity of the definition.

Comment: One commenter (IV-D-21) suggested that "other than water" be deleted from the definition of a "process heater." The commenter (IV-D-21) explained a section of a process heater is often used to heat water or generate steam. This is done to make use of what otherwise would have been waste heat.

Response: The definition of process heater has been revised to read "an enclosed combustion device that primarily transfers heat liberated by burning fuel directly to process streams or to heat transfer liquids other than water." The EPA contends that the revised definition does not exclude process heaters that use excess heat to heat water or generate steam, as their primary function is to heat process streams.

Comment: One commenter (IV-D-21) foresaw a potential conflict between the definitions of fuel gas system and "refinery fuel gas." The commenter (IV-D-21) suggested that "refinery fuel gas" be replaced by "gas supplied by a fuel gas system" or, less preferably, by "fuel gas." The commenter (IV-D-21) stated that refineries often share fuel gas systems with associated petrochemical and HON process units.

Response: The EPA agrees that it should be recognized that refineries may share a fuel gas system with an adjacent non-refinery plant. This is accomplished in the definition of fuel gas system, which includes the "offsite and onsite piping control system." The EPA contends that it is not necessary to revise the definition of refinery fuel gas. The definition of miscellaneous process vents excludes "gaseous streams to a fuel gas system." It is in the definition of fuel gas system that the inclusion of petrochemical and other facilities must be made.

Comment: One commenter (IV-D-38) suggested minor wording changes to the definition to more accurately characterize "refinery fuel gas." The commenter (IV-D-38) suggested that the word "species" used to describe components of refinery fuel gas, such as nitrogen and carbon dioxide, be replaced with "compounds" and the phrase "process heaters throughout the refinery" be changed to "process heaters in the refinery."

Response: The EPA contends that the original definition sufficiently and correctly describes refinery fuel gas and would not be enhanced by the suggestions made by the commenter. Therefore, the original wording has been retained.

## 6.0 STORAGE VESSEL PROVISIONS

## 6.1 DEFINITION OF STORAGE VESSELS

Comment: One commenter (IV-D-21) stated that the definition of Group 1 storage vessels should be based on maximum true vapor pressure as opposed to average true vapor pressure. The commenter (IV-D-21) asserted that the MACT floor analysis was based on average true vapor pressure. The commenter (IV-D-21) claimed that average true vapor pressure could be corrected to maximum true vapor pressure by adding 2.07 kPa (0.3 psi). The commenter (IV-D-21) recommended that the Group 1 definition be based on a maximum true vapor pressure of 10.4 kPa (1.5 psia), as opposed to an average true vapor pressure of 8.27 kPa (1.2 psia).

Response: The EPA agrees with the commenter that because the section 114 and ICR questionnaires did not specify the type of vapor pressure requested, the respondents may have provided annual average true vapor pressures instead of maximum true vapor pressures. In order to reflect the uncertainty of the type of vapor pressure provided in the questionnaire responses, the EPA has decided to change the storage vessel applicability cut-off in the final rule from a maximum true vapor pressure of 8.27 kPa (1.2 psia) to 10.4 kPa (1.5 psia). This change does not effect the impacts analysis.

Comment: One commenter (IV-D-09) stated that the definition of maximum true vapor pressure should be clarified by explicitly stating that a liquid is stored at ambient temperature when it is not stored in an insulated tank or heated or cooled while in the tank. The commenter (IV-D-09) explained that because of thermal inertia, the temperature of a liquid stored in a tank changes slowly and can be many degrees hotter or cooler than the temperature of the ambient air. Therefore, the commenter (IV-D-09) concluded that a tank's contents are very seldom at ambient temperatures. The commenter (IV-D-09) concluded that the EPA's criterion for determining the maximum true vapor pressure of the stored liquid is inappropriate since at any given period of time, a liquid may be at, above, or below ambient temperature.

Response: The EPA does not consider it necessary to change the rule in the manner suggested by the commenter. The definition of "maximum true vapor pressure" allows the equilibrium partial pressure exerted by the stored liquid to be determined at the temperature equal to the highest calendar-month **average or the liquid storage temperature for liquids stored above or below the ambient temperature** or at the local maximum monthly average temperature for liquids stored at the ambient temperature determined with API publication 2517, standard reference texts, American Society for Testing and Materials Method D2879-83, or any other method approved by the Administrator. The EPA considers the rule to allow maximum true vapor pressure to be determined above or below ambient temperature for liquids stored in such conditions.

Comment: One commenter (IV-D-54) requested that the EPA require a more strict definition of a wastewater tank than offered in the proposed rule because some of the wastewater tanks exempted by the proposed rule should be covered.

Response: The EPA would like to clarify that the storage vessel provisions apply to raw materials, intermediates, and final products used and produced by a refinery. Wastewater tanks are subject to the BWON, which is referenced in the rule. The EPA does not consider it necessary to change the rule in the manner suggested by the commenter.

Comment: One commenter (IV-D-29) stated that all heavy oil tanks as well as tanks having a low concentration of HAP vapors should be exempt because emissions from them are low.

Response: The EPA considers that a vapor pressure cut-off of 10.4 kPa (1.5 psia) will exclude most materials with low HAP concentrations. However, the EPA agrees that some materials may have low HAP concentrations but also have high vapor pressures due to the volatility of non-HAP compounds in the material. Several products, such as asphalt, have minimal HAP's that may have vapor pressures above 10.4 kPa (1.5 psia) if stored at elevated temperatures. The EPA has evaluated the data supplied in the questionnaire responses (see the memoranda "Petroleum Refinery Liquid HAP and Properties Data" (August 10, 1993) and "Revised MACT Floor Analysis" (July 26, 1995) and letter from P.C. Bailey dated December 23, 1993) and has concluded that a HAP content criterion should be added to the definition of Group 1 storage vessel. The Group 1 storage vessel definition includes a HAP content cutoff of 4 weight percent in the liquid for existing sources and 2 weight percent in the liquid for new sources. The EPA considers these cut-offs adequately exclude heavy oil tanks with low HAP concentrations.

Comment: One commenter (IV-D-40) stated that the 95 percent efficiency reduction as defined in the definition of RCT for storage tanks is inadequate and recommended adding "or 20 ppmv" to make the requirements consistent with the miscellaneous process vents and wastewater RCT.

Response: The EPA has determined that a minimum emission concentration cutoff of 20 ppmv is warranted in cases where the emission concentration is already low such that it cannot be reduced by 95 percent. Therefore, the definition of RCT for storage vessels has been modified to include "A closed-vent system to a control device achieving 95 percent reduction in organic HAP emissions or to an outlet concentration of 20 parts per million by volume.

## 6.2 IMPACTS ANALYSIS

### 6.2.1 Database

Comment: One commenter (IV-D-29) stated that if the EPA's database for storage vessels was based on old emission inventories it must be updated. The commenter (IV-D-29) indicated that the new AP-42 calculation factor drastically reduced estimates of tank emissions in the San Joaquin Valley in California. The commenter (IV-D-29) predicted that tank emissions are much lower than indicated in previous inventories.

Response: The EPA would like to clarify that the storage vessel component of the source-wide MACT floor and the national impacts from storage vessels were developed using information supplied by the refining industry in section 114 and ICR questionnaire responses and were not based on old emission inventories. The EPA asserts that the questionnaire responses provide the most current data available in the refining industry. Emissions from storage vessels were estimated using equations provided in chapter 12 of the Compilation of Air Pollutant Emission Factors (AP-42), revised in July 1993.

Comment: One commenter (IV-D-29) questioned the data for heavy oil vapor pressure used to develop emission factors. The commenter (IV-D-29) claimed that water and non-condensables in heavy oil make it appear to have higher emissions. The commenter (IV-D-29) suggested that another factor for heavy oil be developed instead of using one based on Reid vapor pressure. The commenter (IV-D-29) claimed that many heavy oil tanks do not produce a reading using Method 21.

Response: The data on heavy oils supplied in the section 114 and ICR questionnaires was scrutinized by representatives from the refining industry, State agencies, and the other EPA regions. Based on comments supplied by the industry, reasonable vapor pressures were developed. The EPA is not aware of how to develop emissions and emission factors that are not based on the vapor pressure of the liquid stored. The commenter did not supply information on alternative methods for developing emission factors.

6.2.2 Cost Impacts

Comment: Several commenters (IV-D-09, IV-D-10, IV-D-11, IV-D-19, IV-D-25 and IV-F-1, IV-D-51) contended that the EPA's cost calculations and cost-effectiveness were incorrect for Option 1 requirements. The commenters (IV-D-09, IV-D-10, IV-D-11, IV-D-25, IV-D-51) claimed that the cost impacts were too low for the following reasons:

- Operating costs were not included; as a result, one commenter (IV-D-19) estimated that the costs are at least an order of magnitude lower than they should be. The commenter (IV-D-19) did not provide additional estimates of operating costs.
- Lost capacity from installing controls was not considered; and
- Incremental costs were not presented separately for each type of tank. Three commenters (IV-D-09, IV-D-10, IV-D-25) contended that this resulted in weighting the cost effectiveness toward fixed-roof tanks and obscuring the poor cost effectiveness for tanks already controlled with floating roofs.

One commenter (IV-D-25 and IV-F-1) estimated incremental cost effectiveness for Option 1 for tanks already equipped with floating roofs to be \$17,000 to \$300,000/Mg (\$15,400 to \$272,200/ton) HAP reduction, depending on the type of floating roof, the type of fittings and seals added, and the HAP content of the stored liquid.

One commenter (IV-D-09) stated that including the factors listed above would make the cost-effectiveness \$9,900/Mg

($8,980/ton) of HAP instead of $4,400/Mg ($3,990/ton) of HAP as stated in the proposal.

Response: The EPA contends that all applicable operating costs for controls were considered in the cost impacts. The EPA estimated the annual costs from inspecting storage vessels, recordkeeping and reporting, and annualized capital costs. As noted above, the commenter did not provide details on other costs that should be included as part of the annual costs and did not supply cost data necessary to revise impacts from storage vessels.

The EPA agrees the cost estimates at proposal underestimated degassing and cleaning storage vessels costs and do not include the cost of lost capacity because the EPA did not have cost algorithms or information to estimate this cost. Based on information supplied by the industry, the EPA considers the cost of lost capacity and the cost of degassing and cleaning storage vessels to potentially be very high and could substantially increase the incremental cost-effectiveness and average cost-effectiveness of Option 1. Therefore, the final rule only requires that existing storage vessels comply with the MACT floor level of control, subpart Kb without fittings.

Comment: One commenter (IV-D-50 and IV-F-1) stated that in instances where a storage tank has a floating roof and a single seal, adding a second seal and other control measures will yield very little HAP reduction at a very high cost. The commenter (IV-D-50 and IV-F-1) estimated that storage controls will achieve the poorest emissions reductions at a cost-effectiveness estimate of $4,600/Mg (4,170/ton) and are based on large tanks at large refineries where the best coefficients apply. The commenter (IV-D-50) stated that their analysis indicates that adding a second seal to a floating roof tank would only reduce HAP emissions by a de minimis 680 grams/day (1.5 lbs/day) for an average size gasoline tank at a small refinery.

Response: The requirement for a secondary seal was not based on cost-effectiveness. The MACT floor analysis for storage vessels indicated that the best-controlled 12 percent of sources controlled storage vessels with liquids greater than 10.4 kPa (1.5 psia) to the requirements in subpart Kb (without fittings). Subpart Kb requires that floating roof tanks install a secondary seal. Therefore, the Act requires that EPA must, at a minimum, require the controls in the MACT floor, (i.e., secondary seals on floating roof tanks).

Comment: One commenter (IV-D-29) questioned whether the cost estimate for storage vessels included tank replacement for all bolted and riveted tanks.

Response: The commenter did not explain the reasons bolted and riveted tanks would need to be replaced due to the rule. In estimating the costs of the rule, EPA did not assume that bolted and riveted tanks would have to be replaced and the storage vessel costs were estimated for a typical storage tank. The EPA recognizes that tank specific costs may be greater or less than the costs estimated from the cost equations. However, the EPA considers the cost algorithms to adequately characterize controlling a typical storage vessel in the refining industry.

Comment: One commenter (IV-D-50 and IV-F-1) compared the costs of proposed tank controls for a small refinery to the costs for a large refinery and found them to be twice that estimated by the EPA for the industry. The commenter (IV-D-50) included data on how this comparison was made and concluded that it was reasonable to assume a cost-effectiveness estimate ranging between $8,000 and $10,000/Mg ($7,260 and $9,070/ton) of HAP for tanks at a small refinery.

One commenter (IV-D-50 and IV-F-1) stated that not only will small refineries incur compliance costs twice as high as what large refineries will incur due to economy of scale factors, they will also have twice as many tanks to retrofit compared to the industry as a whole.

Response: The EPA examined the possibility of subcategorizing small refineries to determine if a different level of control could be developed. The EPA analyzed the MACT floor for various crude charge capacity cutoffs (10,000; 20,000; 30,000; 40,000; 50,000; and 60,000 bbl/sd), refinery ozone attainment status, and the types of products at each refinery. The results of the EPA analysis showed that no significant changes from the 10.4 kPa (1.5 psia) cutoff would occur for small refineries. The EPA agrees that controlling storage vessels at small refineries may be less cost-effective than at large refineries. However, the EPA would like to clarify that the MACT floor analysis requires that storage vessels storing materials with vapor pressures greater than or equal to 10.4 kPa (1.5 psia) must be controlled to subpart Kb without fittings regardless of size.

Comment: One commenter (IV-D-06) stated that for equipment vendors to meet the demand for retrofits in the 3-year time period required by the proposed standards, there would be an additional cost for expedited services. The commenter (IV-D-06) concluded that this cost should be included in the EPA's cost estimates.

Response: The EPA has changed the compliance times in the final rule to allow 10 years or at the next inspection and maintenance activity, whichever comes first, for all floating roof vessels. Fixed-roof vessels must still comply with the rule within 3 years of promulgation unless a compliance extension is received under section 112(i)(3)(B) of the Act. If the tank must be replaced to comply with the requirements of the rule, EPA believes that it would be appropriate to grant the compliance extension request and that compliance deadlines would be 4 years in most cases.

The commenter did not explain the basis for their conclusion that expedited services would be necessary. The EPA does not have any data on increased costs due to expedited service and no information was supplied by the commenters. Therefore, this cost was not included in the impacts analysis.

6.2.3 Emissions Impacts

Comment: One commenter (IV-D-50 and IV-F-1) contended that there are increased air emissions associated with cleaning and degassing tanks for required retrofits.

Response: The EPA agrees with the commenter's statement. An analysis of the emissions from degassing and cleaning storage vessels was performed using theoretical models developed by the EPA. For floating roof vessels, the analysis showed that significant emissions of HAP's occur from degassing and cleaning activities such that the emissions cannot be balanced in a reasonable amount of time with the emission reductions from complying with subpart Kb without fittings. The analysis also showed that emissions from degassing and cleaning fixed roof vessels could be balanced under one year by the emission reductions from complying with subpart Kb without fittings. Based on the results of this analysis, the compliance time requirements have been modified for floating roof vessels to be within 10 years or at the next inspection and maintenance activity, whichever comes first.

Comment: One commenter (IV-D-22) asserted that the EPA did not consider the impact of the reformulated gasoline rule on emissions of HAP's from storage vessels. The commenter (IV-D-22) stated that the (reformulated gasoline) RFG rule will result in a reduction in gasoline vapor pressure and benzene concentration in storage tanks.

Response: The impacts analysis and data collection for the refinery standard was done prior to implementation of the RFG rule. In addition, the Act limits the EPA to exclude from the MACT floor those sources that have achieved emission reductions or controls within 18 months before the rule was proposed or within 30 months before the rule was promulgated.

The EPA concluded that the change in gasoline vapor pressure and benzene concentration would not significantly effect the impacts analysis. Data gathered in questionnaire responses indicated that benzene is only one of 11 HAP's that are present in gasoline, and benzene is not present in the highest quantities, nor is it the most volatile.

Comment: One commenter (IV-D-22) asserted that use of maximum monthly average temperature to calculate vapor pressure would greatly overestimate the actual annual average vapor pressure and related emissions from storage vessels located in areas of fluctuating temperatures. The commenter (IV-D-22) stated that this would cause disparities in regions because the amount of HAP emissions controlled would be substantially less in areas of seasonally fluctuating temperatures. Additionally, the commenter (IV-D-22) stated that refineries in colder midcontinent States could claim credit only for those actual annual average emissions controlled even though they were required to incur the costs necessary to control the maximum monthly emissions. The commenter (IV-D-22) recommended basing the control requirement on the vapor pressure of the HAP's contained in the liquid as required by the HON, or to base the vapor control threshold on the annual average HAP vapor pressure calculated from annual average ambient temperatures as available from the National Weather Service.

Response: The EPA agrees that affected liquids may have vapor pressures that are below the vapor pressure cutoff for a portion of the year, but also notes that nonaffected liquids may have true vapor pressures above the cutoffs for portions of the year such as daylight hours during summer months. In a prior rulemaking, EPA realized that basing applicability on maximum instantaneous vapor pressure would result in the broadest applicability and, therefore, the largest emission reduction. This approach could cause planning problems for the industry because they might not be able to adequately predict which vessels would be affected. Because industry may not be able to account for particularly hot days adequately, the instantaneous vapor pressure was rejected as the basis of applicability.

The EPA then examined an annual average vapor pressure format. Vapor pressures of volatile organic liquids are higher in the warmer, summer months, when ambient ozone levels are highest. If applicability were based on the annual average vapor pressure, vessels would not come under the standards even though they were storing liquids with true vapor pressures greater than the applicability cutoff. These vessels would then emit significant quantities of VOC's and HAP's during the summer when ambient ozone levels are highest. Therefore, EPA decided to examine a shorter time frame that would broaden the applicability of the standards, particularly during the summer.

An applicability based on maximum monthly average vapor pressure was selected because this would have a broader applicability than annual averages without the planning problems associated with an applicability based on instantaneous vapor pressure and would base applicability on the contribution to VOC and HAP emissions when ozone levels are highest. The EPA maintains this argument for the refinery MACT standard.

Other regulations, already promulgated, use the maximum monthly temperatures to affect the determination of vapor pressure and applicability. The EPA desires to maintain consistency between these other regulations, the storage requirements in the HON (40 CFR 63, subpart G) and the new source performance standards for volatile organic liquid storage vessels (40 CFR 60, subpart Kb), because all three regulations could affect similar storage vessels in similar processing plants, and because the final refinery rule significantly cross-references these other rules.

The EPA also contends that the commenters suggestion of using HAP vapor pressures alone is impractical and costly. Existing vapor pressure tests only measure the vapor pressure of the bulk liquid. For liquids that are comprised mostly of one HAP, as stored in the SOCMI, this approach would be satisfactory. The organic liquids stored at petroleum refineries contain mixtures of compounds, some of which might be HAP's. Therefore, if HAP partial pressures were required instead of total vapor pressure, speciation of the stored liquid would be necessary. The EPA considers this a costly and unnecessary exercise that would add complexity to the rule. Therefore, the EPA has not revised the final rule in the manner the commenter suggested.

Comment: One commenter (IV-D-48) asserted that proposed exemptions for new sources would encourage facilities to use small, exempt storage vessels rather than collect all of their stored evaporated HAP's in controlled storage vessels.

Response: The EPA disagrees with the commenter. The capacity cut-off for new storage tanks is 151 $m^3$ (40,000 gallons). The industry practice is to store material in larger tanks, generally in excess of 380 $m^3$ (100,000 gallons). Additionally, storing material in a number of smaller storage vessels would be cost and space prohibitive for refineries. Therefore, it is implausible that anyone would use this as a means of avoiding control.

## 6.3 SELECTION OF MACT FLOOR AND MACT FOR STORAGE VESSELS

### 6.3.1 Selection of the Storage Vessels Component of the Source-Wide MACT Floor

Comment: Several commenters (IV-D-09, IV-D-10, IV-D-11, IV-D-25, IV-D-30, IV-D-51) concurred with the EPA that the MACT floor for storage tanks should be NSPS subpart Kb without roof fitting controls. One commenter (IV-D-25) pointed out that roof fitting controls are not required by subparts K, Ka, or RACT rules, and that the degree of fitting control required by subpart Kb has been interpreted differently over time. The commenter (IV-D-25) concluded that only a very small percentage of tanks at refineries meet the roof fitting requirements of subpart Kb, so they do not constitute the refinery MACT floor for existing tanks.

Two commenters (IV-D-09, IV-D-51) stated that the fitting requirements are not found in other rules; therefore, tanks currently controlled to NSPS subpart K or Ka or to EPA RACT controls do not contribute to a MACT floor for roof fitting controls. One commenter (IV-D-19) submitted that fittings requirements were not included in the floor analysis and therefore, should not be included in the final floor determination. One commenter (IV-D-09) added that most tanks are in ozone non-attainment areas regulated under RACT guidelines, which specify Kb-style rim seals but not Kb-style controls on other roof deck fittings.

Response: The EPA thanks the commenters for their views. The final rule requires that storage vessels comply with the MACT floor level of control (subpart Kb without fittings) for the storage vessels component of the source-wide MACT floor.

Comment: One commenter (IV-D-09) stated that the EPA should explicitly state that compliance with the NSPS subpart Kb can be substituted for the requirements proposed in § 63.646.

Response: The final rule explicitly directs refineries which regulations to comply with when there exists overlapping rules. The final rule allows existing sources complying with subpart Kb to continue compliance with subpart Kb instead of the requirements in § 63.646. A Group 1 storage vessel that is part of a new source and is also subject to subpart Kb is required to comply only with the storage vessel requirements in 40 CFR part 63, subpart CC. A Group 2 storage vessel that is part of a new source and is subject to subpart Kb is required to comply only with subpart Kb. A Group 2 storage vessel that is part of a new source and is subject to subpart Kb, but is not required to apply controls by § 63.110d or 63.112d of subpart Kb is required to only comply with 40 CFR part 63, subpart CC.

Comment: One commenter (IV-D-42) requested the development of a separate MACT floor for storage tanks for small refineries. The commenter (IV-D-42) contended that the MACT floor for refinery storage vessels would be disproportionately burdensome for small refineries because many of these refineries are in attainment areas and these tanks would not have been subject to any RACT or other VOC control requirements.

Response: The EPA examined the possibility of subcategorizing small refineries to determine if a different MACT floor level of control could be developed. The EPA analyzed the MACT floor for various crude charge capacity cutoffs (10,000; 20,000; 30,000; 40,000; 50,000; and 60,000 bbl/sd), refinery ozone attainment status, and based on the types of products at each refinery. The results of the analysis showed that no significant changes from the 10.4 kPa (1.5 psia) cutoff would occur for small refineries. The EPA agrees that controlling storage vessels at small refineries may be less cost-effective than at large refineries. However, the EPA would like to clarify that the MACT floor analysis requires that storage vessels storing materials with vapor pressures greater than or equal to 10.4 kPa (1.5 psia) must be controlled to subpart Kb without fittings.

Comment: Two commenters (IV-D-25, IV-D-30) supported selection of the 88th percentile vapor pressure (17.9 kPa [2.6 psia]) instead of the 94th percentile (8.27 kPa [1.2 psia]) that was chosen as the applicability criterion for the storage vessels component of the source-wide MACT floor. One commenter (IV-D-25) contended that the EPA has discretion to select the 88th percentile, and that the incremental cost effectiveness of the 94th percentile (8.27 kPa [1.2 psia]) applicability criteria is $17,000 to $22,000/Mg ($15,420 to $19,960/ton) of HAP.

Response: The Act requires that the MACT floor be determined from "the average emission limitation achieved by the best performing 12 percent of existing sources..." As discussed in section 4.1 of this document, the EPA interprets the word "average" to authorize the Agency to use any reasonable method, in a particular factual context, of determining the central tendency of a data set. The EPA's interpretation of "average" for the storage vessels component of the source-wide MACT floor is the arithmetic mean level of control. Therefore, the floor level of control for storage vessels is control to subpart Kb (without fittings) for tanks storing liquids with vapor pressures greater or equal to 10.4 kPa (1.5 psia).

Comment: Three commenters (IV-D-09, IV-D-21, IV-D-25) recommended raising the MACT floor control applicability criterion from 8.27 kPa (1.2 psia) to 10.4 kPa (1.5 psia).

One commenter (IV-D-09) contended that although the EPA had determined the floor method of control correctly, it had underestimated the vapor pressure threshold at which the floor control was applied by 2.07 to 4.82 kPa (0.3-0.7 psia). The commenters (IV-D-09, IV-D-21, IV-D-25) explained that the Group 1 storage vessel threshold was based on maximum monthly average vapor pressure; however, the section 114 questionnaire responses provided data on yearly average storage temperatures and this information was used to make the MACT floor decision. The commenters (IV-D-09, IV-D-21, IV-D-25) explained that the two measurements are not interchangeable because the temperature of a stored liquid will trace the average ambient temperature. One commenter (IV-D-09) added that in most U.S. locations the highest monthly average ambient temperature is approximately 5.6-11.1 $^{o}$C (10-20 $^{o}$F) higher than the yearly average temperature. The commenters (IV-D-09, IV-D-21, IV-D-25) stated that the highest monthly average true vapor pressure, assuming a typical 2.3 RVP naphtha, would be 2.07-4.82 kPa (0.3-0.7 psia) higher than the annual average.

Response: The EPA agrees with the commenters that because the section 114 and ICR questionnaires did not specify the type of vapor pressure requested, the respondents may have provided annual average true vapor pressures instead of maximum true vapor pressures. In order to reflect the uncertainty of the type of vapor pressure provided in the questionnaire responses, the EPA has decided to change the storage vessel applicability cut-off in the final rule from a maximum true vapor pressure of 8.27 kPa (1.2 psia) to 10.4 kPa (1.5 psia). An analysis of the storage vessel database indicated that a change from 8.27 kPa (1.2 psia) to 10.4 kPa (1.5 psia) will not effect the impacts analysis.

Comment: One commenter (IV-D-48) disagreed with the EPA's floor analysis for storage tanks. The commenter (IV-D-48) asserted that all new and existing vessels should be controlled. The commenter (IV-D-48) stated that the EPA has stated that 86 percent of storage vessels are controlled and cited a reference to support this figure.

Response: The EPA holds the view that its analysis of the floor is consistent with the statute. The Act requires that the MACT floor for existing sources be determined as the average of the best-performing 12 percent of sources, and the MACT floor for new sources be equal to the control used in the best-controlled source. The MACT floor analysis shows that control to subpart Kb (without fittings) is the MACT floor level of control for the storage vessels component of the source-wide MACT floor. The analysis also shows that the average vapor pressure of these tanks is 10.4 kPa (1.5 psia) and the average HAP weight percent in the liquid is 4. Therefore, only existing tanks storing liquids with vapor pressures greater than or equal to 10.4 kPa (1.5 psia) and HAP weight percents in the liquid greater than or equal to 4 are required to be controlled at the floor level of control. The best-controlled tanks store liquids with vapor pressures greater than 0.69 kPa (0.1 psia) and HAP weight percents in the liquid greater than 2. Therefore, new storage tanks with vapor pressures greater than or equal to 0.69 kPa (0.1 psia) and HAP weight percents in the liquid greater than or equal to 2 are required to controlled.

6.3.2 Selection of MACT for Storage Vessels

Comment: Three commenters (IV-D-46, IV-D-53, IV-D-57) supported Option 1 requirements (NSPS subpart Kb requirements for tanks with vapor pressures of 5.17 kPa (0.75 psia) or greater) for storage tanks as MACT. One commenter (IV-D-53) pointed out that Option 1 was less than the floor cost on a dollar per megagram of HAP controlled basis and the incremental cost per megagram of HAP controlled was less than the control cost for the floor or Option 1. The commenter (IV-D-53) concluded that because the provision was not cost prohibitive and Option 1 was the most cost-effective, it should be selected as MACT for existing sources. The commenter (IV-D-46) provided that the incremental value of Option 1 was below many used by the New Source Review Permitting Program to justify past additional best available control technology (BACT).

Several commenters (IV-D-09, IV-D-22, IV-D-25 and IV-F-1, IV-D-44, IV-D-51) objected to the Option 1 requirements for storage tanks. Three of the commenters (IV-D-09, IV-D-22, IV-D-51) supported the MACT floor level of control. Several commenters (IV-D-25 and IV-F-1, IV-D-36, IV-D-38, IV-D-44) stated that Option 1 would not be cost effective. One commenter (IV-D-25) contended that the cost effectiveness for Option 1 was underestimated, and that Option 1 could only be justified for existing fixed roof tanks. The commenter (IV-D-25) claimed that control beyond the floor for tanks already equipped with floating roofs could not be justified by reasonable cost effectiveness criteria. Three commenters (IV-D-36, IV-D-38, and API hearing/transcript) alleged the

$4,400/Mg ($3,990/ton) incremental cost estimate was low by an order of magnitude, and that it should be closer to $54,000/Mg ($48,990/ton) VOC. One commenter (IV-D-38) argued that the estimate was low because operating costs and the cost of lost capacity were not included. One commenter (IV-D-44) agreed with the API's finding that baseline emissions were only 59,000 Mg (65,000 ton) as opposed to the 111,000 Mg (122,400 ton) indicated by the EPA. Another commenter (IV-D-36) suggested that further study on this issue must be done. One commenter (IV-D-20) opposed the proposed requirements for storage vessels based on the cost impacts of $4,400/Mg ($3,990/ton) of HAP, and suggested that anything over $3,000/Mg ($2,720/ton) was unreasonable.

Response: The EPA agrees with some of the commenters that the cost estimates at proposal may have underestimated the cost of degassing and cleaning storage vessels, and do not include the cost of lost capacity because the EPA did not have cost algorithms or information to estimate this cost. Based on information supplied by the industry, the EPA considers the cost of lost capacity and the cost of degassing and cleaning storage vessels to potentially be very high and could substantially increase the incremental cost-effectiveness and average cost-effectiveness of Option 1. Therefore, the final rule only requires that existing storage vessels comply with the MACT floor level of control for the storage vessels component of the source-wide MACT floor, subpart Kb without fittings.

Comment: One commenter (IV-D-09) stated that there should be a de minimis HAP concentration exclusion for fixed-roof tanks that would exclude tanks that contain heavy, viscous hydrocarbon intermediates and products such as asphalt, which are stored at elevated temperatures to enable handling. The commenter (IV-D-09) stated that virtually all of these liquids have an initial boiling point above 600 $^{o}$F, and therefore contain no volatile HAP's. In addition, the commenter (IV-D-09) stated that these liquids could not be stored in an internal floating roof tank because of operation and maintenance problems if the heavy liquid product cooled and solidified.

Another commenter (IV-D-20) requested that the proposed rule contain provisions excluding tanks that have a HAP content of 5 percent or less by weight.

Response: The EPA considers that a vapor pressure cut-off of 10.4 kPa (1.5 psia) will exclude most materials with low HAP concentrations. However, the EPA agrees that some materials may have low HAP concentrations but also have high vapor pressures due to the volatility of non-HAP compounds in the material. Several products, such as asphalt, have minimal or no HAP's that may have vapor pressures above 10.4 kPa (1.5 psia) if stored at elevated temperatures. The EPA has evaluated the data supplied in the questionnaire responses and has concluded that a minimum HAP content requirement for the Group 1 storage vessel provisions is warranted. The final rule includes a 4 weight percent HAP requirement for existing Group 1 storage vessels and a 2 weight percent HAP requirement for new Group 1 storage vessels.

Comment: Three commenters (IV-D-10, IV-D-12, IV-D-15) urged the EPA to increase the applicability criterion for crude oil storage tanks from 34.4 kPa (5 psia) to 55 kPa (8 psia). The commenters (IV-D-10, IV-D-12, IV-D-15) contended that many of the hydrocarbons that add volatility to crude oil such as methane, ethane, and propane have little or no adverse health affects. The commenters (IV-D-10, IV-D-12, IV-D-15) asserted because of the presence of these hydrocarbons, crude oil storage tanks could become subject to complex recordkeeping and compliance burdens. The commenters (IV-D-10, IV-D-12, IV-D-15) concluded that increasing the true vapor pressure applicability criterion for crude oil storage tanks to 55 kPa (8 psia) would significantly reduce the cost burdens of the proposed rule without significantly decreasing the associated HAP emission reductions.

One commenter (IV-D-10) contended that the EPA should not base a set of regulations that would affect a large set of stored products with different characteristics on one product. The commenter (IV-D-10) stated that the EPA's selection of 34.4 kPa (5 psia) in the regulation would affect crude oil tanks and tanks storing intermediate blend stocks. The commenter (IV-D-10) objected to basing the crude oil storage requirements on an analysis of gasoline storage tanks with vapor pressures of 38.6 kPa (5.6 psia).

Response: The EPA believes the commenters are referring to a compliance schedule longer than 3 years for storage tanks storing crude oil. The final rule allows existing floating roof storage vessels storing materials with vapor pressures greater than or equal to 10.4 kPa (1.5 psia) and a HAP concentration greater than or equal to 4 percent to comply with the rule within 10 years after promulgation or at the next inspection period. Existing fixed roof vessels storing materials with vapor pressures greater than or equal to 10.4 kPa (1.5 psia) and a HAP concentration greater than or equal to 4 percent are still required to comply within 3 years after promulgation of the rule, unless a compliance extension is obtained under sec. 112 (i)(3)(B) of the Act. These changes were made to reflect the effect of emissions from premature degassing and cleaning of storage vessels. An analysis conducted by EPA shows that emissions from degassing and cleaning fixed roof tanks storing crude oil could be balanced under 3 years with the emissions reduction from implementing subpart Kb controls.

Comment: One commenter (IV-D-57) stated that new storage vessels should at a minimum meet all of the requirements for existing storage vessels from the San Francisco Bay area because the Bay Area has the most stringent storage vessel regulations, including being subject to fitting requirements as well as standards for seals. Additionally, the commenter (IV-D-57) stated that seals and fittings should be part of the inspection and maintenance program, and leak detection and repair programs, and the tanks should be subject to a pressure decay test for leaks prior to filling, similar to the testing proposed in the Gasoline Distribution rule. The commenter (IV-D-57) also stated that all pressure-relief valves on new storage vessels should be pilot-operated. The commenter (IV-D-57) also provided a list of storage controls that they contended should be required for existing sources.

One commenter (IV-D-54) stated that Group 1 storage tank requirements should include more actual monitoring with an OVA rather than visual inspection which can be easily falsified.

Response: EPA's MACT floor analysis for new sources shows that the best-controlled source has a level of control equal to subpart Kb for storage vessels. The EPA recognizes that State or local air pollution control agencies may have different requirements for controlling emissions from storage vessels than the requirements in subpart Kb because subpart Kb was promulgated for new sources. However, the EPA does not have information that equipment and controls mentioned by the commenters, such as OVA's and pressure decay tests, would achieve greater or equivalent control to what is required in subpart Kb. Without data to support the commenters' assertion, such as VOC or HAP control efficiency of these equipment and controls, the EPA cannot make a determination that the commenters' control requirements are equal to or more stringent than the control required in subpart Kb and therefore would be new source MACT.

Comment: One commenter (IV-D-54) requested a higher level of options be required for Group 2 storage tanks and strongly opposed the lack of proposed controls or inspections. One commenter (IV-D-54) recommended requiring controls on Group 1 storage tanks with a capacity of 500 gallons or more.

Response: The MACT floor analysis for storage vessels shows that (for existing sources) the best-controlled 12 percent of sources have an average level of control equal to subpart Kb (without fittings) for tanks storing liquids with vapor pressures greater than or equal to 10.4 kPa (1.5 psia) and capacities greater than or equal to 177 $m^3$ (46,760 gallons). The average level of control for tanks storing liquids with vapor pressures less than 10.4 kPa (1.5 psia) and capacities less than 177 $m^3$ (46,760 gallons) is no control. The MACT floor analysis also shows that (for new sources) the best-controlled storage vessels have control equal to subpart Kb for tanks storing liquids with vapor pressures greater or equal to 3.4 kPa (0.5 psia) and capacities greater than or equal to 151 $m^3$ (40,000 gallons). The EPA analyzed options above the floor level of control based on the statutory criteria in the Act. The results of the analysis showed that options above the floor level of control (i.e., control of Group 2 tanks) were not cost-effective. The lack of cost effective options beyond the floor prevented the EPA from requiring more stringent control than the existing source and new source MACT floor levels of control. Therefore, control of Group 2 storage tanks was not required in the rule.

Comment: One commenter (IV-D-29) stated that the proposed standards for existing storage vessels were too strict. The commenter (IV-D-29) claimed that it would be too difficult to make old tanks vapor tight.

Response: The requirements of the storage vessel provisions were set at the MACT floor. A lower stringency that would still meet the requirements prescribed in the Clean Air Act is not possible. For existing storage vessels the rule requires that liquids with a vapor pressure of 10.4 kPa (1.5 psia) or greater be stored in internal or external floating roof vessels meeting the specifications of §§ 63.646 or the vapors from fixed roof tanks be collected and routed to a control device achieving 95 percent reduction of HAP's. The collection system must be monitored for leaks according to § 63.648. There are no specific requirements for monitoring emissions from vessels. If existing internal or external floating roof tanks do not meet the specifications in § 63.646 or the vapor collection system used with the control device leaks as defined in § 63.648, repairs must be made. The EPA would also like to clarify that the rule does not require that tanks be tested for vapor tightness.

6.4 COMPLIANCE SCHEDULE FOR EXISTING STORAGE VESSELS

Comment: Many commenters (IV-D-06, IV-D-09, IV-D-10, IV-D-11, IV-D-12, IV-D-19, IV-D-20, IV-D-22, IV-D-25 and IV-F-1, IV-D-38, IV-D-42, IV-D-44, IV-D-50, IV-D-51) opposed the EPA's decision to require floating roof tanks storing liquids with vapor pressures above 5.0 psia to achieve compliance in three years. The commenters (IV-D-06, IV-D-09, IV-D-10, IV-D-11, IV-D-12, IV-D-19, IV-D-20, IV-D-22, IV-D-25 and IV-F-1, IV-D-38, IV-D-42, IV-D-44, IV-D-50, IV-D-51) objected to the 3-year compliance schedule for various reasons, including consistency with other regulations, alleged emissions increases, and cost and supply considerations. Recommendations for compliance times ranged from at the next scheduled tank maintenance to 10 years from promulgation.

