

**ENVIRONMENTAL PROTECTION AGENCY****40 CFR Part 60**

[AD-FRL-2509-5]

**Standards of Performance for New Stationary Sources Equipment Leaks of VOC Petroleum Refineries and Synthetic Organic Chemical Manufacturing Industry****AGENCY:** Environmental Protection Agency (EPA).**ACTION:** Final rule.

**SUMMARY:** This action promulgates standards of performance for equipment leaks of volatile organic compounds (VOC) in the petroleum refining industry. The standards were proposed in the Federal Register on January 4, 1983 (48 FR 279). This action also promulgates minor amendments to standards for equipment leaks of VOC within the synthetic organic chemical manufacturing industry (SOCMI). The promulgated standards implement section 111 of the Clean Air Act and are based on the Administrator's determination that fugitive emissions of VOC from the petroleum refining industry cause, or contribute significantly to, air pollution which may reasonably be anticipated to endanger public health or welfare. The intended effect of the standards is to require all newly constructed, modified, and reconstructed refining facilities in the petroleum refinery industry to reduce emissions to the level achieved by the best demonstrated system of continuous emission reduction for equipment leaks of VOC, considering costs, nonair quality health and environmental impact and energy requirements.

**EFFECTIVE DATES:** May 30, 1984. These standards of performance become effective upon promulgation but apply to affected facilities for which construction or modification commenced after January 4, 1983.

Under section 307(b)(1) of the Clean Air Act, judicial review of these standards of performance is available *only* by the filing of a petition for review in the U.S. Court of Appeals for the District of Columbia Circuit within 60 days of today's publication of this rule. Under section 307(b)(2) of the Clean Air Act, the requirements that are the subject of today's notice may not be challenged later in civil or criminal proceedings brought by EPA to enforce these requirements.

The Director of the Federal Register approves the incorporation by reference

of certain publications in 40 CFR Part 60 effective on May 30, 1984.

**ADDRESSES:** *Background Information Documents.* The background information document (BID) for the promulgated standards may be obtained from the U.S. EPA Library (MD-35), Research Triangle Park, North Carolina 27711, telephone number (919) 541-2777. Please refer to "Equipment Leaks of VOC in Petroleum Refining Industry—Background Information for Promulgated Standards of Performance" (EPA-450/3-80-033b). The BID contains: (1) A summary of all the public comments made on the proposed standards and EPA's responses to the comments, (2) a summary of the changes made to the standards since proposal, (3) final Environmental Impact Statement which summarizes the impacts of the promulgated standards, and (4) the rationale for the technical amendments to the standards for equipment leaks of VOC within SOCMI. The BID for the proposed standards may be obtained from the National Technical Information Service, U.S. Department of Commerce, Springfield, Virginia 22161. Please refer to "VOC Fugitive Emissions in Petroleum Refining Industry—Background Information for Proposed Standards," EPA-450/3-81-015a (NTIS PB81-157743)

**Docket.** A docket, number A-80-44, containing information considered by EPA in the development of the promulgated standards for petroleum refineries, is available for public inspection between 8:00 a.m. and 4:00 p.m., Monday through Friday, at EPA's Central Docket Section (A-130), West Tower Lobby, Gallery 1, 401 M Street, S.W. Washington, D.C. 20460. A reasonable fee may be charged for copying.

A docket, number A-79-32, containing information in category VI on the development of the technical amendments to the SOCMI standards, is available for public inspection at the same time and place as for docket A-80-44.

**FOR FURTHER INFORMATION CONTACT:**

Mr. Gilbert Wood, Emission Standards and Engineering Division (MD-13), U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711, telephone (919) 541-5578 concerning policy matters and Mr. James Durham, Chemicals and Petroleum Branch, telephone (919) 541-5671 concerning technical matters.

**SUPPLEMENTARY INFORMATION:****Summary of Standards**

Standards of performance for new sources established under section 111 of the Clean Air Act reflect:

application of the best technological system of continuous emission reduction which (taking into consideration the cost of achieving such emission reduction, any nonair quality health and environmental impact and energy requirements) the Administrator determines has been adequately demonstrated [section 111(a)(1)].

As prescribed by section 111, promulgation of these standards was preceded by the Administrator's determination (40 CFR 60.16, 44 FR 49222, dated August 21, 1979) that these sources contribute significantly to air pollution which may reasonably be anticipated to endanger public health or welfare.

Standards of performance for equipment leaks of volatile organic compounds (VOC) in the petroleum refining industry were proposed on January 4, 1983 (48 FR 279).<sup>1</sup> The promulgated standards apply to specific equipment with the potential to leak VOC. Two types of "affected facilities" apply to the equipment for determining applicability of the standards. Each refinery compressor in VOC service is one type of affected facility. The second type of affected facility comprises certain equipment with the potential to leak VOC, other than compressors, within a refinery process unit. A process unit is defined as all the components assembled to perform any of the physical and chemical operations within a petroleum refinery.

Compressors, valves, pumps, pressure relief devices, sampling systems, flanges and connectors, and open-ended lines in VOC service (that is, contains or contacts a process fluid that is at least 10 percent VOC by weight) are the equipment covered by the standards. The standards require (1) a leak detection and repair program for valves in gas/vapor and light liquid service and pumps in light liquid service; (2) equipment for certain compressors, sampling systems, and open-ended lines; and (3) no detectable emissions (500 ppm as determined by Reference Method 21) for pressure relief devices in gas/vapor service during normal operation. In response to comments on

<sup>1</sup>The proposed standards referred to fugitive emission sources of VOC as the air pollution emission points covered by the standards. The terminology fugitive emission sources can be confusing. The proposed and final standards apply to equipment with the potential to leak VOC and, therefore, the promulgated standards refer to equipment leaks to VOC as the air pollution emission points covered by the standards.

the proposed standards, EPA is exempting valves and pumps within process units located in the North Slope of Alaska from the routine leak detection and repair program and is allowing up to 3 percent of the valves in new process units to be designated as difficult-to-monitor valves. In addition, EPA is providing an alternative procedure for determining "capital expenditure" and is adding requirements for semiannual reports.

Owners and operators of facilities covered by these standards should note that some of the releases covered by these standards might be covered by requirements developed under the Comprehensive Environmental Response, Compensation, and Liability Act. (See 48 FR 23552.)

**Standards for Valves.** The standards for valves have not changed since proposal and are based on a leak detection and repair program that requires: (1) Monthly monitoring of valves in gas/vapor and light liquid service except that valves not found to leak for two successive months can be monitored quarterly until leaks are detected, (2) an initial attempt at repairing these valves within 5 days after detection of a leak, (3) repair of leaking valves within 15 days after detection of the leak unless repair would require a process unit shutdown, and (4) repair of valves during the next process unit shutdown if repair is delayed until a process unit shutdown. Monitoring of equipment to detect leaks is conducted in accordance with Reference Method 21 and a leak is defined as a measured organic concentration equal to or greater than 10,000 parts per million by volume (ppmv). Repair means to reduce the measured organic concentration to less than 10,000 ppmv.

Two alternative standards have been provided for valves in gas/vapor and light liquid service in the final standards. These alternatives are (1) a limit of 2.0 percent of valves which may be leaking at any one time and (2) a skip-period leak detection and repair program for process units achieving less than 2.0 percent of their valves leaking. These alternative standards establish standards for owners and operators who design and operate low-leak process units.

**Standards for Pumps.** The standards for pumps have not changed since proposal and require leak detection and repair of the pump seals or the use of dual mechanical seals with controlled degassing vents. The leak detection and repair program requires: (1) Monthly monitoring of pumps in light liquid service, (2) weekly visual inspections of the seals in pumps in light liquid service,

(3) an attempt at repairing a pump within 5 days after detection of a leak, and (4) repair of a leaking pump within 15 days after detection of a seal failure or leak unless repair would require a process unit shutdown. Pumps that have repair delayed until a process unit shutdown must be repaired during the next process unit shutdown. If a pump cannot be repaired without the use of dual mechanical seals with controlled degassing vents or other equipment, a delay of repair is allowed to install the equipment. In this case, an owner or operator must install the equipment as soon as practicable but may take no longer than 6 months. Pumps using dual mechanical seals with controlled degassing vents and other equipment as specified in the standards are not subject to the monthly leak detection and repair program.