Several commenters (IV-D-06, IV-D-10, IV-D-11, IV-D-19, IV-D-22, IV-D-25, IV-D-38, IV-D-51) argued that a 10-year compliance period for floating roof tanks would be consistent with the intent and purpose of the Clean Air Act, the HON storage tank requirements, and the Benzene Storage NESHAP to reduce HAP emissions. Two commenters (IV-D-11, IV-D-25) added that a 10-year compliance period should be an integral part of the MACT floor requirements for storage vessels because it has been included in all previous federal regulations affecting storage tanks at refineries.

Several commenters (IV-D-20, IV-D-22, IV-D-25, IV-D-42, IV-D-50) recommended that affected facilities should be allowed to retrofit tanks with the required controls at their next scheduled maintenance.

One commenter (IV-D-22) asserted that the proposed control requirements for storage vessels are in conflict with the applicable compliance dates in subpart CC. The commenter (IV-D-22) provided language to resolve this conflict.

Several commenters (IV-D-09, IV-D-11, IV-D-10, IV-D-19, IV-D-25, IV-D-51) asserted that a 3-year compliance schedule would result in increased HAP and VOC emissions. One commenter (IV-D-11) explained that under normal circumstances, tanks are inspected infrequently for corrosion because corrosion rates are low and because tank cleaning and degassing results in emissions of VOC's. The commenter (IV-D-11) referenced a study done by API (commenter IV-D-25) to explain that higher emissions would occur because storage tanks would be degassed and inspected earlier than scheduled resulting in emissions from an additional degassing and cleaning cycle. One commenter (IV-D-10) contended that the 3-year compliance period was based on an incomplete analysis done for the gasoline distribution MACT rule. The commenter (IV-D-10) stated that because the 3-year compliance period would come sooner than the typical 10-year cleaning cycle, the EPA attempted to calculate the number of years it would take to balance the emissions that would be emitted as a result of tank cleaning and degassing with the emission reductions that would be achieved because of the earlier retrofit. The commenter (IV-D-10) asserted that for this analysis, the EPA did not include emissions that may come from the handling of sludge removed from the tank bottom. The commenter (IV-D-10) concluded that the incompleteness of the analysis invalidates the EPA's conclusions because the tank cleaning process could generate sludge that is 90 percent liquid. The commenter (IV-D-10) recommended re-doing the analysis with an estimate of the emissions from sludge handling. One commenter (IV-D-25) performed an analysis of emissions from degassing of tanks in order to apply controls within 3 years versus allowing vessels to wait 10 years or until a scheduled degassing. The commenter (IV-D-25) concluded that it would take several years of control to offset the emissions caused by an earlier degassing. The same commenter (API hearing/transcript) said that their analysis showed that for IFR vessels storing gasoline, the proposed 3-year MACT requirements would not result in a net emission reduction benefit. One commenter (IV-D-11) stated that internal floating roof tanks controlled with subpart Kb rim seals and storing gasoline would require more than 5 years of added emission control to offset degassing and cleaning emissions from these tanks, and the years required for liquids other than gasoline would be longer. One commenter (IV-D-19) estimated a compliance schedule of more than five years would be required to balance tank cleaning emissions for a typical floating roof gasoline storage tank.

One commenter (IV-D-57) asserted that emissions reductions from tanks not currently meeting the NSPS would more than offset the HAP emissions from degassing and cleaning during installation of new controls, if the requirement is imposed within three years rather than at the scheduled maintenance. However, the commenter (IV-D-57) stated that tanks that currently meet control standards may not have substantial emissions reductions; therefore their reductions may not offset the emissions from degassing and cleaning. The commenter (IV-D-57) recommended allowing tanks that meet a certain level of control to delay compliance with the NESHAP until the scheduled maintenance date.

Several commenters (IV-D-19, IV-D-21, IV-D-25, IV-D-44) stated that the 3-year compliance schedule would be cost prohibitive. One commenter (IV-D-25) estimated that it would cost from $167,000 to $323,000/Mg ($151,500 to $293,000/ton) of HAP to meet the subpart Kb rim seal requirements, including the degassing, cleaning, and inspection costs associated with a 3-year compliance time. Two commenters (IV-D-21, IV-D-25) contended that, as an option above the floor, this would not be cost effective. One commenter (IV-D-44) asserted that the 3-year compliance schedule was a needless burden which would control small risks.

One commenter (IV-D-11) referenced cost estimates made by API showing that upgrading internal floating roof tanks storing gasoline to NSPS subpart Kb rim seal requirements would result in a cost-effectiveness ranging from $170,000 to

$320,000/Mg ($151,500 to $293,000/ton) of HAP reduced. The commenter (IV-D-11) stated that the costs did not include disruptions to operations that could occur from forcing tanks to adhere to a 3-year compliance schedule. Based on these estimates, the commenter (IV-D-11) concluded that there was no justification for requiring a 3-year compliance on internal floating roof tanks storing gasoline.

Several commenters (IV-D-09, IV-D-11, IV-D-19, IV-D-22, IV-D-25, IV-D-51) argued that a 3-year compliance schedule would disrupt gasoline and fuel supplies to the public because the refinery MACT compliance period overlaps with RFG implementation. The commenters (IV-D-09, IV-D-11, IV-D-22, IV-D-25 and IV-F-1, IV-D-51) explained that refiners subject to RFG requirements will have additional oxygenated and reformulated gasoline grades that will add to the number of products handled at many refineries, thereby compounding the storage tank availability problem. One commenter (IV-D-25 and API hearing/transcript) stated that having different compliance times based on vapor pressure would cause complications for refineries that frequently change crude oil sources and change the feedstock they store in their tanks.

Several commenters (IV-D-06, IV-D-11, IV-D-25, IV-D-51) noted that the 3-year compliance schedule in the proposed refinery MACT overlaps with the HON, the gasoline distribution NESHAP, and many new State rules. These commenters (IV-D-06, IV-D-11, IV-D-25, IV-D-51) asserted that the result of having so many overlapping compliance schedules will be that there will not be enough trained and capable fabricators and contractors to support tank modification work.

Several commenters (IV-D-20, IV-D-42, IV-D-50 and IV-F-1) urged the rule to be revised to allow small refineries to make required tank modifications and upgrades during scheduled maintenance. Two commenters (IV-D-20, IV-D-50 and Hearing/Ensign) stated that the proposed 3-year storage tank compliance schedule is beyond the reach of small refineries to comply with without adversely affecting fuel supplies to the general public. The commenters (IV-D-20, IV-D-50 and IV-F-1) said this would be consistent with the HON rule.

Additionally, one commenter (IV-D-50) provided the following reasons for not supporting the proposed 3-year storage tank compliance schedule: 1) small refineries have twice as many tanks to retrofit as the industry at large, 2) heavy summer/winter demand because of vacationers, 3) temporary product shortages and subsequent price increases sometimes occur, and 4) for refineries located in colder climates, tank modifications can only be done during warmer months. One commenter (IV-D-46) did not support an extension of the compliance period for storage vessels beyond the three years required in the proposed rule. The commenter (IV-D-46) provided that the New Source Permitting Review in Texas rarely allows more than three years to commence installation of pollution controls equipment.

Response: The EPA recognizes the concerns of the commenters and has revised the final rule to allow some storage vessels to comply with the rule 10 years after promulgation or at the next inspection period. A study of the emissions from degassing and cleaning storage vessels was analyzed using theoretical models developed by the EPA. The analysis showed that significant emissions of HAP's occur from degassing and cleaning activities such that the emissions cannot be balanced in a reasonable amount of time for floating roof vessels by the emission reductions from complying with subpart Kb without fittings. The analysis also showed that emissions from degassing and cleaning fixed roof vessels could be balanced under one year by the emission reductions from complying with subpart Kb without fittings. Based on the results of this analysis, the compliance time requirements have been modified for floating roof vessels to be within 10 years or at the next inspection and maintenance activity, whichever comes first. The compliance for fixed roof vessels is still 3 years unless a compliance extension is obtained under sec. 112 (i)(3)(B) of the Act.

## 6.5 WORDING OF STORAGE VESSEL PROVISIONS

Comment: One commenter (IV-D-25) suggested clarification of the provisions for guide poles for new storage tanks. The commenter (IV-D-25) suggested requiring a pole wiper, which they characterized as a new control technique that goes beyond the requirements of HON and subpart Kb, and is cost effective. The commenter (IV-D-25) also recommended that pole sleeves be allowed as an option to provide flexibility.

Response: The EPA is evaluating the use of polewipers and pole sleeves. After review, if the EPA has determined that these controls are appropriate, revisions to the NSPS to allow them will be proposed.

Comment: One commenter (IV-D-21) pointed out that § 63.646 as written required covers, lids, rim vent spaces and automatic bleeder vents closed at all times. The commenter (IV-D-21) assumed that the EPA meant these requirements to only apply to Group 1 storage vessels and suggested that this be clarified.

Response: The commenter is correct. The final rule has been clarified to only require covers, lids, rim vent spaces and automatic bleeder vents closed at all times for Group 1 storage vessels.

Comment: One commenter (IV-D-25) stated that the approach of cross-referencing the HON storage provisions and then listing modifications and exceptions was confusing.

Response: The EPA recognizes the HON is a large and complex rule. The EPA decided to cross reference the refinery rule requirements to the HON as well as the Benzene Waste NESHAP to reduce repetition in the rule and the size of the rule. The EPA contends that cross-referencing allows the rule to be more easily read and is not a burden on sources. However, the EPA has further clarified and simplified the requirements in the final rule by providing clarifying language where necessary, and by providing tables summarizing the recordkeeping and reporting requirements.

# 7.0 WASTEWATER PROVISIONS

## 7.1 DEFINITION OF WASTEWATER

Comment: One commenter (IV-D-21) suggested that "feed" be deleted from "feed tank drawdown" in the definition of wastewater.

Response: The term "feed tank drawdown" used in the definition for wastewater is used as an example of a wastewater stream. This does not mean that any other type of tank drawdown is not a wastewater. Because the commenter feels that this would add some clarity to the rule, this change has been made.

Comment: One commenter (IV-D-29) suggested that all wastewater systems in refineries handling only heavy crude oil be exempt because they do not have significant VOC emissions, especially small refineries.

Response: The EPA contends that the exemption provided for refineries with a TAB less than 10 Mg (11 tons) allows refineries without significant wastewater HAP or VOC emissions to be exempt from this regulation. Because composition and emissions from heavy crude oil vary from refinery to refinery, the EPA is continuing to base exemptions on quantifiable parameters (i.e., flow rate and concentration) as used in the BWON.

Comment: One commenter (IV-D-51) stated that Group 1 and Group 2 wastewater emission points are referenced in § 63.640(l)(2)(ii) but are not included in the definitions in § 63.641. The commenter (IV-D-51) recommended correcting this problem.

Response: The final rule clearly distinguishes requirements for Group 1 and Group 2 wastewater streams, and also provides separate definitions for them. The term "emission point" is also defined to mean an individual process vent, storage vessel, wastewater stream, or equipment leak. Thus, a Group 1 emission point includes a Group 1 wastewater stream.

## 7.2 IMPACTS ANALYSIS

### 7.2.1 Database

Comment: One commenter (IV-D-29) suggested that the EPA review its database for heavy oil refineries regarding wastewater streams and the controls already imposed on them.

Response: The database did consider controls in place at heavy oil refineries. Many heavy oil refineries, which tend to be small refineries and which would be expected to have lower emissions of benzene and other HAP relative to full-range crude oil refineries, may be exempt from this regulation due the 10 Mg (11 tons) TAB criterion. Additionally, this regulation does not impose any further control than already required by the BWON; neither does this regulation exempt a refinery from current applicable requirements of other rules, including the BWON.

7.2.2 Cost Impacts

Comment: One commenter (IV-D-49) urged the EPA to use the actual compliance costs associated with the Benzene Waste NESHAP. The commenter (IV-D-49) stated that the EPA estimated capital costs to be $250 million, but that actual costs were approximately $2 billion, almost 10 times the EPA estimate. Another commenter (IV-D-25, IV-F-1) stated that control experience shows that cost-effectiveness of wastewater control options above the floor are higher than EPA estimated. The commenter (IV-D-25) used data from 9 companies on the costs of complying with the benzene NESHAP. The commenter (IV-D-25) found control cost effectiveness in the range of $2,000/Mg ($1,800/ton) to $1,200,000/Mg ($1,088,500/ton) of BTEX for individual control options within each refinery, and costs from $2,500 to $1,500,000/Mg ($2,270 to $1,361,000/ton) of BTEX for the 9 refineries as a whole. The commenter (IV-D-25) also noted that costs are likely to be higher for facilities with low initial TAB ($100,000 to $1,000,000/Mg ($90,700 to 907,100/ton) of HAP). Two commenters (IV-D-25 and IV-D-49) cited the following as reasons their cost analysis results in higher numbers than the EPA's analysis:

- it is based on real-life costs incurred by existing facilities,
- the amount of benzene and HAP emissions that would be controlled at the nine refineries is lower than EPA might estimate, because some control and recycling is already in place, and the uncontrolled streams have lower emissions,
- control options other than steam strippers were examined by the commenter.

One commenter (IV-D-06) added that the total cost of compliance, including drain and sewer sealing, waste treatment units, vapor control devices, monitoring, reporting and administrative costs is double that of the EPA's estimate.

Response: The MACT floor level of control for the refinery wastewater stream component of the source-wide floor was determined to be control equivalent to the BWON. The EPA cannot legally require control that is less stringent than the MACT floor. Based on the EPA's current cost estimating approach, the EPA determined that controls more stringent than the BWON would not be cost effective.

7.2.3 Emissions Impacts

Comment: One commenter (IV-D-49) stated that it appears that the EPA is over-estimating HAP emissions from petroleum refinery wastewater operations in a manner similar to the over-estimate made for the Benzene Waste NESHAP.

Response: Emission estimates were developed based on section 114 questionnaire responses, 90-day BWON reports and equilibrium calculations. The EPA has endeavored to use actual operating data whenever possible. When estimates and assumptions were required, sound engineering judgement and accepted practices were employed. The EPA contends that the emissions estimates developed are quite representative of typical conditions and should more closely approximate actual conditions due to the data from industry surveys.

## 7.3 SELECTION OF MACT FLOOR AND MACT FOR WASTEWATER

### 7.3.1 Use of Benzene as a Surrogate

Comment: One commenter (IV-D-19) agreed with the 1/4 ratio for the relationship of benzene to other HAP's that the EPA determined. One commenter (IV-D-52) disagreed with the ratio, stating that the concentration ratio of benzene to other HAP's may differ greatly in various wastewater streams. The commenter (IV-D-52) was concerned that for streams with low benzene loading but high loading of other HAP's, those HAP's will be unregulated.

Response: For emissions and cost estimating, ratios of benzene concentration to HAP concentration were developed for wastewater streams from various process units. The ratios were developed from section 114 questionnaire responses and 90-day BWON reports and are reflective of actual reported wastewater stream concentrations. Based on these data, wastewater from petroleum refinery process units, except for product blending and MEK dewaxing units, have a HAP-to-benzene ratio about 4 to 1. Product blending and MEK dewaxing units have higher HAP-to-benzene ratios. For product blending, however, the levels of HAP and benzene are relatively low with this unit contributing less than one percent of the total HAP emissions (including benzene). For MEK dewaxing units, MEK is added; therefore, the 4-to-1 HAP-to-benzene ratio does not appropriately represent this unit. However, the benzene concentration from these units is greater than 10 ppmw; therefore, the streams would be controlled, making the HAP-to-benzene ratio irrelevant.

Comment: Several commenters (IV-D-06, IV-D-15, IV-D-22, IV-D-25 and IV-F-1, IV-D-30, IV-D-36, IV-D-38, IV-D-44, IV-D-51) supported the EPA's conclusion that benzene is a good surrogate for other volatile HAP's in refinery process unit wastewater. One commenter (IV-D-25) referred to EPA analyses in the docket to support this position. The commenter (IV-D-25) stated that uncontrolled HAP in refineries controlled by the benzene waste NESHAP, and HAP in refineries exempt from the benzene waste NESHAP, are "insignificant."

One commenter (IV-D-46) disagreed with using benzene as a surrogate for other HAP's in wastewater. The commenter (IV-D-46) contended that using benzene only does not define the components of a wastewater stream. Additionally, the commenter (IV-D-46) claimed that benzene has a short residence time and may give a lower than actual organics concentration. The commenter (IV-D-46) stated that if benzene is used as a surrogate for other HAP's in wastewater, no definition of a wastewater stream's components will be available to determine the hazard of the mixture so that it could be included in emissions averaging. Additionally, the commenter (IV-D-46) pointed out that no information would be available on the stream's non-organic HAP content. The commenter (IV-D-46) provided that the State of Texas requires an accurate inventory of emissions for public disclosure and assessing fees.

Response: The EPA believes that benzene is an acceptable surrogate for predicting the presence of other HAP's in petroleum refinery wastewater streams. The EPA used the available technical information, within time and resource constraints, to develop an organic HAP-to-benzene ratio for a certain limited number of model streams where data on the presence of all organic HAP's were not available. For the purpose of assessing nationwide emissions and control options--including the floor--this approach adequately characterizes the wastewater stream. The EPA would like to emphasize that the HAP-to-benzene ratio does account for the presence and emissions of other organic HAP's and that this relationship was developed at the point of generation of the wastewater streams before losses could occur. Docket item II-B-10 contains additional information on benzene as a surrogate. Additionally, this regulation does not mandate that emissions averaging be used. If an owner or operator elects to use emissions averaging, further testing on wastewater streams will be required. The EPA also has no data to indicate that inorganic HAP's are emitted to the atmosphere from petroleum refinery wastewater streams.

Comment: One commenter (IV-D-52) suggested that the EPA select 5 to 10 compounds to represent groups of HAP's with similar characteristics because they felt that benzene loading is not a comprehensive indicator of all HAP emissions from wastewater treatment at a refinery. The commenter (IV-D-52) continued that chemically and structurally benzene is quite different from HAP's which are aliphatics and those which have chloride and nitro groups.

Response: The EPA contends that benzene is an acceptable surrogate for HAP's in petroleum refinery wastewater streams. As stated in the preamble, data shows that the HAP compounds found in petroleum refinery wastewater are very similar in structure and volatility to benzene. The EPA points out that the predominant HAP's found in petroleum refinery wastewater are benzene, toluene, ethylbenzene and xylene, none of which have chloride or nitro groups. The data contained in the section 114 questionnaire responses confirms the EPA's conclusion that there is a strong correlation between benzene and the other organic HAP's.

### 7.3.2 Selection of the Wastewater Component of the Source-Wide MACT Floor

Comment: Five commenters (IV-D-30, IV-D-33, IV-D-36) (IV-D-38, IV-D-44) supported the use of the benzene waste NESHAP's control strategy as an appropriate floor for wastewater HAP's. One commenter (IV-D-49) recommended that the MACT floor for wastewater operations not be more stringent than the Benzene Waste Operations NESHAP.

One commenter (IV-D-44) claimed that the Benzene Waste Operations NESHAP is more stringent than the refinery MACT floor needs to be. However, the commenter (IV-D-44) still endorsed the selection as MACT floor because it is in place and risk analysis does not justify any new controls.

Response: The wastewater component of the source-wide MACT floor was developed using data in 90-day BWON reports. The approach followed the requirements established by the Clean Air Act. The EPA contends that the BWON is the wastewater component of the source-wide floor and represents the average emission limitation achieved by the best performing 12 percent of existing sources. In fact, more than 12 percent of existing sources are complying with the BWON.

### 7.3.3 Selection of MACT for Wastewater Streams Requiring Control

Comment: Several commenters (IV-D-06, IV-D-10, IV-D-11, IV-D-22, IV-D-42, IV-D-50, IV-D-51, IV-F-1) supported the Benzene Waste NESHAP as the MACT standard for wastewater HAP emissions. The commenters (IV-D-06, IV-D-11, IV-D-10, IV-D-22, IV-D-51) asserted that control beyond the BWON is not cost-effective. Four commenters (IV-D-19, IV-D-33, IV-D-36, IV-D-38) expressed support for API's study concluding that controls above the BWON floor are cost ineffective and are actually higher than the EPA estimated.

One commenter (IV-D-06) stated that the drain controls specified in the BWON are appropriate and no additional benefit would be gained by imposing stricter drain control standards. One commenter (IV-D-20) agreed with the EPA that the controls required by Benzene Waste Operations NESHAP also control other HAP in wastewater streams present at petroleum refineries.

Two commenters (IV-D-21, IV-D-19) concluded that the uncontrolled emissions remaining after applicable refineries achieve the BWON level of control would be insignificant and therefore it would not be cost effective to control beyond the BWON level of control.

One commenter (IV-D-48) demanded wastewater controls at all facilities. The commenter (IV-D-48) cited the EPA as stating that 43 percent of refineries are controlled to the level required by the BWON. The commenter (IV-D-48) concluded that more than 12 percent of the sources are controlled. The commenter (IV-D-48) stated that the EPA must also require emission reductions from wastewater streams in facilities not required to be controlled to the level required under the BWON. Another commenter (IV-D-53) disagreed with the EPA's determination that the BWON, which includes the 10 Mg (11 tons) TAB applicability cutoff, should be existing source MACT. The commenter (IV-D-53) asserted that the control requirements of the BWON without the 10 Mg (11 tons) TAB cutoff (control Option 1 above the floor) should be existing source MACT. The commenter (IV-D-53) contended that the BWON, with the 10 Mg TAB cutoff, is less stringent than the average emissions limitations achieved by the best performing 12 percent of existing sources because, based on the EPA's analysis, more than 12 percent of existing sources achieve the emissions limitation required by the BWON. One commenter

(IV-D-36) supported the application of the proposed regulation to only refineries with a TAB of 10 Mg (11 tons) or greater. One commenter (IV-D-52) recommended that the benzene loading limit be lowered from the proposed 10 Mg/year (11 tpy) to 1 Mg/year (1.1 tpy) to reduce other HAP's along with benzene.

Response: The exemption from the wastewater provisions for refineries with a TAB less than 10 Mg (11 tons) was determined to be the wastewater component of the source-wide MACT floor. The 43 percent of refineries that are controlled have TAB greater than 10 Mg (11 tons). No information is available that indicates that refineries with TAB less than 10 Mg (11 tons) are controlled to the same level; thus control of such refineries is not part of the floor. Also, there is no information that the top 12 percent of the refineries control benzene wastes to less than 10 Mg (11 tons). The analyses concluded that the cost of control of going beyond the floor (e.g., controlling refineries with less than 10 Mg (11 tons) TAB) is unreasonable. The commenters did not provide additional data to support their positions, therefore, the EPA has no basis for lowering or removing this criterion.

Comment: One commenter (IV-D-53) disagreed with the EPA's determination that the BWON with the 10 Mg (11 tons) benzene applicability cutoff is new source MACT. The commenter (IV-D-53) asserted that the control requirements of the BWON without the 10 Mg (11 tons) benzene cutoff (Option 1) is new source MACT. The commenter (IV-D-53) argued that the only refinery in Wisconsin will be required (by 1995) to control HAP emissions from wastewater units in a manner essentially equivalent to the BWON. The commenter (IV-D-53) stated that before the proposed regulation is promulgated, an existing facility will be achieving an emissions limitation that is lower than the current definition of new source MACT.

The commenter (IV-D-53) cited the 1990 Amendments as requiring a new source standard to be at least as stringent as the best performing source. The commenter (IV-D-53) provided a copy of Wisconsin's wastewater control requirements.

Response: The EPA has reviewed the emission limitations to be imposed on the facility and has found them to be no more stringent than those required by the BWON. As argued by the commenter, the specific emission suppression and control techniques for waste management units are the same as under the BWON. Although the commenter did not supply sufficient data to support the claim that the 10 Mg (11 tons) TAB cut-off should not apply to new source MACT, the EPA was still able to examine the applicability requirements of the controls to be put in place. Based on the available data, the applicability of such requirements is not more strict than the BWON. Exemption levels from streams at the refinery in question are, in fact, more lenient than exemption criteria in the BWON; therefore, the requirements in question do not form the basis of new source MACT.

#### 7.3.3.1 Selection of Wastewater Streams Requiring Control.

Comment: Two commenters (IV-D-13, IV-D-57) recommended that a more stringent limit of 5 ppmw of VOC in wastewater be required for existing and new sources. One commenter (IV-D-13) contended that under the AQMD rule 1176 if the VOC content of the inlet liquid to a sump or wastewater separator is 5 ppmw or more, the equipment should be subject to control requirements.

Response: The EPA holds firm in its position that applicability determinations for wastewater emission controls under the NESHAP program must be made at the point of generation before concentrations possibly become reduced from dilution or volatilization. Concentration measurements made at the sump may be subject to these limitations, especially given the variability of collection sewer configurations from refinery to refinery. Even the use of a lower threshold concentration (e.g., 5 ppmw) would not necessarily achieve a more stringent or even a consistent MACT control level across all subject refineries because of the inherent wastewater system differences.

7.3.3.2 Selection of MACT Technology.

Comment: One commenter (IV-D-36) requested that air stripping be allowed as an alternative to steam stripping. The commenter (IV-D-36) contended that air stripping can be an effective means of HAP reduction as well as provide significant cost and energy savings.

Response: This regulation does not restrict petroleum refineries to steam stripping as the only acceptable control technology for wastewater emissions. Any technology that meets the reduction requirements of the regulation is acceptable.

7.4 COMPLIANCE DEMONSTRATION FOR WASTEWATER

Comment: One commenter (IV-D-36) requested clarification that reduction of TAB to below 10 Mg (11 tons) is an acceptable level of control for MACT compliance. The commenter (IV-D-36) requested clarification regarding the timing of TAB reduction required for MACT compliance.

Response: If a source has already reduced its TAB to less than 10 Mg (11 tons) for compliance with the BWON, then that source is, in fact, achieving the MACT requirements of this regulation.

# 8.0 EQUIPMENT LEAKS PROVISION

## 8.1 DEFINITION OF EQUIPMENT LEAKS

Comment: One commenter (IV-D-40) requested clarification of the term "tubing" used in the refinery regulation. The commenter (IV-D-40) stated that it should be stated in the rule that "tubing" means pipe, and that construction of piping standards normally specify "seamless" or "welded" tubing with certain wall thicknesses, welding techniques, etc.

Response: The term "tubing is not used in the refinery rule. However, it is part of the definition of hard-piping in the HON, which is referenced throughout the refinery rule. The EPA would like to clarify that the term hard-piping in the HON has been corrected to mean piping or tubing that is manufactured and properly installed using good engineering standards, such as ANSI B31-3. The EPA considers this correction to specify requirements for piping and tubing.

Comment: Two commenters (IV-D-09, IV-D-10) supported changing the definition of light liquid. One commenter (IV-D-10) asserted that the definition of light liquid service should be consistent with NSPS subpart GGG, that is "equipment in light liquid service if the percent evaporated is greater than 10 percent at 150 $^{o}$C (302 $^{o}$F) as determined by ASTM Method D-86." The commenter (IV-D-10) stated that this definition would facilitate the use of the ASTM test data when the vapor pressure data are not available, and be consistent with other rules. Another commenter (IV-D-09) supported changing the definition because refineries have distillation information but rarely have detailed speciation data to satisfy the current definition. The commenter (IV-D-09) also stated that the cost of running ASTM methods for distillation is usually much less than running a complete GC/MS analysis to speciate the stream.

Response: The EPA agrees with the commenters and has decided to revise the definition of light liquid to cross-reference the NSPS subpart GGG definition.

Comment: One commenter (IV-D-57) recommended clarifying whether measurements at the interface of equipment refers to touching the component or as close as possible to the component. The commenter (IV-D-57) expressed concern that industry sources believe interface to mean 1 cm (0.39 in) away from the component. The commenter (IV-D-57) also stated that usage of the 1993 correlation equations emissions with the 1 cm (0.39 in) interface measurements may understate emissions by a factor between 2 and 7. The commenter (IV-D-57) recommended defining the term interface and include a maximum allowable stand-off from the component. The commenter (IV-D-57) recommended 1 cm (0.39 in) as the limiting distance, and also recommended that any correlation equations published by the EPA be based on the 1 cm stand-off.

Response: The EPA does not consider it necessary to specify the leak measurement distance. The rule references Method 21 as the basis for measuring emissions. Method 21 specifies that measurements with a hydrocarbon analyzer be made at the interface, i.e., 0 cm from the leak, unless the monitored equipment has moving parts. If the equipment has moving parts, such as a pump or compressor, a farther distance is allowed for safety reasons.

The EPA would also like to clarify that all correlation equations and emission factors developed by the EPA were based on measurements at a 0 cm distance from the leak.

Comment: One commenter (IV-D-22) requested that the EPA define "in organic service" to be consistent with the HON.

Response: The EPA has revised the final rule to include "in organic HAP service" in order to reduce confusion in the rule.

Comment: One commenter (IV-D-30) requested an explanation of what an "agitator" in a petroleum refinery is.

Response: The proposed rule required affected sources to comply with the requirements of § 63.169 of subpart H. The requirements in this section apply to equipment in heavy liquid service, and agitators. Agitators are primarily used for mixing in batch operations. These type of operations are not typical in petroleum refineries. The final rule clarifies that affected sources must comply with § 63.169 of subpart H, except for the agitator provisions.

Comment: One commenter (IV-D-25) suggested the definition of "process unit shutdown" be changed so that unscheduled events that stop production for less than 72 hours are not considered shutdowns. The commenter (IV-D-25) stated that a longer time than 72 hours would be required to safely make repairs when working with high temperature and high pressure refinery equipment. Another commenter (IV-D-21) agreed with the definition of "process vent shutdown".

Response: The definition of "process unit shutdown" is taken from subpart H of this part, and includes the following language: " Process unit shutdown is a work practice or operational procedure that stops production from a process unit or part of a process unit during which it is technically feasible to clear process material from a process unit or part of a process unit consistent with safety constraints and during which repairs can be affected." This language allows sources to not make a repair even if more than 24 hours have elapsed if they can show that it is not technically feasible or safe to make the repair. Until more detailed information is received that shows why a change is needed, EPA does not believe that it would be appropriate to revise the definition as suggested.

Comment: One commenter (IV-D-21) pointed out that the phrase "organic monitoring device" was not used in the proposal and suggested that it be deleted from the definitions. The commenter (IV-D-21) requested that if the phrase is not deleted, gas chromatographs should also be listed, as they work under the same principles.

Response: The commenter is correct. "Organic monitoring device" was defined in the proposed rule, but never used in the provisions. The EPA deleted the phrase from the final rule.

8.2 EMISSION CONTROL TECHNOLOGY (GENERAL)

Comment: One commenter (IV-D-47) requested that EPA consider revising Method 21 specifications to allow trial of newer and better adapted leak detection technologies. The commenter (IV-D-47) contended that OVA's do not perform well at concentrations levels of 1,000 and 500 ppm. The commenter (IV-D-47) specifically stated that at these concentrations, the OVA readings become unstable and are not reproducible because variations in sample intake may occur and because leaks are not well-mixed systems. The commenter (IV-D-47) stated that the solution to this problem is to allow the use of leak sensing equipment whereby the leak sensing element is brought into close proximity to the leak rather than conveying escaped gas from the leak to the leak sensor by means of a sample pump. The commenter (IV-D-47) stated that this would result in a zero sample intake rate, which results in accurate, reproducible, and reliable test results, and will also reduce the variations in test results caused by wind and operator technique. The commenter (IV-D-47) supplied results of an experiment demonstrating variability in sample intake. The commenter (IV-D-47) provided an example of a zero intake leak sensing device.

Response: The EPA recognizes that there are a variety of combinations of sampling and analytical methods that can be used to detect leaks, some of which will be more sensitive to small leaks than others. Method 21 is not limited to one detection principle, but to change Method 21 in the manner suggested by the commenter could affect the stringency of the standard, and thus would not be acceptable. The commenter is referred to the General Provisions (40 CFR part 63, subpart A), which provides a mechanism for requesting an alternative monitoring method, and to Method 301, which discusses requirements for validating alternative testing or monitoring techniques.

Comment: One commenter (IV-D-44) suggested that a provision similar to the one set forth in § 63.177 be included to allow alternative means of leak detection approved by the EPA to be utilized. Two commenters (IV-D-19, IV-D-25) requested that the refinery NESHAP be changed to incorporate the "alternative means of emission limitation" provisions in §§ 63.177, 63.178, and 63.179 of HON in order to allow flexibility.

Response: The EPA would like to clarify that §§ 63.177 through 63.179 of subpart H do not involve the monitoring instrument alternative standards. Sections 63.177 through 63.179 provide alternative standards for batch operations, building controls, and provide a mechanism for either a manufacturer of equipment or sources to petition for alternative standards. The General Provisions (40 CFR part 63, subpart A) already provides opportunity for alternate means of emission limitation; therefore, referencing these sections from subpart H is not necessary. However, in order to clarify any confusion that may arise, the EPA has decided to reference §§ 63.177 and 63.179 of subpart H. Section 63.178 was not included because it applies to batch processes. The EPA does not consider batch processes to be applicable to the refining industry.

## 8.3 IMPACTS ANALYSIS

### 8.3.1 Cost Impacts

Comment: One commenter (IV-D-22) contended that the cost estimate for equipment leaks was flawed. The commenter (IV-D-22) objected that an option above the floor requiring more stringent control was determined to be less costly than the floor. The commenter (IV-D-22) stated that in developing costs, the EPA substituted a fivefold increase in repairs and the potential for a threefold decrease in monitoring for the provisions of the petroleum refinery NSPS floor. The commenter (IV-D-22) asserted that because the negotiated rule has a leak definition that is 5 times stricter than the NSPS the chance for reduced monitoring will be eliminated. Therefore, the commenter (IV-D-22) argued that such provisions must necessarily require more frequent repairs than the petroleum refinery NSPS and cannot be less expensive than the NSPS. The commenter (IV-D-22) concluded that because costs have been erroneously estimated, the EPA has not met the statutory requirement of considering cost for above the floor options.

Response: The EPA used the best information available to estimate costs. Cost information was obtained from surveys sent to equipment leak control vendors and refineries, and previously developed costs presented in the Equipment Leaks Enabling document. If cost information were supplied by commenters, the EPA would consider this new information to reassess its costs. No information was provided by the commenter.

However, the EPA agrees that enough question in the emissions estimate exists, and therefore the credit from controlling emissions, due to possible overestimates from the equipment leak emission factors that Option 1 may not be a better option. Therefore, the final rule allows sources to comply with the requirements in subpart VV (equivalent to the petroleum refinery NSPS [40 CFR part 60, subpart GGG]) or Option 1, the negotiated rule without connector monitoring. The selection of the alternative is left to the owner or operator and can be revised in each permit renewal.

Comment: One commenter (IV-D-50 and IV-F-1) stated that many small refineries have not been required to implement LDAR programs and they do not have expertise in setting up and operating such programs. The commenter (IV-D-50) explained that small refineries will experience high LDAR compliance costs compared to the industry at large because of high start-up costs, less computer applications, and poorer economies of scale. The commenter (IV-D-50 and IV-F-1) estimated that the first year costs associated with implementing and operating a LDAR program for a small refinery would be approximately one-half million dollars. The commenter (IV-D-50 and IV-F-1) added that small refineries will incur additional costs to install required computer applications associated with LDAR programs. The commenter (IV-D-50) went on to say that a small refinery will incur higher LDAR costs than a large facility on a per barrel basis, because both facilities will have a similar number of points to monitor and maintain, but the small refinery will have fewer barrels in which to allocate LDAR costs.

Response: The EPA agrees that controlling equipment leaks at small refineries may be less cost-effective than at large refineries. The EPA examined the possibility of subcategorizing small refineries to determine if a different MACT floor level of control for equipment leaks could be developed. MACT floors were analyzed for various crude charge capacity cutoffs (10,000; 20,000; 30,000; 40,000; 50,000; and 60,000 bbl/sd), refinery ozone attainment status, and based on the types of products at each refinery. The results of the analysis showed that no significant changes from the equipment leaks component of the source-wide MACT floor, the petroleum refinery NSPS equipment leaks program (40 CFR part 60, subpart GGG), would occur for small refineries. Therefore, all refineries are subject to the control equivalent to the petroleum refinery NSPS level of control. The EPA did revise the final rule to address concerns of small refineries regarding the cost of establishing the program by removing the criteria to have 1/3 of the refinery comply within 6 months after promulgation, 2/3 of the refinery comply within 12 months after promulgation, and the entire refinery comply within 18 months after promulgation. The final rule requires the entire refinery to comply with the standard within 3 years after promulgation. The EPA believes this extra time will benefit small refineries and refineries that have never implemented an equipment leaks program by allowing sufficient time to establish and properly operate a leak detection program.

8.3.2 Emission Impacts

Comment: Several commenters (IV-D-09, IV-D-10, IV-D-11, IV-D-12, IV-D-22, IV-D-25 and IV-F-1, IV-D-51) contended that the equipment leak provisions were not cost-effective because the EPA's emission factors significantly overestimate emissions, and therefore, emission reductions. Three commenters (IV-D-09, IV-D-22, IV-D-25) explained that a recently published API study undermines the theoretical basis of the negotiated rule, resulting in equipment leak fugitive emissions being overestimated by as much as a factor of 10. Two commenters (IV-D-25, IV-D-51) noted that the EPA adopted a new set of equipment leak emission factors and correlation equations for petroleum refineries, but did not use these new correlation equations and emission factors to determine cost-effectiveness of the equipment leak provisions. Two commenters (IV-D-09, IV-D-25) concluded that the result is that the cost-effectiveness is in actuality $15,000/Mg ($13,600/ton) of HAP vs the EPA's estimate of $1,500/Mg ($1,360/ton) of HAP. Therefore, one commenter (IV-D-09) stated that it is obsolete to control equipment leak fugitives by means of traditional leak detection and repair programs. One commenter (IV-D-51) contended that using the updated equations and factors would show that controls more stringent than the proposed rule cannot be justified. One commenter (IV-D-30) stated that the new fugitive emission factors for equipment leaks developed by API are more reflective of current technology and operating practices.