**Standards for Compressors.** The standards have generally not changed since proposal and require compressors to be equipped with seals having a barrier fluid system that prevents leakage of the process fluid to the atmosphere. The system must: (1) Use a barrier fluid that is something other than a light liquid or gaseous VOC; (2) either operate at a pressure greater than the compressor seal area pressure, or be equipped with a barrier fluid degassing reservoir connected by a closed vent system to a control device; and (3) be equipped with a sensor so that seal failures may be detected. When seal failure is detected, repair is required within 15 days unless repair would require a process unit shutdown. An initial attempt at repair is required within 5 days. If a compressor is equipped with a closed vent system to transport leakage from the seal to a control device, it is exempt from the above requirements.

Compressors in hydrogen service have been exempted from the final standards based on an analysis of cost effectiveness for these compressors. "In hydrogen service" means that a compressor contains a process fluid that is greater than 50 percent hydrogen by volume, as determined by ASTM Methods E-260, E-168, or E-169. Also, EPA is exempting existing reciprocating compressors that could become an affected facility under provisions of Section 60.14 or 60.15 from the standards if the owner or operator demonstrates that recasting the distance piece or replacing the compressor are the only options available to bring the compressor into compliance with the standards.

**Standards for Sampling Connections.** The standards require that VOC purged from sampling connections be recycled

to the process by a closed sampling loop or that these VOC be collected in a closed collection system for recycle or disposal without VOC emissions to atmosphere. In-situ sampling systems are exempt from these requirements. These standards have not changed since proposal.

**Standards for Open-Ended Lines.** The standards require that: (1) Open-ended lines be sealed with a second valve, cap, blind flange or plug except when the open-ended lines are in use; and (2) if a second valve is used, the valve on the process side must be closed first to avoid trapping VOC between the valves. The only change made to these standards since proposal clarifies that open-ended lines in double block and bleed valve systems may be unsealed when they are functioning as the vent for these systems.

**Standards for Pressure Relief Devices.** The standards require that: (1) Pressure relief devices have "no detectable emissions" of VOC except in cases of overpressure relief; and (2) after each overpressure relief, pressure relief devices be returned to a state of no detectable emissions within 5 days. These standards have not changed since proposal. As noted in the preamble to the proposed standards, pressure relief devices are one of the few fugitive emission sources for which a performance standard can be established. There are a variety of alternative ways of complying with this standard. "No detectable emissions" of VOC, in this case, means 500 ppm or less above the background level as measured by Reference Method 21.

**Standards for Control Devices.** The standards include requirements for control devices used in conjunction with control of equipment leaks. In general, these requirements have not changed since proposal. The standards require: (1) That vapor recovery systems be designed and operated for at least 95 percent control, and (2) that enclosed combustion devices be designed and operated to provide a minimum residence time of 0.75 seconds at a minimum temperature of 816°C or to achieve 95 percent reduction. Flares used to comply with these standards must (a) be operated with no assist or with air or steam assist, (b) be designed and operated with no visible emissions except for periods of time not to exceed 5 minutes in any 2-hour period, (c) be operated with a flame present, and (d) meet other operational requirements including maximum exit gas velocities and minimum heat content values. Some specific requirements for flares have been added since proposal. The

standards for closed vent systems and control devices ensure the use of devices that have an efficiency better than 95 percent, including steam-assisted and nonassisted flares designed for and operated with an exit velocity of less than 18 m/sec. EPA has been studying the question of whether additional types of flares will also achieve better than 95 percent efficiency; if so, the Agency will revise the standards accordingly.

**Miscellaneous Provisions.** Flanges, pressure relief devices in liquid service, equipment operating at subatmospheric pressures, and all equipment components in "heavy liquid" VOC service are excluded from the routine monitoring requirements of the standards. Even though the standards do not require monitoring these equipment for leaks, the standards require that, if indications of VOC leaks are visually or otherwise detected from these equipment, they must be monitored using Method 21 to detect leaks. If a leak is detected, it must be repaired within 15 days. This provision improves current industry housekeeping practices for these pieces of equipment.

Under section 111(h)(3), any person may request the Administrator to permit the use of an alternative means of emission limitation instead of a design, equipment, work practice or operational standard. The Administrator will permit the use of such alternative means if the Administrator determines, after notice and opportunity for a public hearing, that it will achieve emission reductions at least equivalent to those required by the design, equipment, work practice or operational standards. The permission will take the form of an amendment to the appropriate standards.

The final standards include semiannual reports to enable enforcement agencies to assess compliance with the standards. The semiannual reports provide a summary of the data recorded on leak detection and repair of valves, pumps, and other equipment types. The semiannual reports may be waived for affected facilities in States where the regulatory program has been delegated, if EPA, in the course of delegating such authority, approves reporting requirements or an alternative means of source surveillance adopted by the State. In these cases, such sources would be required to comply with the requirements adopted by the State.

Compliance with the leak detection and repair program and equipment requirements will also be assessed through review of records and inspections. Records of leak detection, repair attempts, and maintenance for

equipment leaks of VOC are required by the standards. Notifications are also required as described in the General provisions for new source standards (40 CFR 60.7).

The General Provisions for Part 60 are being revised to include an incorporation by reference in the provisions of 40 CFR 60.17

#### Summary of Impacts of the Standards

**Emission Reductions.** The standards of performance will reduce equipment leaks of VOC from newly constructed, modified, and reconstructed process units and compressors in the petroleum refining industry by about 60 percent in comparison to those emissions that would result in the absence of the standards. The standards will reduce the emissions by about 31,000 Mg, a reduction of emissions from 49,000 Mg/yr to about 18,000 Mg/yr in the fifth year after the standards were proposed. These impacts are based on current industry practices including requirements associated with State implementation plans. The standards will cover about 100 newly constructed refining facilities (process units including compressors) and up to 182 modified and reconstructed refining facilities in the fifth year after proposal.

**Cost and Economic Impacts.** The cost and economic impacts of the standards are reasonable. The standards will require an industry-wide capital investment over the initial 5-year period after the standards were proposed of approximately \$7.2 million for newly constructed refining facilities and up to \$17.9 million for modified and reconstructed refining facilities. The industry-wide net annualized cost for newly constructed, modified, and reconstructed refining facilities would be about \$4.1 million in the fifth year after proposal. Significant price increases are not expected to result from these standards because the standards will tend to increase average prices by less than 0.1 percent.

**Other Impacts.** These standards of performance will not increase the energy usage of petroleum refinery process units. In general, the controls required by the standards do not require energy. Furthermore, the effect of the standards will be to increase efficiency of raw material usage so that a net positive energy impact will result. Implementation of the standards will have no impact on solid waste within the petroleum refining industry. In contrast, the standards would also cause a small positive impact on water quality by containment of potential liquid leaks. The recordkeeping and reporting requirements will require an

average of 20 industry person years annually for the years 1984 and 1985.

The environmental, energy, and economic impacts are discussed in greater detail in the BID for the promulgated standards. (See the ADDRESSES section of this preamble.)