Several commenters (IV-D-13, IV-D-16, IV-D-34, IV-D-57) did not support the use of new AP-42 correlation equations for equipment leaks. Three commenters (IV-D-13, IV-D-34, IV-D-57) raised a number of concerns with the new equations, including: sample population being too small, not a representative sampling of component sizes, pressures, and temperatures. One commenter (IV-D-34) stated that they provided comments to the EPA on June 21, 1994, on a 1993 study that the equations are based on. Two commenters (IV-D-13, IV-D-57) added that adoption of these revisions in conjunction with the NESHAP may pressure air agencies in California to abandon a stringent, cost-effective method of controlling emissions.

Response: The EPA would like to clarify that the equipment leak data that are being used to estimate the costs and emission reductions of the equipment leak rules were developed in 1980. The data provided in 1993 by API cannot be used to revise the factors because two sets of information are needed. These include the amount of emissions generated per piece of equipment leaking at a given concentration and the percent of equipment that are actually leaking at these concentrations. The 1980 study that was used to estimate the impacts of the refinery MACT rule used a consistent sampling methodology to address both of these factors based on sampling at uncontrolled refineries. The 1993 American Petroleum Institute (API) study developed new information only on emissions per piece of leaking equipment using a different methodology. As stated in API's report, this information was developed from refineries in California for use with other information to estimate facility-specific equipment leak emissions. The EPA used the API data to revise the equipment leak correlation equations and default zero emission rates. EPA could not revise the average equipment leak factors for refineries because percent leaking data were not provided. The EPA also believes it would be inappropriate to combine the 1993 information with the 1980 data to develop new emission estimates because the sampling methodologies were different and it is not clear that it is appropriate to use information from well controlled refineries to estimate emissions from facilities that have never been subject to a leak detection and repair program. Therefore, the 1993 study data was not used to revise the emission estimates.

The EPA recognizes that new correlation equations developed for the refining industry indicate that the refinery factors may overestimate emissions, which may make the negotiated rule (without connector monitoring) cost-ineffective. This cannot be accurately determined because the appropriate information to update average emission factors is not available. The EPA recognizes that enough uncertainty exists in the emission and cost estimates to question the results of the cost-effectiveness analysis. In recognition of this uncertainty and to provide compliance flexibility, the EPA has changed the final rule to provide each existing refinery with a choice of complying with either: (1) 40 CFR part 60 subpart VV, or (2) the negotiated rule without connector monitoring. Although not required in the final rule, the EPA promotes use of the negotiated rule without connector monitoring because it is believed to provide considerable product, emissions, and cost savings to a refinery.

## 8.4 SELECTION OF MACT FLOOR AND MACT (GENERAL EQUIPMENT LEAKS)

Comment: One commenter (IV-D-29) suggested that the EPA exempt equipment already controlled by VOC regulations.

Response: The EPA agrees in general that it may be very burdensome for sources to be subject to several equipment leak regulations with similar, but not identical, requirements. In an effort to reduce the burden, the EPA has provided in subpart H that compliance with that rule will constitute compliance with any overlapping NSPS or NESHAP. In addition, on April 10, 1995 EPA proposed amendments to subpart H to allow an owner or operator to elect to comply with subpart H for all VOC containing equipment in lieu of compliance with subpart VV, GGG, or KKK of part 60. For owners or operators who elect to comply with subpart VV instead of subpart H of part 63, there will be only one Federal program and overlapping requirements should not be an issue.

Comment: One commenter (IV-D-29) asserted that all equipment in contact with heavy oil should be exempt from the equipment leaks provisions, including recordkeeping requirements, because the VOC emissions are insignificant.

Response: The EPA disagrees with the commenter. Heavy oil that leaks and mixes with water may be a source of significant emissions. The EPA considers the requirements for components in heavy liquid service to be minimal.

Comment: Two commenters (IV-D-36, IV-D-38) supported the exclusion of equipment in contact with material containing less than 5 percent HAP's. One commenter (IV-D-36) requested that it be clarified that this is an option and equipment in contact with less than 5 percent HAP's may be included if it is more convenient. The commenter (IV-D-36) explained that many existing leak monitoring programs include all components containing material lighter than kerosene and requiring a different accounting would be extremely burdensome.

Response: The EPA thanks the commenters for their support. The five percent value is the minimum concentration of HAP's that the EPA considers to indicate a stream in HAP service. A source may chose to include streams that are less than 5 percent HAP in the monitoring program.

8.4.1 Selection of MACT Floor

Comment: Two commenters (IV-D-36, IV-D-44) supported the use of petroleum refinery NSPS levels as the MACT floor. One commenter (IV-D-44) argued that petroleum refinery NSPS should be adopted as MACT floor for administrative simplicity. The commenter (IV-D-44) also alleged that the risk analysis does not support a more stringent level of control than the petroleum refinery NSPS standards. The commenter (IV-D-44) stated that compliance with the NSPS standards and HON should be considered compliance with the leak detection provisions of the proposed regulation and wording should be added to the regulation to make this clear.

Response: The refinery MACT standard is not based on risk, but the statutory criteria required in the Act. The Act requires that the floor be determined based on the average emissions limitation achieved at the best-controlled 12 percent of sources. The EPA's MACT floor analysis indicated that the equipment leak component of the source-wide MACT floor is control equal to the petroleum refinery NSPS (40 CFR part 60, subpart GGG). As stated earlier, due to the uncertainty in the impacts analysis and to provide compliance flexibility, the EPA has changed the final rule to provide each existing refinery with a choice of complying with 40 CFR part 60 subpart VV (which is equivalent to 40 CFR part 60, subpart GGG) or the negotiated rule without connector monitoring provisions.

Comment: Two commenters (IV-D-22, IV-D-42) requested the development of a separate MACT floor for equipment leaks at small refineries, in which the floor should not exceed the petroleum refinery NSPS requirements. Several commenters (IV-D-12, IV-D-22, IV-D-42) stated that compliance with the NSPS would be less burdensome than compliance with the proposed refineries NESHAP. Two commenters (IV-D-12, IV-D-42) supported longer initial compliance periods for the proposed rule (18 months) and supported requiring the NSPS control with a 3 year compliance time for small refineries since short-term initial compliance for small refineries, which do not have an LDAR system, would be infeasible.

Two commenters (IV-D-22, IV-D-44) explained that the best equipment leak controls, which will set the MACT standard, will be found at large refineries located in the worst ozone attainment areas. However, the commenters (IV-D-22, IV-D-44) stated that these refineries do not accurately reflect the best controls found in small refining companies or refineries located in ozone attainment areas. One commenter (IV-D-22) added that LDAR programs are non-existent at small refineries and at many refineries located in ozone attainment areas. The commenter (IV-D-22) claimed that small refineries in nonattainment areas produce heavier petroleum products such as fuel oils, lubes, or asphalt, which are generally not included in LDAR that focus on light liquid streams. Therefore, the commenter (IV-D-22) supported extended compliance times to help many small refineries and refineries located in attainment areas digest significant start-up costs associated with LDAR.

Another commenter (IV-D-57) asserted that there should be no difference in equipment leak requirements for small and large refineries.

Response: The EPA would like to clarify that the equipment leaks component of MACT floor analysis predicates that refineries control equipment leaks at least to the petroleum refinery NSPS (40 CFR part 60, subpart GGG) level of control. As discussed in section 4.0 of this document, EPA examined the question of whether subcategorization would result in significantly different requirements for small refineries. In this analysis, the EPA analyzed the equipment leak component of the source-wide MACT floor for various crude charge capacity cut-offs and determined that no significant changes from the NSPS equipment leaks program would occur for small refineries (refineries under 10,000 bbl/sd to 50,000 bbl/sd of crude). Therefore, all refineries are subject to control equivalent to the NSPS level of control.

The EPA agrees that small refineries may not have the experience to implement an LDAR program for equipment leaks in a short time-frame without significant expense. The EPA also contends that other refineries that do not currently have LDAR programs may also have trouble implementing the rule in 6 to 18 months. In response to these comments, the EPA has changed the final rule to require that all refineries, regardless of size, comply with a LDAR program with the same leak definition and monitoring frequency as 40 CFR part 60 subpart VV (which is equivalent to 40 CFR part 60, subpart GGG) within 3 years after promulgation of the rule; there will not be interim deadlines during the 3-year period by which portions of the refinery are required to comply during this time. A refinery that chooses to comply with the modified negotiated rule must then implement Phase II within 4 years and Phase III 5 1/2 years after promulgation of the rule. A refinery that chooses to comply with subpart VV would continue to implement that program.

Comment: Two commenters (IV-D-13, IV-D-57) contended that the since more than 12 percent of refineries are located in the Bay Area and South Coast Area in California, and these regions have the most stringent equipment leaks regulations in the nation, the EPA should adopt the requirements from these regions as MACT floor for existing and for new equipment. One commenter (IV-D-13) asserted these leak standards include not allowing leaks to exceed 1,000 ppm measured at a source, i.e., 0 cm from the source or up to 1 cm (0.29 in) away from the source if 0 cm reading is impractical. The commenter (IV-D-13) asserted that the AQMD's best available control technology both for VOC and toxics require all new valves and flanges less than 5.08 cm (2 in) in diameter to be leakless.

One commenter (IV-D-57) stated that use of special seals should not release the source from performing at least annual inspection of pumps. The commenter (IV-D-57) added that equipment leaks from new process units should be subject to more stringent I&M and LDAR than existing sources. The commenter (IV-D-57) stated that valves and connectors should meet monthly I&M with LDAR at 100 ppm with one cm stand-off, because there are refinery processes in the Bay Area that currently meet this level. Additionally, the commenter (IV-D-57) asserted that new pumps and compressors should meet quarterly I&M with LDAR at 500 ppm measured at 1 cm (0.39 in).

Response: The equipment leak component of the source-wide MACT floor for existing sources was developed based on the best available data, which was the data provided in the section 114 and ICR questionnaire responses. The MACT floor analysis at proposal was based on equating control information reported on the questionnaires to the control effectiveness of Federal programs on a model refinery. This method may have underestimated the control efficiency at some sources that had lower leak definitions and had higher equipment counts than those in the model refinery. In order to correct these oversights, the equipment leaks component of the source-wide floor was revised to include the effect of actual equipment counts and leak definitions. The results of the revised analyses showed that the existing source floor is still control equal to the control required by the NSPS.

Both the proposal and revised floor analysis were determined using a broad definition of source (i.e., the collection of all leaking equipment at a refinery). The EPA believes that the commenters view is based on a narrow definition of affected source. The EPA contends that when the total effect of the South Coast and Bay Area rules are analyzed on a refinery, including all the exemptions, these rules are not more stringent than the MACT floor level of control.

The EPA's position was arrived at from a study that compared the overall control efficiency of the Bay Area and South Coast equipment leaks rules, and subpart VV. Average leak rate equations, leak frequencies, and equipment leak control efficiencies presented in the Equipment Leaks Protocol Document were used to estimate overall efficiency of controlling equipment leaks from a refinery. The results of the comparison showed that the control efficiency for refineries complying with the South Coast or Bay Area regulations was similar to the control efficiency for refineries complying with the requirements in 40 CFR part 60 subpart VV. Within, the accuracy of this analysis, the EPA considered the control effectiveness of the South Coast, Bay Area, and subpart VV to be equivalent in most cases.

Regarding one commenter's (IV-D-57) concern for the need for annual inspection of sealless pumps, the EPA believes that the rule does require this. The EPA did not adopt the suggestions of other commenters that the rule require new sources to install "leakless" valves and connectors. As discussed in previous rulemakings, information available to EPA shows that "leakless" equipment can have significant emissions when failures occur and this equipment is not available for all situations in refinery operations. The commenters did not provide any information that indicated that this equipment is available and suitable for installation in new refinery operations.

Comment: One commenter (IV-D-57) asserted that equipment leaks must be subject to I&M no less frequently than quarterly. The commenter (IV-D-57) stated that a study showed that quarterly I&M decreases emissions by 50 to 60 percent from I&M performed annually. The commenter (IV-D-57) added that by allowing I&M frequency to decrease biannually, the EPA provides for a substantial number of components to remain leaking for up to 2 years, which is 8 times longer than what is allowed in the Bay Area or South Coast. The commenter (IV-D-57) recommended the EPA only allow less frequent I&M only when the previous 3 inspections found components in compliance with a more stringent leak definition (1,000 ppm) or when a greater percentage are in compliance, (e.g., fewer than 0.25 percent leaking instead of 0.5). The commenter (IV-D-57) stressed that under no circumstances should I&M be performed less frequently than annually.

Response: The EPA disagrees with the commenters conclusion. The EPA believes that there is a trade-off between emissions reductions and inspection frequency. In examining the appropriateness of the HON valve standards to refinery operations, the EPA considered whether to extend some of the concepts of the negotiated valve standard to the valve and pump standards for refineries. The negotiated valve standard included incentive provisions to encourage better performance and two forms of penalty options to consider differences among the facilities ability to undertake a quality improvement program. The EPA determined that the continuous use of better performing equipment, i.e., equipment that does not leak at the low leak definitions of Phase III, would result in lower emissions than more frequent monitoring of the equipment. After considering the predicted differences in effectiveness of different monitoring intervals for pumps, the EPA also concluded that an incentive for better performance could be included in the pump standard and still assure better emission performance. Therefore, the proposed rule and the final refinery standard allow a QIP for both valves and pumps in Phase III.

8.4.2 Selection of MACT

Comment: One commenter (IV-D-50 and IV-F-1) commended the EPA for proposing to extend the equipment leak compliance time by 18 months to help small refineries implement programs, but encouraged the EPA to further extend the compliance time to the 3 year period allowed under section 112.

Two commenters (IV-D-45, IV-D-50 and IV-F-1) supported the maximum 3 year LDAR implementation time to achieve compliance with the petroleum refinery NSPS level of control. One commenter (IV-D-10) added that the EPA should provide the full 3 year compliance period for the equipment leaks provisions to all refineries. The commenter (IV-D-10) contended that the cost of implementing and complying with the rule will be as much for large refineries as small ones. Two commenters (IV-D-45, IV-D-50, and IV-F-1) believed that the small refinery LDAR requirements should be based on the petroleum refinery NSPS requirements instead of the negotiated rule. One commenter (IV-D-45) stated that they use in-place state-of-the-art hydrocarbon gas detection systems and high quality standard procedures for maintenance and repair and included (in Appendix C of their comment) the results of fugitive testing at their units.

Response: The EPA would like to clarify that the equipment leak component of the source-wide MACT floor analysis predicates that refineries control equipment leaks to a level of control equal to the petroleum refinery NSPS (40 CFR part 60, subpart GGG). The EPA analyzed the equipment leak component of the source-wide MACT floor for various crude charge capacity cut-offs and determined that no significant changes from the petroleum refinery NSPS equipment leaks program would occur for small refineries (refineries under 10,000 bbl/sd to 50,000 bbl/sd of crude). Therefore, all refineries are subject to control equivalent to the petroleum refinery NSPS level of control.

The EPA agrees that small refineries may not have the experience to implement an LDAR program for equipment leaks in a short time-frame without significant expense. The EPA also contends that other refineries that do not currently have LDAR programs may also have trouble implementing the rule in 6 to 18 months. Furthermore, special consideration could provide small refineries with unfair competitive advantage over large refineries. In response to these comments, the EPA has changed the final rule to require that all refineries, regardless of size, comply with a LDAR program with the same leak definition and monitoring frequency as 40 CFR part 60 subpart VV (which is equivalent to subpart GGG) within 3 years after promulgation of the rule. At the end of the third year the entire refinery must be in compliance with the level of control specified in subpart VV; there will not be interim deadlines during the 3-year period by which portions of the refinery are required to comply during this time. A refinery that chooses to comply with the modified negotiated rule must then implement Phase II within 4 years and Phase III 5 1/2 years after promulgation of the rule.

Comment: One commenter (IV-D-48) recommended that the EPA adopt the numerical standards negotiated for the HON for the equipment leaks provisions. The commenter (IV-D-48) alleged that these standards are achievable and that adopting identical provisions will make compliance and enforcement simpler. The commenter (IV-D-48) stated the proposed equipment leaks provisions are weaker than the HON provisions. The commenter (IV-D-48) asserted that the equipment leaks standard involves enforceable maximum achievable emission limitations. The commenter (IV-D-48) listed several specific recommendations to strengthen the equipment leaks provisions. One commenter (IV-D-57) contended that the standards for leaking valves and connectors should be set at 500 ppm. The commenter (IV-D-57) disagreed with the EPA's conclusion that technology is not available for refineries to meet the same stringent standards required under the HON. The commenter (IV-D-57) stated that in the Bay area all refineries meet a 500 ppm leak definition and by 1997 some refineries will be required to meet 100 ppm definition. The commenter (IV-D-57) stated that in the South Coast a leak definition of 1000 ppm measured at 0 cm is equivalent to 500 ppm measured at 1 cm. The commenter (IV-D-57) asserted that the EPA should explicitly chose one standard and specify a screening distance.

One commenter (IV-D-54) expressed disappointment at the equipment leaks provisions because the leak definition is too high. The commenter (IV-D-54) contended that the EPA should require a leak definition of 500 ppm, as Texas has done in its MID program, rather than the 2,000 ppm that is currently in the rule. The commenter (IV-D-54) contended that a leak definition of 2,000 does not provide adequate protection for a community and also does not consider the clusters of petroleum refineries around a community.

Another commenter (IV-D-19) expressed appreciation for the consistency demonstrated by using subpart H of the HON as a framework for the equipment leaks section and the effort made to differentiate refineries from chemical plants. Another commenter (IV-D-11) agreed that the EPA has made reasonable adjustments to the negotiated rule to be applicable to refineries which affords refineries some flexibility.

One commenter (IV-D-29) contended that a 10,000 ppm TOC emissions standard leak definition is sufficient for existing refineries. The commenter (IV-D-29) claimed that a stricter standard will force equipment replacements or facility shutdowns.

Response: The final rule allows refineries to comply with either subpart VV (which is equivalent to the petroleum refinery NSPS [40 CFR part 60, subpart GGG]) or the modified negotiated regulation. The leak definition for subpart VV equipment leaks is 10,000 ppmv. The leak definition levels prescribed in the proposed rule, and in the modified negotiated regulation option, were developed based on the standards in the HON. Process streams in the SOCMI industry have a higher concentration of HAP's than streams in refineries. In order to provide a comparable control level for the refinery industry, the HON leak definitions were adjusted based on the stream composition information available to the EPA.

Comment: One commenter (IV-D-22) objected to a 1000 ppm valve standard because the EPA's own analysis shows that no refinery out of a list of 134 achieves an equipment leak control efficiency greater than that of the petroleum refinery NSPS. The commenter (IV-D-22) admits that one State has a leak definition at that level. However, the commenter (IV-D-22) asserted that the existence of a standard in a single State proves neither its technical feasibility, its cost-effectiveness, nor its equivalency to the statutory definition of a MACT floor.

One commenter (IV-D-09) contended that the EPA should focus on restructuring the equipment leak provisions to concentrate on the rapid repair of gross emitters, i.e., those equipment components that leak relatively large amounts. The commenter (IV-D-09) stated that refineries agreed that it was appropriate to adopt the structure of the negotiated rule, but not necessarily the numerical standards.

Response: The EPA considers the proposed rule to focus on the largest emitting equipment: pumps in light liquid service, compressors, and valves in light liquid and gas service. The baseline emissions analysis indicates that over 80 percent of the emissions are from these pieces of equipment. The promulgated rule limits emissions from these components by over 70 percent.

Comment: One commenter (IV-D-22) opposed using the negotiated rule in the refinery MACT because it was based on another proceeding to which the commenter was not included. Therefore, the commenter (IV-D-22) claimed that the EPA's use of the negotiated rule ignores both applicable administrative and due process requirements. Two commenters (IV-D-45, IV-D-50 and IV-F-1) stated that even though the EPA has indicated that the petroleum refinery NSPS represents the MACT floor for equipment leaks, a more stringent approach was negotiated with API, who represents large refineries.

Response: The EPA views the negotiated regulation as another existing equipment leak control program, and, as such, it can be included in the impacts analysis. The fact that no refinery is currently complying with it is not relevant because it is an option above the floor level of control. Proposal of this option was based on the finding that it will achieve additional emissions reductions in a cost effective manner. The proposal of the refineries MACT allowed ample opportunity for comments to be submitted and considered in promulgating the final standards. No administrative or due process requirements have been violated.

The HON was not developed exclusively from negotiations with API. The refining industry, represented by API, participated with representatives from the chemical industry in developing the negotiated regulation for equipment leaks, which was used in the HON. The HON equipment leak provisions were developed with the understanding that the refining industry is not included in the HON equipment leaks standard. Additionally, the equipment leak provisions in the refinery MACT standard are not the same as the HON provisions; they have been modified to apply to the refining industry. The commenter's non-participation in the regulatory negotiation for equipment leaks is not relevant to this rulemaking.

## 8.5 EQUIPMENT - SPECIFIC PROVISIONS

### 8.5.1 Pumps in Light Liquid Service

Comment: One commenter (IV-D-25) supported the Phase III leak definition for pumps (2,000 ppm) in the proposed refinery NESHAP, which is higher than in the HON rule. The commenter (IV-D-25) claimed the HON approach of using one level for the leak definition and another to trigger repair requirements for pumps is complicated, would achieve little HAP emission reduction, and would not be cost effective.

Two commenters (IV-D-22, IV-D-44) suggested that the definition for pump leaks should be 10,000 ppm, the petroleum refinery NSPS standard leak definition, instead of 2,000 ppm.

One commenter (IV-D-22) objected to the 2,000 ppm leak definition for pumps because the technology may not perform in the same manner in all situations. The commenter (IV-D-22) asserted that there is no justification for extending an isolated performance level to all process services as an enforceable standard. The commenter (IV-D-22) argued that EPA admits that the risk from HAP emissions is very low in the base case before implementing controls. Given this fact, the commenter (IV-D-22) stated that it does not make any real or measurable difference to the risk by imposing a standard of 10,000 ppm instead of 2,000 ppm. The commenter (IV-D-22) added that given the low risk, industry should be given the choice as to whether to install single or dual seal pumps and whether or not to monitor.

Response: The final rule allows owners or operators the option of complying with subpart VV (which is equivalent to the petroleum refinery NSPS) or modified subpart H equipment leak standards. Subpart VV has a leak definition of 10,000 ppmv.

The EPA disagrees that the 2,000 ppmv leak definition in the modified subpart H cannot be met. Based on information used to develop previous regulations, the EPA believes that a 2,000 ppmv leak definition can be met with existing control technologies for pumps, such as dual or mechanical seals. The EPA would like to clarify that the equipment leak provisions are work practices. The standard requires repair of leaking pumps exceeding the leak definition, and exceedences are not a violation by themselves.

The EPA would also like to clarify that the MACT standards were based on the statutory criteria. The Act specifically requires EPA to set technology-based rather than risk-based standards when developing the MACT standards. The residual risk of the rule will be analyzed 8 years after the MACT standards have been promulgated.

Comment: One commenter (IV-D-48) supported the inclusion of pumps in light liquid service and heavy liquid service. The commenter (IV-D-48) demanded that if the EPA concludes that reductions in emissions from this equipment is not achievable, it must provide an explanation based on evidence in the record.

Response: Equipment in light liquid service and heavy liquid service are both regulated in the equipment leak provisions.

Comment: Several commenters (IV-D-21, IV-D-22, IV-D-25, IV-D-42) stated that reciprocating pumps in light liquid service should be excluded from the equipment leaks provisions because these pumps are designed to leak small amounts for lubricating purposes, and no available packing technology can effectively reduce levels to 2000 ppm. One commenter (IV-D-25) added that retrofitting reciprocating pumps with secondary seals can be very costly or infeasible depending on the design and dimensions. The commenter (IV-D-25) added that they did not know of any data for setting a reasonable standard. Two commenter (IV-D-21, IV-D-22) added that reciprocating pumps are used infrequently and usually only for maintenance activities. Three commenters (IV-D-22, IV-D-25, IV-D-42) also contended that for the same reasons, reciprocating compressors should be excluded from the rule.

Another commenter (IV-D-57) asserted that reciprocating pumps and compressors should be regulated because they are sources of substantial emissions. One commenter (IV-D-46) noted that the State of Texas makes no distinction between reciprocating pumps and others in light liquid service subject to LDAR requirements. The commenter (IV-D-46) acknowledged that reciprocating pumps are more difficult to make leak free, but argued that this is made up for by the fact that there tend to be far fewer in a refinery. The commenter (IV-D-46) recommended that reciprocating pumps not be exempted.

Response: The EPA contends that reciprocating pumps are sources of emissions that cannot categorically be exempted from the rule. However, the EPA agrees that replacing reciprocating pumps may be costly. Therefore, the final rule exempts reciprocating pumps in heavy liquid service, and in light liquid service if recasting the distance piece or reciprocating pump replacement is required. This exemption is consistent with the MACT floor.

Comment: One commenter (IV-D-10) contended that the provision in § 63.648 allowing quarterly monitoring for pumps if the percent leak rate is less than 3 percent of pumps or one pump is not clear as to when such monitoring may start. The commenter (IV-D-10) recommended that quarterly monitoring of pumps may begin in Phase I if leak rate frequency is met.

Response: The EPA has clarified that the QIP for pumps begins in Phase III of the rule. This is consistent with the valve monitoring QIP requirements. The rule does not preclude an owner or operator from complying with the Phase III leak provisions earlier. If the owner or operator wishes to monitor pumps and valves less frequently earlier than 2000, the owner or operator will need to have the monitoring data to show that they are meeting the percent leaking pumps criteria.

Comment: One commenter (IV-D-10) stated that leak rate triggers for pumps should be clarified by allowing a choice between the percentage of pumps or the specified number of pumps.

Response: The purpose of allowing a specified number of pumps leaking rather than a percentage of pumps is for cases when a limited number of pumps exist such that the percentage of pumps specified would allow less than one pump leaking. For example, if there are fewer than 33 pumps at a facility, the percent leaking pumps allowed to conduct quarterly monitoring would be less than one. The EPA rounded this number to the next highest integer, i.e., one. The EPA does not consider it appropriate to allow owners or operators to choose between a specified number of pumps and the percent leaking pumps. In situations other than the one described, the specified number will always be less than the number of pumps calculated from the percent leaking pumps. The EPA does not consider it appropriate to allow a less stringent requirement. Therefore, the pump provisions qualify the choice between the percent leaking criteria and the specified number by requiring the owner or operator to choose whichever is the greater number.

8.5.2 Compressors

Comment: One commenter (IV-D-46) contended that compressors in light liquid service are easily maintained by leak prevention repairs and are controlled by venting to control devices and should not be exempt from the equipment leaks provision.

Response: The EPA would like to clarify that: (1) compressors are not used for light liquids, but only to provide motive force for gaseous fluids, and (2) the proposed rule does not exempt compressors. Compressors are required to be controlled with a closed-vent system or be equipped with mechanical seals that meet the criteria of the rule. The EPA also disagrees with the commenters opinion that compressors should be part of a LDAR program. It is not feasible to require an LDAR program for compressors because compressor leaks cannot be repaired easily and may require removing the component from service. Additionally, monitoring compressors may pose a safety risk because the area of the leak contains moving parts.

8.5.3 Sampling Connection Systems

Comment: One commenter (IV-D-10) recommended that sampling valves and sampling connectors be excluded from applicability because they already have self-closing plugs that contribute only de minimis emissions.

Response: The sampling connection provisions apply to the sample purge which occurs when sampling is done. The presence or absence of plugs is not relevant. The EPA requires that the purge be captured and returned to the process, or destroyed.

8.5.4 Valves in Gas/Vapor and Lines in Light Liquid Service

Comment: Several commenters (IV-D-10, IV-D-11, IV-D-25, IV-D-38) noted that the preamble indicates that in calculating percent leaking valves, up to 1 percent of valves per year to a maximum of 3 percent of valves may be excluded if they are non-repairable. Three commenters (IV-D-10, IV-D-25, IV-D-38) believed this provision had been inadvertently omitted from the proposed regulation and suggested regulatory wording to include it. Another commenter (IV-D-11) contended that the provision for nonrepairable valves and connectors in the HON should also be included in the refinery MACT standard because refinery turnaround schedules typically are longer than those of chemical plants. Therefore, the commenter (IV-D-11) stated that it makes sense to include the HON provisions in the manner discussed in the preamble. One commenter (IV-D-38) provided specific language for this provision to be added to § 63.648.

Response: The final rule has been corrected to include language that allows exclusion of up to a maximum of 3% of the valves from the percent leaking valve calculation. The EPA would also like to clarify that the non-repairable valve provisions are only applicable to refineries complying with the modified subpart H requirements, and do not apply to the subpart VV equipment leak requirements.

Comment: The commenter (IV-D-25) supported the Phase II and III leak definitions (1,000 ppm) and benchmark performance levels (percent leaking equipment) selected for valves in the proposed refinery NESHAP. The commenter (IV-D-25) reasoned that the selection of different levels than the HON is justified because refinery processes have larger equipment, have longer run times between turn-arounds, and cannot achieve the same average leak rates as chemical plants. They (IV-D-25) stated that a leak definition of 500 ppm would result in minimal HAP reductions and would not be cost effectiveness. One commenter (IV-D-44) suggested that the definition for valve leaks should be 10,000 ppm, the petroleum refinery NSPS standard leak definition, instead of 2,000 ppm. One commenter (IV-D-22) opposed the 1,000 ppm leak definition for valves because the EPA does not demonstrate that this requirement meets the statutory criteria in 112(d)(3)(A). The commenter (IV-D-22) stated that Texas and Louisiana's recent requirements for LDAR programs cannot be used in the analysis because they were promulgated within the last 18 months. The commenter (IV-D-22) asserted that choosing the 1,000 ppm standard because it can be reliably implemented and is achievable is not the statutory requirement which the EPA must apply.

The commenter (IV-D-22) added that the proposed standard imposes a penalty QIP for poor performance and makes good performance harder to achieve and higher repair costs inevitable by reducing the leak definition by a factor of 10.

Response: The EPA would like to clarify that in the final rule, owners or operators are only required to comply with the equipment leak standards of subpart VV (which is equivalent to the petroleum refinery NSPS [40 CFR part 60, subpart GGG)]; however, the EPA allows owners or operators the option to comply with a modified version of subpart H instead of subpart VV. Subpart VV has a leak definition of 10,000 ppmv. Refineries that choose to comply with the modified subpart H must meet the leak definitions specified in the rule. The EPA disagrees with the commenters who contended that lower leak definitions should not used because they were taken from standards that were promulgated within the last 18 months. The leak definitions at proposal have been used at several facilities in Texas since the late 1980's, and thus before the 18 month limitation. In addition, the leak definitions were part of an option above the floor level of control. The EPA selected this option at proposal after considering the statutory criteria (emission reduction, cost, or other impacts).

Comment: One commenter (IV-D-21) stated that it is unclear when an owner/operator must elect to comply with the percent leaking calculation basis in the valve standard. The commenter (IV-D-21) supported the interpretation that the decision can be made at any time. Additionally, the commenter (IV-D-21) stated that facilities will not have enough information initially to determine which valve monitoring program to select. The commenter (IV-D-21) suggested that the EPA, rather than making this a one-time decision, allow facilities to change the basis infrequently, perhaps once per year with a notification of the change three months prior.

Two commenters (IV-D-20, and IV-D-25) requested that the requirement in § 63.648(d) to choose whether to calculate percent leakers on a facility or process unit basis be required before entering the first monitoring period of Phase III because fugitive sources are required to be monitored on a quarterly basis up until Phase III requirements become applicable.

Response: The final rule clarifies when owners or operators are required to comply with Phase III of the valve requirements. The final rule specifies that facilities complying with the optional connector monitoring requirements and the reduced valve monitoring frequency comply in Phase III. The rule does not preclude an owner or operator from complying with the Phase III leak definitions earlier. If the owner or operator wishes to monitor pumps and valves less frequently or use the connector monitoring option earlier than in Phase III, the owner or operator will need to show that they have monitoring data that qualifies them for less frequent monitoring. The rule also requires that owners or operators shall decide no later than the first monitoring period after Phase I whether to calculate the percentage of leaking valves on a process unit or source-wide basis.

Because Phase I begins 3 years after promulgation of the rule, the EPA believes that sufficient time has been allowed for owners or operators to comply fully with the rule. The EPA disagrees with the commenters' suggestion of allowing facilities to change the percent leaking basis with a notification of change, because there would be no guarantee that a consistent program would be maintained or would not be manipulated. The EPA has clarified in the final rule that once owners or operators have decided to choose to calculate percent leaking valves either source-wide or on a process unit basis, all subsequent calculations shall be made on the same basis unless a permit change is made.

Comment: Two commenters (IV-D-10, IV-D-25) asserted that the provisions for leaking valves in table 4 of subpart CC, entitled "Valve Monitoring Frequency Alternatives" should be corrected to show that for percent leaking valves greater than 5 percent, monthly monitoring or a QIP is allowed as an option.

Response: The EPA agrees with the commenter. The final rule has been revised to reflect these changes.

8.5.5 Connectors in Gas/Vapor and Light Liquid Service

Comment: Several commenters (IV-D-09, IV-D-22, IV-D-25, IV-D-31, IV-D-36, IV-D-38) supported the optional connector monitoring program in the proposed rule. One commenter (IV-D-25) saw the proposed approach as being consistent with common sense, E.Q. 12866, and statements by Carol Browner to the effect of affording compliance flexibility. Two commenters (IV-D-20, IV-D-25) added that a mandatory connector LDAR program is likely to be costly and produce few HAP emission reductions.

One commenter (IV-D-49) claimed that scheduled testing of connectors should not be required as part of a LDAR program for fugitive emissions and that the requirement for connectors should be no more burdensome than that contained in the NSPS. One commenter (IV-D-50 and IV-F-1) recommended limiting the inclusion of connectors in LDAR programs. The commenter (IV-D-50) stated that because connectors rarely leak, the identification and monitoring of connectors represents an inefficient and wasteful regulatory cost. The commenter (IV-D-50) stated that LDAR programs for small refineries can be made much more cost-effective if the EPA extends the following proposed connector options to small facilities: 1) a random 200 connector survey, 2) a connector inspection program, and 3) the negotiated rule's connector program. One commenter (IV-D-31) disagreed with the position of the Louisiana Department of Environmental Quality who is currently attempting to impose a connector fugitive program in Louisiana. The commenter (IV-D-31) stated that Louisiana has not performed a cost benefit analysis to justify such a program.

One commenter (IV-D-19) stated that while they appreciated the attempt at providing flexibility, they questioned the wisdom of including a provision requiring the monitoring of connectors. Even though the commenter (IV-D-19) understands that the provisions are optional, they claimed that connectors do not leak if installed properly. The commenter (IV-D-19) contended that the program will not reduce HAP emissions and was only included to pacify State agencies. The commenter (IV-D-19) concluded that there is no valid basis for including or excluding connectors in a leak detection program and therefore the percent leaking valve targets in table 5 should remain as the required measures of success. The commenter (IV-D-19) suggested that § 63.649(b) and (c) be stricken and the requirements of table 5 be incorporated as the standard for compliance. One commenter (IV-D-57) contended that connectors are a source of substantial emissions at refineries and should not be excluded from a stringent I&M and LDAR requirements.

Response: The final rule requires that refineries meet the equipment leak requirements in subpart VV; subpart VV does not require connector monitoring. Connector monitoring is only an option that may be chosen if the owner or operator elects to comply with subpart H provisions and elects to use the provisions of §63.648 (c)(2)(ii) for valve monitoring rather than subpart VV. Because connector monitoring is only an option, the EPA does not consider that any additional burden is placed on the industry. The connector monitoring alternatives were included in the rule to allow owners or operators the flexibility to combine State and Federal regulations and avoid complying with multiple equipment leak programs. The EPA also contends that the emission reduction with the connector alternatives is essentially the same as without the alternatives. Thus, the alternatives do not decrease the emission reductions or stringency.

Comment: One commenter (IV-D-21) recommended that connectors not be included with components subject to the one-third or two-thirds compliance deadline. The commenter (IV-D-21) claimed that if a source elects not to monitor connectors or to monitor 200 random connectors, they would not have a basis for estimating the total number of connectors.

Response: The final rule does not require that compliance be phased-in. Instead, the entire refinery must be in compliance with equipment leak provisions in subpart VV (which is equivalent to the petroleum refinery NSPS [40 CFR part 60, subpart GGG)] or a modified version of subpart H within 3 years after promulgation of the rule. The connector monitoring option of the modified subpart H is only applicable if the owner or operator meets the performance levels specified for Phase III. Phase III starts 5 1/2 years after promulgation of the rule. The owner or operator may elect to do connector monitoring options earlier if they can prove they are meeting the Phase III performance requirements. The EPA believes that these modifications will allow sufficient time for refineries to establish and effectively operate leak detection and repair programs.

Comment: One commenter (IV-D-21) requested that the option to monitor leaking equipment on a process unit or source wide basis be extended to connectors whenever there are percent leaking criteria.

Response: The final rule allows source-wide or process unit wide calculation of percent leaking connectors. This is only applicable for the connector inspection alternative or the subpart H connector alternative. Once the owner or operator has decided whether to calculate percent leaking connectors on a process unit or source-wide basis, all subsequent calculations shall be made on the source basis unless a permit change is made.

Comment: One commenter (IV-D-21) stated that it is unclear when an owner/operator must elect to comply with the connector program. The (IV-D-21) supported the interpretation of making this decision at any time. Two commenters (IV-D-10, IV-D-25) suggested that the alternative connector monitoring provisions begin in Phase III. One commenter (IV-D-25) added that visual inspection could be done in Phases I and II, and LDAR monitoring could be introduced in Phase III when a control strategy is selected.

One commenter (IV-D-21) also suggested that the requirement to elect a random 200 connector program 12 months after promulgation be changed to 24 months. Additionally, the commenter (IV-D-21) suggested that the EPA, rather than making this a one-time decision, allow facilities to change the basis infrequently, perhaps once per year with a notification of the change three months prior.

Response: The final rule clarifies that the owner or operator shall decide no later than the first monitoring period after the Phase III compliance date which connector monitoring alternative they will comply with. The owner or operator may select the connector monitoring options earlier than Phase III if they can prove they are meeting the

Phase III performance criteria. The EPA has also specified in the final rule that the Random 200 connector program be on a source-wide basis in order to alleviate confusion.

The EPA disagrees with the commenters' suggestion of allowing facilities to change the type of connector option with a notification of change. The EPA contends that there would be no guarantee that a consistent program would be maintained or that the equipment leak provisions would not be manipulated. The EPA has clarified in the final rule that once the owners or operators have chosen a connector monitoring option any election to change after the initial election shall be treated as a permit modification according to the terms of 40 CFR part 70.

Comment: One commenter (IV-D-21) recommended the 1 percent per year maximum for nonrepairable leaking connectors be phased in to allow for problems implementing monitoring programs in the first year. The commenter (IV-D-21) suggested that the number of nonrepairable connectors allowed during the first year be 2 percent and 1 percent the year after.

Response: The EPA contends that the commenter's suggestion would add complexity and confusion to the rule without providing much benefit. The EPA contends that sufficient time has been allowed in the final rule for owners or operators to establish a working leak detection and repair program. The EPA would also like to clarify that the connector monitoring alternatives are only an option, and are not required by the rule. Therefore, the EPA chose not to incorporate the commenter's suggestion in the final rule.

Comment: One commenter (IV-D-21) recommended that the random 200 connector program be based on the source-wide population of connectors as opposed to 200 random connectors per refinery or 200 random connectors per process unit. One commenter (IV-D-22) agreed that testing of connectors should not be required, but that it should be allowed as an option. The commenter (IV-D-22) supported either testing 200 randomly selected connectors initially, with subsequent testing of 200 connectors on a frequency determined by the percent leaking, or monitoring all connectors initially and again on a frequency determined by the percent leaking. The commenter (IV-D-22) supported testing of connectors on lines of 2" in diameter or larger for the case when a facility chooses to test connectors.

Another commenter (IV-D-10) recommended that the random 200 connector alternative be used with the owner or operators discretion in the choice of the 200 connectors to be chosen for each monitoring episode. The commenter (IV-D-10) supported not tagging 200 connectors. The commenter (IV-D-10) asserted that if the sample of 200 connectors can be selected either the same or differently at the discretion of the owner or operator for one monitoring episode to the next, then the burden of tracking the connectors would be reduced without sacrificing statistical validity.

Response: The final rule specifies that the Random 200 alternative be done on a source-wide basis. The EPA maintains that a random sample is necessary in order to prevent manipulation of the results. Therefore, the EPA has not changed the random sampling requirements in the final rule in the manner the commenter suggested.

8.5.6 Closed Vent Systems and Control Devices

Comment: One commenter (IV-D-06) contended that sample valves and tank mixers on storage tanks are part of the tank and should be exempt from equipment leak provisions. Two commenters (IV-D-06, IV-D-25) asserted that converting sample valves on tanks to closed vent systems would be costly and have a minimal impact on emissions. The commenters (IV-D-06, IV-D-25) provided estimates of $5,000/tank or a total cost of $500,000 for 100 tanks, at a cost-effectiveness of $15,000/Mg ($13,600/ton) HAP.

Response: The EPA agrees with the commenters. Tank mixers and sample valves on storage tanks are not subject to the equipment leak provisions in the refinery MACT rule.

8.5.7 Delay of Repair

Comment: One commenter (IV-D-48) recommended that to determine if emissions from purged material resulting from an immediate repair are greater than fugitive emissions from delaying a repair one should compare the controlled purge material to cumulative emissions from the leak assumed at the intensity measured throughout the delay period. The commenter (IV-D-48) also requested that the decision to delay repair be documented.

Response: The final rule references both subpart VV and subpart H. Subpart VV and subpart H both describe procedures for delay of repair and the required documentation. The EPA does not consider it necessary to specify additional requirements.

8.5.8 Quality Improvement Programs

Comment: One commenter (IV-D-48) noted that they negotiated a QIP as an alternative to providing for a violation every time a leak definition was exceeded as quid pro quo for tougher leak definitions and frequent monitoring. The commenter (IV-D-48) reserved the right to raise legal questions if the final rule does not match the HON rule.

Response: The refining industry, represented by API, participated with representatives from the chemical industry in developing the negotiated regulation for equipment leaks, which was used in the HON. The HON equipment leak provisions were developed with the understanding that the refining industry is not included in the HON equipment leaks standard. There is no obligation in this rulemaking to require the same provisions as in the HON equipment leaks standard. Thus, the proposed and final refinery NESHAP differs from the HON where appropriate due to differences between refinery and chemical plants.

8.5.9 Other

Comment: One commenter (IV-D-06) stated that because maintenance on tank mixers is linked with taking tanks out of service, tank mixers should not be treated as equipment leak emissions. The commenter (IV-D-06) added that repair or maintenance of tank mixers often requires dropping the tank liquid level or taking the tank out of service, resulting in an increase in cleaning and degassing emissions if the tank is taken out of service before normally scheduled. The commenter (IV-D-06) explained that the tank mixer needs to continue operating until the tank is taken out of service to prevent increased buildup of sludge in the tank, resulting in higher emissions when the tank is cleaned. The commenter (IV-D-06) recommended requiring maintenance on tank mixers during the next scheduled time for taking the tank out of service. One commenter (IV-D-25) argued that tank mixers, which are installed in the side of the tank wall to maintain a consistent liquid mixture throughout the tank, should not be regulated under equipment leaks. The commenter (IV-D-25) said that maintenance or repair of tank mixers often requires taking the tank out of service, and should not be required any sooner than the next scheduled time for taking the tank out of service.

Response: The EPA agrees with the commenter and the rule has been revised to clarify this point.

Comment: One commenter (IV-D-21) requested that the calibration levels from the HON be modified for leak definitions in the proposed regulation. The commenter (IV-D-21) stated that, preferably, all of the calibration levels for the different leak definitions would be the same to avoid recalibrating instruments. The commenter (IV-D-21) suggested that the EPA allow calibration of instruments at 10,000 ppm or else 10,000 ppm as long as there are valves or pumps in Phase I, 2,000 ppm when there are pumps in Phase II and 1,000 ppm thereafter.

Response: The EPA has been working to clarify the provisions in subpart H. The EPA proposed revisions to § 63.180 of subpart H on April 10, 1995, to address this point. These modifications will be finalized well before compliance date for the Refinery rule.

Comment: One commenter (IV-D-21) suggested that it be clarified that the one-third (or two-thirds) criteria apply to the source-wide population, whether the owner/operator elects to comply on a source-wide or process unit basis. The commenter (IV-D-21) pointed out that this would allow flexibility for difficult to control process units. Additionally, The commenter (IV-D-21) claimed that assigning components to units to determine if one-third or two-thirds of the components are in compliance does not make sense if the owner/operator elects to comply on a source-wide basis. The commenter (IV-D-21) recommended that § 63.640(h)(3)(i) should begin "At least one-third" and § 63.640(h)(3)(i) should begin "At least two-thirds." Another commenter (IV-D-20) suggested the addition of the word "approximately" in front of the 1/3 and 2/3 refinery components that must be in compliance with the rule, stating that the exact counts of fugitive sources are not necessarily available and can easily change in a 6 month time period and that requiring exactly 1/3 or 2/3 will result in increased recordkeeping that is not justified.

One commenter (IV-D-21) stated that facilities will not have enough information six months after promulgation to elect for either source-wide or process unit monitoring. The commenter (IV-D-21) suggested that the EPA, rather than making this a one-time decision, allow facilities to change the basis infrequently, perhaps once per year with a notification of the change three months prior. The commenter (IV-D-21) also recommended that the instructions for calculating the source-wide population of components be clarified to indicate that estimates of counts are acceptable for components not in the monitoring program until 18 months after promulgation.

Response: The final rule no longer requires phased-in compliance. Instead, the entire refinery must be in compliance with the control requirements of subpart VV within 3 years after promulgation of the rule. The final rule also specifies that facilities complying with the optional connector monitoring requirements, and the reduced valve and pump monitoring frequency of the modified negotiated regulation comply in Phase III. The rule also requires that owners or operators shall decide no later than the first monitoring period after Phase I whether to calculate the percentage of leaking valves on a process unit or source-wide basis. Because Phase I begins 3 years after promulgation of the rule, the EPA believes that sufficient time has been allowed for owners or operators to comply fully with the rule.

The EPA disagrees with the commenters' suggestion of allowing facilities to change the percent leaking basis with a notification of change, because there would be no guarantee that a consistent program would be maintained or would not be manipulated. The EPA has clarified in the final rule that once owners or operators have decided to choose to calculate percent leaking valves or connectors either source-wide or on a process unit basis, all subsequent calculations shall be made on the same basis unless a permit change is made. The EPA believes these changes simplify the rule and makes it easier for all refineries to establish leak detection and repair programs in order to reduce HAP and VOC emissions.

## 8.6 RECORDKEEPING AND REPORTING FOR EQUIPMENT LEAKS

Comment: One commenter (IV-D-21) found the compliance dates for equipment leaks unclear and difficult to meet. The commenter (IV-D-21) asserted that more time will be required to upgrade such equipment as agitators, sampling connection systems, open-ended lines, surge control vessels, bottoms receivers and instrumentation systems since these are not normally monitored. The commenter (IV-D-21) made several suggestions that they claimed would provide clarity and flexibility.

Response: The EPA contends that minimal upgrades are required for the equipment listed by the commenter. Agitators, surge control vessels, and bottoms receivers are not included in the equipment leak provisions of the Refinery MACT rule. Instrumentation systems have minimal monitoring requirements, and sampling connectors and open-ended lines have minimal control requirements.

Comment: One commenter (IV-D-25) asserted that the requirement in § 63.652(b) to comply with the HON subpart H recordkeeping and reporting sections is too general, because some portions of subpart H are not incorporated into the petroleum refineries NESHAP. The commenter (IV-D-25) suggested more detailed language or a table similar to table 5 of the proposed rule to specify which HON recordkeeping and reporting requirements apply to refineries.

Response: The final rule clarifies the recordkeeping and reporting requirements of subpart H applicable to the refinery rule. A table has also been provided in the final rule that summarizes the applicable subpart H recordkeeping and reporting requirements.

Comment: One commenter (IV-D-09) stated that the EPA should exempt components covered by more stringent equipment leak programs because recordkeeping and reporting requirements are different or repetitive and mistakes in paperwork may cause heavy liabilities. Another commenter (IV-D-22) stated that the EPA should eliminate overlapping and duplicate monitoring, testing recordkeeping and reporting requirements by adding the same language to the applicability section last that found in HON (40 CFR 63.160(b) and (c)).

Response: The EPA agrees with the commenters that elimination of overlapping and duplicate recordkeeping and reporting requirements is necessary to provide a clear and understandable rule for owners and operators who must comply with it. The final rule clarifies which recordkeeping and reporting requirements are to be met when different equipment leak regulations are applicable.

Comment: One commenter (IV-D-11) requested that the EPA not require detailed documentation on connector location because the work associated with the optional program is to be random. The commenter (IV-D-11) stated that it was consistent with common sense and Executive Order 12866.

Response: The EPA agrees with the commenter that requiring detailed connector locations would be overly burdensome and would not be very useful. The final rule allows connectors to be identified by the area or length of pipe and need not be individually identified. The EPA believes that this modification will reduce the burden on the industry while maintaining necessary documentation to verify compliance.

## 8.7 WORDING OF EQUIPMENT LEAKS PROVISION

Comment: One commenter (IV-D-21) suggested that "indications of liquids dripping" in § 63.649(c)(4) concerning connector inspections be replaced with "leaks" to avoid the citation of oil stains as indications of liquids dripping.

Response: The EPA has revised § 63.649(c)(4) in the final rule to state that "a leak is detected if liquids are observed to be dripping at a rate greater than three drops per minute." This language is consistent with other sections of the equipment leak provisions, and with other equipment leak standards.

Comment: One commenter (IV-D-21) requested that "as defined in § 63.174" be added to the last sentences of § 63.649(b) and (c) to provide clarification that the words "inaccessible" and "unsafe-to-monitor" have been previously defined.

Response: The EPA agrees with the commenter, and has edited the rule as suggested.

Comment: One commenter (IV-D-21) found the phrase "technically feasible" too broad. The commenter (IV-D-21) stated that some repairs may be technically feasible, but not cost effective. The commenter (IV-D-21) suggested that the phrase be modified to " technically feasible by normal repair techniques" in the proposed regulation. Alternatively, the commenter (IV-D-21) suggested that the correction could be made in the HON and § 63.649(e) in the proposed regulation could be deleted.

Response: Connectors are not sources of high emissions and some connector repairs may be very costly. The EPA agrees with the commenter that the phrase "by normal repair provisions" be added to the connector repair provisions. This change was made in the final rule.

Comment: One commenter (IV-D-19) stated that table 3 has been incorrectly printed to indicate that the QIP program for valves is mandatory. The commenter (IV-D-19) stated that this is not consistent with agreements reached by API and EPA nor with the HON. The commenter (IV-D-19) contended that the QIP program for valves should be a voluntary program.

Response: The EPA agrees with the commenter and has revised table 3 to indicate that the QIP is a voluntary program.

Comment: One commenter (IV-D-48) stated that the equipment leaks provision exempts those who monitor connectors from any inspection of valves, though no mention of this is made in the preamble. The commenter (IV-D-48) concluded that this is a drafting error and recommended that it be fixed in the final rule.

Response: The commenter is correct that the proposed rule contained a drafting error. The final rule corrects this mistake; those who monitor connectors may monitor valves less frequently.

Comment: One commenter (IV-D-21) suggested changes that will clarify that § 63.648(b), which defines leaks for pumps and valves, and § 63.168(a)(1)(ii) apply to pumps in light liquid service and valves in gas/vapor and light liquid service. The commenter (IV-D-21) claimed § 63.648, the monthly light liquid pump monitoring provision, should include the underlined: "Except as provided in paragraph (h) of this section, owners or operators that achieve less than

(1) 10 percent if light liquid pumps leaking or (2) three light liquid pumps leaking, whichever is greater, shall monitor light liquid pumps monthly."

Response: The EPA has made this change in order to clarify the requirements and reduce confusion.

Comment: Two commenters (IV-D-21, IV-D-25) stated that § 63.148(a) and (f) of the proposed refinery rule cross-reference § 63.169 of the HON. Section 63.169(b) of HON defines a leak as 500 ppm for valves, connectors, and instrumentation systems; however, § 63.648(b) and § 63.649 define leaks as 1,000 ppm. The commenters (IV-D-21, IV-D-25) suggested language to establish a consistent definition of 1,000 ppm for valves, connectors, and instrumentation systems. One commenter (IV-D-38) requested that the underlined be added to the end of § 63.649(f) to make the definition consistent with other leak definitions in the refinery rule:

(f) Connectors in gas/vapor service or light liquid service are subject to the requirements for connectors in heavy liquid service in § 63.169 of subpart H of this part except the leak definition for connectors is the same as the definition for valves in table 2 of this subpart.

Response: The EPA has clarified the final rule by adding the following language: "The leak definition for valves, connectors, and instrumentation systems subject to § 63.169 is 1,000 parts per million volume." The leak definition was developed from the HON definition of 500 ppmv factored taking into consideration the lower HAP concentrations in process streams for refineries than in SOCMI facilities.

## 8.8 MISCELLANEOUS

Comment: In response to EPA's request for comment on whether the HAP contents of the petroleum liquids in the processing lines are below the 5 percent (by weight) applicability level in the equipment leak provisions, one commenter (IV-D-23) stated that they are confident that all of their process lines have greater than 5 percent HAP in them, since they all have greater than 3.7 percent benzene. Another commenter (IV-D-45) stated that HAP content in the crude oil delivered to the COTU's has less than 5 percent benzene, toluene, ethylbenzene and xylenes (BTEX) and n-hexane as measured in lab speciation of their crudes. The commenter (IV-D-45) included speciated lab results from testing of the HAP content in the crude from their facilities.

Response: The EPA thanks the commenters for their information.

Comment: One commenter (IV-D-21) requested that the EPA allow facilities to establish there own boundaries for process units, so long as they are disclosed to the regulating agency upon request and are not drawn to avoid regulation.

Response: The final rule does not preclude owners or operators from establishing boundaries for process units. The final rule only requires that petroleum refining process units classified under SIC code 2911 comply with the rule. The final rule also affords the owners or operators the choice of drawing boundaries on a process unit or on a source-wide basis.

## 9.0 GENERAL MONITORING, RECORDKEEPING,

AND REPORTING COMMENTS

## 9.1 USE OF MONITORING TO DETERMINE COMPLIANCE

Comment: Three commenters (IV-D-22, IV-D-42, IV-D-44) suggested that the EPA allow for alternative forms of compliance monitoring besides CEM's. Two commenters (IV-D-22, IV-D-42) requested that the EPA allow the use of other monitoring technologies, such as predictive emission and parametric monitors. One commenter (IV-D-44) recommended that the EPA allow requests for alternative monitoring methods subject to review and approval by the Administrator.

Response: Neither the proposed rule required nor the final rule requires the use of CEM's to demonstrate or assure compliance. Instead, it requires a combination of performance testing and continuous control device operating monitoring. The final rule also allows sources to request approval to use alternative monitoring systems. This will reduce the burden by allowing greater use of existing systems. Alternative monitoring systems specifically discussed in the rule include nonautomated systems and data compression systems. These systems will be allowed on a site-specific basis, dependent upon approval of the implementing agency. Other alternative monitoring methods may also be allowed if they are approved by the implementing agency as provided in part 63, subpart A (General Provisions).

Comment: Five commenters (IV-D-21, IV-D-22, IV-D-29, IV-D-44, IV-D-59) provided suggested changes to the frequency of data collected or the wording on the method of calculating daily averages. One commenter (IV-D-44) suggested that the 15 minute monitoring period be extended to hourly. The commenter (IV-D-44) claimed that 15 minute monitoring would be ludicrous for data that do not vary significantly from day to day, such as data regarding storage tanks. Three commenters (IV-D-22, IV-D-29, IV-D-44) asserted that monitoring periods should be no less frequent than daily.

One commenter (IV-D-59) suggested that the monitoring frequency be deleted from the rule altogether and left to 40 CFR part 63, subpart A (General Provisions). The commenter (IV-D-59) suggested that States be free to require more frequent monitoring than required by the General Provisions whenever they think necessary or appropriate.

One commenter (IV-D-21) requested that the calculation of daily averages be clarified. The commenter (IV-D-21) suggested that "...calculated as the average of all values for a monitored parameter" in § 63.652(h)(3)(v)(A) be revised to "...calculated as the average of all data recorded pursuant to § 63.652(h)(3)(ii) for a monitored parameter..." because daily averages should not be based on all values for a parameter.

Response: The final rule has been changed to require retention of hourly average values of continuously monitored values. The proposal required calculation of 15-minute averages. Under the proposal, if the daily average value was outside the established ranges (i.e., excess emissions occurred), the 15-minute values had to be retained; if the daily average value was within the established range, the 15-minute values could be converted to hourly averages and the hourly averages could be retained instead of the 15-minute averages. Upon reconsideration, the EPA finds the proposed 2-step process (of first computing and recording 15-minute averages, and then being allowed to convert them to hourly averages for record retention) to be burdensome and unnecessary. Hourly average values provide a sufficient record to support the calculation of the daily average value of a parameter. Therefore, to reduce the recordkeeping burden, the rule has been changed to specify that hourly averages must be retained for all days, regardless of whether or not excess emissions occurred. The rule no longer requires recording of 15-minute average values.

As at proposal, the daily averages values of a parameter are used to determine whether excess emissions have occurred. This allows for minor fluctuations in hourly data as long as the daily average is within the established range. The EPA has revised the wording of the rule to incorporate the changes discussed above and clarify the calculation of daily averages as suggested by the commenter (IV-D-21). These changes do not change the rule, but rather clarify what was originally intended.

For process vents where continuous parameter monitoring is required, the value of the parameter must still be measured at least once every 15 minutes, although only the hourly average must be recorded and retained. Many facilities already have computerized systems and monitor parameters more frequently than once every 15 minutes for process control purposes. The 15-minute monitoring frequency is also consistent with the General Provisions and previous NSPS and NESHAP for process vents from similar industries.

The EPA believes that some commenters may be under a misimpression that the rule requires continuous monitoring for storage vessels. Under both the proposed and final rules, continuous (e.g, every 15 minutes) monitoring is not required for storage vessels. If the vessels are controlled by floating roofs, periodic inspections are required. If the vessels are routed to control devices, the owner/operator must submit for approval a control device design and operating plan that specifies the parameters to be monitored and the frequency. Storage vessel emissions are not continuous; therefore, continuous emissions monitoring is not warranted.

Sources subject to this NESHAP must comply with all applicable monitoring requirements contained in the rule. In response to the commenters (IV-D-59) suggestion that monitoring requirements be left to the General Provisions, the EPA notes that the General Provisions provide a broad general regulatory framework for all part 63 NESHAP's; however, the specific provisions of each NESHAP override the General Provisions in those instances where requirements differ. At proposal and promulgation of the refineries NESHAP, the EPA determined that it is appropriate to override some of the General Provisions to reduce the monitoring, recordkeeping, and reporting burden for refineries, or to clarify how the requirements apply to refineries.

The Act allows State and local agencies to enforce regulations that are more stringent than Federal rules. A more stringent rule may or may not have more stringent monitoring, recordkeeping, and reporting provisions. All sources subject to the final petroleum refinery NESHAP must comply with the monitoring, recordkeeping, and reporting provisions contained in the rule. A source with a more stringent State or local standard would be required to comply with the provisions of that standard.

Comment: Two commenters (IV-D-39, IV-D-46) supported the use of parameter monitoring as an alternative to CEM. One of the commenters (IV-D-46) also supported the formation of parameter ranges and their approval process.

One commenter (IV-D-44) recommended that a daily average be used to determine if an excursion or noncompliance has occurred, not an exceedence on the CEM.

Response: Under the NSPS and NESHAP programs, parameter monitoring has generally been used in place of CEM's, especially for VOC control devices. The final rule, as at proposal, requires monitoring of control device operating parameters and reporting of periods when daily average parameter values are outside site-specific ranges. The source is provided the flexibility to establish appropriate site-specific parameter ranges with their permitting authority. These operating parameter ranges are then written into their operating permit and are enforceable. If the daily average value is outside the established range then it is a violation of the emission standards. Neither the proposed nor the final rule require the use of CEMs to assure compliance.

Comment: One commenter (IV-D-25) pointed out that the rule is unclear on how long a flare pilot light must be absent to be considered excess emissions, and suggested wording changes.

Response: The proposal and promulgation provisions for process vents and wastewater sections require reporting only if all pilot flames to a flare are out. Records must be kept of periods when each individual monitoring device or pilot light is not working, but if the flare has multiple pilot lights, reporting is not required unless all pilot flames are out.

If all pilot flames are out, it indicates that the flare is not functioning, and emissions being routed to the flare are not being controlled. Failure to operate a required control device for any length of time is a violation of the NESHAP, unless it is during a period of startup, shutdown, or malfunction. The refineries NESHAP and the General Provisions include startup, shutdown, and malfunction provisions.

Comment: One commenter (IV-D-25) suggested that, for purposes of determining periods of excess emissions, the rule should exclude periods of startup, shutdown, malfunction, or monitoring system calibration. The commenter (IV-D-25) contended that the startup, shutdown, and malfunction plan is not necessary because the refinery NESHAP already specifies many work practices, and the OSHA Process Safety Management Regulation already includes start-up and shutdown plan requirements for petroleum refinery process units. The commenter (IV-D-25) also suggested limitations to the scope of the plan if the EPA still decides to require a plan.

One commenter (IV-D-06) requested that the administrative requirements be reduced by eliminating or reducing the requirements for startup, shutdown, and malfunction plans because most of the requirements are included in the regulation as work practices. The commenter (IV-D-06) expressed confusion as to what level of detail is needed for startup, shutdown, and malfunction plans. The commenter (IV-D-06) stated that if a startup, shutdown, and malfunction plan is required, the following limitations should be included: (1) for equipment leaks, the startup, shutdown, and malfunction plan should only include the dates of process unit shutdowns and startups. This commenter (IV-D-06) stated that this information is pertinent to the repair work required to take place during process unit turnarounds and there is no relevance to maintaining procedures checklists to the proper operation and maintenance of fugitive sources; (2) for storage tanks, the startup, shutdown, and malfunction plan should only include the date when a tank is taken out of service and returned to service; (3) for miscellaneous process vents, the startup, shutdown, and malfunction plan is applicable in its present requirements; and (4) for wastewater, the startup, shutdown, and malfunction plan should not be applicable since the information is already covered in the BWON.

One commenter (IV-D-20) requested that reporting required by § 63.652(g)(1), such as reports of start-up, shutdown, and malfunction be removed and changed to a recordkeeping requirement since other reports already require the same data to be reported. The commenter (IV-D-20) stated that substitution of other reports which require similar data should be allowed.

Response: The NESHAP General Provisions [§ 63.6(f)(1)] state that "emission standards...apply at all times except during periods of startup, shutdown, and malfunction...". During such periods, a source must follow their site-specific startup, shutdown, and malfunction plan.

Start-up, shutdown, and malfunction plans are described in the General Provisions. Therefore, they are not described in the refineries NESHAP. The General Provisions [§ 63.6(e)(3)(vi)] clearly state that a source's SOP manual or an OSHA plan may be used to satisfy the requirements for a startup, shutdown, and malfunction plan if they contain all the required information and are available for inspection by the regulatory authority. This provision will avoid duplicative efforts.

One purpose of the startup, shutdown, and malfunction plan is to ensure that sources and pollution control equipment are operated in a manner consistent with good air pollution control practices for minimizing emissions during these events. Another purpose is to minimize the reporting burden associated with startup, shutdown, and malfunction events. The plan allows the source to describe the procedures they will follow during these events. If the plan is followed, then a simple letter report can be submitted semiannually to state that the plan was followed during start-ups, shutdowns, and malfunctions during that 6-month period [§ 63.10(d)(5)(i) of subpart A]. If the plan is not followed, an immediate report describing the malfunctions and the actions that are inconsistent with the plan is required. If a plan were not required, then detailed reports would be needed for all malfunctions to demonstrate that the event was a malfunction and that emissions were minimized during the event. Thus, the plan greatly reduces the ongoing reporting burden. The plan also avoids questions over whether an event envisioned in the plan is a malfunction or a violation of the emission standard. If a malfunction occurs and it is covered by the source's start-up, shutdown, and malfunction plan, and the procedures in the plan are followed, the occurrence is not counted as an emissions exceedence.

The commenter is correct in stating that equipment leaks from pumps, valves, and other components are not considered malfunctions. For equipment leaks, only startup, shutdown, and malfunction of any control device would need to be considered. The detection and repair of such leaks is addressed in the NESHAP, and therefore does not need to be included in the startup, shutdown, and malfunction plan.

Comment: One commenter (IV-D-40) contended that the non-automated monitoring requiring operator manual records once per hour contained in the rule is unreasonable for some operations. The commenter (IV-D-40) explained that some States such as New Jersey allow different monitoring frequencies based on the type of operation (e.g. batch plants often are only required to manually record the flow of water to a scrubber once per batch cycle. The commenter (IV-D-40) also said that batch times may range from 1 hour to 2 days. The commenter (IV-D-40) said the plant maintains low-flow interlocks or alarms to insure adequate water flow to the control device. For these reasons, the commenter (IV-D-40) stated that the one-hour requirement is not cost-effective or appropriate in many cases. The commenter (IV-D-40) suggested allowing up to 4-hour intervals for manual monitoring after review and approval with the permit authority.

Response: The EPA estimates that there are relatively few facilities that do not already have automated computer monitoring systems in place. The EPA agrees that there is often only a need for a minimum amount of data to obtain a valid average. The EPA addressed this issue on the HON in order to reduce the burden on those sources that did not have automated computer monitoring systems in place. The refineries NESHAP refers to provisions contained in § 63.151(g) of the HON subpart G, which allow non-automated sources to request approval from the permitting authority to manually read and record the value of the relevant operating parameter less frequently. In approving the request, the implementing agency may consider the variability of the parameter, and whether a longer monitoring frequency is sufficient to characterize control device operation.

There are very few batch process vents within petroleum refineries. Cokers are batch operations, however, provisions have been added to exclude "coking unit vents associated with coke drum depressuring at or below a coke drum outlet pressure of 15 psig, deheading, draining, or decoking (coke cutting)." The implementing agency may consider and approve less frequent monitoring and recordkeeping for batch process vents as long as the minimum data for a valid average is obtained.

Comment: One commenter (IV-D-25) noted that the proposed rule appeared to use the term "period of excess emissions" and "excess emissions" interchangeably, and recommended some editorial clarifications.

One commenter (IV-D-52) was confused with the provisions describing excess emissions as an operating day when monitoring data are insufficient to constitute a valid hour of data for at least 75 percent of the operating hours. The commenter (IV-D-52) considers excess emissions to be those which are higher than allowable emissions and considers the EPA definition to be closer to the commenter's definition of downtime. Downtime would include any operating time when a CEM is not recording valid monitoring data at least 75 percent of the hour while the source is in operation, because of maintenance or some other similar circumstance. The commenter (IV-D-52) stated that such downtime is not considered a violation if less than specified availability levels. The commenter (IV-D-52) recommended that the required operating time for monitors should be 90 percent of the source's operating time over a calendar quarter, because many CEM's exceed 90 percent availability. The commenter (IV-D-52) recommended that the period of excess emissions be based on a shorter period than a daily average and suggested the hourly average. The commenter (IV-D-52) added that their State is switching to hourly averages for CEM data that is used to determine compliance with an hourly limit.

Response: The monitoring under this rule is not CEM-based. Multiple options are available to demonstrate compliance with the performance-based standard. Because of the number of differing operation and production differences across petroleum refineries, an absolute emissions limit would not be practical. Therefore, periods of excess emissions are defined based on operations and emissions control performance.

Period of excess emissions means any of the following conditions:

(A) An operating day when the daily average value of a monitored parameter, except presence of a flare pilot flame, is outside the range specified in the Notification of Compliance Status Report.

(B) An operating day when all pilot flames of a flare are absent.

(C) An operating day when monitoring data are insufficient to constitute a valid hour of data for at least 75 percent of the operating hours. Monitoring data are insufficient to constitute a valid hour of data if measured values are available for less than three 15-minute periods within the hour. For data compression systems approved under paragraph (g)(5)(iv) of § 63.651, monitoring data are insufficient to constitute a valid hour of data if there are less than four data values recorded during the hour.

The EPA's definition for process downtime has nothing to do with CEM. If monitoring data are not collected or the monitored parameter is out of range due to a "malfunction", as defined in the NESHAP general provisions, this is not considered to be a violation. (Requirements for startups, shutdown and malfunction plans, records, and reports contained in the NESHAP General Provisions address malfunction situations). However, if there is not a monitor malfunction, it is reasonable to consider days when insufficient monitoring data are collected to be periods of excess emissions and violations of the emission standards. Otherwise, monitors could be turned off when excess emissions were occurring.

While many monitors may be able to function 90 percent of the time on a long-term average basis, it would be unreasonable to consider it a violation if monitors operate less than 90 percent of the time in each single day. Requiring monitors to operate greater than 90 percent of the time in each single day would add substantially to the operating cost of the rule. The 75 percent level allows for short-term monitor problems that are promptly corrected; and if 75 percent of the data are available, this is sufficient to determine whether the monitoring parameter is within its range on a daily average basis.

Comment: One commenter (IV-D-59) strongly agreed that violations of the parameters on which the compliance plan is based must be considered violations of the emissions standard.

Response: As the commenter stated, an excursion of the daily average value of a parameter outside the established range would constitute a violation of the emission standards.

Comment: One commenter (IV-D-59) maintained that if the EPA wishes to allow data compression systems, it should also require that these systems regard all deviations from the operating parameters established as indicating noncompliance.

Response: Approved data compression systems are a fully acceptable alternative type of continuous alternative type of continuous monitoring system. As with any continuous monitoring system, if the daily average recorded by the data compression system is outside the established range, this is considered a period of excess emissions and a violation of the emission standard. The commenter is suggesting a different standard for facilities using data compressor systems. Under the commenter's suggestion, if a single measured value was outside the range this would be considered a violation, even if the excursion was for only a few minutes. For continuous monitoring systems, including approved data compressions systems, the rule determines excess emissions based on the daily average value of the monitored parameter. It would be inequitable to establish a more stringent standard for sources with data compression systems.

The proposed and final rule allows a source to request approval to monitor using data compression as an alternative monitoring, recordkeeping, and reporting system. Sources wishing to use data compression must apply to the permitting authority for the approval of this alternative. The EPA has established minimum criteria that data compression systems must satisfy in order to ensure recorded data are sufficient to represent the process and determine whether excess emissions have occurred. These minimum criteria assure that data compression systems will be equivalent to traditional continuous monitoring and recordkeeping systems.

In order to be approved, an acceptable data compression system must be capable of: (1) measuring the operating parameter value more frequently than at least once every 15 minutes; (2) recording the hourly average values each hour during periods of operation; (3) recording the date and time when monitors are turned off or on; (4) recognizing unchanging data that may indicate the monitor is not functioning properly, alerting the operator, and recording the incident; and (5) computing daily average values of the monitored operating parameter based on recorded data. The request for approval must contain a description of the monitoring system and data compression recording system, including the criteria used to determine which monitored values are recorded and retained, the method for calculating hourly and daily averages, and a demonstration that the system meets the five criteria previously discussed.

## 9.2 RECORDKEEPING REQUIREMENTS

Comment: One commenter (IV-D-36) disagreed with the five-year record retention requirements. The commenter (IV-D-36) found the requirement burdensome and not a direct benefit to the environment. Two commenters (IV-D-36, IV-D-44) recommended a three-year record retention policy.

Another commenter (IV-D-59) strongly disagreed with the proposal to allow records to be destroyed after five years. The commenter maintained that records should be retained as long as necessary in order to document possible violations.

Response: The petroleum refinery NESHAP and General Provisions require records to be kept for five years, which is consistent with the recordkeeping requirements of section 70.6 of the operating permit program and other NESHAP. The rule has been changed to state that records must be maintained in such a manner that they are readily accessible (e.g., within 24 hours). Records may be maintained on-site or off-site, in hard copy or computer readable format, as long as they are readily accessible. This replaces the proposed provisions that required records to be retained on-site or accessible from a central location by computer for the first 2 years. As long as a record can be retrieved within 24 hours, the intent of the standards is met. There is no need to be overly restrictive in specifying how and where to maintain the record. Storage of records for more than 5 years would be burdensome, and any compliance issues should be identified within 5 years. Furthermore, the statute of limitations for enforcement is 5 years so there is no reason to keep records for a longer period of time.

Comment: Two commenters (IV-D-19, IV-D-21) stated that the words "each" in § 63.652(h)(3)(i)(A) and "all" in (B) would make recordkeeping burdensome because many of the refineries have computers to measure data values frequently. The commenters (IV-D-19, IV-D-21) suggested that the requirements of § 63.652(h)(ii) be rewritten so that if data is measured more than once per minute, only one measurement from each one-minute block need be used to satisfy § 63.652(h)(3)(i)(A) or (B).

Response: As explained in a previous response, the final rule has been changed to require records of hourly average values rather than 15-minute averages. However, parameter values must still be measured at least once every 15 minutes. Generally, all measured values must be used to calculate the hourly average. If values are measured once every 15 minutes, 4 values would be used to calculate each hourly average. However, as the commenter pointed out, if a value is measured more frequently than once per minute, more than 60 values would be used to calculate the hourly average, if the wording of the rule required use of all measured values. In accordance with the commenter's suggestion, the wording has been revised such that if data are measured more frequently than once per minute, one measurement from each 15-minute block may be used in calculating the hourly averages. This procedure will yield a representative hourly average. It will reduce the burden of the calculation and avoid penalizing sources that measure values much more frequently than is required by the standard.

As stated in previous responses, only the hourly average values are required to be retained on record. If a source wishes to keep records of 15-minute or more frequent average values instead of or in addition to hourly averages, they may do this, but it is not required by the final rule. These provisions ensure that there will be enough monitoring values recorded and retained to be representative of the monitoring period, while reducing the burden that would be associated with digital conversion of data, transferring data to tape or hard copy, copying, and storing the data if all the 15-minute or more frequently measured values had to be retained.

Comment: One commenter (IV-D-29) requested that recordkeeping costs be minimized. The commenter (IV-D-29) did not agree with the approach of using recordkeeping instead of testing for enforcement. The commenter (IV-D-29) asserted that recordkeeping places a high cost on the industry and regulatory agencies to monitor unnecessary records.

One commenter (IV-D-22) asserted that the language of the proposed rule does not reflect some of the flexibility which the EPA seems to be intending in the preamble language. The commenter (IV-D-22) explained that the level of data required in a complete test report for each test method used for a particular source is an overly burdensome requirement. The commenter (IV-D-22) stated that test reports should be on one performance report per facility and should be submitted to the EPA at the discretion of the source as to which report.

Response: Monitoring and recordkeeping is necessary to demonstrate compliance on an ongoing basis. If testing alone were used, repeated testing would be required. Periodic testing of every emission point subject to the standards would be extremely burdensome and is not necessary to determine compliance. Instead, the rule specifies initial testing for vents that are not routed to the fuel gas system. (Some boilers and flares do not require a performance test.) After the initial test, operating parameters are monitored and recorded to assure compliance. Because monitoring can be done on a continuous basis, it is a better indicator of ongoing compliance than periodic testing, and it is also less burdensome than frequent testing would be. For storage vessels, periodic inspections of floating roof seals must be performed because testing is not feasible.

The EPA recognizes that unnecessary recordkeeping requirements would burden both the source and the enforcement agencies. Every attempt has been made to reduce the amount of recordkeeping to only that which is necessary to demonstrate compliance. For example, sources have the option of retaining records either in paper copy or in computer readable formats, whichever is less burdensome and less costly. For continuously monitored parameters, the rule has been changed to require retention of only the hourly average data rather than 15-minute data. For storage and equipment leak inspections that reveal no problems, only the date of the inspection must be recorded, not detailed results. Periodic reports include only periods of excess emissions, not a summary of all the data.

If multiple performance tests are conducted for the same kind of emission point using the same test method, only one complete test report is submitted along with summaries of the results of the other tests. This reduces the number of lengthy test reports to be copied and submitted.

The test report provisions apply primarily to process vents. The storage vessel provisions allow a design analysis instead of a performance test; and the refineries NESHAP refers to subpart VV of part 60 or to the HON subpart H for equipment leaks, recordkeeping and reporting, and to BWN for wastewater, and does not impose any new requirements. For process vents, it is necessary to submit one complete test report for each test method in order for the enforcement authority to verify that the test protocol, sampling and analysis, quality assurance procedures, and calculations have been done correctly. If the same method is used to test other process vents, the test reports for the other vents may be retained on site and only the results must be reported. The EPA considers this level of recordkeeping the minimum necessary to ensure compliance.