#### Public Participation

Prior to proposal of the standards, interested parties were advised by public notice in the Federal Register (46 FR 23982, April 29, 1981) of a meeting of the National Air Pollution Control Techniques Advisory Committee to discuss the standards for equipment leaks of VOC in the petroleum refining industry recommended for proposal. This meeting was held on June 3, 1981. The meeting was open to the public, and each attendee was given the opportunity to comment on the standards recommended for proposal. An additional information document (AID), entitled "Fugitive Emission Sources of Organic Compounds—Additional Information on Emissions, Emission Reductions, and Costs," was prepared to address technical issues on fugitive emissions control technology and to set forth EPA's most recent position on these issues. The AID was distributed for public comment, and 14 comment letters were received. The standards were proposed in the Federal Register on January 4, 1983 (48 FR 279). The preamble to the proposed standards described the availability of the BID for the proposed standards, which discussed in detail the regulatory alternatives considered and the impacts of these alternatives.

Public comments were solicited at the time of proposal, and copies of the BID were distributed to interested parties. The public was also given the opportunity to discuss data, views, or arguments at a public hearing concerning the proposed standards in accordance with section 307(d)(5) of the Clean Air Act. The public comment period was from January 4, 1983, to March 21, 1983. Twenty-four comment letters were received and, at the request of interested parties, EPA met to clarify specific aspects of the proposed standards. A public hearing, however, was not held. Comments on the proposed standards have been carefully considered and, where determined to be appropriate by the Administrator, changes have been made in the proposed standards.

#### Significant Comments and Changes to the Proposed Standards

Comments were received from industry, State and local air pollution

control agencies, trade associations, and environmental groups. A detailed discussion of these comments and responses can be found in the BID for the promulgated standards. (See the ADDRESSES section of this preamble.) The comments and responses in the BID serve as the basis for the revisions which have been made to the standards between proposal and promulgation. Major changes made in the standards since proposal are indicated in the "Summary of Standards" section of the preamble. The major comments and responses are summarized in the next section of the preamble. The comments and responses in this preamble have been combined into the following areas: Basis for the Standards, Applicability of Standards, Modification and Reconstruction, and Reporting and Recordkeeping.

**Basis for the Standards**

*Comment:* Several commenters questioned EPA's selection of the proposed standards. The commenters felt that less stringent levels of control would be more cost effective and, therefore, should be chosen.

*Response:* Section 111 of the Clean Air Act, as amended, requires that standards of performance be based on the best system of continuous emission reduction that has been adequately demonstrated, considering costs, nonair quality health and environmental impacts and energy requirements. The control techniques for equipment leaks of VOC have been adequately demonstrated. The nonair quality health and environmental impacts associated with implementation of the standards are generally beneficial.

TABLE 1. CONTROL COSTS PER MEGAGRAM OF VOC REDUCED <sup>a</sup>

Equipment type and control technique <sup>b</sup>	Emission reduction (kg/yr)	Average \$/Mg <sup>c</sup>	Incremental \$/Mg <sup>d</sup>
<b>Pressure relief devices:</b>			
Quarterly leak detection and repair	4.4	*(170)	(170)
Monthly leak detection and repair	5.3	(110)	250
Rupture disks <sup>f</sup>	9.8	410	1,000
<b>Compressors:</b>			
Controlled degassing vent <sup>f</sup>	16.5	150	150
<b>Open-ended lines:</b>			
Caps on open-ended lines <sup>f</sup>	2.8	460	460
<b>Sampling systems:</b>			
Closed purge sampling <sup>f</sup>	2.6	810	810
<b>Valves:</b>			
Quarterly leak detection and repair	68	*(110)	*(110)
Monthly leak detection and repair <sup>f</sup>	77	*(60)	310
Sealed bellows valves repair	110	4,700	16,700
<b>Pumps:</b>			
Annual leak detection and repair	3.0	850	850

TABLE 1. CONTROL COSTS PER MEGAGRAM OF VOC REDUCED <sup>a</sup>—Continued

Equipment type and control technique <sup>b</sup>	Emission reduction (kg/yr)	Average \$/Mg <sup>c</sup>	Incremental \$/Mg <sup>d</sup>
Quarterly leak detection and repair	9.8	157	*(140)
Monthly leak detection and repair	11.5	159	170
Dual mechanical seal systems vented to a flare	13.9	2,000	10,000

<sup>a</sup> Costs and emission reductions based on fugitive emission source (component) counts in Model Unit B from the EID for the proposed standards, EPA-450/3-81-010a, page G-3.  
<sup>b</sup> Further discussion of control techniques can be found in Chapters 3 and 4 of the EID for the proposed standards and in Section 2 of the EID for the promulgated standards.  
<sup>c</sup> Average dollars per megagram (total effectiveness)—(annualized cost per component) ÷ (annual VOC emission reduction per component).  
<sup>d</sup> Incremental dollars per megagram—(Annualized cost of the control technique—not annualized cost of the final best restrictive control technique) ÷ (annual emission reduction of control technique—annual emission reduction of the next less restrictive control technique).  
<sup>e</sup> Values in parentheses denote savings.  
<sup>f</sup> Control technique selected as the basis for the standard.

EPA analyzed the annualized cost of controlling VOC emissions and the resultant emission reduction of VOC for each alternative control technique. In response to comments, EPA reviewed these estimates and, consequently, corrected the emission reduction estimates associated with valves. The control cost per megagram of VOC reduced for medium-sized process units are presented in Table 1 for each equipment type covered by the standards. In choosing among the control techniques for each type of equipment covered by the standards, EPA first considered their effectiveness and costs. Then, for the control techniques which were selected as the most effective with reasonable costs, EPA considered the economic impact on the industry of these control techniques. After reviewing the decisions made for the proposed standards, EPA concluded that the proposed standards generally should not be made less stringent on the basis of cost effectiveness. However, for compressors in hydrogen service the cost effectiveness, as explained below, is unreasonable, and the standards have been revised to exclude them from the standards.

One should note that these costs do not represent the actual amounts of money spent at any particular plant site. The cost of VOC emission reduction systems will vary according to the petroleum product being produced, production equipment, plant layout, geographic location, and company preferences and policies. However, these costs are considered typical of most control techniques for equipment within petroleum refineries, reflect relatively high cost control techniques where alternative techniques are available, and can be used in selecting

the level of control to be required by the standards.

*Pressure Relief Devices.* The annualized costs and VOC emission reductions achieved for monthly and quarterly leak detection and repair programs and for the use of control equipment (rupture disks) were determined for pressure relief devices in gas service. As Table 1 shows, both the quarterly and monthly leak detection and repair programs are less expensive than installation of rupture disks. Leak detection and repair programs result in average credits of \$170/Mg and \$110/Mg of VOC for quarterly and monthly programs, respectively. A monthly leak detection and repair program achieves an additional 0.9 Mg/yr emission reduction for medium-sized process units at an incremental cost of \$250/Mg compared to a quarterly leak detection and repair program. Rupture disks achieve an additional 4.5 Mg/yr emission reduction at an incremental cost of \$1,000/Mg. However, EPA is establishing a performance standard (as indicated by no detectable emission limit) allowing a variety of alternative ways of complying with the standard. EPA used conservative assumptions in making this incremental cost calculation; the \$1,000/Mg incremental cost of achieving this 4.9 Mg/yr of emission reduction is more than what many process units would experience. Thus, a no detectable emission limit was selected as the basis for the pressure relief device standard.

*Compressors.* Only one control technique can be considered for compressor seals: the installation of control equipment such as barrier fluid systems. If a compressor is found leaking, the repair procedure would be the installation of control equipment. Because compressors are not generally spared, repair would be delayed until the next turnaround, thereby reducing the effectiveness of a leak detection and repair program to essentially zero. The installation of control equipment results in a cost of \$150/Mg of VOC. This cost is reasonable and, therefore, control equipment was selected as the basis for the standards for compressors.

EPA is providing an exemption from these equipment requirements for existing reciprocating compressors which become affected facilities through modification or reconstruction provisions of §§ 60.14 and 60.15 provided the owner or operator demonstrates that recasting the distance piece or replacing the compressor are the only options available to bring the compressor into compliance. This exemption is necessary because the cost

impact of installing the required control equipment or replacing the compressor is unreasonable under these conditions. These compressors will be exempt from the standards until they are replaced by new compressors or the distance pieces are replaced.