## 9.3 REPORTING REQUIREMENTS

### 9.3.1 Initial Notification

Comment: One commenter (IV-D-59) stated that the initial notification is a simple matter and should be required within 60 days of promulgation instead of 180. The commenter noted that, with respect to construction and reconstruction, consistency with the statute requires immediate notification, since after promulgation new sources must comply with new source MACT. The commenter stated that the State agencies administering new source review programs must know whether a source seeking a construction permit has a MACT obligation before the permit is granted.

Response: The final rule has been changed to delete the requirement for an initial notification. This decision was made as part of a reanalysis of the recordkeeping and reporting requirements to eliminate duplicative requirements and reduce the recordkeeping burden of the standards. As summarized in section 9.4, many commenters believed the proposed recordkeeping and reporting requirements were overly burdensome.

The Initial Notification is not necessary for refineries because it would duplicate the operating permit program and because the name and location of all the refineries in the U.S. are already known. Several readily available journals (e.g., Hydrocarbon Processing, Oil and Gas Journal) publish lists of refineries. Thus, States and EPA regional offices can easily determine which sources in each State will be subject to the petroleum refineries NESHAP. Furthermore, refineries that are major sources are required to obtain Title V operating permits. The due-dates for title V operating permit applications will generally fall after proposal or shortly after promulgation of the petroleum refineries NESHAP, depending on State schedules, but prior to the 3-year compliance time in the NESHAP. The Title V applications will identify that the refineries are subject to the NESHAP. Therefore, a separate Initial Notification would be duplicative and has been eliminated from the final rule.

9.3.2 Notification of Compliance Status

Comment: Several commenters (IV-D-09, IV-D-20, IV-D-21, IV-D-22, IV-D-36, IV-D-42) objected to some of the Notification of Compliance Status Report requirements in the proposed rule. Several commenters (IV-D-09, IV-D-20, IV-D-21, IV-D-22, IV-D-36) objected to the requirement that refineries that make changes to feedstock type make a Notification of Compliance Status Report to the EPA or delegated authority. The commenters (IV-D-09, IV-D-20, IV-D-22) asserted that refineries change crude slate constantly based on world-wide market condition, product demand, transportation costs and availability, and equipment operating conditions. One commenter (IV-D-20) urged the EPA not to require a Notification of Compliance Status Report for changes in the throughput rate. The commenters (IV-D-09, IV-D-20) concluded that these requirements would require almost constant notification.

Four commenters (IV-D-21, IV-D-22, IV-D-36, IV-D-42) contended that the reporting requirements associated with operational changes or addition of minor emission points are too burdensome. The commenters (IV-D-22, IV-D-42) contended that refineries make many deliberate operational changes each week that do not increase significant emissions; therefore, it would be difficult to document each change in a Notification of Compliance Status Report. The commenters (IV-D-21, IV-D-22, IV-D-42) recommended that only when a deliberate operational change causes a Group 2 point to become a Group 1 point or meets the criteria for reconstruction should additional reporting or recordkeeping be triggered. Two commenters (IV-D-21, IV-D-36) urged that notification not be required for feedstock and operational changes due to their frequency and the insignificant effect they have on emissions. One commenter (IV-D-21) recommended that the underlined text in the following sentence from § 63.640(i)(3) be deleted: "A process change to an existing petroleum refining process unit shall be subject to the reporting requirements...".

Two commenters (IV-D-22, IV-D-42) stated that minor emission points such as valves and connectors are added periodically, which result in small increases in emissions, and is it therefore unreasonable to require an Notification of Compliance Status for additional equipment leak emission points. One commenter (IV-D-42) suggested that either equipment leaks be removed from the definition of emission point or the phrase "emission point" in § 63.640(l)(3) be replaced with "storage vessel, miscellaneous vents, or wastewater stream" because the commenter (IV-D-42) contended that it was not the EPA's intention that added potential equipment leaks trigger a Notification of Compliance Status Report because such emission points are tracked through a LDAR program.

Response: The proposed provisions in § 63.640(l) and (m) were intended to require a Notification of Compliance Status Report only if a process vent, storage vessel, or wastewater stream is added or if an operational change causes a process vent or storage vessel to change from Group 2 to Group 1.

Most feedstock changes would not cause the group status of a vent or storage vessel to change, and therefore, most feedstock changes would not need to be reported. It was the EPA's intent to require a Notification of Compliance Status Report if a petroleum refinery makes an equipment change or rebuilt equipment. It was not the EPA's intent to require a Notification of Compliance Status Report if a petroleum refinery makes a change within the original design. The wording of the final regulation has been revised to clarify the intent.

The EPA has also removed the phrase "emission point" and replaced it with "storage vessel, miscellaneous process vent, or wastewater stream" to clarify that the addition of valves and connectors does not trigger a Notification of Compliance Status Report.

Comment: One commenter (IV-D-21) supported the flexibility provided by allowing information to be submitted in an operating permit application, an amendment to an operating permit application, a separate submittal, or a combination of the three. The commenter (IV-D-21) stated that this minimizes the number of time consuming management reviews required.

Response: The EPA has made every effort to reduce the reporting burden, and to require only those reports necessary to determine compliance. If the information required in the notification of compliance status report has been previously submitted in an operating permit application or amendment, then the requirements of the rule have been fulfilled.

Comment: One commenter (IV-D-21) suggested that if a Notification of Compliance Status or additional data is required due to a changed or added emission point, the Notification of Compliance Status Report or data should be included with other periodic reports the next regular reporting date after the Notification of Compliance Status Report was due. The commenter (IV-D-21) asserted that additional deadlines beyond normal reporting are not worth the added burden because there is no associated emissions decrease. The commenter (IV-D-21) requested that the sentence "The applicable reports include, but are not limited to:" be changed to read "The applicable reports shall be submitted with other periodic reports required by §§ 63.652(f) and (g) and include but are not limited to:"

Response: The final rule has been clarified such that when a Notification of Compliance Status Report is required due to the addition of an emission point or a change from Group 2 to Group 1, the Notification of Compliance Status Report may be submitted either in the next periodic report or within 150 days after the new or changed emission point is required to achieve compliance, whichever is later. This will allow the operator flexibility, and reduce the reporting burden and the number of separate reports that must be submitted. Subpart CC requires periodic reports to be submitted semiannually within 60 days of the end of each 6-month period. Thus, if the Notification of Compliance Status Report is submitted in the next periodic report, it will be within 8 months of the compliance date, even if the compliance date falls on the first day of a reporting period; and on the average the next periodic report would be 5 months (150 days) after the compliance date for the new or changed emission point. Allowing sources to include the Notification of Compliance Status Report in the periodic report will simplify reporting and reduce the number of submittals. However, if a change is made near the end of a reporting period, a source may not have time to perform any required testing, receive the test results, and prepare the Notification of Compliance Status Report before the next periodic report is due. In these cases, the source will be allowed 150 days from the date the added or changed Group 1 emission point is required to achieve compliance. This is the same amount of time as allowed for the initial Notification of Compliance Status Report.

Comment: One commenter (IV-D-57) asserted that 150 days is too long for filing a Notification of Compliance Status Report because sources have 3 years to comply and should be able to prepare the notice in a shorter time frame.

Response: The final provisions allow 150 days after the compliance date for a source to submit their Notification of Compliance Status Report. This amount of time is necessary and sufficient for the source to complete the performance tests and set monitoring parameter ranges. The rule requires control equipment to be installed and operating on the compliance date. Testing cannot take place until the control equipment has been installed. Time is needed after the compliance date to conduct performance tests, receive analytical results from the lab, prepare test reports and other compliance demonstration documentation, and allow for management review. The 150 days is based on information submitted by the chemical industry during development of the HON on the length of time it takes to conduct a performance test and receive the analytical results. The scope of the MACT standard will involve large amounts of information, where 150 days is necessary. Both the HON and NESHAP General Provisions allow 150 days or more for these activities. A source is always allowed to submit a report prior to the due date.

9.3.3 Periodic Reports

Comment: Some commenters (IV-F-19, IV-D-21, IV-D-22) expressed opposition to quarterly reporting of an emission point if the parameter values are outside the established range for more than 1 percent of the operating time or its monitoring device has a downtime greater that 5 percent in a semiannual reporting period. One commenter (IV-D-19) suggested that only semiannual reporting be required. The commenters found this requirement burdensome and inconsistent with other recordkeeping requirements. One commenter (IV-D-19) attested that penalties for noncompliance are sufficient incentive for compliance and increased reporting does not improve enforceability. One commenter (IV-D-21) claimed that the proposed percentages could be interpreted as requiring calculation of percentages based on 15 minute averages rather than periods of excess emissions (days). The commenter (IV-D-21) claimed that this interpretation would make the data compression provision useless. The commenter (IV-D-21) provided changes to avoid interpretation that 15 minute averages should be used in determining percent of time outside of a compliance range. The commenter (IV-D-21) suggested several minor corrections concerning the period of excess emissions. One commenter (IV-D-22) recommended using 5 percent monitor noncompliance and 5 percent monitor downtime provisions as a standard for submittal of quarterly reports.

One commenter (IV-D-44) suggested that the continuous emissions monitor noncompliance rates should be a 5 percent monitor noncompliance rate and a 10 percent monitor downtime rate measure for each monitor, not across the refinery or process units.

In response to a request for comments on requiring more frequent reporting dependent upon the frequency or duration of exceedences, one commenter (IV-D-46) suggested that the requirements address the periodicity of exceedences, in order to encourage fundamental problems that result in frequent, but short duration exceedences to be corrected.

One commenter (IV-D-59) was concerned about the complexity of making the frequency of reporting depend upon the number of violations. The commenter stated that it is unlikely that the State agency will have the time necessary to determine whether sources claiming the right to report less frequently have earned it. The commenter suggested that if the EPA wishes to reduce the frequency of reporting for facilities with good compliance histories, it should set reasonably high standards for these reductions and require companies to report more frequently if violations occur. The commenter recommended that EPA require a statement listing Act requirements that applied during the last two years and certification that there had been no violations.

One commenter (IV-D-59) suggested that companies that qualify for semiannual reporting must report more frequently if a violation occurs after qualifying for semiannual reporting. The commenter specifically suggested that reporting should be quarterly if a violation occurs within the year. The commenter stated that if any non-compliance is tolerated for this purpose, 1 percent of time out of compliance is better than 5 percent.

Response: The final rule has been changed to remove the requirement for quarterly reporting in cases where monitoring parameters are out of range or monitors are not operating more than a specified percent of time. Instead, semi-annual reporting is required for all facilities. At proposal, all facilities were required to report semiannually, but if the specified percentages were exceeded and the regulatory authority requested it, quarterly reporting could be required.

This change was made because the EPA agrees that the quarterly reporting system proposed added complexity to the rule, it may not be helpful for enforcement, and that penalties for noncompliance are a sufficient deterrent for poor performance. The rule specifies that if the daily average value of a monitored parameter is outside the established range or if valid monitoring data are not available for at least 75 percent of the operating hours in a day, then excess emissions have occurred and the emission standard has been violated. Thus, sources have a clear incentive to keep monitors operating and parameters within range. Because a single day out of the 6-month (182 days) reporting period can be a violation, sources with parameters out of range as little as 0.5 percent of the time may have a violation.

Semiannual reporting is consistent with Title V operating permit reporting requirements. Requiring separate quarterly reports for some facilities adds complexity and increases the reporting burden for both the facility and the enforcement agency. It would require calculation of percentages, tracking of which facilities and emission points are on quarterly versus semiannual schedules, and extra report preparation and review time. Semiannual reports will provide the regulatory agency information on excess emissions within about 6 months of the occurrence. This is well within the 1-year timeframe in which the agency can take administrative enforcement actions (see later comments in this section).

Comment: One commenter (IV-D-52) suggested periodic reports be submitted within 30 days of the recording period, instead of 60 days as currently required.

Response: The final provisions require periodic reports to be submitted no later than 60 days after the end of each 6-month period. This time period should allow enough time for the source to gather data, prepare, review, and finalize the periodic report. Because of the large number of emission points at a refinery, 30 days may be inadequate. A source is always allowed to submit a report prior to the due date.

Comment: One commenter (IV-D-20) suggested annual reports instead of semiannual reports for those reports required by § 63.652(f)(1) and (f)(6).

One commenter (IV-D-59) stated that a chaotic situation will exist where the frequency of reporting varies from standard to standard.

Response: The periodic reporting system of semiannual reporting is in conformance with § 70.5(c) of the operating permits program, which states that sources are required to submit reports no less frequently than once every six months.

Annual reporting was not selected as requested by the commenters, because it would significantly reduce the EPA's ability to take administrative enforcement actions.
Section 113(d) of the Act limits assessment of administrative penalties to violations that occur no more than 12 months prior to the initiation of the administrative proceeding. Periodic reports are a primary means of identifying possible violations, and annual submittal would not give the enforcement agency time to review the report and take action on a violation that occurred early in the reporting period within one year after the event. Administrative proceedings are far less costly than judicial proceedings for both the EPA and the regulated community.

9.3.4 Additional Reporting

Comment: One commenter (IV-D-29) stated that notification before tank inspections is unnecessary. Another commenter (IV-D-20) requested that the reporting requirements for notifications of inspections for storage vessels be removed and changed to a recordkeeping requirement. One of the commenters (IV-D-29) questioned the existence of data showing that occasional tank inspections are a significant health risk. The commenter (IV-D-29) questioned who was going to pay for the local inspector and if the emissions created by the local inspector coming to the tank site had been considered.

Response: The proposed and final refineries NESHAP requires the same notification as previous storage tank regulations including HON and the NSPS (40 CFR part 60, subpart Kb). The EPA has determined that the notification requirements for an owner or operator to inform the implementing agency of an upcoming seal gap measurement (for EFR vessels) and of vessel refilling when a vessel has been emptied and degassed (for both IFR vessels and EFR vessels) is a reasonable requirement and is not unnecessarily burdensome. These notifications are not required to be submitted very frequently. For IFR vessels, which is a common type of floating roof vessel, the notification requirement for vessel refilling will be required once per ten years, or each time the vessel is emptied and degassed. For EFR vessels, the notification requirement for vessel refilling has no specified schedule, as the notification is required each time this type of vessel is emptied and degassed, according to the schedule established by the facility operating the vessel. The EPA anticipates that EFR vessels will be emptied and degassed no more frequently than once every ten years. Also for EFR vessels, the notification requirement for seal gap measurements will be required once per year. The EPA maintains that this notification requirement is not unnecessarily burdensome; these notifications are necessary for effective enforcement of the rule.

The EPA also concluded that these notification requirements are not likely to result in findings of noncompliance against sources. If a source cannot notify the implementing agency within 30 days due to an unplanned event, a source is not necessarily in noncompliance. Both of these notification provisions specify that if the seal gap measurement or internal inspection associated with the vessel refilling were unplanned, then the notification could be made seven days in advance of the measurement or refilling, rather than the standard 30 days in advance.

The EPA has also concluded that, based on discussions with State agencies, these notifications will result, in many cases, in observers being sent to facilities to be present during the measurement or inspection. The EPA recognizes that some implementing agencies may choose to send observers to these measurements and inspections less frequently than other implementing agencies; however, the EPA anticipates that the majority of implementing agencies will use these notifications for enforcement purposes.

Comment: One commenter (IV-D-36) recommended that the EPA make modifications necessary to allow reports required by the Benzene NESHAP's and NSPS programs to satisfy all reporting requirements of Title III and the proposed refinery NESHAP regulation.

Response: The EPA agrees that duplicative reporting should be avoided, and has clarified the refineries NESHAP to state which compliance and reporting requirements apply to emission points that are subject to the refineries NESHAP as well as previous NSPS or NESHAP. The proposed refineries NESHAP specified that the only reporting required for wastewater is the reporting required by the BWON. This provision has been retained in the final rule. The refineries NESHAP equipment leaks reporting is the same as "for 40 CFR part 60, subpart VV or the HON (40 CFR part 63, subpart G), depending on the compliance method chosen by an owner or operator." The HON overrode reporting requirements of the SOCMI equipment leaks NSPS in cases where the same equipment was subject to both rules. Wording has been included in the final refineries NESHAP to clearly state that the refineries NESHAP reporting requirements also over-ride the petroleum refinery equipment leaks NSPS and the benzene equipment leaks NESHAP for equipment subject to multiple rules. For storage, provisions have been added to the final rule to state whether the refineries NESHAP, the benzene storage NESHAP, or the NSPS (40 CFR part 60, subparts K, Ka, and Kb) apply for storage vessels subject to multiple rules. This will result in only a single report for each storage vessel. For process vents, no other NSPS or NESHAP are expected to apply to the same process vents that are subject to the petroleum refineries NESHAP. The reader is referred to section 3.5 of this document for additional discussion of regulatory overlap issues.

Comment: One commenter (IV-D-44) suggested that test reports be combined so that one performance report can be submitted on the frequency established in the Title V permit.

Two commenters (IV-D-42, IV-D-51) recommended incorporating MACT reporting requirements into the Title V permitting program.

Response: A source must comply with all rules that apply to each emission point. If some of the monitoring, recordkeeping, and reporting for these different rules requires submittal of the same information, then the source can discuss with the implementing agency how to avoid duplicative monitoring, recordkeeping, and reporting.

If test reports and other information required by the Notification of Compliance Status have already been submitted as part of a Title V operating permit program they do not have to be submitted again.

9.4 RECORDKEEPING AND REPORTING BURDEN

Comment: Many commenters (IV-D-13, IV-D-19, IV-D-22, IV-D-34, IV-D-36, IV-D-39, IV-D-42, IV-D-51) alleged that the recordkeeping and reporting requirements are extremely burdensome, and do not contribute to improvement in air quality and may divert resources away from compliance activities. One commenter (IV-D-39) urged the EPA to continue to look for ways to reduce the monitoring and reporting burden associated with the proposed rule. Some commenters (IV-D-13, IV-D-34) contended that State and local agencies need flexibility to allow alternative recordkeeping, reporting, and monitoring approaches that are more cost effective, but provide equally effective compliance determinations. Otherwise, one commenter (IV-D-13) asserted, that sources would be subject to duplicate recordkeeping requirements and would incur additional costs and use of resources. One commenter (IV-D-34) believed that States and local agencies need flexibility to allow alternative recordkeeping and reporting requirements as an incentive for enhanced inspection and maintenance and the installation of high performance equipment. One commenter (IV-D-51) also requested that the EPA consider monitoring, reporting and recordkeeping required for compliance with State and local standards to be equivalent to the MACT monitoring, reporting and recordkeeping requirements of the refinery NESHAP.

Response: The EPA recognizes that unnecessary monitoring, recordkeeping, and reporting requirements would burden both the source and the enforcement agencies. Every attempt has been made to reduce the amount of monitoring, recordkeeping, and reporting to only that which is necessary to demonstrate compliance.

Consistent with the Paperwork Reduction Act, the EPA always attempts to reduce the burden of recordkeeping and reporting requirements on the regulated community to the maximum extent, while still maintaining the enforceability of the rule. The types of data required and frequency of monitoring and recordkeeping are based on the likely variability of emissions from the kind of point being regulated. The EPA believes that the recordkeeping and reporting requirements in the petroleum refinery NESHAP are the "bare minimum" necessary to determine compliance on a continuous basis.

For example, at proposal almost all reports were consolidated into the Notification of Compliance Status, and the Periodic Reports. This simplifies and reduces the frequency of reporting. Sources have the option of retaining records either in paper copy or in computer readable formats, whichever is less burdensome. If multiple performance tests are conducted for the same kind of emission point using the same test method, only one complete test report is submitted along with summaries of the results of the other tests. This reduces the number of lengthy test reports to be copied and submitted. For continuously monitored parameters, periodic reporting is limited to excursions outside the established ranges. The in-range values are not required to be reported.

Changes have been made between proposal and promulgation to further reduce the recordkeeping and reporting burden. In particular, the requirement to submit an Initial Notification has been eliminated. Periodic reports are required to be submitted semiannually for all facilities that do not use emissions averaging (the proposal would have required quarterly reports if monitored parameters were out of range more than a specified percent of the time.)

The final rule also allows retention of hourly average values of monitored parameters, whereas the proposal would have required retention of 15-minute records on days when excess emissions occurred. Provisions were added to avoid duplicative reporting for equipment subject to multiple NESHAP and NSPS. The rationale for these changes is presented in the preceding sections of this chapter.

The rule contains provisions to request the use of alternative monitoring and recordkeeping systems, providing sources the flexibility to use their existing monitoring and recordkeeping equipment as long as the source can demonstrate compliance with the rule. Non-automated sources can request approval to take manual readings and record a value at least once an hour, for use in determining daily average values. Sources wishing to use data compression systems can request approval to do so. This will allow sources that have data compression systems already installed or who plan to install a system to monitor process control, to utilize these systems if they demonstrate compliance with the rule. These requests can be approved by the State permit authority. The General Provisions (§ 63.8(f)(4) of subpart A) also include procedures for sources to apply to use alternative monitoring procedures.

State and local agencies have the option of enforcing different, but equivalent, monitoring, recordkeeping, and reporting requirements if they submit information on their program to the EPA for approval under the procedures for delegation of NESHAP authority under section 112(l) of the Act.

Furthermore, in cases where reporting requirements of State or local rules duplicate those of the petroleum refineries NESHAP, a source can work with their State or local Title V permit authority to avoid duplicate submittals.

Comment: One commenter (IV-D-20) was concerned that the 4,281 hours estimated per refinery for recordkeeping and reporting in the preamble represents 2.25 employees per refinery, which seems excessive since the associated costs will do nothing to improve the environment.

One commenter (IV-D-19) argued that the estimate of 4,281 hours per record keeper annually may be valid for smaller, less complex refineries, but would be much greater for refineries with greater throughput and complexity. The commenter (IV-D-19) suggested that the EPA be required to demonstrate net cost benefit to the recordkeeping and reporting requirements contained in the proposal, similar to analyses prepared on the stringency of controls.

One commenter (IV-D-22) added that recordkeeping and reporting costs were not included in the cost impact analysis.

Response: The EPA disagrees with the commenter (IV-D-20) that the recordkeeping and reporting associated costs do nothing to improve the environment. Although direct HAP emissions reduction does not occur as a result of recordkeeping and reporting, it is the only way that the EPA can ensure that control requirements, and thus HAP emissions reductions, are met.

The EPA included monitoring, recordkeeping, and reporting costs along with the cost of control in the cost impact analysis done to support the MACT determination. Therefore, a separate cost analysis for monitoring, recordkeeping and reporting is not necessary. The EPA has also reduced the monitoring, recordkeeping, and reporting burden 20 percent since proposal.

The EPA agrees with the commenter (IV-D-19) that refineries with a greater throughput and complexity may incur a greater burden than a smaller refinery. However, those refineries that are more complex with greater throughputs have more emission points for which control must be assured. Although a larger, more complex refinery may incur a larger burden than average, the revenue from greater production would offset any inequities.

Comment: One commenter (IV-D-20) requested that performance tests conducted prior to the effective date of this rule be allowed in demonstrating compliance with this rule (e.g., if flares have previously demonstrated compliance with the NSPS requirements contained in § 60.18, this should suffice since these requirements are identical to § 63.11).

Response: Previous test results may be used as long as the test methods required by the petroleum refineries NESHAP were used and the process emission characteristics during the test are still representative of current operations.

Comment: One commenter (IV-D-39) supported an alternative method of providing operational flexibility that the EPA would establish through a case-by-case waiver system. The commenter's suggested waiver system would allow sources that meet specific threshold criteria to determine an alternative compliance option where the control level for the entire source is at least as stringent as the MACT level of control. The commenter (IV-D-39) offered to participate in a pilot project if the EPA decided to pursue one.

Response: In keeping with the EPA's stated goal in rulemakings, the EPA is allowing an owner or operator of a petroleum refinery to emissions average among different emission points defined under the "affected source" to comply with the petroleum refinery NESHAP. Similar to the commenter's suggestion, this offers refineries more opportunities to find cost-effective emission reductions from overall facility operations. The averaging provisions are structured such that "debits" generated by not controlling an emission point that otherwise would require control must be balanced by achieving extra control at other refinery emission points covered by the NESHAP.

# 10.0 EMISSIONS AVERAGING PROVISIONS

## 10.1 SHOULD EMISSIONS AVERAGING BE ALLOWED

Comment: Several commenters (IV-D-09, IV-D-10, IV-D-19, IV-D-20, IV-D-21, IV-D-22, IV-D-25, IV-D-30, IV-D-36, IV-D-38, IV-D-42, IV-D-44, IV-D-50, IV-D-51, and IV-F-1) expressed support for the concept of emissions averaging to allow more cost-effective HAP emission reduction. One commenter (IV-D-19) found the philosophy of emissions averaging to be consistent with the published statements of Administrator Browner, the Common Sense Initiative and Executive Order

12866. The commenter (IV-D-19) maintained that requiring facilities to install costly controls when less expensive controls will achieve the same or greater results does not make sense. The commenter (IV-D-19) cited the Amoco Yorktown study as a good example of what emissions averaging attempts to accomplish. One commenter (IV-D-25) recommended several changes to the proposed averaging provisions to improve overall cost-effectiveness, as summarized under sections 10.2 through 10.10 of this chapter. Three commenters (IV-D-12, IV-D-22, IV-D-42) stated that emissions averaging provides flexibility to facilities for developing site-specific and/or the most cost-effective controls for HAP's. Two commenters (IV-D-20, IV-D-50 and IV-F-1) supported the concept of emissions averaging as a cost- effective way to achieve environmental benefits.

Three commenters (IV-D-15, IV-D-35, IV-D-51) were opposed to emissions averaging in the proposed rule. One commenter (IV-D-35) opposed emissions averaging because they do not believe that it is possible to prove emissions "equally hazardous." One commenter (IV-D-54) objected to any emissions averaging scheme because the commenter claimed it is a loophole for refineries to perform peak pollution dumping. The commenter (IV-D-54) contended that averaging lets industry use cost instead of toxicity as the basis of making emissions reductions. One commenter (IV-D-52) had serious reservations about emissions averaging because of the difficulties inherent in determining compliance and risk.

Three commenters (IV-D-16, IV-D-55, IV-D-57) opposed the use of emissions averaging for existing and new sources. One commenter (IV-D-55) expressed concern that emissions averaging would result in less environmental protection and increased administrative and enforcement burdens. Two commenters

(IV-D-55, IV-D-16) suggested that emissions averaging be eliminated from the proposed regulation. One commenter (IV-D-55) provided their comments opposing the proposed emissions averaging provision in the HON for further explanation of their opposition to the emissions averaging provision in the proposed regulation. One commenter (IV-D-57) objected to emissions averaging because it would promote regulatory and enforcement complexity by allowing averaging between emission points that operate under different conditions, processing different materials, and at remote locations.

One commenter (IV-D-46) stated that emissions averaging is costly and resource intensive and the level of effort could be applied to other areas of compliance with greater results. The commenter (IV-D-46) asserted that paperwork and workload could be reduced by eliminating emissions averaging.

Response: Emissions averaging has been maintained in the final rule as an option for sources to use to comply with subpart CC. This decision is in keeping with the EPA's general policy of encouraging the use of flexible compliance approaches where they can be properly monitored and enforced. Under particular circumstances, emissions averaging can provide sources the flexibility to comply in the least costly manner while still maintaining a regulation that is workable and enforceable. The EPA's goal in crafting the emissions averaging provisions in the final rule has been to make emissions averaging available to sources faced with some emission points that are particularly difficult or costly to control. At the same time, the EPA has structured the emissions averaging provisions to ease the enforcement burden on implementing agencies.

The rationale for the specific provisions of the emissions averaging policy is detailed throughout this chapter.

Comment: One commenter (IV-D-53) was opposed to emissions averaging. The commenter (IV-D-53) stated that if the BWON level of control without the 10 Mg benzene cutoff is selected as Wastewater MACT and Option 1 is chosen as MACT for storage vessels, any possibility of emissions averaging will be eliminated and therefore the provision is unnecessary.

Response: Neither of the options described by the commenter were chosen as MACT for wastewater or storage vessels in this rule. Hence, there are opportunities for a source to use emissions averaging. Moreover, the final rule has expanded opportunities for using emissions averaging because emission points at marine terminals can now be considered as part of the source subject to the rule.

Comment: Four commenters (IV-D-22, IV-D-25 and IV-F-1, IV-D-42, ID-F-49) opposed allowing States the discretion to include or exclude emissions averaging. One commenter (IV-D-22) opposed giving States the option to not include emissions averaging in the implementation of refinery MACT because it will allow States to circumvent statutory requirements to demonstrate increased stringency for not using emissions averaging. The commenter (IV-D-22) added that it was possible that the over-control of credit sources will lead to even greater HAP emission reduction than if all sources were controlled without averaging. The commenter (IV-D-22) contended that the rule is a national regulation instead of a site-specific rule; therefore, all facilities should be governed by the same standard and compliance approaches. Otherwise, the commenter (IV-D-22) asserted some facilities would suffer economic disadvantages. The commenter (IV-D-22) concluded that if States exclude averaging, they should be required to develop a section 112(l) delegation process. Another commenter (IV-D-25) stated that the provision to allow States to eliminate emissions averaging as a compliance option is inconsistent with E.O. 12866. The commenter (IV-D-25) contended that without averaging the rule "specifies the behavior or manner of compliance that regulated entities must adopt," ignores the directive that regulations be designed "in the most cost-effective manner to achieve regulatory compliance," and stifles innovation. The commenter (IV-D-25) said that the proposed section 112(l) rule provides ample flexibility for State agencies, and that the special provisions to allow adoption of the rule with or without averaging will actually make the adoption process more complex for many States. Two commenters on the marine loading rule (Docket A-90-44: IV-D-92, IV-D-93) argued that State and local discretion to preclude averaging might effectively eliminate the utility of emissions averaging.

On the other hand, one commenter (IV-D-55) urged that the restriction allowing states to implement the MACT standards without emissions averaging be maintained. The commenter (IV-D-55) supported the portions of the preamble that allow State and local agencies "to obtain delegation of the standards without the averaging provisions without having to undergo section 112(l) delegation and approval process." The commenter (IV-D-55) requested that these provisions be included and clearly stated in the final rule and in the preamble. Another commenter (IV-D-13) opposed emissions averaging unless, in addition to allowing States the flexibility to exclude averaging, the regulation requires that sources must demonstrate that emissions averaging is more stringent than MACT and allows States and local agencies to require demonstration of no net increase in risk when emissions averaging is used.

Response: The EPA maintains that States should have discretion on whether to allow emissions averaging for a number of reasons. First, the EPA acknowledges that averaging can be more complex to administer than the rule allowing only point-by-point compliance, so allowing averaging could increase the administrative burden, which is an especially important concern for implementing agencies with limited personnel and resources. However, the determination of what constitutes too much administrative burden will differ from State to State. Some States may consider emissions averaging an acceptable strategy for compliance and will retain the program.

Second, the EPA recognized that averaging in the rule could be inconsistent with some States' ongoing air pollution control programs. The EPA supports the use of emissions averaging where it may be appropriate, and maintains again that the program has been designed to be enforceable and protective of health and welfare. However, the EPA also acknowledges that its use must be balanced by the individual needs of State and local agencies that bear the responsibility for administering and enforcing the rule. Furthermore, with the inclusion of these provisions, the EPA does not consider the stringency of the rule with or without averaging to be an issue.

This rule is a national rule that must fit into a situation that is already not an even "playing field"; States have differing rules and sites are all unique in terms of their mix of products, rules that govern them, site layout, etc. Allowing this discretion will not add to the uneven "playing field" because without this provision, most States already have the ability to exclude emissions averaging through the section 112(l) rule adjustment process encoded in 40 CFR 63.92, 63.93, and 63.94. Rather, the EPA has decided to make excluding averaging more simple by exempting the decision from the section 112(l) rule adjustment process. Including this provision will reduce paperwork burdens on States, expedite delegation of the rule to States, and remove a potential source of uncertainty for sources subject to the petroleum refineries NESHAP.

The EPA does not agree that providing for State discretion in the rule itself is either unnecessary or burdensome for States. While the section 112(l) rule adjustment process would also permit States to choose to implement the rule without averaging, providing for that choice in the rule itself streamlines the process by eliminating EPA review of the choice. In addition, since the section 112(l) rule permits States to make the choice, providing for the exercise of such discretion in the rule itself cannot be viewed as placing any new burdens on States. The provision of an option will not impose a burden or impose new requirements; it increases choice and flexibility.

Because emissions averaging is an alternative compliance method to the primary control strategy, States should have the discretion to exclude it as opposed to other provisions that are essential to the rule and for which no alternative compliance mechanism has been provided.

Finally, the EPA predicts that instead of creating promulgation difficulties and uncertainties, providing the clarifications in this provision at this time will benefit sources as well as States. Without this provision, sources might be uncertain during the section 112(l) rule adjustment process about whether averaging ultimately would be allowed or not in their State, yet would be given no added time for compliance. The EPA predicts that because of their complex nature, many sources will need the full time period allowed for compliance.

Comment: One commenter (IV-D-34) urged the EPA to adopt emissions averaging with provisions similar to those developed in the HON. Another commenter (IV-D-57) added that all restrictions on averaging included in the HON should be incorporated into this standard.

In contrast, three commenters (IV-D-19, IV-D-21, IV-D-44) maintained that attaching conditions to emissions averaging, as was done for the HON, would make emissions averaging virtually useless for cost-effective HAP emission reduction.

Response: The emissions averaging program in this rule includes essentially the same provisions as those featured in the emissions averaging program in the HON. Similarities between the two rules include the following: inclusion of all points except equipment leaks and biotreatment units; interpollutant trading; no averaging at new sources or between sources; a limit on the number of points that can be included in averages; no banking of credits; States discretion to allow averaging; and risk or hazard consideration in averages. More similarities between the two rules exist other than those listed here. The similarities are intentional because the program designed for the HON addressed most of the same concerns voiced during this rule proposal. The averaging programs designed for the HON and for this rule strike the appropriate balance between allowing sources flexibility to comply and adequately protecting the environment.

## 10.2 SCOPE OF EMISSIONS AVERAGING

Comment: Three commenters (IV-D-19, IV-D-25, IV-D-30) supported including new sources in emissions averaging. One commenter (IV-D-25) argued that because new source MACT is based on the single best-controlled source and is very stringent, it is inevitable that cost-ineffective controls will be required for some emission points. The commenter (IV-D-25) therefore concluded that there is a great need for new and reconstructed sources to be included in the emissions averages in order to allow more cost-effective means of achieving equivalent emission reductions. The commenter (IV-D-25) also disputed the relevance of the proposal statement that averaging would not be useful because new sources would be required to meet the NSPS, and commented that in cases where the NSPS is less stringent than MACT, averaging would be possible.

On the other hand, three commenters (IV-D-16, IV-D-52, IV-D-55) supported the exclusion of new sources from emissions averaging. One commenter (IV-D-55) requested that this provision be included and clearly stated in the final rule and in the preamble.

Response: The EPA agrees with some of the commenters that it is appropriate that emissions averaging be restricted to existing sources only. Averaging is a mechanism designed to provide each source the flexibility to comply with the MACT standard in a way that is most practical and cost-effective for the individual source. By employing averaging, a source is able, for example, to avoid adding controls to an outlying emission point that would be very expensive to control, or to avoid replacing expensive control technology that does not achieve enough emission reduction to meet the standard. These concerns are applicable to existing sources. A new source can be designed to avoid expensive outlying emission points, and retrofitting is obviously not an issue. In addition, when a new source is constructed, it can be designed to accommodate the required MACT controls in the most practical and cost-effective manner, thus reducing the need for the flexibility of averaging.

The EPA does not agree with the commenters who argue that prohibiting averaging at new sources would result in a more stringent standard. This rule has been drafted to provide that averaging is no less stringent than the standard without averaging. Thus, allowing new sources to comply only via use of the reference control technologies and not via averaging does not require those sources to meet a more stringent standard. Instead, it requires them to meet a more specific, and thus more easily implemented standard. However, even if prohibiting averaging at new sources would result in new sources being held to a more stringent standard, such a result would not be unlawful as the statute clearly provides that new source standards may be more stringent than those for existing sources.

Comment: Eight commenters (IV-D-10, IV-D-19, IV-D-20, IV-D-21, IV-D-22, IV-D-42, IV-D-48, IV-D-51) contended that a facility composed of several source categories should be allowed to average emissions across the entire facility. Seven commenters on the proposed marine loading rule (Docket A-90-44: IV-D-23, IV-D-91, IV-D-92, IV-D-93, IV-D-97, IV-D-99, IV-D-101) also supported averaging across source categories. Three commenters (IV-D-10, IV-D-22, IV-D-42) contended that fugitive emissions, marine vessel loading and gasoline distribution operations should also be included in emissions averaging. One commenter (IV-D-19) stated that averaging should be allowed anywhere and everywhere within the contiguous boundaries of a major source. Two commenters (IV-D-19, IV-D-21) cited facilities where marine operations, refining operations, gasoline distribution operations and/or pipeline breakout stations are co-located as being a critical example because promulgation of MACT standards for these fall within a seven-month window. The commenter (IV-D-19) suggested that the position to prohibit inter-source category averaging be reconsidered.

One commenter (IV-D-19) claimed that inter-source category averaging is not precluded by law, citing section 112(a)(1) in which Congress defined a "major source" as "a contiguous area under common control." Two commenters (IV-D-19 and IV-F-1) submitted that inter-source averaging is supported philosophically by the Common Sense Initiative and Executive Order 12866.

One commenter (IV-D-25 and IV-F-1) recommended that emissions averaging should be broadened to include all emission points subject to MACT controls within a contiguous major source facility regardless of whether the emission points are within the same source category. Specifically, the commenter (IV-D-25 and IV-F-1) would like to include process units subject to the refineries NESHAP, marine vessel loading operations, gasoline distribution systems, and process units subject to the HON in the same emissions averaging when these units are co-located at refineries. The commenter (IV-D-25 and IV-F-1) cited more cost-effective emission reductions as an advantage of a broader averaging program and stated that without emissions averaging the cost of the marine loading regulation is over $100,000/Mg of HAP reduction. The commenter (IV-D-25) attached a legal analysis to support their position that the EPA has ample legal authority to allow MACT compliance by emissions averaging across source categories.