In response to several commenters' concerns, the costs of controlling valves and compressors in hydrogen service were analyzed. EPA found that significant emission reductions are achieved for valves in hydrogen service at a reasonable cost (\$106/Mg of VOC). However, control of compressors in hydrogen service results in a cost effectiveness of \$4,600/Mg of VOC. EPA, therefore, decided to exclude compressors in hydrogen service from the standards.

**Open-ended Lines and Sampling Systems.** EPA considered caps or closures as the control technique for open-ended lines. Caps and closures are used in the petroleum refining industry and are expected to be used even more frequently in the future. The cost and emission reduction presented in Table 1 are the cost and emission reduction which would be realized for an open-ended line that is not controlled. The \$460/Mg of VOC cost for controlling emissions of VOC from open-ended lines is reasonable.

EPA considered closed purge sampling as the control technique for sampling systems. Closed purge systems are becoming increasingly common in this industry. The \$810/Mg of VOC cost for controlling emissions of VOC from sampling systems is reasonable.

**Valves.** Several leak detection and repair programs were considered for valves. The costs of seal bellows valves are unreasonable. The leak detection and repair programs differed in the monitoring frequency which would be implemented. As Table 1 shows, the quarterly monitoring program results in savings (\$110/Mg of VOC on the average). This occurs because the value of the recovered VOC is greater than the cost to implement the quarterly monitoring program. The monthly monitoring program results in the largest emission reduction at an average credit of \$60/Mg of VOC. The incremental cost per Mg of VOC emissions reduced for the monthly program is \$310/Mg of VOC (compared to the quarterly program) with an incremental emission reduction of 11 Mg/yr for a medium-sized process unit. EPA considers these costs to be reasonable. Therefore, EPA selected a monthly leak detection and repair program as the basis for the standards for valves.

**Pumps.** The control costs incurred for each megagram of VOC emissions

reduced were determined for three leak detection and repair programs and for the use of dual mechanical seals with controlled degassing vents. The leak detection and repair programs incur lower costs than the costs which would be incurred with equipment installation. The lowest average and incremental costs per MG are associated with a monthly leak detection and repair program. The monthly program achieves a higher degree of control than the quarterly program, but it achieves a lower degree of control than installation of control equipment. However, even though control equipment provides for the greatest amount of VOC reduction, the \$10,900/Mg incremental costs to obtain the additional 2.4 Mg/yr are judged to be unreasonably high. Because the costs for equipment are unreasonably high, and the costs for monthly leak detection and repair are reasonable, monthly leak detection and repair was selected as the basis for the standards for pumps.

**Economic Impact Considerations.** An economic analysis was performed which evaluated the economic impacts of the selected standards. The results of that analysis are presented in detail in the BID for the promulgated standards. As summarized in the Summary of the Impacts of the Standards section of this preamble, the industry-wide net annualized cost will be about \$4.1 million in 1986. This cost is not expected to result in industry-wide price increases. These impacts are reasonable.

#### Applicability of Standards

**Comment 1:** Commenters questioned the use of the group of fugitive emission sources within a process unit as an "affected facility" stating that the definition is inconsistent with the terms of the Clean Air Act and added that control of fugitive emissions through new source performance standards is unworkable.

**Response 1:** In choosing the designation of affected facilities, EPA examined fugitive emission sources of VOC in light of the terms and purpose of section 111 of the Clean Air Act. The Clean Air Act mandates the EPA to set standards for any pollutant emitted from a category of new or modified "stationary sources." Section 111(a)(3) of the Act defines the term "stationary source" to mean "any building, structure, facility, or installation which emits or may emit any air pollutant." The fugitive emission equipment pieces in VOC service in a process unit, viewed in the aggregate, are a "facility" that may emit air pollutants and, therefore, are appropriately considered as a

"source."<sup>1</sup> Since the purpose of section 111 is to minimize emissions by application of the best demonstrated system of emission reduction at new and modified sources (considering cost, non-air quality health and environmental impacts, and energy requirements), there is a presumption that the narrowest designation (i.e., individual pieces of equipment) is proper. However, EPA, for the reasons discussed at proposal (48 FR 281-282), rejected the equipment component (individual fugitive emission sources or pieces of equipment) designation for fugitive emission. Consequently, the next most narrow definition, the group of fugitive equipment components in VOC service within a process unit, was considered. Review of the relevant statutory factors did not lead to the conclusion that designating each group of equipment components in a process unit as an affected facility would result in adverse impacts.

Some commenters suggested that EPA cannot select the "equipment" in VOC service as the affected facility because that equipment is not an apparatus to which the standards apply, under the definition of "affected facility" at 40 CFR 60.2. On the contrary, since the requirements in these standards apply only to the "equipment" in VOC service, the § 60.2 definition requires EPA to limit the affected facility to that equipment.<sup>2</sup> Moreover, for the reasons

<sup>1</sup> This agrees with the dictionary definition of "facility," meaning "something designed, built, installed, etc., to serve a specific function or performed a particular service" (The Random House College Dictionary, Revised Edition, 1976). The group of equipment in VOC service covered by these standards is designed and installed to serve the specific function of handling the processing of petroleum products into intermediate or more refined materials.

Note in this regard that the Court of Appeals for the District of Columbia Circuit has stated that:

In designating what will constitute a facility in each particular industrial context, EPA is guided by a reasoned application of the terms of the statute it is charged to enforce, not by an abstract "dictionary" definition. This court would not remove this appropriate exercise of the agency's discretion.

ASARCO v. EPA 578 F.2d 310, 324 n. 17 (1978). EPA's selection of the groups of fugitive VOC emissions-related equipment as the affected facility reflects a reasoned application of section 111. It assures that an identifiable subset of petroleum emissions—equipment leaks of VOC—is controlled as soon as the equipment responsible for those emissions is either modified, reconstructed, or newly constructed. For the reasons explained at proposal and in the text below, a broader definition (e.g., all the components of a process unit) would simply delay that result.

<sup>2</sup>The comment that this group of equipment is not an "apparatus" is without merit. Webster's New Collegiate Dictionary, 1977, defines "apparatus" as, *inter alia*, "the functional machinery by means of which a systematized activity is carried out." The

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discussed in the previous paragraph, a broader affected facility would be inconsistent with the purposes of section 111. It would allow emission reductions resulting from the incremental control of emission points to which the standards do not apply to offset increases in emissions resulting from emission points to which the standards do apply. This would simply delay coverage of the equipment through the modification provisions. Based on these considerations, EPA rejected this approach. Therefore, the affected facilities for the standards are: (1) Compressors in petroleum refineries and (2) the group of equipment (pressure relief devices, open ended lines, sampling systems, valves, and pumps) in a process unit.

One commenter requested that the standards apply to each piece of equipment in VOC service. As the commenter noted, EPA judged that implementing a leak detection and repair program (the principal control technique considered for the standards) for a very small proportion of all the equipment components at a plant site would be too costly. The commenter did not agree with this judgement. However, explained in detail in the BID for the promulgated standards, EPA reconsidered this decision and concluded that the process unit is an appropriate basis for an affected facility, except for compressors.

*Comment 2:* Other commenters requested that the definition of "volatile organic compounds (VOC)" specifically state which organic compounds are excluded.

*Response 2:* Volatile organic compounds (VOC) are defined as organic compounds that participate in photochemical reactions. Any organic compound is presumed to participate in atmospheric reactions unless the Administrator determines that it does not. EPA considers several organic compounds to have negligible photochemical reactivity. These are methane, ethane, 1,1,1-trichloroethane, methylene chloride, trichlorofluoromethane, dichlorodifluoromethane, chlorodifluoromethane, trifluoromethane, trichlorotrifluoroethane,

vagueness of this definition suggests that the term does not plainly exclude the group of equipment EPA has selected as the affected facility. Beyond that, however, the purpose of the § 60.2 definition is merely to identify as the "affected facility" the specific equipment actually subject to a standard of performance. Focusing on the word "apparatus," as if the Agency had intended it to have some additional effect, is inconsistent with that fairly simple purpose.

dichlorotetrafluoroethane, and chloropentafluoroethane.

*Comment 3:* One commenter stated that process units with in-place state-of-the-art hydrocarbon gas detection systems should be exempted. This commenter requested that units in an arctic environment be exempted because of several unique aspects of refining in the North Slope of Alaska.

*Response 3:* The presence of an in-place state-of-the-art hydrocarbon gas detection system does not necessarily ensure emission reductions. Gas detection systems set for 12,500 ppm would permit VOC to be emitted without notice. Several megagrams of VOC would be released to the atmosphere annually without the use of specific control techniques like those required by the standards. The commenter did not demonstrate that their system resulted in at least equivalent emission reductions as the standards. Upon request by EPA, the commenter explained the specific control techniques used at their plant, many of which are identical to those required by the standards. Based on EPA experience, gas detection systems alone are ineffective for reducing equipment leaks of VOC. Thus, EPA has not exempted process units using these systems from the standards. The final standards do, however, allow an existing control program to be continued if EPA determines that the program is at least equivalent to the requirements of the standards.

EPA has studied the commenter's concerns and acknowledges that there are several unique aspects to refining in the North Slope of Alaska. Accordingly, EPA concluded that the costs to comply with the routine leak detection and repair requirements of the proposed standards may be unreasonable. These operations incur higher labor, administrative, and support costs associated with leak detection and repair programs because: (1) They are located at great distances from major population centers, (2) they must necessarily deal with the long-term, extremely low temperatures of the arctic, and consequently (3) they must provide extraordinary services for plant personnel. These unique aspects make the cost of routine leak detection and repair unreasonable (Document Number IV-B-15). Therefore, EPA has decided that refineries in the North Slope of Alaska are exempt from the routine leak detection and repair requirements of the standards. This exemption does not include the equipment requirements in the standards because the cost of those requirements is reasonable.

*Comment 4:* Commenters accused EPA of incorporating into the standards a bias against small refiners. They asserted that small refiners will be affected more adversely than will large refiners.

*Response 4:* In analyzing the economic impacts of the standards, EPA assumed a reasonably small throughput for a range of process unit types. EPA anticipated that process units with small throughput would show significant adverse economic impacts, if any exist, much more readily than large throughput units. Thus, EPA's impact analysis was sensitive to impacts on small refiners. However, no adverse economic impacts were projected (see Chapter 9 of the BID for the proposed standards). Therefore, EPA concluded that the standards are reasonable in general and considered specifically how the standards impact small firms.

#### Modification and Reconstruction

*Comment 1:* Commenters requested that the capital expenditure determination (as it relates to the modification provisions) be revised so that it is more practicable.

*Response 1:* After reviewing the comments concerning the difficulties with using the capital expenditure definition, EPA agreed that the definition for capital expenditure may be difficult to use for some refineries. Accordingly, EPA decided to provide an alternative to the procedures in the General Provisions. Although the implementation of the capital expenditure definition has been made more practicable, the original intent of the definition has been maintained.

The alternative uses an adjusted annual asset guideline repair allowance (AAGRA) and the replacement costs to determine capital expenditure. The adjusted AAGRA is determined by a formula and is based on a ratio that reflects inflation of costs over the last several years. The adjusted AAGRA is multiplied by the replacement costs of the equipment within the facility to determine the value of a capital expenditure.

*Comment 2:* Commenters held that reconstruction costs should not be accumulated. Two commenters requested EPA to exclude from the reconstruction provisions the costs of equipment replacement done for routine maintenance purposes.

*Response 2:* EPA is considering an amendment to the reconstruction provisions (40 CFR 60.15) so that reconstruction costs are accumulated for a 2-year period. EPA promulgated the reconstruction provisions to comply



with Congressional intent to ensure that essentially new facilities due to reconstruction would be subject to "new source" performance standards. The reconstruction provisions were promulgated in 1975 (40 FR 5846), and EPA has applied these provisions consistently since that time.

A source is identified for consideration as a reconstructed source when: (1) The fixed capital costs of the new components exceed 50 percent of the fixed capital costs that would be required to construct a comparable, entirely new facility, and (2) it is technologically and economically feasible to meet the applicable standards set forth. The final judgment on whether a replacement constitutes reconstruction will be made by the Administrator. The purpose of the reconstruction provisions is to ensure that an owner or operator does not attempt to avoid the application of performance standards to his or her essentially new reconstructed facility by retaining minor components such as support structures, frames, housing, etc., and claiming that the facility therefore does not qualify as "new source." EPA authority to subject reconstructed sources to new source standards of performance has not been questioned in any court decision.

If one considers the 50 percent cost factor which triggers reconstruction strictly on a project-by-project basis, a wide variety of interpretations can arise as to what a "project" entails. For example, a process unit with several hundred pieces of equipment may refurbish one-third of them and then 1 year later begin to refurbish another one-third. If these maintenance efforts were interpreted as separate projects, neither one would likely exceed the 50 percent replacement cost to trigger reconstruction. If, however, it was the owner's original intent to refurbish two-thirds of the equipment, the two maintenance efforts would be interpreted as one project and would probably constitute a reconstruction. In many cases, it would not be possible to determine the original intent of the owner or operator. EPA believes that it is appropriate to reduce the number of subjective determinations concerning an owner's intent. One way to do this for the reconstruction provisions is to apply a criterion which considers the expenditures made over a fixed time period. This would rely on a reasonable objective surrogate for the owner's subjective intent.

The administrative effort to keep the required records of expenditures should not be a burden on the industry. Section

60.15 defines the "fixed capital cost" of replacement components as the capital needed to provide all the "depreciable" components. By excluding nondepreciable components from consideration in calculating component replacement costs, many components that are replaced frequently to keep the plant in proper working order are excluded from this recordkeeping. The recordkeeping required under the "fixed time period" interpretation of reconstruction is the same as the recordkeeping that would be required under a strictly project-by-project interpretation. In either case, the dollar amount of the component replacements taking place at the facility must be determined and recorded.

Accordingly, EPA is clarifying the meaning of "proposed" component replacements in § 60.15. Specifically, EPA has been interpreting "proposed" replacement components under § 60.15 to include components which are replaced pursuant to all continuous programs of component replacements which commence (but are not necessarily completed) within the period of time determined by EPA to be appropriate for the individual NSPS involved. Until this revision is promulgated in the General Provisions of 40 CFR Part 60, EPA is selecting a 2-year period as the appropriate period for purposes of this NSPS (Subpart GGG). EPA will count toward the 50 percent reconstruction threshold the "fixed capital cost" of all depreciable components (except those described in the next response) replaced pursuant to all continuous programs of reconstruction which commence within any 2-year period following proposal of these standards. In EPA's judgment, the 2-year period provides a reasonable, objective method of determining whether an owner of facilities within petroleum refineries is actually "proposing" extensive component replacement, within EPA's original intent in promulgating § 60.15.

Reconstruction costs are the fixed capital cost or the capital needed to provide all the "depreciable" components, while most routine maintenance practices involve the use of nondepreciable components. Because routine maintenance items (valve packing, pump seals, replacement rupture disks, nuts and bolts) cost very little compared to the cost of equipment (covered by the standards) in a process unit, it is very unlikely that even if these parts were all depreciable routine maintenance would trigger a reconstruction even if accumulated over several years. The cost of these items is

relatively small. In EPA's judgment, maintaining records of the repair or replacement of these items may constitute an unnecessary burden. Moreover, EPA does not consider the replacement of these items an element of the turnover in the life of the facility. Therefore, in accordance with 40 CFR 60.15(g), the final standards (Subpart GGG) will exempt certain frequently replaced components from consideration in applying the reconstruction provisions to petroleum refinery process unit facilities.