Another commenter (Docket A-90-44: IV-D-91) argued that emissions averaging will increase flexibility, encourage innovative control strategies, and result in more cost effective control and greater HAP emission reduction.

Two commenters (IV-D-51, IV-D-57) recommended that the earliest compliance date be used for different source categories with different compliance dates that are included in an emissions averaging scheme. One commenter (IV-D-25) suggested that differences in compliance deadlines among difficult NESHAP should not prevent averaging across source categories. The commenter (IV-D-25) observed that the standards for petroleum refineries, marine vessel loading, and gasoline marketing will be promulgated within a short time period. The commenter (IV-D-25) suggested that EPA could address the issue of different compliance dates by requiring that any emission debits be offset by credits generated at the same time as the earlier compliance date.

One commenter (IV-D-22) contended that the EPA includes facilities that are co-located in applicability determinations; therefore, the same criterion should be used in emissions averaging provisions. The commenter (IV-D-22) supported making the refinery MACT rule compatible with the 112(d) intent to base MACT rules on average emission limitation instead of best controls for each category of emissions for the best refineries. One commenter (IV-D-49) recommended including as an option emissions averaging across all organic source categories co-located at the petroleum refinery site.

On the other hand, two commenters (IV-D-13, IV-D-57) contended that it was inappropriate to allow emissions averaging between source categories. Three commenters on the proposed marine loading rule (Docket A-90-44: IV-D-94, IV-D-98, IV-D-100) opposed averaging emissions between separate source categories. Two commenters (IV-D-13, IV-D-57) objected to emissions averaging across facilities and source categories for MACT standards unless the rule allowed flexibility for State and local agencies to exclude emission averaging. One commenter (IV-D-57) contended that the EPA indicated that such an option would be available, but it was not in the proposed rules. Another commenter (IV-D-12) expressed concern that emissions averaging in the proposed rule would allow too many different kinds of emission points to be averaged. The commenter (IV-D-12) opposed emissions averaging across divergent processes and operations because it would augment the already substantial competitive advantages enjoyed by large refineries without creating any air quality benefits. The commenter (IV-D-12) contended that unlike small refineries, large refineries are vertically integrated with a diverse array of operations allowing them to cut back high cost reductions in refinery process and offset them with low cost reductions in other areas. Therefore, the commenter (IV-D-12) concluded that emissions averaging should not include marine loading operations, distribution, or SOCMI areas.

Response: After studying the arguments presented by the commenters both for and against a broader averaging approach, the EPA has decided to retain the narrower approach contained in the proposed rule.

The EPA agrees with the commenters who argued that the statute provides broad discretion to define "source," and does not prohibit averaging in setting standards under section 112(d) of the Act. However, the EPA has determined that section 112 does provide some limits on the scope of averaging, and that the broader averaging approach exceeds those limits.

The statute requires the EPA to consider emissions from the entire facility in order to determine whether it is a major source subject to a given MACT standard. However, the EPA is also required to develop a list of source categories, which are to be composed of "sources" that are then subject to regulation under MACT standards. Both the language of section 112(d) and the legislative history indicate that sources in the category can be co-located with a major source, but are just as likely to be merely a portion of a facility. Thus, a large facility emitting more than 25 tons of multiple HAP's will, in most cases, be composed of multiple sources in different source categories subject to standards on different dates. It does not follow that, because applicability under section 112 (i.e., whether a facility emits sufficient HAP's to be considered a major source) is determined on a facility-wide basis, compliance with specific standards written for sources that comprise only a part of a facility should be permitted on a facility-wide basis. The most that can be inferred is that the entire facility is the <u>largest</u> entity that can be defined as a source within any category, but that the source in a category can, and often will be, smaller than the entire facility.

In accordance with section 112(i) of the Act, all sources in the category for which a standard is in effect must be in compliance by a specified date. Commenters' arguments that section 112(i) allows compliance with a standard that is set for a source category to be achieved by a "source" that is more extensive than the source in the category (i.e., the entire major source that the source in the category is a fraction of), is inconsistent with the specific language of section 112(i). Section 112(i) provides different compliance requirements for new and existing sources. New sources must comply with an applicable standard earlier than existing sources, which can be given up to three years to comply. Moreover, section 112(i)(3) provides for compliance dates to be established for "each category or subcategory of existing sources." This provision clearly applies to compliance by sources in a category rather than compliance with a standard by any points within an entire major source. Therefore, section 112(i) clearly provides for compliance by individual sources within the relevant category rather than overall compliance by a major source with a standard applicable to only part of the major source.

Thus, the EPA is adopting the more limited approach to averaging that was contained in the proposed rule. All sources within a given source category must comply individually with the standard either by application of the reference control technology or by compliance with an approved emissions average. Transferring emission reduction obligations to points outside of the source within the category would be inconsistent with the requirement of section 112(d) of the Act that standards be set for sources in a listed category, and the requirements of section 112(i) that compliance with such standard be achieved by sources in the category.

The petroleum refineries source category has been redefined since proposal to include marine loading and gasoline distribution operations located at refineries for reasons described in the response to the next comment. Thus these operations can be included in emissions averages. Sources in other source categories, such as SOCMI process units located at refineries, cannot be included in emissions averages. The SOCMI is a distinct source category for which a NESHAP (the HON) was promulgated in April 1994, over a year ago. The commenters have provided no compelling information or rationale for changing the source category definition that was already established under the HON. The HON compliance date is already established in the April 1994 standards, and cannot legally be extended beyond the 3-year period allowed by the Act. Detailed implementation plans for HON sources using emission averaging must be submitted by October 1995. Thus, significant planning and investment has already been made toward compliance with the HON. Changing the source category and source definitions and allowing averaging across HON and refinery process units would be disruptive and of little practical value. Both the HON and refineries NESHAP provide significant flexibility, without the added complexity of averaging across SOCMI and refinery process units.

Comment: Four commenters (IV-D-19, IV-D-21, IV-D-25 and IV-F-1, IV-D-51) supported averaging of refinery emissions with emissions from marine terminals. In response to the EPA's request for comments, one commenter (IV-D-25) stated that including marine loading in emissions averaging will not appreciably increase the complexity of rule enforcement. The commenter (IV-D-25) observed that assessment of compliance for marine loading is no more difficult than for storage vessels, process vents, or wastewater operations and should not be a reason to exclude marine loading from emissions averaging. The commenter (IV-D-25) added that emission factors for marine loading and other transfer operations are well characterized and accepted, so credit and debit calculations will be practical.

In response to EPA concerns about the equity of allowing emissions averaging for marine loading at refineries, while other marine loading operations would not have a similar means of reducing compliance costs, the commenter (IV-D-25) suggested two solutions. First, commenter (IV-D-25) suggested expanding averaging outside the source category such that marine loading operations located at gasoline marketing terminals or other sources could also use emissions averaging. Second, commenter (IV-D-25) suggested that the proposed marine loading rule should be revised to exclude small operations emitting low levels of HAP's. Another commenter (IV-D-51) added that marine terminals connected to the refinery operations by pipeline, located near the refinery and associated with its operations, or if a marine terminal is integrally linked with the refinery, should be considered "co-located." The commenter (IV-D-51) stated that where the operations of a refinery are dependant on the marine terminal for its supply, and the refinery is the main supplier of commodities going to the marine terminal they should be considered one facility. The commenter (IV-D-51) recommended allowing averaging of refining emission sources with those at marine terminal loading operations because it would reduce costs and provide flexibility in achieving the required reductions.

In contrast, four commenters (IV-D-46, IV-D-48, IV-D-52, IV-D-57) opposed the inclusion of marine loading emissions in the emissions averaging scheme. One commenter on the marine loading rule (Docket A-90-44: IV-D-98) also opposed including marine loading in emissions averaging. Two commenters (IV-D-48, Docket A-90-44: IV-D-98) argued that marine loading and petroleum refineries are two separate source categories and that the Act does not permit averaging across source categories. (See section 3.1 for additional comments on source category selection.)

Three commenters (IV-D-46, IV-D-48, Docket A-90-44: IV-D-98) claimed that averaging with marine loading operations will result in uncontrolled peak emissions. The commenters (IV-D-46, IV-D-48) pointed out that marine loading generates significant emissions during loading and little between loading. The commenters (IV-D-46, IV-D-48) claimed that including marine loading operations in emissions averaging would allow high peak concentrations and augment a facilities emissions' contribution to peak ozone concentrations, violating the health standard and limiting the health effects of the proposed regulation. One commenter (IV-D-46) added that making up for marine loading emissions by controlling other refinery units would be complicated because of the variability of materials due to changes in market demand. The commenter (IV-D-46) contended that balancing the emissions would be difficult and cumbersome and the owner/operator could easily be in noncompliance.

Two commenters (IV-D-48, Docket A-90-44: IV-D-98) claimed that the EPA has not proposed monitoring sufficient to reliably determine the amount of emissions allowed or emission reductions generated for marine loading operations. One commenter (IV-D-48) also provided that the Amoco Yorktown study identified marine loading as a cost-effective emission reduction opportunity. Two commenters (IV-D-46, IV-D-48) stated that this opportunity should be addressed by the marine loading rule. One commenter (IV-D-48) disagreed with the study's conclusion that supported a broader averaging. The commenter (IV-D-48) stated that there were many technical deficiencies in the study. The commenter (IV-D-48) suggested that emissions reductions could be achieved by additional controls on wastewater, which the commenter did not agree are cost ineffective, as opposed to including marine loading operations.

One commenter (IV-D-46) recommended variables to be taken into consideration in calculating emissions from marine vessel loading operations, if they are to be included in emissions averaging. The commenter (IV-D-46) also suggested potential methods to be used and potential difficulties that may be encountered.

One commenter (IV-D-57) provided the following reasons for objecting to averaging between refineries and marine vessels: (1) the categories are separate because marine terminals are major sources in their own right and their operation is not continuous; (2) SOCMI products are covered under the Marine Vessel category as well as refinery products; (3) marine terminals are often separated from the refinery plant site by a substantial distance; which has significant impacts on the exposed population, because there may be two or more entirely separate exposed populations; and (4) the disparate nature of the operations could reasonably result in exposure spikes, when batch processes are left uncontrolled in exchange for control of continuous emissions.

One commenter (IV-D-52) disagreed with the proposal to include marine vessel loading operations in emissions averaging because emissions from marine vessels are so high that an incidental amount of overcontrol might allow a refinery to avoid control of most other HAP sources, thereby circumventing the intent of Title III to apply MACT to all HAP sources. Additional comments for and against including marine loading in emissions averages that were submitted to the marine loading regulation docket (A-90-44) are summarized in the promulgation BID for that regulation.

Response: In the final rule, emission points in marine vessel loading and unloading facilities and bulk gasoline terminals co-located with a refinery have been included in the petroleum refinery source category and in the definition of "source" for the petroleum refineries NESHAP. Under the final rule, emission points from marine vessel loading and bulk gasoline terminal transfer racks may be included in an emissions average with other refinery process unit emission points. Because marine loading operations and bulk gasoline transfer operations located at refineries are supplying raw materials to petroleum refinery process units or transferring products of the refinery process units, they are logically considered part of the same source as the petroleum refinery process units. (In a similar way, loading of SOCMI chemical products into tank trucks and railcars was considered part of the chemical manufacturing process unit for sources subject to the HON). Marine loading and bulk gasoline terminal operations at refineries must be operated in close connection with refinery process units since they supply feed to and receive products from these units. Because marine loading and bulk gasoline terminals have been defined to be part of the source subject to the petroleum refineries rule, the prohibition against intersource averaging is not violated.

In keeping with the EPA's stated goal of increasing flexibility in rulemakings, this decision has been made to provide more opportunities to average and in so doing optimize the opportunities for finding cost-effective emission reductions from overall facility operations on-site. Controls cannot be designated for each and every point in a refinery source due to economics and site-specific variations. Emissions averaging allows the owner or operator to find the optimal control strategy for their particular situation.

In this line, the Amoco Yorktown study must not be over-used to conclude that marine loading is always cost effective to control. Specific emission estimates, cost estimates, and control strategies for the Yorktown facility may not represent other refineries due to site-specific differences, and uncertainties in the Yorktown cost and emission estimates. The study does highlight the importance of compliance flexibility and site-specific pollution prevention strategies to achieve cost-effective control. Emissions averaging allows this flexibility.

In regards to the comments on peak exposure, the EPA took this into account by requiring a quarterly check along with the requirement that debits and credits balance annually. If a State believes that further consideration of peak exposure is needed, it can be taken into account in their own risk assessment methodologies; they are free to consider it in the hazard or risk equivalency demonstration.

Comment: One commenter (IV-D-48) stated if marine operations are included in emissions averaging, the deadlines for establishing emission standards for petroleum refineries must be accelerated to the marine vessel schedule. Another commenter (IV-D-46) stated that all deadlines for petroleum refineries and marine vessels should remain separate, except for the emission averaging deadlines. The commenter (IV-D-46) suggested that averaging plans and compliance deadlines should be based on promulgation of the regulation that is promulgated last.

Response: Because marine loading and bulk gasoline terminals located at refineries are now included in the petroleum refineries source category and are subject to subpart CC, the compliance date for these operations is the same as for petroleum refining process units. The EPA has amended the marine vessel loading and unloading operations NESHAP MACT standards schedule to the same schedule as the petroleum refineries NESHAP. Marine vessel loading operation sources subject to reasonably available control technology (RACT) standards, under section 63.560(c), must be in compliance with the MACT provisions (RACT is equal to MACT) on and after 2 years after the promulgation date.

Comment: One commenter (IV-D-19) objected to the exclusion of fugitive emissions from averaging. One commenter (IV-D-25) requested that the EPA reconsider including equipment leaks in the emissions averaging program. The commenter (IV-D-25) suggested that emission data they have previously submitted to the EPA could be used to quantify emissions for purposes of averaging. The commenter (IV-D-25) gave specific examples of equipment leak control programs that could generate credits, such as using lower leak definition rates than required by the rule or performing LDAR on streams that would otherwise be excluded.

Response: The EPA acknowledges that methods are available for quantifying emissions from equipment leaks; however, this is not at issue in emissions averaging. Equipment leaks cannot be included in emissions averages for two reasons. First, a reference control efficiency cannot be established for the standard for equipment leaks because the percent reduction achieved by complying with the equipment leaks provisions of subpart CC will vary depending on the characteristics of the process and the equipment being controlled. Second, no method currently exists for determining allowable emissions for leaks, i.e., residual emissions from equipment controlled according to subpart CC. Without a reference control efficiency or the ability to assign allowable emissions, debits and credits cannot be established for any kind of point. Third, there is no practical way for enforcement to verify compliance.

Comment: One commenter (IV-D-20) requested that the wording in § 63.650(d)(4) be revised to say "Wastewater, whether or not treated in a biological treatment unit, cannot be used to generate credits or debits." Another commenter (IV-D-46) who requested that wastewater streams be excluded from emissions averaging claimed that wastewater emissions are difficult to quantify due to changing conditions and lack of calculation techniques. The commenter (IV-D-46) contended that the transitory nature of wastewater is contradictory to the basis of emissions averaging. The commenter (IV-D-46) requested that if wastewater emissions are not excluded, they be subject to more rigorous monitoring and testing and a more conservative discount factor, such as three to one, be used.

Response: The EPA considers the estimation of wastewater emissions on an annual basis to be as reliable as for the other kinds of points and hence, suitable for inclusion in emissions averaging.

The EPA has recognized that the testing procedures for measuring emissions from areas such as surface impoundments influence the emission mechanisms and would not yield accurate estimates of actual emissions. Therefore, credits for wastewater streams, as well as applicability of this rule to wastewater streams and Group status of streams, are determined at the stream point of generation. Also, if a wastewater stream is being controlled as a credit generator, the stream must comply with the standards for transport and handling equipment, which require suppression to eliminate the influence of factors such as wind speed, and surface configurations. This ensures that the only emissions that need to be considered are those from the control device.

As in the case of other emission points, characteristics such as HAP concentration, temperature, and flow rate remain relatively constant in wastewater streams so that representative values can be used. The rule provides that if operating conditions change such that previously measured values are no longer representative, the values must be redetermined.

The rule specifies that wastewater streams treated in biological treatment units are not eligible for emissions averaging. All other types of control are acceptable as long as their reduction efficiency can be determined. The EPA is confident that by making biological treatment of wastewater ineligible for averaging, the potential for underestimation of wastewater emissions will be minimized.

Comment: One commenter (IV-D-48) recommended that emissions averaging be limited to allow only emission points that are unfeasible or impractical to control in some extraordinary way to be included.

Response: Emissions averaging is intended to be used for just such emission points referred to by the commenter. However, the source does not have to make any type of demonstration of feasibility or practicality of controlling an emission point to include it in an average. As long as emissions credits and debits can be calculated accurately through use of the equations in the rule, the kinds of emission points specified in the rule will be eligible for inclusion in averages.

Comment: One commenter (IV-D-46) supported use of the HON threshold criteria (hazard or risk equivalency, discount factor) in the petroleum refinery NESHAP. The commenter (IV-D-46) did not support including cost as a threshold criterion for an interpollutant averaging scheme. The commenter (IV-D-46) contended that extreme cost would be different for different size refineries and difficult to define. The commenter (IV-D-46) agreed with using environment-based criteria, but asserted that using cost-based criteria is beyond the authority of the EPA.

Response: In the final rule the EPA has maintained the threshold criteria used at proposal and in the HON (hazard or risk equivalency and a discount factor). No additional threshold criteria was added, including ones based on cost.

Comment: Two commenters (IV-D-57, Docket A-90-44: IV-D-100) asserted that emissions averaging should not be allowed if a net VOC increase would occur. The commenter (IV-D-57) stated that HAP decreases should not occur at the expense of potential ozone increases.

Response: If another State or Federal regulation applies to an emission point subject to this rule, the more stringent of the requirements takes precedence. As such, if another rule requires control more stringent than the reference control technology (RCT) established by this rule, the point cannot be left uncontrolled or undercontrolled as a debit generator in an emissions average. However, if controls are installed after 1990 and achieve more stringent control than is required by the other State or Federal rule, the emission point is eligible as a credit generator in an emissions average, but only for the control above what is required by the other rule.

Even if the RCT established in this rule is the more stringent of two requirements, the source must maintain the control established by the other requirement. If the point were controlled with the RCT from this rule, both requirements would be met. However, if the source plans to use the point as a debit generator, the point must still meet the other requirement. The emission point can be used as an undercontrolled (according to this rule) debit generator for which the difference in control between this rule and the other requirement is the basis for the debits.

Comment: One commenter (IV-D-57) supported a case-by-case review of proposals to average, rather than making a blanket allowance for the category. The commenter (IV-D-57) supported requiring a source to demonstrate the burden faced by the source in complying without averaging as well as enhanced environmental benefits from averaging.

One commenter (IV-D-46) stated opposition to an option for compliance allowing case-by case waivers for facilities meeting certain threshold criteria. The commenter (IV-D-46) claimed that the system would be too burdensome with a third option. Additionally, the commenter (IV-D-46) stated that case-by-case waivers should be administered at the State, not Federal, level. The commenter (IV-D-46) asserted that if waivers are allowed, the associated emission points should be considered in an averaging program.

Response: Emissions averaging is allowed for all sources except those in States that exercise the discretion to exclude it from their implementation of the rule. Including the program in the rule is preferable to a case-by-case "variance waiver" approach to allowing or disallowing emissions averages. Again, the decision to include emissions averaging was made to increase the flexibility of sources to comply with the rule as long as equivalent emission reductions to point-by-point compliance is ensured.

The EPA does not consider it necessary for a source to submit comparative cost or burden analyses with proposals to emissions average. As long as the emissions average achieves equivalent emission reductions to compliance on a point-by-point basis, the average is suitable. Furthermore, incorporation of a discount factor in the averaging program provides some assurance of an enhanced environmental benefit from the use of averaging.

## 10.3 INTERPOLLUTANT TRADING AND RISK ANALYSIS

Comment: Four commenters (IV-D-16, IV-D-48, IV-D-52, IV-D-55) supported the requirement that sources demonstrate equivalent risk in their emissions average and that the methodology chosen to make this assessment will be determined by the implementing agency. One commenter (IV-D-46) requested that specific steps for determining equivalent risk be provided. The commenter (IV-D-46) recommended that the health risk analysis include carcinogenicity, acute and chronic impacts, bioaccumulation, and existing chemical background levels. The commenter (IV-D-46) also requested that the effects of dispersion and exposure spikes be addressed. Two commenters (IV-D-46, IV-D-57) supported making risk demonstrations required for refinery sources as stringent as those for the HON. One commenter (IV-D-57) stated that the rule should specify that where the assessment methods available can not adequately address the potential health impacts of a proposed averaging scenario, the averaging should be disallowed. The commenter (IV-D-57) stated that Protocols must be approved in advance on a case-by-case basis.

In contrast, five commenters (IV-D-10, IV-D-19, IV-D-22, IV-D-25, IV-D-36) opposed the requirement to demonstrate equivalent risk when opting for emissions averaging. Two commenters on the proposed marine loading rule (Docket A-90-44: IV-D-92, IV-D-93) commented that equivalent risk demonstration has no place in a technology-based regulation. One commenter (IV-D-22) concluded that the MACT provisions do not require risk to be equal across different source categories and also do not require risk to be equal within a given source category. One commenter (IV-D-36) stated that health risk assessment should not be required as it is expensive and time-consuming.

One commenter (IV-D-25) contended that risk assessments will be a significant burden and will discourage emissions averaging. The commenter (IV-D-25) thought it is unreasonable and arbitrary to require risk demonstrations without regard to whether risks are significant or insignificant. The commenter (IV-D-25) further contended that there is no evidence that averaging will create unacceptable risks, and that in some cases averaging may reduce risks. One commenter (IV-D-10) also added that after installation of MACT controls or establishment of work practices, health risks would be significantly reduced. The commenter (IV-D-10) concluded that addressing health risks now would halt any emissions averaging program.

<u>Response</u>: It is appropriate to introduce the consideration of risk in emissions averaging. The floor and the RCT's for the rule were determined without any consideration of risk. On the other hand, averaging represents an alternative to the technology-based system of point-by-point compliance, and as an alternative, must be demonstrated to result in equivalent control. This demonstration can consider risk without violating the intent of section 112(d) of the Act.

It is possible that in some cases having to make a risk equivalency demonstration may so increase the cost of averaging that it is no longer more cost-effective to average, but the EPA does not think this is likely in most cases because of the limited size of most averages. Even though it is difficult to predict whether averaging would be more likely to increase or decrease risk, any possibility of increased risk would represent HAP control that is not completely equivalent to point-by-point compliance.

The EPA considers risk assessment methodologies and toxicological information to be developed sufficiently to make adequate risk and hazard equivalency determinations. The EPA will not establish a presumptive minimum process for making determinations; however, an annotated bibliography of hazard and risk assessment references is being published by EPA to assist State and local agencies and the industry in locating suitable methods for their situation. The provisions of the final rule are that risk or hazard equivalency demonstrations are to be made to the satisfaction of the implementing agency. As such, the process is left entirely at the discretion of the implementing agencies. They are free to use any methodologies and procedures they choose.

Comment: Three commenters (IV-D-10, IV-D-22, IV-D-25) argued that the proposed risk equivalency demonstration provisions should be eliminated. Two commenters (IV-D-10, IV-D-25) claimed that it is inappropriate to address risk under section 122(d) of the Act because standards prescribed under section 112(d)(2) are to be based on technology, not risk, and risk will be adequately addressed in the future under section 112(f). One commenter (IV-D-19) cited section 112(f) of the Act as reserving risk assessments for eight years after promulgation of a section 112(d) standard. One commenter (IV-D-25) noted that section 112(d) lists emission reduction, costs, and other factors to be considered in setting MACT standards, but does not list risk. The commenter (IV-D-25) claimed that Congress' exclusion of risk from section 112(d) was deliberate, and that Congress intended EPA to establish technology-based standards first, and then address remaining residual risks 8 years later. One commenter (IV-D-10) added that residual health risk is to be addressed after the installation of MACT controls or the establishment of work practice standards. The commenter (IV-D-25) contended that the refinery NESHAP, with averaging, will achieve substantial emission and risk reductions, and that the potential for small remaining health risks should not compromise the effort to make the NESHAP requirements as efficient and cost-effective as possible.

Response: The EPA believes it has the authority under the Act to establish provisions as part of the alternative averaging system that will assure that there is no increase in risk or hazard as a result of a source's election of the averaging compliance option. The fact that section 112(f) of the Act contemplates that residual risk will be evaluated at a later time and that other provisions specifically call for the consideration of risk does not mean that the EPA is precluded from considering risk or hazard in other contexts. Consequently, the EPA maintains that it has the authority to address risk and hazard in the averaging program through a procedure such as the one adopted in the final rule--the requirement that sources that elect to use averaging must demonstrate, to the satisfaction of the implementing agency, that compliance through averaging would not result in greater risk or hazard than compliance without averaging.

Comment: Four commenters (IV-D-35, IV-D-48, IV-D-54, IV-D-55) opposed interpollutant trading.

Two commenters (IV-D-35, IV-D-55) explained that they are opposed to emissions averaging because they do not believe that it is possible to determine equitable trades for chemicals with varying toxicity. Two commenters (IV-D-35, IV-D-48) asserted that interpollutant trading is legally and scientifically unsound because not enough data exist for ranking and a sophisticated methodology that can be used to accurately rank chemicals has yet to be developed.

One commenter (IV-D-35) maintained that interpollutant trading would not ensure greater emission reductions than a direct implementation of MACT. The commenter (IV-D-35) further claimed that one-directional "equivalence" is theoretically more feasible than two-directional. The commenter (IV-D-35) contended that while it is possible to determine which chemical's emissions should be a high priority for reduction, it is not possible to determine how much emissions of a less hazardous chemical must be reduced to account for increased or continued emissions of a more hazardous chemical. The commenter (IV-D-35) further explained the above arguments by providing summary of their comments on the ranking scheme proposed by section 112(g) of the Act. The commenter (IV-D-35) also provided the complete comments as an attachment.

One commenter (IV-D-54) objected to interpollutant trading on the grounds that interpollutant trading would increase workplace hazards and increase adverse health effects to the community. One commenter (IV-D-55) asserted that the public health risks of interpollutant trading are uncertain and should be reviewed by experts in public health risk assessment before being included in any national policy.

One commenter (IV-D-48) claimed that trading can be accomplished without interpollutant trading. The commenter (IV-D-48) contended that the reasoning for allowing interpollutant trading in the HON, that there are a large number of chemicals and chemical processes in SOCMI facilities, does not hold true for petroleum refineries. The commenter (IV-D-48) stated that if the EPA concluded that trading cannot be accomplished without interpollutant trading, trading should not be allowed at all.

The commenter (IV-D-48) contended that if interpollutant trading is allowed by the proposed regulation, the requirements for evaluating risk should be much stronger than those required by the HON. The commenter (IV-D-48) suggested that the EPA require demonstration that the trade reduces hazard, reduces risk, and provides greater benefit for the environment. The commenter (IV-D-48) claimed that it is inappropriate for companies to determine which health risk a community will be exposed to; the commenter (IV-D-48) requested that the population a certain distance from the facility have the right to veto the proposed average.

On the other hand, one commenter (IV-D-36) suggested that trading HAP's on a pound for pound basis would have little adverse effect on the surrounding community because in petroleum refineries HAP's generally exist in low concentrations. The commenter (IV-D-36) also proposed that a simplified method of determining toxicity could be used. The commenter (IV-D-36) offered a weighing factor method developed by the Bay Area Quality Management District in California as an example. The commenter (IV-D-36) suggested that pound-for-pound or weight-factor tradeoffs be allowed if the nearest residential area is more than a specified distance from a facility.

Response: As stated at proposal, the EPA considers it appropriate to allow interpollutant trading, i.e., to allow emissions of different HAP's to be included in emissions averages. To restrict averaging to only points emitting the same HAP would be excessively restrictive in this industry where emission streams are mixtures of different HAP's. The requirement in the final rule of a risk or hazard equivalency demonstration should help to allay concerns for public health and welfare. Worker health and safety continues to be guarded by other Federal statutes, and allowing averaging of different HAP's will not compromise that protection.

The EPA is also sensitive to the charges that a HAP-speciated averaging system would consume additional resources and increase the administrative burden for both sources and implementing agencies. However, many States already require risk or hazard examinations, and so would not consider the demonstration of risk or hazard equivalency an additional burden. Moreover, the limit on the number of points that can be included in averages should minimize any additional burden and cost.

The EPA agrees with the claims that sources have no incentive to propose emissions averages that could increase risk or hazard, and stated as much at proposal. However, the EPA was equally persuaded that a source's decision to average will be based largely on technical and economic criteria, and so recognized the necessity of elevating risk or hazard as a consideration in averaging as well. If sources will control the most hazardous emissions first for the reasons commenters stated, then they need not fear that a risk or hazard examination would severely limit their averages.

The EPA acknowledges that limitations in the scientific understanding of HAP toxicity exist. However, the EPA does not believe the limitations are substantial enough to make interpollutant trading impossible or to bar implementing agencies from making adequate risk and hazard evaluations. The EPA agrees that trades should not result in increased hazard or risk from any source. In the final rule, the State or local regulatory agency can prevent any of the situations described by commenters from occurring by restricting or rejecting emissions averaging plans that do not demonstrate hazard or risk equivalency to their satisfaction.

Comment: Four commenters (IV-D-55, IV-D-35, IV-D-16) urged that the hazard ranking system developed under section 112(g) of the Act not be used for emissions averaging in this rule. One commenter (IV-D-55) asserted that the section 112(g) de minimis and hazard ranking scheme were developed to comply with specific conditions and are not applicable to other situations because of the assumptions used. The commenter (IV-D-55) recommended that the EPA prepare a memorandum on how the de minimis and hazard ranking were derived and warn that they not be adapted to other regulations. The commenter (IV-D-57) added that until the hazard ranking scheme in section 112(g) has undergone full peer review and has been tested in practice on similar sources, it should not be used to determine the acceptability of a trade. One commenter (IV-D-25) contended that toxicity-based credit and debit determination would add complexity and difficulty. The commenter (IV-D-25) also noted that several compounds, (including 2,2,4-trimethylpentane [iso-octane], which is a common component of refinery emissions) are unranked under the proposed section 112(g) rules.

In contrast, two commenters (IV-D-46, IV-D-48) recommended that the restrictions on interpollutant trading be at least as stringent as those in section 112(g). One commenter (IV-D-46) requested that an offsetting definition of "less hazardous pollutant" be used instead of "less hazardous quantity."

Response: The EPA has published an annotated bibliography of references that represents a collection of methods for carrying out comparative risk and hazard determinations. States can select a method from this bibliography as guidance or they may use their own established procedures, or review procedures used by plants proposing averages on a case-by-case basis. A State agency has full discretion if it so chooses to employ a method similar to or based on the system incorporated into the proposed rule implementing section 112(g) of the Act. On the other hand, if a State has an established risk estimation protocol for their State air toxics rules, they may choose to use those procedures.

Comment: Two commenters (IV-D-13, IV-D-57) supported requiring risk demonstrations for emissions averaging without requiring a section 112(l) equivalency submittal. One commenter (IV-D-34) contended that the two most important provisions to include in this NESHAP and to allow without requiring a section 112(l) equivalency submittal are: (1) that States (or local agencies) be allowed to decide when emissions averaging is appropriate, and (2) that States be allowed to require a demonstration of no net increase in risk when emissions averaging is used.

Response: The commenters' concerns have been met because as stated in section 10.1 of this chapter, States do have the discretion to exclude emissions averaging from their implementation of the rule without having to go through the section 112(l) rule adjustment process. Likewise, a risk or hazard equivalency determination is required for proposed emissions averages. Furthermore, the provision allowing States to avoid the section 112(l) rule adjustment process has no bearing on the requirement for a risk or hazard determination.

## 10.4 NUMBER OF POINTS IN AVERAGES

Comment: Six commenters (IV-D-10, IV-D-19, IV-D-22, IV-D-25, IV-D-36, IV-D-49) opposed limiting the number of points that can be included in an average to 20. One commenter (IV-D-36) stated that regardless of the number of emission points, the net result will be emissions equal to or less than without averaging. The commenter (IV-D-36) contended that the limit is an additional constraint without corresponding environmental benefit. One commenter (IV-D-10) stated that the EPA did not provide any factual basis for limiting the number of points. The commenter (IV-D-10) added that because the EPA has legal authority to allow emissions averaging within a major source, the EPA must first show a logical and rational basis to limit the number of emission points before imposing such a limitation.

One commenter (IV-D-25) claimed that the EPA has not demonstrated that the burden that would result from eliminating the limitation on the number of emission points would outweigh the advantages to facilities that would use emissions averaging. The commenter (IV-D-25) contended that the additional monitoring, recordkeeping, and reporting requirements for emissions averaging will reduce the burden of agency enforcement activities, so a limitation on the number of emission points is not necessary to address enforcement concerns. The commenter (IV-D-25) also argued that the limitation on the number of emission points would preclude the future possibility of equipment leaks being included in emissions averaging. The commenter (IV-D-25) observed that averaging may be used to avoid costs of control for numerous small emission points by over-controlling a few large emission points, and that a limitation on the number of points would preclude use of averaging in such a situation.

Two commenters on the marine loading and unloading operations rule (Docket A-90-44: IV-D-92, IV-D-93) contended that the limitation on the number of emission points has no sound basis, and that its elimination will not significantly increase the burden on implementing agencies.

In contrast, one commenter (IV-D-55) supported limiting the number of emissions points in a average. The commenter (IV-D-55) requested that this provision be included and clearly stated in the final rule and in the preamble.

Response: The final rule, as at proposal, limits a source to including no more than 20 Group 1 and Group 2 emission points in an emissions average. Where pollution prevention measures are used to control emission points to be included in an average, no more than 25 points can be included. For example, if two points to be included in an average are controlled by the use of a pollution prevention measure, the source can include up to 22 points in their emissions average. However, if six or more points in the average are controlled by pollution prevention, the source can include no more than 25 points in their average.

It is anticipated that most sources will not find a large number of opportunities to generate cost-effective credits. If so, most averages will involve a limited number of emission points, and imposing a limit should not affect most sources. The EPA rejected the choice of a fixed percentage of points at a source because for larger sources, this could result in hundreds of emission points in averages, which is unacceptable from an enforcement perspective.

The limit of 20 points, 25 if pollution prevention is used, was chosen because the EPA anticipates that most sources will rarely want to include more than 20 points in an average. A higher number of points is allowed where pollution prevention is used in order to encourage pollution prevention strategies, and because the same pollution prevention measure may reduce emissions from multiple points. Otherwise, allowing much more than 20 to 25 points would make enforcement increasingly untenable. Thus, the competing interests of flexibility for sources and enforceability were balanced in this decision.

There may be situations where overcontrolling a point could generate enough credits to offset emissions from a number of smaller debit-generating points, but the limit on the number of points should not discourage averaging in these cases. If one credit generator could balance more than 19 debit generators, the limit would ensure that the source had credits to spare. However, it should be pointed out that this is not the situation for which emissions averaging was designed. The more likely situation is where a source finds it more cost-effective to control some Group 2 points or overcontrol other Group 1 points than it is to apply the RCT to a Group 1 point that would otherwise be required. In other words, averages will probably be constructed by identifying debit generators first and then locating enough credit generators to offset the debit generators' emissions.

The EPA does not agree that the implementing agency would not bear much of the burden of averaging. The source's effort to comply with monitoring, recordkeeping and reporting requirements will be matched equally by the agency's oversight and approval. Nor is future inclusion of equipment leaks in averages a sufficient reason to not restrict averages. The limit addresses present concerns. If equipment leaks can be addressed in averaging at a later date, the limit may be reexamined at that time.

10.5 GENERATION OF CREDITS AND DEBITS

10.5.1 What Actions are Creditable

Comment: Four commenters (IV-D-19, IV-D-20, IV-D-22, IV-D-25) asserted that the EPA should give credit for shutdowns. One commenter (IV-D-25) contended that shutdowns are a legitimate means of reducing emissions and should be useable to generate credits. The commenter (IV-D-25) proposed that: shutdowns be creditable for a 5-year lifespan, at 20 percent per year; and shutdowns that are part of the Early Reductions program, pollution prevention program, or 33/50 program should be creditable based on recent actual emission estimates.

In contrast, two commenters (IV-D-52) opposed including shutdown credits in the emissions averaging provisions. One commenter (IV-D-59) requested that the EPA clarify that slow downs cannot generate credits. The commenter (IV-D-59) stated that shutdowns are obviously off limits in § 63.650(d)(3).

Response: It is not appropriate to allow credit in emissions averaging for permanent shutdowns or slowdowns even if they are part of an Early Reductions commitment under section 112(i)(5) of the Act. No matter what the motivation for a shutdown or slowdown, the emission reductions from the production curtailment are not made permanent if emissions averaging credit is allowed. If credit were granted for the emission reduction, the source could then emit an equal amount of emissions from its debit generators. This is in contrast to point-by-point compliance, where if a point is shut down, the emissions reduction is permanent. To allow credit in emissions averaging for permanent shutdowns and slowdowns results in less stringent compliance and more total emissions than point-by-point compliance, in which case emissions averaging does not represent an equivalent compliance alternative.

Comment: One commenter (IV-D-48) claimed that allowing facilities to credit prior reductions lowers emission reductions to less than the maximum achievable. The commenter (IV-D-48) stated that EPA does not have the authority to allow facilities to achieve less than the maximum achievable reduction in emissions. The commenter (IV-D-48) claimed that facilities that have voluntarily reduced emissions have already been rewarded by an extension of the facilities MACT compliance deadline, improved public relations, reduced future compliance costs. The commenter (IV-D-48) asserted that the EPA never promised industry that voluntary reduction would be creditable toward future requirements. The commenter (IV-D-48) alleged that Congress has determined that early reductions cannot be used for crediting. The commenter (IV-D-48) cited Title One. Cong. Rec. S. 2989 (March 22, 1990) and rejection of a Bush Administration proposal as proof that Congress does not support allowing the 90 percent early MACT reductions as a creditable surplus because they were required. The commenter (IV-D-48) argued that Congress intended sources to fully comply with MACT standard once the 6-year period of the alternative emission limitation is over. The commenter (IV-D-48) claimed that some refineries would be able to exempt themselves from MACT standards completely due to post-1990 reductions. The commenter (IV-D-48) also claimed that the credits proposed by the EPA go against Congressional intent by crediting non-enforceable prior reductions. The commenter contended that Congress intended the Early Reductions program to offer deadline extensions for enforceable reductions. The commenter (IV-D-48) claimed that allowing credits for early reductions is double-counting. The commenter (IV-D-48) provided an example of how a prior emission reduction could be double-counted. The commenter (IV-D-48) suggested that double-counting be prohibited.