The costs of these frequently replaced valve parts will not be considered in calculating either the "fixed capital cost of the new components" or the "fixed capital cost that would be required to construct a comparable, entirely new facility" under § 60.15. In EPA's judgment, these items are pump seals, valve packings, nuts and bolts, and rupture disks. Replacements of pumps, valves, and other fugitive equipment at turnarounds or at other times are included in reconstruction costs. For turnarounds that involve significant refurbishment of a process unit, EPA would likely consider this a reconstruction. EPA also considers it appropriate to include in reconstruction costs the replacement of equipment due to the accidental loss of an original component, since the reason for an owner's refurbishing a facility has no bearing on whether the facility itself is comparable to a new source for which application of the best control systems is reasonable.

#### Reporting and Recordkeeping

*Comment 1:* One commenter remarked that the standards are not enforceable and another commenter stated that reporting should be added to the standards.

*Response 1:* Reports, records, and inspections will be used to ensure compliance by all facilities subject to these standards. State and EPA Regional air quality control authorities have successfully implemented regulations similar to the standards. At proposal EPA stated that routine reporting was not required. Reporting requirements were limited to notifications of construction, anticipated startup and actual startup, and an intention to comply with one of the alternative standards. At that time, EPA believed that these reporting requirements would not provide a mechanism for checking the thoroughness of the industry's efforts to reduce fugitive emissions of VOC. The Agency decided instead that compliance

would be assessed through in-plant inspections.

EPA has now decided that reporting is necessary to assess implementation of the work practice and equipment requirements of the standards. EPA agrees with the commenter that facilities not complying with the standards might have an unfair advantage (albeit, somewhat small). More importantly, facilities not complying with the standards would not be using BDT as required by the Clean Air Act, the purpose of which is to prevent new pollution problems. EPA believes that reporting is important to the effective enforcement of the standards. Reporting will reduce the necessity for many in-plant inspections, while improving the enforceability of the standards. EPA's conclusion that reports are useful is also based on the experience of the State and local air quality control boards.

As explained at proposal, three alternatives were considered for reporting requirements. The three alternatives represented trade-offs among varying amounts of in-plant inspections and report preparation for enforcement. The first alternative required no routine reporting and relied on inspections for enforcement. The third alternative relied almost totally on reports and would require minimum inspections to judge compliance. Under the second alternative, some reporting and some inspections is required and is included in the final regulations. These reporting requirements, however, have been streamlined to include reporting of data on leak detection and repair of pumps, valves, and other equipment types only. In addition, periodic reports are on a semiannual rather than quarterly basis. The semiannual reporting requirements may be waived for affected sources in any State that is delegated authority to enforce these standards, provided EPA approves reporting requirements or an alternative means of source surveillance adopted by the State. Such sources would be required to comply with the requirements adopted by the State.

*Comment 2:* Commenters wrote that the recordkeeping requirements were needlessly complex and burdensome. In contrast, another commenter stated that more information should be recorded to ensure compliance with the standards.

*Response 2:* Before the standards were proposed, EPA considered three alternative levels of recordkeeping. The proposed recordkeeping requirements were considered the minimum consistent with adequate enforcement; thus, the paperwork burden on owners and operators is the minimum amount necessary to enforce the standards

adequately. At proposal, EPA weighed the paperwork burden on the industry against the burden on the enforcement authority (Federal, State and local) to determine compliance with the standards and selected the proposed requirements.

Compliance with the final standards will be generally determined through inspection. However, because the intent of the standards is a continuous reduction in equipment leaks of VOC and continuous inspection by enforcement authorities is not possible, records must be maintained if an inspector is to determine retrospectively whether a facility has been in compliance with the standards. EPA considers the required records for an owner or operator's leak detection and repair program necessary to document the operator's compliance efforts. These records would likely already be maintained by a prudent owner or operator, and should therefore add little additional recordkeeping burden.

The records required for identifying fugitive emission components, and control device schematics and design data are not unreasonably burdensome. This information would be developed only once, and would require changing or updating only if the facility were changed. The control device schematics and design data should be available to plant engineers already, and as such do not represent an added burden. For new facilities, the reasons why a component must be installed in a location which makes it difficult or unsafe to monitor must be documented prior to installing the component in such a position. The number of difficult-to-monitor or unsafe-to-monitor components will be small and, therefore, should not create an excessive recordkeeping burden. After considering the comments that the recordkeeping requirements are needlessly complex and burdensome and the comment that more information was needed to enforce the standards adequately, EPA decided to promulgate the recordkeeping requirements as proposed.

#### Changes Being Made to SOCM I Standards (Subpart VV)

Several of the decisions made on the standards of performance for equipment leaks of VOC within petroleum refineries (since they were proposed) affect EPA's position on standards of performance (Subpart VV) for equipment leaks of VOC within the Synthetic Organic Chemical Manufacturing Industry (SOCMI). These decisions are the result of new or additional technical analysis of the control techniques considered in the

standards for petroleum refineries and SOCM I and, therefore, should be made consistent for these two standards. The decisions concern the alternative for determining a "capital expenditure," the clarification of reconstruction provisions, difficult-to-monitor valves in new units, and double block and bleed valve clarification. The discussions of these decisions are found in sections 2.2.3.1, 2.7 4.2, and 5.0 of the BID for promulgated standards as they apply for petroleum refineries. The basis for the revisions to Subpart VV is consistent with these discussions. Since these revisions either simply clarify ambiguous aspects of the current regulation or provide more practicable alternatives to current requirements consistent with their intent and without changing their substance, EPA believes that additional notice and comment are unnecessary. For this reason, the Agency finds "good cause" under 42 U.S.C. 7607(d)(1) and 5 U.S.C. 553(b), subparagraph (B) to promulgate these revisions together with the refinery standards. In addition, a few typographical errors were printed in the Federal Register when Subpart VV was promulgated. These errors are also corrected in this notice.

#### Docket

The docket is an organized and complete file of all the information considered by EPA in the development of this rulemaking. The docket is a dynamic file, since material is added throughout the rulemaking process. The docketing system is intended to allow members of the public and industry involved to identify and locate documents so that they can participate effectively in the rulemaking process. Along with the statement of basis and purpose of the proposed and promulgated standards and EPA responses to significant comments, the contents of the docket will serve as the record in case of judicial review, except for interagency review materials [section 307(d)(7)(A)].

#### Miscellaneous

In accordance with section 117 of the Act, publication of these promulgated standards was preceded by consultation with appropriate advisory committees, independent experts, and Federal departments and agencies. This regulation will be reviewed 4 years from the date of promulgation as required by the Clean Air Act. This review will include an assessment of such factors as the need for integration with other programs, the existence of alternative methods, enforceability, improvements



in emission control technology, and reporting requirements.

Section 317 of the Clean Air Act requires the Administrator to prepare an economic impact assessment for any new source standard of performance promulgated under section 111(b) of the Act. An economic impact assessment was prepared for this regulation and for other regulatory alternatives. All aspects of the assessment were considered in the formulation of the standards to ensure that cost was carefully considered in determining the best demonstrated technology. The economic impact assessment is included in the background information documents for the proposed standards and the promulgated standards.

The information collection requirements in this rule have been submitted for approval to OMB under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.* These requirements were approved; the OMB control number is 2060-0067.

**"Major Rule" Determination.** Under Executive Order 12291, the Administrator is required to judge whether a regulation is a "major rule" and, therefore, subject to certain requirements of the Order. The Administrator has determined that this regulation would result in none of the adverse economic effects set forth in section 1 of the Order as grounds for finding a regulation to be a "major rule." Fifth-year annualized costs of the standards would be as much as \$4.1 million for the projected 282 newly constructed, modified, and reconstructed refining facilities that could be affected by the standards during the first 5 years. The economic analysis shows that any combination of the control techniques presented in Table 1, excluding the use of sealed bellows valves, would not have a significant impact on petroleum refineries. The standards result in no adverse impact on profitability (decrease less than 0.5 percent), would have a potential to increase slightly the consumer price of petroleum products (0.1 percent or less), and would have no adverse impact on capital availability for construction of refineries. The Administrator has concluded that this rule is not "major" under any of the criteria established in the Executive Order.

As discussed in the "Basis For the Standards" section of this preamble, costs per megagram of VOC emission reduction were used in selecting the standards promulgated by this rulemaking. This regulation was submitted to the OMB for review as required in Executive Order 12291. Any

comments from OMB to EPA and any EPA responses to those comments are available for public inspection in Docket No. A-80-44, Central Docket Section, at the address given in the ADDRESSES section of this preamble.

**Regulatory Flexibility Analysis Certification.** The Regulatory Flexibility Act of 1980 requires that adverse effects of all Federal regulations upon small businesses be identified. According to current Small Business Administration guidelines, a small business in the petroleum refining industry is one that has 1,500 employees or fewer. There are many small companies that refine petroleum and employ fewer than 1,500 persons. However, even if facilities owned by small businesses do become subject to the standards, none will be adversely affected. This can be said because the price and profitability impacts previously described have been estimated from the perspective of the "smaller" refinery units in operation. Thus, the economic impact for facilities owned by small businesses is not considered significant. Pursuant to the provisions of 5 U.S.C. 605(b), I hereby certify that this rule will not have a significant economic impact on a substantial number of small entities.

#### List of Subjects in 40 CFR Part 60

Air pollution control, Aluminum, Ammonium sulfate plants, Asphalt, Cement industry, Coal, Copper, Electric power plants, Glass and glass products, Grains, Intergovernmental relations, Iron, Lead, Metals, Metallic minerals, Motor vehicles, Nitric acid plants, Paper and paper products industry, Petroleum, Phosphate, Sewage disposal, Steel, Sulfuric acid plants, Waste treatment and disposal, Zinc, Tires, Incorporation by reference, Can surface coating, Sulfuric acid plants, Industrial organic chemicals, Organic solvent cleaners, Fossil fuel-fired steam generators, Fiberglass insulation, Synthetic fibers.

Dated: May 15, 1984.

William D. Ruckelshaus,  
Administrator.

#### PART 60--[AMENDED]

40 CFR Part 60 is amended as follows:  
1. By adding a new Subpart GGG as follows:

#### Subpart GGG—Standards of Performance for Equipment Leaks of VOC in Petroleum Refineries

Sec.  
60.590 Applicability and designation of affected facility.  
60.591 Definitions.  
60.592 Standards.  
60.593 Exceptions.  
60.594-60.599 [Reserved]

Authority: Sections 111 and 301(a) of the Clean Air Act, as amended, [42 U.S.C. 7411, 7601(a)], and additional authority as noted below.

#### Subpart GGG—Standards of Performance for Equipment Leaks of VOC in Petroleum Refineries

§ 60.590 Applicability and designation of affected facility.

(a)(1) The provisions of this subpart apply to affected facilities in petroleum refineries.

(2) A compressor is an affected facility.

(3) The group of all the equipment (defined in § 60.591) within a process unit is an affected facility.

(b) Any affected facility under paragraph (a) of this section that commences construction or modification after January 4, 1983, is subject to the requirements of this subpart.

(c) Addition or replacement of equipment (defined in § 60.591) for the purpose of process improvement which is accomplished without a capital expenditure shall not by itself be considered a modification under this subpart.

(d) Facilities subject to Subpart VV or Subpart KKK of 40 CFR Part 60 are excluded from this subpart.

#### § 60.591 Definitions.

As used in this subpart, all terms not defined herein shall have the meaning given them in the Act, in Subpart A of Part 60, or in Subpart VV of Part 60, and the following terms shall have the specific meanings given them.

"Alaskan North Slope" means the approximately 69,000 square mile area extending from the Brooks Range to the Arctic Ocean.

"Equipment" means each valve, pump, pressure relief device, sampling connection system, open-ended valve or line, and flange or other connector in VOC service. For the purposes of recordkeeping and reporting only, compressors are considered equipment.

"In Hydrogen Service" means that a compressor contains a process fluid that meets the conditions specified in § 60.593(b).

"In Light Liquid Service" means that the piece of equipment contains a liquid that meets the conditions specified in § 60.593(c).

"Petroleum Refinery" means any facility engaged in producing gasoline, kerosene, distillate fuel oils, residual fuel oils, lubricants, or other products through the distillation of petroleum, or through the redistillation, cracking, or reforming of unfinished petroleum derivatives.

"Petroleum" means the crude oil removed from the earth and the oils derived from tar sands, shale, and coal.

"Process Unit" means components assembled to produce intermediate or final products from petroleum, unfinished petroleum derivatives, or other intermediates; a process unit can operate independently if supplied with sufficient feed or raw materials and sufficient storage facilities for the product.

§ 60.592 Standards.

(a) Each owner or operator subject to the provisions of this subpart shall comply with the requirements of § 60.482-1 to § 60.482-10 as soon as practicable, but no later than 180 days after initial startup.

(b) An owner or operator may elect to comply with the requirements of § 60.483-1 and § 60.483-2.

(c) An owner or operator may apply to the Administrator for a determination of equivalency for any means of emission limitation that achieves a reduction in emissions of VOC at least equivalent to the reduction in emissions of VOC achieved by the controls required in this subpart. In doing so, the owner or operator shall comply with requirements of § 60.484.

(d) Each owner or operator subject to the provisions of this subpart shall comply with the provisions of § 60.485 except as provided in § 60.593.

(e) Each owner or operator subject to the provisions of this subpart shall comply with the provisions of § 60.486 and § 60.487

(Sec. 114 of Clean Air Act as amended (42 U.S.C. 7414))

§ 60.593 Exceptions.

(a) Each owner or operator subject to the provisions of this subpart may comply with the following exceptions to the provisions of Subpart VV

(b)(1) Compressors in hydrogen service are exempt from the requirements of § 60.592 if an owner or operator demonstrates that a compressor is in hydrogen service.

(2) Each compressor is presumed not to be in hydrogen service unless an owner or operator demonstrates that the piece of equipment is in hydrogen service. For a piece of equipment to be considered in hydrogen service, it must be determined that the percent hydrogen content can be reasonably expected always to exceed 50 percent by volume. For purposes of determining the percent hydrogen content in the process fluid that is contained in or contacts a compressor, procedures that conform to the general method described in ASTM E-260, E-168, or E-169 (incorporated by

reference as specified in § 60.17) shall be used.

(3)(i) An owner or operator may use engineering judgment rather than procedures in paragraph (b)(2) of this section to demonstrate that the percent content exceeds 50 percent by volume, provided the engineering judgment demonstrates that the content clearly exceeds 50 percent by volume. When an owner or operator and the Administrator do not agree on whether a piece of equipment is in hydrogen service, however, the procedures in paragraph (b)(2) shall be used to resolve the disagreement.

(ii) If an owner or operator determines that a piece of equipment is in hydrogen service, the determination can be revised only after following the procedures in paragraph (b)(2).

(c) Any existing reciprocating compressor that becomes an affected facility under provisions of § 60.14 or § 60.15 is exempt from § 60.482 (a), (b), (c), (d), (e), and (h) provided the owner or operator demonstrates that recasting the distance piece or replacing the compressor are the only options available to bring the compressor into compliance with the provisions of § 60.482 (a), (b), (c), (d), (e), and (h).

(d) An owner or operator may use the following provision in addition to § 60.485(e): Equipment is in light liquid service if the percent evaporated is greater than 10 percent at 150°C as determined by ASTM Method D-99 (incorporated by reference as specified in § 60.18).