Response: As at proposal, credit is not allowed in the final rule for actions taken prior to November 15, 1990, the date of passage of the 1990 Amendments to the Act. Emission reductions from previous actions prior to that date occurred for reasons unrelated to the Amendments (such as other State requirements) or this rule and are included in the source's control on the baseline date. If the EPA allowed reductions from such previous actions to qualify for credits, then the source would be able to generate more debits and, thus, more total emissions than would be allowed under point-by-point compliance.

The provision is necessary to maintain emissions averaging as an alternative means of compliance, achieving equal or greater reductions than the rule without averaging. Credit cannot be allowed for previous actions (taken prior to November 15, 1990), which enables a source to emit more pollution than would otherwise be allowed. Also, if a previous reduction was required by another State or Federal rule, the control can be used to meet the requirements for Group 1 points in this rule as long as the control is to the level that the rule specifies. However, the control cannot be used to generate emissions averaging credit.

It is possible that because no credit is allowed for previous actions, some owners and operators may choose to relocate existing controls from Group 2 points to other points instead of installing new devices as long as the controls on the Group 2 points were not required by other State or Federal rules. However, as long as the higher-emitting Group 1 points are controlled to the required level or reductions equivalent to controlling Group 1 points are achieved, the objective of the rule is realized.

Comment: One commenter (IV-D-59) maintained that if a source-wide average is used, the EPA must take emission reductions achieved through pollution prevention into account in determining the MACT achievable emission reduction for the source.

Response: Credit is allowed for reductions achieved by a pollution prevention measure applied after November 15, 1990 to a Group 2 point or to a Group 1 point if the pollution prevention measure achieves reductions greater than what could be achieved using the RCT.

The EPA acknowledges that some of the emission reductions from a pollution prevention measure will be offset by emission increases elsewhere in the source if the pollution prevention measure is used to generate credit for an average. However, the EPA does not agree that emissions averaging interferes with the intent of pollution prevention by allowing emissions to be "shifted" instead of preventing their release altogether. The intent of pollution prevention is to reduce emissions in an economical and environmentally sound manner. Under emissions averaging, it does not matter how emissions are controlled so long as the level of reduction required by the rule is achieved.

Pollution prevention is a method to reduce emissions that is highly desirable because it often results in emission reductions in several media. The EPA encourages its use to the fullest extent; this emphasis in encouraging pollution prevention is one of the reasons for allowing the use of emissions averaging.

Comment: One commenter (IV-D-40) suggested revising the pollution prevention provisions to include out-of-process recycling. The commenter (IV-D-40) stated that pollution prevention is defined too narrowly. The commenter (IV-D-40) suggested adding preventive maintenance programs to the list of pollution prevention measures contained in § 63.650(j)(1)(ii).

Response: Because in-process recycling is a pollution prevention measure, it can be used to generate credits. Credits would be calculated as provided in the rule for any pollution prevention measure. On the other hand, it has been determined that emission reductions from out-of-process recycling, which is not a pollution prevention measure, cannot be included in emissions averaging because out-of-process recycling is out of the jurisdiction of this rule. Out-of-process recycling involves waste management outside of the source, and thus is not subject to this standard.

Comment: One commenter (IV-D-25) found it acceptable to exclude credits for greater efficiency for reference control technologies.

One commenter (IV-D-59) asked the EPA to clarify in § 63.650(d)(2) that sources may never claim credit for using RCT at greater than the efficiency presumed by the EPA; and only technologies that are fundamentally different from the reference control technologies and that achieve better results than the reference control efficiency are allowed credit.

Response: Reference control efficiency ratings for RCT were established because there is a minimum level of emissions reduction that can be achieved by each RCT. It is acknowledged that due to the different characteristics of emissions to be controlled, RCT can sometimes achieve greater emission reductions than predicted by the RCT's reference efficiency rating. However, the EPA still maintains that providing credits for these instances of better RCT performance is inappropriate for the same reasons stated in the proposal preamble.

First, the magnitude of debits, not just credits, is based on the RCT's reference efficiency ratings. Emission debits are calculated as the difference between the actual uncontrolled or undercontrolled emissions and the emissions if RCT had been installed. Of course, because debit generators are uncontrolled or undercontrolled, the actual control efficiency that would have been achieved by the RCT cannot be determined, so a reference control efficiency must be assumed. It is impractical to require continuous testing of the debit generator to determine the actual level of control that would be achieved if RCT were applied.

If it could be determined that the RCT on a debit generator could achieve greater reductions than its rated efficiency, the magnitude of debits from the point would be greater. Thus, to give credit for reductions above an RCT's rated efficiency and not to increase the magnitude of debits as well would represent a windfall from averaging. It would also result in a net increase in emissions over the level that would be expected if there were no emissions averaging. The policy of reference control efficiency ratings for RCT is fair as long as it is applied equally to debit and credit generators.

Second, to grant credits for the small amount of emission difference that might occur above a reference efficiency would lead to significant enforcement problems. It would be very difficult for a source to ensure that, on a continuous basis, an RCT achieves an emissions reduction above its reference efficiency rating. It would be even more difficult, if not impossible, for sources to prove to inspectors that they are in fact achieving these higher levels of efficiency. Use of a reference control efficiency for each RCT allows inspectors to simply check that the equipment is in place and operating as planned. Then, the implementing agency can check records to examine the calculation of debits and credits in order to make a compliance determination.

Hence, the use of reference efficiency ratings helps ensure that the emissions averaging system will result in the same or greater emission reductions as point-by-point compliance. In addition, the use of reference efficiency ratings simplifies the emissions averaging system, thus making it more easily enforced.

Allowing credits for reductions that go beyond a benchline standard (i.e., the reference control efficiency) is consistent with the concept of MACT. Although reference efficiencies have been established for the RCT's, the EPA does not consider it inconsistent to allow credit for higher efficiencies achieved by means other than the RCT's. If a source can achieve a higher control efficiency than a RCT through use of an alternative technology or pollution prevention measure, it is achieving more emission reduction than required by MACT. The source's alternative technology or pollution prevention measure may not have been established as MACT because MACT must be set for a source category, and as such, must be universally available for that source category. The fact that one source can employ control technologies that exceed MACT does not mean all sources can use the same technologies.

Comment: One commenter (IV-D-22) contended that the RCT for storage tanks should not include fittings. The commenter stated that if fittings are installed the emissions averaging provisions should allow credit to be generated for the fittings.

Response: The RCT for storage tanks does not include controlled fittings. In other words, an owner or operator does not have to apply controlled fittings to a storage tank for the assigned 95 percent reference control efficiency to apply. Installing controlled fittings to a storage tank only increases the percent emission reduction by about 1 percent. Because emissions from a storage tank are relatively low, the amount of credit that would result from applying controlled fittings is very small. It should be noted that an owner or operator can request approval for a higher nominal efficiency for technologies that are unique or for situations where the RCT is used in a unique way. Approval for a higher nominal efficiency for certain fittings may be possible.

10.5.2 Discount Factors

Comment: Four commenters (IV-D-19, IV-D-25 and IV-F-1, IV-D-36, IV-D-38) objected to the 10 percent discount factor to be applied to emissions savings. One commenter (IV-D-19) submitted that a discount factor does not support the purpose of emissions averaging or Executive Order 12866. Two commenters (IV-D-19, IV-D-36) objected to the discount factor as a penalty for attempting to be innovative and achieve compliance cost-effectively. One of the commenters (IV-D-19) asserted that the purpose of emissions averaging was to provide options for achieving compliance in a cost-effective manner without invoking a penalty. Two commenters (IV-D-36, IV-D-38) asserted that the discount factor reduces the utility and incentive of using emissions averaging as well as reducing flexibility. One of the commenters (IV-D-36) argued that the EPA's justification that the cost savings should be shared with the environment was weak and that the environment will benefit from the regulation without the penalty. Two commenters on the proposed marine loading and unloading operations rule (Docket A-90-44: IV-D-92, IV-D-93) argued that the 10 percent discount unfairly penalizes those who utilize emissions averaging and will act as a deterrent to use.

Four commenters (IV-D-22, IV-D-25, IV-D-49, IV-D-51) opposed using discount factors. One commenter (IV-D-25) opposed any discounting because discounting will act as a deterrent to averaging and defeat the cost-effectiveness of the averaging program. The commenter (IV-D-25) argued that a discount factor will preserve the competitive disadvantage of facilities with higher than typical compliance costs. The commenter (IV-D-25) also argued that a discount factor will penalize innovation by requiring innovative compliance methods to achieve greater emission reduction. One commenter (IV-D-22) stated that there is no justification for any discount. The commenter (IV-D-22) contended that a facility should not be punished because it implements a cost-effective approach to compliance. Another commenter (IV-D-51) asserted that any discounting of emission credits is unnecessary and will act as a disincentive to participating in an averaging program, ultimately defeating the cost-effectiveness of the program. However, the commenter (IV-D-51) stated that if a discount factor is unavoidable to promulgate an emissions averaging provision, then it should not exceed more than 10 percent. The commenter (IV-D-51) stated that proposed MACT and RACT reductions are significant and the flexibility to meet the standard by emissions averaging should not be precluded by additional reductions.

In contrast, one commenter (IV-D-55) supported the inclusion of a discount factor for emissions averaging. The commenter (IV-D-55) requested that this provision be included and clearly stated in the final rule and in the preamble.

Response: A discount factor of 10 percent is required in calculating credits in the final rule. An exception is provided for reductions accomplished by the use of pollution prevention measures. For pollution prevention measures, full credit with no discounting is allowed.

The EPA acknowledges that a credit discount factor will make averaging of points with marginal differences in cost effectiveness unlikely. However, the EPA disagrees with commenters that a discount factor could completely eliminate the incentive to achieve compliance through emissions averaging.

The goal of emissions averaging is not to enable sources to reduce their overall compliance costs to the industry average, or to gain a competitive advantage. Rather, the purpose of averaging is to allow sources to comply with the rule in the least costly manner for their site-specific situation. Sources will definitely realize cost savings using emissions averaging instead of installing RCT; otherwise, they will not use emissions averaging. The purpose of a discount factor, then, is to ensure that the emission points selected for averages are the ones where truly significant cost savings can be realized and to share this savings with the environment.

The EPA accepts the rationale for using a credit discount factor that the environment should also benefit from cost savings achieved through emissions averaging. On the other hand, the use of a discount factor is not inconsistent with the Act nor does it represent a "price" or penalty for using averaging. Emissions averaging is an alternative method for complying with the MACT standard that offers flexibility and the opportunity to apply a more cost-effective control option for compliance. Sources are able to lower their control costs for the points included in the average below the cost required to comply on a point-by-point basis. The decision to include a discount factor recognizes that a portion of the cost savings could be used to benefit the environment, i.e., to achieve more emission reductions than is required under point-by-point compliance.

The EPA does not consider sharing a 10 percent portion of savings with the environment to be so great a disincentive to dissuade many sources from choosing to use averaging. Sources will always realize lower control costs under averaging versus point-by-point compliance. If this were not so or if the source does not consider the cost savings substantial enough, the option of emissions averaging would not be selected.

Credits generated by pollution prevention measures are not discounted in the final rule. The EPA is not concerned that a discount factor would discourage the use of pollution prevention or any other type of control that could achieve significant cost savings. Rather, no discount factor is being applied to pollution prevention to identify it as the preferred method of achieving emission reductions and thus encourage its use.

Only measures that qualify as pollution prevention activities according to the EPA's Pollution Prevention Strategy are considered pollution prevention measures under the rule and therefore are not discounted. The emissions reductions from these measures are fully quantifiable. The EPA cannot confirm one commenter's suggestion that pollution prevention measures are less expensive to implement than other types of controls; the commenter provided no accompanying data. In fact, these measures can require more planning, process redesign, and lead time than add-on measures. The EPA does not share the concern that the discount factor selected for the final rule will discourage the development of innovative control technologies because the value of the discount factor is small. The EPA expects that new technologies that can reduce emissions more than existing technologies, and do so more cost-effectively, will be developed and implemented regardless of the application of a small discount factor.

10.6 AVERAGING COMPLIANCE PERIOD

Comment: One commenter (IV-D-25) supported the proposed annual average compliance period with quarterly reporting because it will allow for seasonal and other short-term variation. The commenter (IV-D-25) opposed any shorter compliance periods (with or without banking) because shorter periods do not allow enough flexibility for seasonal variation in emissions or short-term production variations and would significantly discourage the use of emissions averaging. The commenter (IV-D-25) contended that the quarterly excursion limits and reports will provide sufficient information for enforcement on a timely basis and prevent excessive short-term emissions.

Another commenter (IV-D-46) suggested that the compliance period is adequate if a violation is considered to have occurred at the end of the compliance period, when noncompliance is reported, as opposed to when a device fails. The commenter (IV-D-46) explained that this allows administrative action to be taken up to one year after the end of the compliance period.

On the other hand, one commenter (IV-D-48) opposed the annual compliance period because peak exposures would be higher than they would be with a shorter compliance period. The commenter (IV-D-48) asserted that the EPA recognized this in its proposed economic incentives rule. Another commenter

(IV-D-48) claimed that the annual compliance period may make administrative enforcement impossible. The commenter (IV-D-48) cited administrative enforcement as a Congressionally approved, inexpensive tool that should not be made unusable. The commenter (IV-D-48) stated that the quarterly cap permitting administrative enforcement when sources produce more than 30 percent extra emissions does not provide an adequate check because administrative enforcement could not be used if sources stayed within the cap but violated the annual limit. The commenter (IV-D-48) asserted that the EPA should not allow exceedances of 5 to 29 percent to become unenforceable through administrative enforcement mechanisms.

Response: The compliance period for averaging that was proposed, an annual period with quarterly checks, has been maintained for the final rule. Allowing averaging over a year's time instead of just one quarter provides flexibility for sources whose production rates vary over time. It also factors in the seasonal changes in products of refineries. This is an extremely critical factor for this industry. The additional requirement that debits cannot exceed credits by more than 30 percent in any one quarter should assure that wide-ranging fluctuations in HAP emissions will not occur.

A shorter averaging period than annual would preclude the use of some emission points in averages. An annual period allows inclusion of points that: (1) do not have the same emission rates during some periods of the year; and (2) must undergo temporary maintenance shutdowns at different times during the year. Hence, an annual period provides sources the necessary latitude to construct the most cost-effective averages. Moreover, the EPA considers it within their authority under the Act to establish the averaging period as any length that can be demonstrated to be enforceable.

The EPA is satisfied that the annual period will not pose any significant enforcement and administrative problems. It is true that the annual averaging period could reduce the EPA's ability to use administrative enforcement actions. However, the requirement of a quarterly emissions check enables use of the administrative enforcement mechanism and allows more frequent enforcement than just once a year. Judicial proceedings can also be undertaken against sources violating the annual average or the quarterly check.

Comment: One commenter (IV-D-25) suggested that debits be allowed to exceed credits by 30 percent in any quarterly reporting period to allow for seasonal variation. However, the commenter (IV-D-25) also commented that, in some cases, the alternative quarterly excursion limit based on allowable emissions in the operating permit may be an improvement over the percentage-based quarterly limit because the emission level might be easier to calculate than the percentage and would be more consistent with permit requirements.

Response: The commenter is commenting on an option proposed in the proposed HON. This option was not chosen for the final HON nor the proposed petroleum refinery NESHAP. The rationale for not choosing this option follows.

The EPA did not adopt the allowable emissions alternative for the quarterly emissions check because of concerns about an absolute emissions limit based on projections. Operating levels for calculating allowable emissions are based on representative predictions of realistic operating scenarios. The use of such a system creates an incentive to "game," i.e., to project higher operating rates for credit-generating points than is representative or realistic. In contrast, the quarterly check included in the final rule depends on the actually demonstrated operating rate during the quarter, not projections.

Under the industry-proposed allowable emissions alternative, it would make no difference whether the emissions from a debit generator increase or the emissions from a credit generator decrease; as long as the total emissions are below the cap, the facility remains in compliance. However, in order for a source to be in compliance on an annual basis, credits from overcontrol must equal or exceed debits from undercontrolled points in order to result in the same or greater emission reductions as would have occurred under point-by-point compliance. A quarterly limit on the debit-to-credit ratio is more consistent with this approach. If the emissions from a debit point increase and/or the emissions from the credit point decrease significantly, it could impact whether or not the facility is in compliance. A large increase of emissions from a debit generator or decrease in emissions from a credit generator (i.e., a deviation greater than 30 percent from the emissions that would have occurred under a point-by-point compliance) is significant. Therefore, the debit-to-credit ratio limit represents a better check on potential annual noncompliance.

In this rule, the source does not need to know what its total allowable emissions are in any period because the total emissions are not limited. The source must either maintain RCT's properly or ensure that debits are balanced by an equal number of credits with a leeway of 30 percent each quarter. The EPA maintains that instead of allowing for an easier compliance determination, a system of assigning credits based on allowable emissions requires a great deal more scrutiny of the source's prediction of operating levels. As stated previously, the entire rule is designed to be consistent with the operating permit program rule encoded at 40 CFR part 70. There should be no conflict between this rule and the operating permit because the quarterly check, as well as the annual credit/debit balance and the monitoring requirements will be stipulated as permit conditions.

10.7 BANKING

Comment: One commenter (IV-D-46) stated that banking should not be included as a compliance provision. The commenter (IV-D-46) claimed that banking with an annual compliance period is redundant and banking between compliance periods would make enforcement problematic and not be beneficial to public health. Another commenter (IV-D-48) supported quarterly block averaging without banking as the best compliance period. The commenter (IV-D-48) expressed opposition to banking because it increases peak emissions, allows credits for reduction that would have happened anyway, and increases gaming and the administrative burden. Additionally, the commenter (IV-D-48) found banking to be inconsistent with maximum achievable reductions.

In contrast, one commenter (IV-D-22) supported banking of credits. The commenter (IV-D-22) claimed that without banking, a source will run the risk that unexpected events will throw off the credit-debit balance during the compliance period.

Response: Banking of extra credits generated in one compliance period for use in a future compliance period is not allowed. The likelihood of significant administrative burden resulting from tracking the generation and use of banked credits was the primary reason for not including banking. With the goal in mind of keeping the administration of the rule as simple as possible, credit banking represents a complication that would affect the source and implementing agency alike. Another reason for excluding banking from the proposed and final rule was the possibility that communities near sources could experience peak HAP exposures if banked credits were allowed to offset unexpected increases in emission debits. Any additional flexibility offered by banking is offset by the increased administrative burden and potential for peak exposures such that little overall advantage can be gained from allowing credit banking.

10.8 MONITORING

Comment: One commenter (IV-D-25) suggested that EPA should clarify that if a single monitor is malfunctioning, then the assumption of minimum credits or maximum debits applies only to the emission point(s) addressed by the monitor in question.

Response: The only emission point that is affected by this provision is the point exhibiting the excursion. If that point is a credit generator, it will be assumed that the point generated no credits for the duration of the excursion. No other points are affected, and the source will not be doubly penalized.

Comment: The EPA requested comments on whether exposure spikes could result if batch emission streams were left uncontrolled in exchange for control of continuous emission streams, or vice versa. One commenter (IV-D-51) replied that if a continuous stream is controlled in exchange for control of a batch stream, emissions reductions could be estimated using established emission factors for a defined period of time for the continuous stream, and emissions from the batch process could be quantified using emission factors. The commenter (IV-D-51) stated that emissions averaging could work for batch processes if total emissions over a specific period of time were quantified. One commenter on the proposed marine loading and unloading operations rule (Docket A-90-44: IV-D-92) stated that the concern about potential exposure spikes is unwarranted, and that there are many factors that would need to be analyzed before any conclusions could be made regarding exposure spikes and adverse health effects.

One commenter (Docket A-90-44: IV-D-100) stated that an intermittent process should be allowed to offset a continuous process, but that continuous processes should never be allowed to offset an intermittent process. The commenter contended that resulting exposure spikes from intermittent processes would likely exceed threshold criteria levels for health and environment equivalency, and gave an example of an intermittent process occurring once a month that offsets its emissions with the daily emissions of a continuous process. In the commenter's example, actual excess emissions for the one-day intermittent process are 30 times the offset during that one day the process emits. The commenter contended that this emissions spike would dramatically increase acute exposure and that unfavorable weather conditions and the location of the loading operation could increase the risk of public exposure.

Response: In the absence of any significant volume of response to the request for comment on this issue, the EPA will allow emissions from batch emission streams to be included in emissions averages and allow marine terminal and gasoline distribution loading operations to be included in the average. The quarterly cap on the ratio of debits to credits is intended to limit the possibility of exposure peaks. Furthermore, the averaging provisions require that the owner or operator demonstrate to the satisfaction of the State or local agency, that the emissions average does not increase risk or hazard relative to point-by-point compliance. If peak exposures are a concern, the agency can consider this in determining whether to approve the average.

Furthermore, there are only a small number of batch vents at refineries. Coking units are batch processes but the miscellaneous process vents definition exempts specific vents from coking units, so these batch vents are not subject to the standards and would not be included in an average. Thus, it is expected that few, if any batch vents will be included in averages. It should be recognized that some emission points such as storage vessels and loading racks are also characterized by intermittent emissions somewhat similar to the discontinuous emissions from batch processes. However, because loading occurs fairly frequently, and emissions from an individual loading event are relatively small compared to total petroleum refinery emissions, such emissions are not expected to cause significant exposure peaks. The commenter's example of once per month is not typical of many operations. Moreover, no evidence has been presented that emissions averaging would permit a very different mix of emissions to occur than would point-by-point compliance. That is, peaks of exposures from batch streams should be equally likely under point-by-point compliance as under emissions averaging, so emissions averaging does not represent a less effective control strategy on this point.

Comment: One commenter (IV-D-59) supported the EPA's proposal to assume that points within an average are out of compliance during the time when some points exceed operating parameters. The commenter (IV-D-59) suggested, however, that the EPA should specify that this non-compliance will extend for the duration of the compliance period, absent proof that the emissions average was balanced based on comprehensive measured emissions data. The commenter (IV-D-59) explained that if emissions limits were exceeded during a limited period of time, that provides no justification for assuming, without proof, that those exceedances were balanced later in the compliance period. The commenter (IV-D-59) stated that temporary exceedances should still be a separate short-term violation even when the short-term violation is balanced out.

Response: Because of the effect an excursion could have on a control device's effectiveness, a source that experiences excursions might be in violation of the standard. Hence, as specified in the rule, when points in an average experience excursions outside the established operating parameter ranges, no credits would be assigned to a credit generator and maximum debits would be assigned to a debit generator for the period of the excursion. The presumption is that the excursion is caused by a significant problem in control device operation and the device is not achieving emission reductions. However, if the source has data indicating that some partial credits or debits may be warranted, the rule provides that the source can submit that information to the implementing agency with their next Periodic Report. Partial credits and debits can be assigned with the approval of the implementing agency.

The periodic report will show credits and debits for the entire quarter, including periods of time when there was not an excursion. When there is no excursion, the credits and debits are calculated using the previously established control device efficiencies and the equations in the rule. If a control device has been rated at, for example, 98 percent, that number is used for periods when there is not an excursion.

The periodic report will show credits and debits for the entire quarter, including periods of time when there was not

an excursion. When there is no excursion, the credits and debits are calculated using the previously established control device efficiencies and the equations in the rule. If a control device has not been rated at, for example, 98 percent, that number is used for periods when there is not an excursion. As long as a source uses the equations specified in the rule correctly and determines the inputs to the equations according to the stipulated methods, there is no reason to doubt the accuracy of the debit and credit estimations.

An exceedance of a monitored operating parameter would also be considered a short-term violation if the daily average value is outside the range established in the NCS or operating permit and if the exceedance is not due to a startup, shutdown, or malfunction. This provision is the same as for Group 1 points that are controlled using point-by-point compliance rather than emissions averaging.

Comment: One commenter (IV-D-59) complained that there is no basis to verify whether industry estimates of the amount of the emissions to be debited proves correct in practice, because the emissions monitoring is inadequate because there is no monitoring of uncontrolled Group 1 points. The commenter (IV-D-59) stated that the monitoring of credits is unreliable, especially for highly variable streams like wastewater, storage, and loading. The commenter (IV-D-59) concluded that because the credit is a product of the percentage reduction and the inlet concentration, a reliable testing procedure for both numbers on a frequent basis is necessary to be able to check whether the claimed quantity of credits is correct. The commenter (IV-D-59) recommended that the EPA require CEM's where feasible especially for streams involved in emissions averaging. The commenter maintain that in cases where CEM's are not practicable, emissions averaging should be prohibited. A commenter on the proposed marine loading and unloading operations rule (Docket A-90-44: IV-D-98) stated that because the rule does not require real-time monitoring of marine loading and unloading operations emissions, there is no basis for reliability checking a source's estimates of credits and debits. The commenter (Docket A-90-44: IV-D-98) further stated that the 10 percent discount factor may compensate for the likely imprecision of emission estimates.

Response: There are several mechanisms for enforcement of emissions averaging. Monthly credits and debits must be calculated based on measured and recorded values for different parameters depending on the kind of emission point, such as HAP concentration, flow rate, and monthly operating hours for process vents and rack throughputs for transfer operations. Values for some of these parameters (e.g., concentration and flow) are determined initially rather than measured continuously, but the rule requires a re-determination when process or operating changes are made to a debit or credit generator that could cause the previously measured values to be no longer representative. Other values that vary from month to month, such as operating hours for process vents and throughput for transfer racks, are recorded for each month, and the monthly values are used to calculate debits and credits. These procedures and equations in the rule allow sufficiently accurate estimation of monthly credits and debits to determine compliance. If credits do not equal or exceed debits in a year's time, or if debits exceed credits by more than 30 percent in any quarter, this is a violation of the emission standard, and enforcement action can be taken.

Furthermore, the controls applied to most Group 1 and Group 2 points in an emissions average must be monitored continuously. It is a violation of the standards if the monitored average parameter values are outside the established range, and enforcement actions can be taken. Finally, provisions in the rule require conservative estimation of credits and debits during excursions. These procedures will assure debits are not underestimated and credits are not overestimated during monitoring excursions.

The EPA considered various means of determining credits and debits, and concluded that it is not technically feasible or necessary to use CEM's. To measure emissions continuously, both CEM's to measure HAP concentrations and continuous flow monitors would be needed at every emission point. There are no CEM's available for measurement of some organic HAP's. Where CEM's are available, they are generally more costly and more complex to calibrate and operate than operating parameter monitors, and may have greater downtime and greater uncertainty in their measurements. It was determined that the combination of credit and debit calculations based on representative operating conditions and records of process operation such as monthly operating hours and throughputs, along with continuous monitoring of control device operating parameters would be a more reliable and efficient means of enforcing emissions averaging than requiring CEM's.

## 10.9 RECORDKEEPING AND REPORTING

Comment: One commenter (IV-D-19) objected strongly to the requirement for monthly credit and debit calculations, citing them as unnecessary and unwarranted. The commenter (IV-D-19) suggested that the requirement should be quarterly calculations and compliance reporting as required by a source's part 70 permit. The commenter (IV-D-19) reiterated opposition to requirements any more demanding than those they have suggested, arguing that no added value is provided. Another commenter (IV-D-51) contended that the quarterly reporting of credits and debits is overly burdensome and unnecessary. Two commenters (IV-D-22, IV-D-51) recommended annual reporting instead.

Response: The EPA recognizes that some additional monitoring, recordkeeping, and reporting is necessary for emissions averaging. For example, credits and debits must be calculated monthly and reported quarterly to ensure that the required emission reductions are achieved, and Group 2 points being used to generate credits must apply the same control device monitoring as Group 1 points. Owners or operators should take the recordkeeping and reporting requirements into account when deciding whether to utilize emissions averaging.

The EPA considers the monitoring, recordkeeping, and reporting requirements to be the minimum necessary to demonstrate compliance. The EPA has considered ways to reduce the general recordkeeping and reporting burden without sacrificing enforceability. For example, the rule requires reporting of monitored parameter values only when they are outside the established range. The rule also allows case-by-case requests to use data compression and other alternative monitoring and recordkeeping systems that may allow continued use of current or more cost-effective systems at plants. Another provision allows retention of hourly rather than 15-minute average values of monitored parameters. The goal of these provisions is to reduce the burden for all plants, including those that utilize emissions averaging.

Comment: One commenter (IV-D-52) contended that the emissions averaging provisions will be virtually impossible to enforce and will result in undue administrative burdens for tracking and recordkeeping.

Response: The administrative burden of implementing the emissions averaging program of the rule is one issue voiced by all concerned parties to which the EPA paid particular attention. The proposed and final rule were designed with the express purpose of easing perceived administrative burdens. However, some provisions are necessary to improve enforceability or to ensure public health protection, which may contribute to the administrative burden.

Calculation of emission debits and credits are required for only the points included in an emissions average, not for all emission points at a source. An average can contain no more than 20 points, 25 if pollution prevention is used, so the concern over the number of points for which emission estimates are required has been addressed. The source need only calculate two emission values for a debit generator and two values for the credit generator. For a debit generator, actual emissions based on the controls in place (if any) and emissions if the RCT had been applied need to be calculated and compared. These values can be easily calculated using estimates of uncontrolled emissions and the reduction efficiencies of controls that were demonstrated in initial performance tests, and specific procedures for making estimates and carrying out performance tests are provided in the rule. For a credit generator, the emissions that are allowed under the rule and the actual emissions are calculated using procedures specified in the rule as well.

The EPA does not consider the estimation methodologies for averaging to be too complex. Tracking emissions is not unduly complex either as the points included in averages must be identified separately in the Implementation Plan or the operating permit. Debits and credits are calculated monthly based on limited inputs such as monthly operating hours and previously measured values. Adjustment of emission calculations for fluctuations is required only if an excursion occurs, and specific procedures have been included in the final rule to address such situations. It was acknowledged earlier that some additional monitoring, recordkeeping, and reporting is necessary to implement emissions averaging and to ensure proper operation. But, again, the EPA maintains that with the limits on averaging, any additional burden has been limited as well and does not far exceed that associated with compliance on a point-by-point. If, however, an implementing agency does realize greater costs in administering averages, the cost could be addressed by applying a higher permit fee for the points included in emissions averaging.

## 10.10 MISCELLANEOUS

Comment: One commenter (IV-D-46) expressed an interest in reviewing the calculations and methods used by the EPA to determine that emissions averaging between refinery units and marine loading operations would provide for greater emissions reductions than reductions achieved without averaging.

Response: The equations and calculations included in the final rule for estimating emissions from any emission point included in an average are taken from well-established and available references. The opportunity for reviewing and commenting on the use of such equations is during the public comment period of this and other rules establishing such equations. The rule is designed to require that emissions reductions achieved by every emissions average are greater than or equal to reductions that would be required without averaging. As required by the rule, the equivalency of emissions reductions between an emissions average and point-by-point compliance is demonstrated by calculating the difference in the emissions under both scenarios for each emission point in the average to calculate the credit or debit for each point. The emission credits (for greater reductions than required by the standards) must outweigh the debits for the average to be allowed. Thus, if the average does not achieve equal reductions to point-by-point compliance (actually, greater reductions for the average because a discount factor is applied) then the average cannot be allowed.

Comment: One commenter (IV-D-54) stated that if emissions averaging is not removed from the rule, it needs to be made more stringent by using emission numbers instead of percentages to reflect the net result of emissions averaging.

Response: It is assumed that by emission numbers, the commenter is referring to emission rates in units such as pounds per hour. Emissions averages are balanced in terms of actual mass of emissions, not percentages. The equations in the rule result in emission credits and debits in Mg/yr, and the credits must outweigh the debits. However, calculating the mass emissions for emissions averaging also depends on establishing reference control efficiencies. It is not possible in this rule to determine reference control efficiencies or emission limits in terms of an emissions rate because of the large diversity and hence variance in emissions from the same kind of emission point found in petroleum refineries. Because of the variation in mass emissions, any single mass limit would be achievable by some sources with no controls whereas it could not be achieved by other (e.g., larger) sources even if the best controls were applied. On the other hand, a control efficiency can be established for a kind of emission point regardless of its emission rate.

Because the same percent control efficiencies are applied to both debit and credit generators, there is no chance of a discrepancy in comparing emissions between the two.

## 11.0 ECONOMICS AND BENEFITS ANALYSIS

Comment: Two commenters (IV-D-44, IV-D-07) stated that the proposed regulation has little environmental benefit while creating economic hardships for the refining industry. Two commenters (IV-D-44, IV-D-14) claimed that the costs of the proposed regulation outweigh the benefits and go against Executive Order 12866 and the Common Sense Initiative. One commenter (IV-D-44) suggested that the proposal be withdrawn. The commenter (IV-D-44) argued that the risk benefit calculation by the EPA does not warrant additional controls.

Response: The final regulation provides for significant reductions of 48,000 Mg per year of HAP emissions and 252,000 Mg per year of VOC emissions. The refining industry will as a whole experience a loss of production of less than one percent of U.S. refining capacity, as estimated in the economic impact analysis. Between 0 and 7 refineries are expected to be at risk of closure, with the estimate likely being closer to 0 than 7. This was calculated based on assumptions that likely overestimate the given range.

The monetized benefits, $153.4 million, exceeded the social costs (equal to the compliance costs plus $16 million from increased imports beyond exports) by $58.1 million. All benefits from VOC control were not monetized. Among the benefits from VOC control not monetized were chronic health benefits such as reductions in chronic health effects (e.g., sinusitis, hay fever),reduced materials damage (corrosion, deterioration), ecosystem effects (decreased biomass, decline in species richness and diversity, decreased lifespan for organisms), aesthetics (unpleasant odors, visibility), and acute health effects (increased cancer incidence, genetic damage, reduction in pulmonary function) in attainment areas.

Thus, there is evidence for additional control and for not withdrawing the rule. For more information, consult the regulatory impact analysis.

Comment: One commenter (IV-D-07) alleged that due to the fact the current U.S. refining capacity is close to maximum utilization, if seven refineries are required to close because of the proposed regulation, the nation's dependence on foreign oil will increase. The commenter (IV-D-07) also cited the loss of productivity and jobs, and greater prices for motor fuels as additional negative effects of the proposed regulation. The commenter (IV-D-07) requested a more cost effective regulation.

Response: The economic impact analysis estimated a one percent reduction in net exports (exports-imports), and a less than one percent reduction in domestic output of affected petroleum products. Thus, there is a slight increase in the U.S.'s demand for foreign petroleum products, which may translate into a slight increase in use of foreign oil for that purpose. The estimate for the number of refineries at risk of closure was from between 0 and 7, with the estimate likely being closer to 0 than 7. However, this was calculated based on assumptions that likely overestimate the given range.

Estimated job losses are expected to be small, with the reduction being less than 0.5 percent of the U.S. refinery workforce as of 1993. The price increase for motor fuels should also be small, as the price increase for five affected products, including gasoline, is estimated to be under 0.6 percent.

Comment: One commenter (IV-D-14) claimed that the proposed regulation will have a major cost impact on independent producers, who depend on refineries to purchase wellhead hydrocarbons, but will provide little benefit to the environment. Commenters (IV-D-14, IV-D-29) requested that the proposed regulation be re-assessed considering the resultant consequences from the closure of small refineries. The commenter (IV-D-14) alleged that less competition and higher compliance costs for refiners due to the proposed regulation will drive wellhead prices down. The commenter (IV-D-14) also stated that closing of small refineries will increase transportation costs for independent producers, who will have to use trucks or railcars as opposed to existing pipelines. The commenter (IV-D-14) claimed that this increase in cost could result in severe economic damage to struggling producers.

Response: The Agency's economic impact analysis focused on the effects to the refinery industry, the industry most directly affected by the final regulation. The EPA focuses on the primary industry (the refinery industry, in this case) affected by a regulation since the economic impacts to secondarily affected industries are usually insignificant. For more explanation of this, refer to the economic impact analysis in the public docket. For this analysis, EPA believes the economic impact on secondarily affected industries are small because there are only small changes in domestic output for affected products. As to effects on transportation costs, the estimate for closures of small refineries is a range, and it is possible no small refiners may close. If there are any increases in transportation costs, they should be small and unlikely to result in severe economic damage to producers. Since the economic analysis focused on impacts to the refinery industry, EPA did not estimate effects on transportation costs, and the resulting impacts.

Comment: One commenter (IV-D-14) claimed that the proposed regulation will increase emissions due to the estimated closure of up to 30 small refineries. The commenter (IV-D-14) explained that independent producers will be required to use trucks and railcars to get oil to larger refineries when the small refineries that they had pipelines to are shut down. The commenter (IV-D-14) claimed that trucks and railcars can pollute more than pipelines. The commenter (IV-D-14) also contended that large refineries in nonattainment areas will increase production and therefore emissions to make up for the loss of production from the shutdown of small refineries.

Response: The estimate of 30 closures comes from the "Analysis of the Impact of Environmental Compliance on Plant Operations," developed by the Agency's OPAR, and its estimate referred to the possibility that between zero and 30 refineries may be at risk of closure, not that up to

30 refineries will close. The OPAR's analysis examined the impacts from a number of EPA regulations from a financial standpoint, and did not compute the closure risk estimate from a market analysis standpoint, as was done here to arrive at the 0 to 7 range. The OPAR's analysis looked at the impacts from a number of EPA regulations, but did not account for this NESHAP.

Any increase in production from refineries in nonattainment areas should be small, given the small price increases on affected products. Therefore, any increase in emissions should also be small.

Comment: One commenter (IV-D-44) disagreed with the EPA's estimate of 0.52 statistical life per year for the total cancer risk from benzene and naphthalene. The commenter (IV-D-44) contended that naphthalene is classified as a possible carcinogen, not a known carcinogen, by the EPA and therefore should not be included in the risk analysis. The commenter (IV-D-44) estimated that the exclusion of naphthalene produces a lifetime cancer risk for 0.015 per million persons. The commenter (IV-D-44) asserted that the Act permits the EPA to delist a source category if no source in the category emits HAP's in quantities which may cause a lifetime cancer risk greater than 1.0 per million persons. The commenter (IV-D-44) also alleged that the HEM-I used to estimate the cancer risks is overly conservative and biases risk estimates upwards.