(e) Pumps in light liquid service and valves in gas/vapor and light liquid service within a process unit that is located in the Alaskan North Slope are exempt from the requirements of § 60.482-2 and § 60.482-7

2. By adding in alphabetical order the new terms "capital expenditure," "double block and bleed system," and "replacement cost" in § 60.481 of Subpart VV as follows:

§ 60.481 Definitions.

\* \* \* \* \*

"Capital expenditure" means, in addition to the definition in 40 CFR 60.2, an expenditure for a physical or operational change to an existing facility that:

(a) Exceeds P the product of the facility's replacement cost, R, and an adjusted annual asset guideline repair allowance, A, as reflected by the following equation:  $P = R \times A$ , where

(1) The adjusted annual asset guideline repair allowance, A, is the product of the percent of the replacement cost, Y, and the applicable basic annual asset guideline repair

allowance, B, as reflected by the following equation:  $A = Y \times (B - 100)$ ;

(2) The percent Y is determined from the following equation:  $Y = 1.0 - 0.575 \log X$ , where X is the year of construction; and

(3) The applicable basic annual asset guideline repair allowance, B, is selected from the following table consistent with the applicable subpart:

TABLE FOR DETERMINING APPLICABLE FOR B

Subject applicable to facility	Value of B to be used in equation
VV	12.5
GG	12.5
GGG	7.0
RRR	4.5

\* \* \* \* \*

"Double block and bleed system" means two block valves connected in series with a bleed valve or line that can vent the line between the two block valves.

\* \* \* \* \*

"Replacement cost" means the capital needed to purchase all the depreciable components in a facility.

\* \* \* \* \*

(Sections 111, 114, and 301(a) of the Clean Air Act, as amended (42 U.S.C. 7411, 7414, 7501(a)))

3. By adding paragraph (c) to § 60.482-6 as follows:

§ 60.482-6 Standards: Open-ended valves or lines.

\* \* \* \* \*

(c) When a double block-and-bleed system is being used, the bleed valve or line may remain open during operations that require venting the line between the block valves but shall comply with paragraph (a) at all other times.

(Sections 111, 114, and 301(a) of the Clean Air Act, as amended (42 U.S.C. 7411, 7414, 7501(a)))

4. By revising paragraph (d)(1) of § 60.480 as follows:

§ 60.480 Applicability and designation of affected facility.

\* \* \* \* \*

(d)(1) If an owner or operator applies for one or more of the exemptions in this paragraph, then the owner or operator shall maintain records as required in § 60.486(i).

\* \* \* \* \*

(Sections 111, 114, and 301(a) of the Clean Air Act, as amended (42 U.S.C. 7411, 7414, 7501(a)))

5. By revising paragraph (d) of § 60.482-1 as follows:

**§ 60.482-1 Standards: General.**

(d) Equipment that is in vacuum service is excluded from the requirements of § 60.482-2 to § 60.482-10 if it is identified as required in § 60.486(e)(5).

(Sections 111, 114, and 301(a) of the Clean Air Act, as amended (42 U.S.C. 7411, 7414, ~ 7601(a)))

6. By revising paragraph (c)(2) and paragraph (h)(2) of § 60.482-7 as follows:

**§ 60.482-7 Standards: Valves in gas/vapor and in light liquid service.**

(c) \*\*\*  
(2) If a leak is detected, the valve shall be monitored monthly until a leak is not detected for 2 successive months.

(h) \*\*\*  
(2) The process unit within which the valve is located either becomes an affected facility through § 60.14 or § 60.15 or the owner or operator designates less than 3.0 percent of the total number of valves as difficult-to-monitor, and

(Sections 111, 114, and 301(a) of the Clean Air Act, as amended (42 U.S.C. 7411, 7414, 7601(a)))

7. By revising paragraphs (c)(2) (ii) and (vi) of § 60.487 as follows:

**§ 60.487 Reporting requirements.**

(c) \*\*\*  
(2) \*\*\*  
(ii) Number of valves for which leaks were not repaired as required in § 60.482-7(d)(1),

(vi) Number of compressors for which leaks were not repaired as required in § 60.482-3(g)(1), and

(Sections 111, 114, and 301(a) of the Clean Air Act, as amended (42 U.S.C. 7411, 7414, 7601(a)))

(Approved by the Office of Management and Budget under control number 2060-0067.)

8. By adding § 60.488 to Subpart VV as follows:

**§ 60.488 Reconstruction.**

For the purposes of this subpart:  
(a) The cost of the following frequently replaced components of the facility shall not be considered in calculating either the "fixed capital cost of the new components" or the "fixed capital costs that would be required to construct a comparable new facility" under § 60.15: pump seals, nuts and bolts, rupture disks, and packings.

(b) Under § 60.15, the "fixed capital cost of new components" includes the fixed capital cost of all depreciable components (except components specified in § 60.488 (a)) which are or will be replaced pursuant to all continuous programs of component replacement which are commenced within any 2-year period following the applicability date for the appropriate subpart. (See the "Applicability and designation of affected facility" section of the appropriate subpart.) For purposes of this paragraph, "commenced" means that an owner or operator has undertaken a continuous program of component replacement or that an owner or operator has entered into a contractual obligation to undertake and complete, within a reasonable time, a continuous program of component replacement.

(Sections 111, 114, and 301(a) of the Clean Air Act, as amended (42 U.S.C. 7411, 7414, 7601(a)))

9. By revising paragraphs (a) (34), (35), and (36) by adding (a)(4) of § 60.17 of Subpart A—General Provisions as follows:

**§ 60.17 Incorporation by reference.**

(a) \*\*\*  
(34) ASTM E169-63 (Reapproved 1977), General Techniques of Ultraviolet Quantitative Analysis, IBR approved for § 60.485(d) and § 60.593(b).

(35) ASTM E168-67 (Reapproved 1977), General Techniques of Infrared Quantitative Analysis, IBR approved for § 60.485(d) and § 60.593(b).

(36) ASTM E260-73, General Gas Chromatography Procedures, IBR approved for § 60.485(d) and § 60.593(b).

(40) ASTM D86-78, Distillation of Petroleum Products, IBR approved for § 60.593(d).

(Sections 111, 114, and 301(a) of the Clean Air Act, as amended (42 U.S.C. 7411, 7414, 7601(a)))

**Appendix A [Amended]**

10. By redesignating the heading "5.2 Apparatus" as "5.1 Apparatus" in Method 18 of Appendix A as follows:

5.1 Apparatus

(Sections 111, 114, and 301(a) of the Clean Air Act, as amended (42 U.S.C. 7411, 7414, 7601(a)))

11. By revising the first equation in Section 6.2.1.1 in Method 18 of Appendix A as follows:

$$Q_2 = Q_1 \sqrt{\frac{P_2 T_1}{P_1 T_2}} \quad \text{Eq. 18-1}$$

(Sections 111, 114, and 301(a) of the Clean Air Act, as amended (42 U.S.C. 7411, 7414, 7601(a)))

12. By revising the citation "Citation 21 in section 8." to "Citation 18 in section 8." in 6.2.1.1 in Method 18 of Appendix A.

(Sections 111, 114, and 301(a) of the Clean Air Act, as amended (42 U.S.C. 7411, 7414, 7601(a)))

13. By changing the word "caped" to "capped" in section 6.2.2.1 in Method 18 of Appendix A.

(Sections 111, 114, and 301(a) of the Clean Air Act, as amended (42 U.S.C. 7411, 7414, 7601(a)))

14. By changing all the "mg/liter" to "g/liter" in section 6.2.2.3 in Method 18 of Appendix A.

(Sections 111, 114, and 301(a) of the Clean Air Act, as amended (42 U.S.C. 7411, 7414, 7601(a)))

15. By changing the word "with" to "within" in section 7.4.4.3 in Method 18 of Appendix A.

(Sections 111, 114, and 301(a) of the Clean Air Act, as amended (42 U.S.C. 7411, 7414, 7601(a)))

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