Response: The EPA has revised the risk assessment and benefits analysis and did not include naphthalene as a carcinogen. Benzene and cresols are the two HAP's identified as carcinogens in the revised analysis. While the values in HEM-I are conservative, the benefit analysis attempted to calculate values that were not conservative. Our analytical methodology did not presume conservative assumptions for values other than the annual cancer incidence inputs.

Comment: One commenter (IV-D-44) disagreed with the EPA's estimate of $148.3 million for health effects benefits resulting from reduction in VOC emissions. The commenter (IV-D-44) alleged that there were inaccuracies in the calculation of emissions from miscellaneous process vent emissions and equipment leaks and explained these inaccuracies. The commenter (IV-D-44) estimated the general human health benefits from refinery MACT to be approximately $49 million. The commenter (IV-D-44) claimed that the VOC reductions claimed by this regulation will occur as a result of State Implementation Plans required by the Act.

Response: The EPA appreciates any data that will assist the Agency in accurately calculating emissions from sources that will be covered by our regulations. The benefits calculated by the EPA are in annual terms since the emission reductions are in annual terms, thus the $49 million estimate mentioned by the commenter must also be an annual value. Controls used to reduce HAP's also reduce VOC in the same emission streams. Thus, it is appropriate for the Agency to account for VOC reductions in this rule.

Comment: One commenter (IV-D-44) alleged that the proposed regulation fails to take into account the costs imposed on the refining industry due to other Federal regulations.

Response: The costs calculated were not cumulative in that they did not include capital and annual costs from concurrent and other recently promulgated regulatory actions affecting the refinery industry. However, the regulatory alternatives chosen were based on requirements from existing regulations the refinery industry was already familiar with, and thus will make the industry's effort at compliance less difficult and less costly.

Comment: One commenter (IV-D-48) alleged that the EPA ignored Congress' decision not to base standards on cost-benefit analysis in citing cost benefit analysis as a rationale for the exemptions in the proposal.

Response: While all MACT rules must control to at least the MACT floor for the source categories of concern, the Agency has discretion in going above the floor based on costs. The promulgated alternatives meet the MACT floor for each type of emission point except for equipment leaks, and the alternative is a choice of control levels that each represent a more stringent alternative than the floor.

Comment: One commenter (IV-D-48) claimed that the cost-benefits analysis contains serious flaws. The commenter (IV-D-48) alleged that toxics release data indicate that pollutants not quantified or discussed in the RIA are emitted from petroleum refineries in large quantities. The commenter (IV-D-48) stated that excluding these pollutants caused the cost to benefit ratio to be overestimated.

Response: The eleven organic HAP's known to be in equipment leak emissions are listed in the final RIA and are listed in the final preamble. Information identifying these HAP's was taken from the TRI database. While the Agency may have not included some pollutants from refineries, EPA did attempt to use the most recent emissions data available. The commenter did not identify or include data on those pollutants that the Agency is claimed to not have looked at.

Comment: One commenter (IV-D-48) claimed that the cost-benefit analysis is incorrect because non-cancer related health effects were not characterized or quantified.

Response: Non-cancer related health effects were characterized in Chapter 7 of the RIA, and one of those, an estimate of increases in agricultural yields was quantified and listed in the promulgation preamble.

Comment: One commenter (IV-D-48) alleged that the cost-benefit analysis is inadequate under the E.O. on environmental justice because it did not consider the health risks from multiple and cumulative exposures from the combined pollutants of petroleum and non-petroleum sources. The commenter (IV-D-48) claimed that this analysis cannot be used as a decision making tool.

Response: The benefit analysis considered all the available data from affected sources that were relevant to the necessary calculations. Data for cumulative exposures to pollutants from petroleum and non-petroleum sources was not included in the benefit analysis because it was not available.

Comment: One commenter (IV-D-29) requested that the proposed regulation be withdrawn due to a lack of benefits. The commenter (IV-D-29) claimed that the EPA has shown that there is no HAP reduction health benefit associated with this regulation. The commenter (IV-D-29) acknowledged that the proposed regulation will reduce VOC, but contended that VOC reduction does not justify the regulation. The commenter (IV-D-29) claimed that VOC emissions in nonattainment areas were already being reduced. Additionally, the commenter (IV-D-29) alleged that the VOC benefits were overestimated.

Response: There are health benefits from HAP reduction associated with this regulation. The monetized benefits did exceed the costs of regulation by $58.1 million, and the regulatory baseline did account for the latest VOC emission estimates in ozone nonattainment areas. As to the estimate of VOC benefits, the estimate does not include VOC benefits for the following: 1) acute health benefits in ozone attainment areas, and 2) chronic health effects, such as fewer cases of sinusitis, hay fever, damage to materials, and ecosystem effects. Thus, the estimate may underestimate benefits from VOC emission reductions.

Comment: One commenter (IV-D-30) stated that the proposed emissions standards will increase costs. The commenter (IV-D-30) stated that the increased costs include capital costs for additional control equipment and monitoring systems as well as significant manpower costs to comply with the recordkeeping and reporting requirements.

Response: The final standard will increase costs, but the economic impact analysis determined that the impacts from these costs were insignificant. Price changes and production decreases were both estimated at under 0.6 percent for affected products. Estimated recordkeeping and reporting costs for the final regulation are one-third less than at proposal ($20 million instead of $30 million), a significant reduction. This occurred due to reductions in the level of monitoring required, and reduction in redundant recordkeeping and reporting activities.

Comment: One commenter (IV-D-25) claimed that the economic impact analysis underestimates the portion of the total refinery MACT compliance costs borne by refiners and overstates the costs passed on to petroleum product consumers in the form of price increases.

Response: In estimating these impacts, EPA's analysis did include price elasticities of demand for the affected products in the calculations. The price elasticity of demand is a measure of the response of consumers to a 1 percent change in the market price for a product. In the case of the products modeled, the highest elasticity point estimate was

-0.8 (liquified petroleum gas) to a low of -0.15 (jet fuel). Since the price elasticities of demand are all less than -1, the regulatory control costs are more likely to be paid by the consumers of these products when compared to products with elastic demand, all other factors equal. Also, price increases for products with inelastic demand lead to revenue increases for their producers. Thus, the price increases estimated here should lead to higher revenues for the refining industry, again all other factors being equal.

While a portion of the compliance cost is borne entirely by the refiners, they should be able to pass on much of the remaining costs to consumers given the low demand elasticities they face. In the long-run, given a high level of competition, all the costs of control can be passed on to consumers. As to Gulf and East Coast refiners, it is possible that they face higher elasticities of demand than those used in the report, and thus perhaps can pass less of their costs to consumers by increased product prices. No information was submitted by the commenter on specific elasticities of demand for Gulf and East Coast refiners. However, since the elasticities mentioned earlier incorporate the behavior of consumers of products produced by these refiners also, the industry impacts calculated should not be a significant underestimate.

Comment: One commenter (IV-D-25) said the economic impact analysis should distinguish between refineries in attainment versus nonattainment areas because the magnitude of the impact will be different.

Response: The cost analysis calculated costs specific to each affected refinery, and the data used as input to the costs analysis distinguished between whether a refinery was in an ozone nonattainment area or not. Consequently, the economic impact analysis reflects the distinction.

Comment: One commenter (IV-D-25) suggested that if contract workers were considered, estimated employment losses would be 50 percent higher.

Response: It should be noted that the estimate of employment losses was quite small (slightly more than 100 nationwide), and even if the analysis considered contract workers, the job losses would not increase much in the aggregate. In general, control cost estimates tend to overstate the costs of emissions control. The Agency questions the basis for a 50 percent increase in the employment losses, and hoped that the commenter would provide more data on how effects on the labor could be better examined.

Comment: The commenter (IV-D-25) said the assertion that an increase in petroleum product imports will be accomplished by a worsening of merchandise trade balance is simplistic and not necessarily true.

Response: An increase in petroleum product net imports will be accompanied by a worsening of the merchandise trade balance, all other trade factors being equal. It should be noted that one of the reasons the U.S. merchandise trade balance has been largely negative for the past several years has been due to large domestic expenditures on foreign oil, an increase due to ever-increasing demand for petroleum products. However, increasing exports of other goods may offset future increases in petroleum product imports. The statement made that the "merchandise trade balance is not a simple function of a change in imports" is correct.

Comment: One commenter (IV-D-22) asserted that the EPA's analysis of the benefits of the proposed MACT rule is factually and technically flawed. The commenter (IV-D-22) stated that the EPA used its HEM-I model which is overly conservative. The commenter (IV-D-22) also asserted that naphthalene should not have been used in the risk analysis because it is not classified as a known carcinogen.

Response: The benefits analysis incorporated the best information available on the species of HAP's known to be in refinery emission streams, and while the Agency did use the HEM-I model for its risk assessment, it did not use those calculations to calculate overly conservative, worst-case benefits values. Used in the benefit analysis was a methodology known as "benefits transfer" that takes a range of monetary benefits per ton VOC emission reduction from a 1989 study (OTA, "Catching our Breath") and transfers it to the level of VOC reductions from this rule. This methodology is a standard way of estimating monetary VOC benefits from compliance with NESHAP's. Naphthalene will no longer be classified as a carcinogen in the RIA for promulgation, but cresols will.

Comment: One commenter (IV-D-09) contended that the proposed rule grossly underestimates the cost of compliance with the proposed regulation, perhaps by as much as a factor of 3. The commenter (IV-D-09) asserted that industry's 5-year capital cost will approach $600 million as opposed to the EPA's estimate of $207 million. The commenter (IV-D-09) extrapolated this estimate based on estimated costs for their 5 refineries and the total capacity of their industry. The commenter (IV-D-09) stated that the EPA has historically underestimated costs at refineries and cited the BWON as an example.

Response: The EPA has undertaken its best efforts to accurately estimate the costs of compliance associated with the final regulation. In no way did we attempt to provide an underestimate of the capital costs of the regulation. The assertion that industry's 5-year capital cost will approach attempts an extrapolation from a limited number of refineries that is inappropriate based on the information submitted to the Agency. The EPA's estimate was based on the best information available as to what refineries would have to do to comply, and the $207 million estimate is based on that information.

Comment: One commenter (IV-D-22) contended that the closure of 7 refineries as a result of the rule will effect competition. The commenter (IV-D-22) added that the loss of small businesses and the loss of jobs will have a significant effect on the national economy. Another commenter (IV-D-12) asserted that the EPA had underestimated the number of small refinery closures, and also underestimated the regulatory and economic impact because it underestimated the costs when compared to industry estimates. Another commenter (IV-D-06) asserted that the refinery MACT regulation may not result in refinery closures as this would more likely be due to Title II requirements. The commenter (IV-D-06) recommended that the EPA determine whether any double counting of refinery closures was included in its analysis.

Response: A range of 0 to 7 refineries that were at risk of closure was estimated in the economic analysis and further elaborated on in the regulatory flexibility analysis, an analysis of the impacts on small businesses from federal regulations. Due to certain assumptions (e.g., that the firms with the highest per-unit cost of compliance are the marginal firms), it is likely that the number of refineries at risk of closure is closer to 0 than 7. The level of job loss is expected to be insignificant (less than one-fourth of

1 percent of all refinery jobs), and the regulatory flexibility analysis shows that the impact on small refineries and their employees, while higher than for other refineries, will be low as well.

The estimates of costs are not underestimates of the costs of compliance. We included as much data from industry as was deemed possible, particularly cost data.

The comment on possible refinery closures resulting from compliance with Title II provisions comes from the estimate provided in the March 1994 EPA report, "Analysis of the Impact of Environmental Compliance on Plant Operations." It should be noted that this report came out before the economic impacts of this regulation were estimated, and the report did not account for the refineries affected by this Title III standard. As far as known, there should be no double counting of refineries at risk of closure. It should be recognized, however, that the closure risk estimates given in each case are in ranges, not point estimates.

Comment: Two commenters (IV-D-12, IV-D-22) noted that the EPA's own RIA demonstrated that the total cancer risk of HAP emissions from refineries is low. Therefore, the commenters (IV-D-12, IV-D-22) contended the rule is unnecessary, and is an example of one that is in conflict with the Common Sense Initiative.

Response: While the total cancer risk is low, there is a sufficiently high level of risk from exposure to HAP's in some individual refinery emission streams to conclude that risks to some exposed to emissions from refineries in ozone nonattainment areas are reduced significantly as a result of this standard. Our revised risk assessment has shown that approximately 4.5 million people exposed to refinery emissions experience a risk of mortality from cancer of greater than

1 in 1 million, a level of risk that is the cutpoint between a source category on the list of HAP's in Title III of the Act. In addition, the Agency, as it is doing through the Common Sense Initiative, attempted to enlist industry cooperation at all points of the rule-making process, and attempted to link provisions of the rule to regulations already promulgated, thus limiting additional paperwork and expenditure.

Comment: One commenter (IV-D-12) urged the EPA to determine the emission reduction benefits of the rule in non-attainment areas taking into account the HAP reductions produced by other federal, state, and local rules.

Response: The regulatory baseline took into account HAP reductions from other rules as much as possible for ozone nonattainment and attainment areas. For further detail, refer to the "Regulatory Impact Analysis for the Petroleum Refinery NESHAP" document. This document can be retrieved from the docket for the final rule. The docket for the final rule is available for public inspection between 8:00 a.m. and 4:00 p.m., Monday through Friday except for Federal holidays, at the following address: U.S. Environmental Protection Agency, Air and Radiation Docket and Information Center (MC-6102), 401 M Street SW, Washington, DC 20460; telephone: (202) 260-7548.

Comment: One commenter (IV-D-42) stated that because the refinery MACT rule is for controlling HAP emissions, the justification for any refinery MACT requirements should be based solely on a cost-benefit analysis of HAP's and not VOC. However, the commenter (IV-D-42) asserted that the EPA admits that it was not possible to identify the speciation of HAP emission reductions for each type of emission point, so the EPA reported that the benefits associated with the petroleum refinery NESHAP were determined to be small. The commenter

(IV-D-42) contended that this was inconsistent with the requirements of the Act because MACT is a standard from HAP's not VOC. Therefore, the commenter (IV-D-42) asserted that the proposed rule is flawed because the stringency of the proposed refinery MACT rule would not be justified by a cost/benefit analysis based solely on the reduction of HAP's. The commenter (IV-D-42) stated that the EPA should not promulgate the rule until it has done a cost-benefit analysis based on HAP's.

Response: While this regulation is meant to control HAP emissions, the Agency recognizes that control of one type of pollutant often leads to control of other pollutants at the same time. The emission streams from refineries are primarily VOC, with a small fraction of HAP's within. Thus, any benefits estimated to occur from a rule that controls VOC, though their control is of secondary importance, should be included as benefits attributable to the rule unless the reductions will occur as a result of another rule or program (certain Title I rules, for example). A benefit-cost comparison based solely on known HAP's leads to negative net benefits from the rule, but to exclude the benefits from VOC reduction would be inappropriate. In addition, there are benefits to HAP reduction we cannot quantify at present (e.g., reduction of HAP exposure to concentration levels before the inhalation reference-dose concentration, and ecosystem effects).

Comment: One commenter (IV-D-22) asserted that the EPA's RIA analysis did not include other Act rulemakings that will be concurrent with the refinery MACT rule. The commenter (IV-D-22) stated that the EPA's analysis of impacts of environmental compliance indicate that in addition to the

7 refinery closures estimated for the refinery MACT, another 30 would be closed because of other rules.

Response: It should be noted that the risk of closure estimate given in this economic analysis and the other one are ranges, with zero being at the bottom of the range. Since the March 1994 analysis of impacts of environmental compliance did not include the results of the economic analysis for this rule, there should be no double counting. However, the number of refineries estimated at risk of closure in these analyses are likely much lower than 37.

Comment: Three commenters (IV-D-27, IV-D-28, IV-D-49) referred to President Clinton's Executive Order 12866 which directs federal agencies to choose regulatory approaches where the benefits outweigh the costs. The commenters (IV-D-27, IV-D-28) contended that the proposed petroleum refinery NESHAP does not follow this mandate, and therefore should be re-evaluated and/or withdrawn completely. [Also see section 3.2.1 for similar comments about small refineries.] Five commenters (IV-D-08, IV-D-27, IV-D-28, IV-D-49, IV-F-1) stated that the costs of the rule ($207 million in capital costs and $110 million in annual costs) do not outweigh the benefits (less than one cancer case per year) and contended that the proposed rule should be re-evaluated and reproposed with benefits that justify the costs.

Response: The final alternatives for each emission point are at the MACT floor, which is the minimum level of control. The only exception is equipment leaks, where a more stringent alternative (to be more precise, a choice of alternatives) than the floor was found to be more cost-effective.

Also, the VOC benefits at these alternatives exceeded the compliance costs by $58.1 million. The HAP benefits associated with the regulation are low, but control of VOC occurs along with HAP control. Consequently, it is proper to include the benefits of VOC emissions control as part of the benefits of the rule.

Comment: Five commenters (IV-D-27, IV-D-28, IV-D-39, IV-D-49, IV-F-1) were concerned that the EPA has sought to justify the costs of this regulation based on VOC reductions, in light of the minimal HAP reductions. One of the commenters (IV-D-27) reminded the EPA that the intent of Title III rules is to minimize the emissions of HAP's. One commenter (IV-D-27) was under the impression that VOC emissions would be addressed in the SIP's under Title I of the Act.

Response: The intent of Title III rules is to minimize emissions of HAP's, but many sources being affected by these rules have emission streams with high concentrations of VOC. Thus, control of VOC often occurs along with control of HAP's for the same rules.

Comment: One commenter (IV-D-27) encouraged the EPA to develop a tiered approach in risk assessments, as recommended by the National Academy of Sciences report "Science and Judgement in Risk Assessment." The commenter (IV-D-27) contended that this tiered approach would recognize the differences between those refineries that pose a risk to public health versus those that do not.

Response: The Agency is reviewing the National Academy of Sciences report.

Comment: One commenter (IV-D-39) stated that there is considerable competition in the refining market, that the number of independent refineries which have historically been the major oil companies primary competitors, continue a downward trend. The commenter (IV-D-39) stated that the number of U.S. refineries has declined by over 45 percent (315 to 172) with small refineries constituting the majority of those shutdowns and job losses of over 500,000. The commenter (IV-D-39) stated that many independent and small refineries occupy geographic market niches which if disrupted, could result in supply shortages and price spikes in certain areas of the U.S.

Response: While the number of U.S. refineries has declined considerably over the last fifteen years, the level of U.S. refinery output has increased from 14.36 million barrels per day in 1981 to 16.16 million barrels per day in 1992, an increase of 13 percent. These results are associated with increases in economies of scale associated with petroleum refining. While many independent and small refineries occupy geographic market niches, the results from the economic analysis show that the Refinery NESHAP should not cause supply shortages and price spikes in rural locations through most of the U.S.

Comment: One commenter (IV-D-49) contended that the proposed rule will act as a subsidy for foreign gasoline imports which is not only unsound public policy, but is in direct opposition to the Congressional intent of the Act.

Response: Foreign gasoline importers may experience additional revenues from the imposition of this regulation, but the increase will be modest, since the projected product price changes will be under 0.6 percent at the wholesale level. The rule is not a subsidy for foreign gasoline imports.

Comment: One commenter (IV-F-1) contended that the EPA's cost-effectiveness estimates and overall cost projections of the proposed rule are understated since the agency did not include the input of a single small refinery. The commenter (IV-F-1) estimated that the compliance costs for a small refinery would be twice that of a larger facility, on a per barrel basis. One commenter (IV-D-39) cautioned the EPA that compliance costs for small refineries as a percentage of sales are more than twice as high as larger refineries.

Response: The EPA sent ICR's to all facilities in the industry. The ICR's requested information on HAP emissions, characteristics of refinery liquids, and control devices at refinery process units for process vents, storage vessels, and equipment leaks. No responses were received from refineries and useable information on all three kinds of emission points was received from 116 out of 132 refineries. This information was considered in developing estimates of emissions, emission reductions possible from application of controls, and cost of the rule.

The Agency did include information from small refineries in the development of the rule and the analyses associated with it. As part of EPA's Regulatory Flexibility Analysis, compliance costs for small refineries as a percentage of sales were estimated at more than twice as high as larger refineries. This was a calculation required under the Federal Guidelines for doing Regulatory Flexibility Analyses, and is consistent with EPA's more recent Guidelines for accomplishing Regulatory Flexibility Analyses. The economic impacts reflect this estimate.

Comment: One commenter (IV-D-50) referred to a report showing that 91 of 120 petroleum refineries that have shut down since 1980 were small refineries. The commenter (IV-D-50) also contended that in the past 14 years, more than half (56 percent) of all small refineries in the U.S. have shut down. The commenter (IV-D-50) stated that after the closures in the early 1980's due primarily to the elimination of government programs, closures have been related to compliance costs of environmental regulations which have rendered these facilities uneconomic.

Response: It is uncertain as to whether compliance costs of environmental regulations are related to increased closures of small refineries. However, economies of scale for refinery production have grown, and that may be an alternate explanation as to why average refinery production capacity has grown, and the smaller refineries are closing.

Comment: One commenter (IV-D-50) stated that the EPA's economic analysis for the proposed rule fails to consider the collective costs and impacts of other government requirements on the petroleum refining industry. The commenter (IV-D-50) cited a 1993 report contending that the U.S. refining industry would need to spend $37 billion during this decade to meet environmental requirements. The commenter (IV-D-50) stated that small refineries have limited ability to finance the requirements contained in the proposed rule.

Response: Results from the Regulatory Flexibility Analysis showed that while there is a possibility that some small refineries are at risk of closure, most small refineries will have adequate capital available to finance the purchase of equipment needed to comply with the requirements.

Comment: One commenter (IV-F-1) reported that the job loss connected with the 7 refinery closures due to the proposed rule would be approximately 10,000 jobs. The commenter (IV-F-1) included details in an appendix to the comments.

Response: The economic analysis analyzed the direct impacts of the regulation, and did not analyze the effects on nearby communities and other entities. Given that between 0 and 7 refineries are at risk of closure, with the estimate most likely closer to 0 than 7, the job loss due to indirect effects should be nowhere close to 10,000. Estimates of job losses in the analysis are between 0 and 114.

Comment: One commenter (IV-D-50) stated that refineries with operating capacity ranging between 10,000 and 20,000 barrels/day experience a high level of competition among ourselves as well as from other refineries. The commenter (IV-D-50) cited a report that stated that most of the markets served by the small refineries tend to be less populated regions where economic activity within the area can hardly support large scale refining operations and most of the products are sold within a 200 mile radius of the refinery. The commenter (IV-D-50) also stated that most of the small refineries indicated that about 70 percent of the products moving within their distribution were marketed by major oil companies.

Response: What is mentioned here about the markets served by small refiners is consistent with information already collected by the Agency. Small refiners tend to serve niche markets, markets that larger refiners typically do not find profitable to service. There is, however, increasing competition in regions normally served only by small refiners. Major refiners are starting to extend pipelines to more rural areas, and to market their products in areas of the country that they have traditionally not served.

Comment: Two commenters (IV-D-27, IV-D-39) stated that while the EPA estimated in the proposed rule that more than 7 refineries may be forced to close, that number appears too low. One commenter (IV-D-27) referred to the draft final report "Analysis of the Impact of Environmental Compliance on Plant Operations," which has estimated that up to 30 small refineries (17 percent of U.S. refineries) would be closed as a result of Act requirements. The commenter (IV-D-27) reminded the EPA that during the Act floor debates it was stated "MACT is not intended to drive sources to the brink of shutdown." Commenters stated that the closures of small refineries will: increase foreign imports of finished products, permanently damage local economies, as well as disrupt the chain of local commerce, affecting crude suppliers and producers, gasoline distributors, independent marketers, and others.

Two commenters (IV-D-37, IV-D-60) stated that the proposed rule is likely to force many producers to ship their oil further distances, thus driving up costs and increasing the risk that some oil will be spilled while in transit, because the proposed emission controls are based on those in place on large refineries in nonattainment areas and smaller refineries are likely to be forced to close.

Three commenters (IV-D-28, IV-D-40, IV-D-50) provided reasons why smaller refineries will incur higher costs to reach compliance per unit of output than larger refiners under the proposed rule: there are diseconomics of scale in building small facilities; small refineries usually incur higher capital costs than their larger better financed competitors; small refineries are predominantly located in attainment areas where the emission controls are less stringent than in non-attainment areas; small refineries tend to be older and less sophisticated, and therefore have further to go to reach compliance, and would not be able to recover the costs of implementing control technology by raising product prices, since competing refineries in non-attainment areas would not be as significantly impacted.

Response: The number of refineries at risk of closure predicted in the economic analysis was from 0 to 7, not 7. Due to a number of assumptions that likely overstate the level of impact, this range may be an overestimate. The estimate provided in the other EPA report was also a range; the number of refineries at risk of closure was from 0 to 30. Since the ranges given here are likely overstatements, the effects mentioned on local economies and the chain of suppliers should be minor. While smaller refineries are more likely to be at risk of closure than others, again the number should be small enough that effects from possible closures will have an insignificant impacts on affected products. The reasons given by commenters as to why smaller refineries incur higher costs to reach compliance per unit of output are correct; they are in the economic impact analysis and the associated Regulatory Flexibility Analysis.

Comment: One commenter (IV-F-1) stated that geographically, small refineries that produce light liquid products, such as gasoline, are located in attainment areas or in areas that experience few problems; LDAR programs are modest or non-existent in such facilities. Small refineries that are located in ozone nonattainment areas generally manufacture heavier petroleum products such as lubes or asphalt, or fuel oil. The commenter (IV-F-1) noted, however, that LDAR programs focus on leaks from light liquid streams. The commenter (IV-F-1) stated that the result is an over regulation of small refineries.

Response: Small refineries typically produce heavy petroleum products such as lubes, asphalt, or residual fuel as a greater percentage of their product mix than larger refineries. The Agency has looked into the possibility that many refineries making these products may not be subject to the applicability criteria in the regulation, and therefore will not be subject to this rule.

As part of the consideration of issues regarding the effects of this rule on small refiners, the EPA analyzed the refinery data bases to see if subcategorization would change the requirements for small refiners. The EPA explored subcategorization based on crude charge capacity, by ozone attainment status, and by refineries containing processes that are used to produce gasoline (such as catalytic cracking, coking, and catalytic reforming). Within each subcategory, the process vents, storage vessels, and equipment leaks data bases were sorted from most stringent to least stringent control.

The MACT floor (average of the top 12 percent of sources) for each subcategory was identified. The MACT floors for small refineries are not significantly different from the industry as a whole. The floor for process vents is the same for small refiners as for the entire industry. The floor for storage tanks would increase the materials vapor pressure cutoff from 10 kPa (1.5 psia) to 11 kPa (1.7 psia), which would result in a minimal cost savings since there are few petroleum liquids in this volatility range. The floor for equipment leaks would reduce the monitoring frequency; however, small refiners would still incur the cost of setting up and implementing an LDAR program. This analysis is documented in the docket for this rule.

Based on the EPA's analysis and the comments received during the public comment period, a separate subcategory for small refineries has not been included in the final rule. This decision was based on there being no clear relationship between refinery size or design emission potential.

Comment: Two commenters (IV-D-23, IV-D-24) objected to the potential for the refinery NESHAP to close seven small refineries. One commenter (IV-D-24) was concerned that the closing of these independent sources of fuel would lessen the competition in the marketplace and fuel prices will go up.

Response: The results of the economic impact analysis show that it is likely that reductions in product output will be small (less than 0.6 percent), and that the number of refineries at risk of closure is from 0 to 7, with the likely number of closures between closer to 0 than 7 due to the assumptions in the economic analysis. Since the estimated impacts on the refinery industry are small, the chances of fuel prices (or refinery products prices) increasing are small, and there would then be minimal changes in the level of competition in the marketplace.

Comment: One commenter (IV-D-23) stated that the cost of complying with refinery NESHAP will be extraordinarily high for the refinery industry, as reported in the RIA and specifically for their refinery. In addition, the commenter (IV-D-23) continued, the refinery NESHAP is only one of many capital expenditures that increasing regulations demand that the refinery undertake. Currently, the commenter (IV-D-23) explained, all of the refinery's available capital is dedicated to coming into compliance with RCRA rules, development of reformulated gasoline, low sulfur diesel, wastewater improvements, and underground storage tank regulations. The commenter (IV-D-23) contended that the current EPA policy has promoted an environment where only the large mega-refineries can survive and is forcing smaller refineries out of business.

Response: The EPA, in compliance with the Regulatory Flexibility Act of 1980 and its own Regulatory Flexibility Analysis Guidelines, attempts to analyze the impacts its rules have on affected small businesses, not only to determine the impacts but to find ways of mitigating those impacts if they are found to be significant. The Agency has explored different ways to mitigate the impacts on small businesses while still promulgating a MACT standard. Those efforts are underway. The Agency is aware of the rules that refineries are having to comply along with this standard, and is cognizant of considering them as we review this standard prior to promulgation.

A Regulatory Flexibility Analysis has been completed for this rule, and its findings were considered in the preparation of the rule.

Comment: One commenter (IV-D-24) was concerned about the cost of the rule being passed on to gasoline marketers, chain retailers, and, ultimately, the American consumer.

Response: The economic impact analysis showed that the price changes that consumers, whether they be marketers, retailers, or drivers, will be small. Estimated price changes to refiners for affected products should be less than 0.6 percent, and consumers will experience a price change less than that. This is the case because the incidence of impacts from the compliance costs will be shared by refiners and consumers.

Comment: One commenter (IV-D-24) stated that there is no rationale for the proposed regulation: the adjusted cancer risk is very low, and the general benefits to human health resulting from the proposal do not justify the estimated costs of the program to the refinery industry. The commenter (IV-D-24) quoted the EPA cost estimates for complying with the proposed rule of $850 million and $110 million per year for monitoring, testing, reporting and compliance costs, and the estimated benefits to improved human health over the next five years of $49 million, and concluded that the proposal cannot be justified and must not be finalized.

Response: The capital costs for the proposed rule are $213 million and the total annual costs are $79 million. The total annual costs do include a component for capital recovery, so the capital and annual costs are not additive. In addition, the estimated benefits from VOC emissions reductions are $153.4 million annually. Thus, the annual benefits, which include benefits from increased agricultural yields along with those to human health, exceed the annual costs. In addition, the monetized benefits are likely to be an underestimate. Reductions in VOC emissions that lead to reductions in ozone concentrations may contribute to reductions in chronic health impacts (e.g., sinusitis, hay fever), and reduced damage to some materials (e.g., elastomers). None of these benefits were monetized. Benefits from compliance in ozone attainment areas were also not accounted for. The same controls for HAP's also control VOC, and thus these emission reductions are also credited to the rule.

# 12.0 GENERAL POLICY ISSUES

## 12.1 COMMON SENSE INITIATIVE

Comment: One commenter (IV-D-42) contended that the rule is in conflict with Executive Order 12866 by not being clearly understood, and by using excessive reference to other rules. Five commenters (IV-D-10, IV-D-19, IV-D-21, IV-D-25, IV-D-57) asserted that reading, understanding and complying with the regulation in the specified compliance periods has been made more difficult by cross-referencing with provisions in the SOCMI HON. Three commenters (IV-D-19) (IV-D-21) IV-D-48) suggested that if a provision of a MACT standard is to be duplicated, it should be reprinted in the new regulation. Additionally, one commenter (IV-D-19) pointed out that amending regulations to which other regulations refer could prove difficult.

Two commenters (IV-D-06, IV-D-25) suggested rewriting the rule to flow logically without cross-referencing other sections or other regulations. The commenters (IV-D-06, IV-D-25) also suggested use of flow charts to describe applicability and tables to summarize requirements. The commenters (IV-D-06, IV-D-25) also suggested listing the reporting and recordkeeping requirements with the sections for each type of emission point instead of at the end of the entire rule. One commenter (IV-D-57) recommended providing a table of HON requirements and those of other incorporated rules.

Response: The EPA appreciates the commenters' suggestions for improving the structure of the proposed regulation. The EPA agrees that efforts should be made to ensure that a regulation can be read and understood with minimal difficulty.

Many changes were made to the final rule to make it clearer: all recordkeeping and reporting requirements were included in the rule instead of being referred to in other rules, a table was provided describing which general provision requirements pertain, and guidance was given on overlapping requirements. However, the rule still cross-references other regulations control requirements. This was done to avoid inadvertently introducing errors through small changes in wording and because of the savings in time, paper and printing costs. The EPA does not consider the proposed rule to be in conflict with Executive Order 12866.

Comment: One commenter (IV-D-57) recommended providing a table of the HON requirements and those of other incorporated rules. One commenter (IV-D-06) stated that the format of the Refinery MACT regulation should be simplified, showing all the section and sub-section designations on each sub-section, or by indenting each sub-section further than in the section it belongs in.

Response: The format for section and subsection designations is standard for all Federal regulations and cannot be changed for this rule.

The EPA evaluated whether the use of tables or charts could be used to simplify the regulation and found that the kind and volume of information that would be required for provisions not already presented in these formats made it an impractical option.

Comments received on previous rules (e.g., HON) indicated a preference for this format and there would be no substantive difference in the rule by putting recordkeeping and reporting requirements with each emission point. Therefore, the EPA maintained recordkeeping and reporting all in one place instead of with each kind of emission point.

12.2 PUBLICATION OF REGULATIONS

Comment: Several commenters (IV-D-09, IV-D-10, IV-D-19, IV-D-40, IV-D-38, IV-D-42, IV-D-51) objected to the EPA not publishing the rule in the Federal Register. One commenter (IV-D-51) stated that without publication of the proposed rule in the Federal Register, it is difficult if not impossible for the owner or operator of new or modified sources to ensure exactly its legal and technical changes to the source to comply with the final rule. The commenter (IV-D-51) also stated that not printing in the Federal Register undermines any enforcement action the EPA may wish to take against an owner or operator. The commenter (IV-D-51) contended that this additional time, given to sources caught in the trap between the proposal date and the final date of a NESHAP rule, has been provided explicitly in the Act at section 112(i)(2).

One commenter (IV-D-09) added that not publishing the rule in the Federal Register resulted in confusion and delay during the comment period. Another commenter (IV-D-42) stated that those who do not have the computer capability to access the EPA bulletin board are left out of the comment process. Two commenters (IV-D-25, IV-D-38) asserted that failure to publish regulations in the Federal Register impairs the public's ability to comment on proposals. One commenter (IV-D-19) cited the Administrative Procedures Act and the CAA as regulations requiring the EPA to publish proposals in the Federal Register. Another commenter (IV-D-40) stated that the monetary savings of not including the regulations are minimal and that they were considering the legality of the EPA's omission. One commenter (IV-D-10) added that changes and corrections that may be posted electronically to the bulletin board at a later data may not provide adequate notice. The commenter (IV-D-10) stated that electronic dissemination of information should be done in an organized manner that would satisfy the public notice requirement of the Administrative Procedures Act and would serve as an additional method of dissemination instead of the sole method. The commenter

(IV-D-10) also stated that software incompatibilities exist between the EPA and many in the regulated community.

Response: The EPA agrees that publication of the proposed rule in the Federal Register would have increased availability of the document and facilitated the comment process. The EPA elected not to publish the proposed regulation based on precedents set by previous regulations and in the interest of conserving resources. The EPA would like to clarify that the comprehensive summary of the regulation was provided in the Federal Register. The summary included all important aspects of the proposed regulation in addition to relevant information that is not in the regulation. The summary provides interested parties sufficient information to determine whether they require a copy of the entire proposed regulation. If a copy is required, several options for obtaining one are available. In addition to the Technology Transfer Network, the proposed regulation is available in the Air and Radiation Docket, which is open to the public, and by either written or telephone request. The EPA contends that the method used disseminate information regarding the proposed regulation and the regulation itself was the most efficient and adequately fulfills the EPA's responsibility to the public.

## 12.3 REQUEST FOR EXTENSION

Comment: One commenter (IV-D-09) objected to not being allowed to have a full 90 days to comment on the regulation.

One commenter (IV-D-12) requested that the comment period be extended by 60 days to allow further study of the proposed regulation so small refineries may provide comments and supporting data on the EPA requests for information in the rule. One commenter (IV-D-29) requested an extension. The commenter (IV-D-29) claimed that additional time was required to obtain economic impact and health risk data for small refineries. The commenter (IV-D-29) asserted that small refineries do not have the manpower or economic data to respond to the comments. The commenter (IV-D-29) asserted that the EPA should be responsible for collecting the data or not propose the regulation.

Several commenters requested that the 60 day comment period be extended (IV-G-09) an additional 30 days (IV-D-02, IV-G-03, IV-G-04, IV-G-05, IV-G-06). Reasons commenters (IV-G-03, IV-G-04) provided for why an extension was needed included: (1) significant changes were made to the rule at the last minute that were not discussed with industry (specifically, emissions averaging among marine terminals and other emission points and a requirement that storage tanks must be in compliance in 3 years), (2) the proposal contained 41 specific requests for information which is difficult to obtain in 60 days, (3) legal and technical analyses will need to be performed by commenters to adequately respond to the EPA (the regulation has been classified as Tier (1), (4) it took a while to receive the RIA and the proposed rule from the EPA.

Response: Because of the short amount of time the EPA had available to review and respond to all comments and then promulgate the final rule by the court ordered deadline, additional time was not available to provide for the public comment period. The EPA did however provide a 60 day comment period for this rule, which is more than the amount of time required for Federal Regulations. Furthermore, the EPA has received and considered comments from interested parties since the comment period closed. Every effort has been made to respond to comments submitted during the comment period and after the comment period was closed.

## 12.4 MISCELLANEOUS

Comment: One commenter (IV-D-21) claimed that the total emissions equation in § 63.642 should be deleted. The commenter (IV-D-21) submitted that the equation is ambiguous because some terms are not defined in a way that explains how to calculate them. The commenter (IV-D-21) stated that the equation is unnecessary and is not actually used and calculation is exempted from all situations.

Response: The equation given in § 63.642 of subpart CC is a representation of the source regulated by this rule. It is not necessary to use this equation to calculate values for complying with the rule. The terms are defined in the final rule.