BEFORE THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

---

364 ENVIRONMENTAL, PUBLIC HEALTH, INDIGENOUS, LABOR, AND COMMUNITY NON-GOVERNMENTAL ORGANIZATIONS, *
(full list attached)

Petitioners,

vs.

ANDREW WHEELER, ADMINISTRATOR,
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Respondent.

PETITION TO THE U.S. ENVIRONMENTAL PROTECTION AGENCY TO REVISE THE CLEAN AIR ACT SECTION 111 AND SECTION 112 STANDARDS APPLICABLE TO PETRO-PLASTICS PRODUCTION FACILITIES

364 ENVIRONMENTAL, PUBLIC HEALTH, INDIGENOUS, AND COMMUNITY NON-GOVERNMENTAL ORGANIZATIONS

350 Bay Area; 350 Brooklyn; 350 Butte County; 350 Eastside (Seattle); 350 Eugene; 350 Fairfax; 350 Kishwaukee; 350 MA-Berkshires; 350 New Orleans; 350 Portland; 350 Sacramento; 350 San Diego; 350 Silicon Valley; 350 SoCal; 350 Triangle; 7th Generation Advisors; A2D2; Advocates for Springfield; Algalita; Alliance of Nurses for Healthy Environments; Already Devalued and Devastated Homeowners of Parsippany; Alter Terra; Animal Welfare Institute; Animals Are Sentient Beings, Inc.; Anthropocene Alliance; Apalachicola Riverkeeper; Arvadans for Progressive Action; Assateague Coastal Trust; ATA; Atchafalaya Basinkeeper; Athens County's Future Action Network, aka Athens County (OH) Fracking Action Network; Augustinians; Aytzim; Ecological Judaism; Azul; Azulita Project; Back Country Excursions; Backbone Campaign; Battle Creek Alliance & Defiance Canyon Raptor Rescue; Bay Area-System Change not Climate Change (BA-SCnCC); Bayou City Waterkeeper; BeanCounters Unlimited; Berks Gas Truth; Berkshire Environmental Action Team (BEAT); Better Path Coalition; Beyond Plastics; Beyond Toxics; Big Blackfoot Riverkeeper, Inc.; Black Warrior Riverkeeper; Breast Cancer Action; Breathe Easy Susquehanna County; Breathe Project; Brooklyn Bridge CSA; Buckeye Environmental Network; Bucks Environmental Action; CA Urban Streams Alliance-The Stream Team; Cafeteria Culture; Cahaba Riverkeeper; California Coastal Protection Network; California Environmental Justice Alliance; California for Progress; California Interfaith Power & Light; California League of Conservation Voters; California Young Democrats Environmental Caucus; Californians Against Waste; Californians for Western Wilderness; Catawba Riverkeeper Foundation; Center for Biological Diversity; Center for Coalfield Justice; Center for Environmental Health; Center for International Environmental Law; Central California Asthma Collaborative; Central Valley Air Quality (CVAQ) Coalition; CEO Pipe Organs/Golden Ponds Farm; CERBAT: Center for Environmentally Responsible Building Alternatives; Christians For The Mountains; Church Women United in New York State; Circle of Wisdom; Circle Pines Center; Citizens For Water; Clean Air Council; Clean Ocean Action; Climate First: Replacing Oil & Gas ; Climate Hawks Vote; Climate Reality Project Los Angeles Chapter; Coalition Against Pilgrim Pipeline - NJ; Coalition for Clean Air; Columbia Riverkeeper; Columbus Community Bill of Rights; Communications Workers of America - District 9, AFL-CIO; Communities First Sewickley Valley; Community Advocates for a Sustainable Environment; Concerned Health Professionals of New York; Concerned Ohio River Residents; Connecticut Fund for the Environment/Save the Sound; Conservation Congress; Cook Inletkeeper; Coosa River Basin Initiative/Upper Coosa Riverkeeper; Coosa Riverkeeper; Courage Campaign; Crawford Stewardship Project; Crystal Coast Waterkeeper; Damascus Citizens for Sustainability; Divest LA; Don't Gas the Meadowlands Coalition; Earth Action, Inc.; Earth Day Network; Earth Ethics, Inc.; Earth Island Institute; Earthworks; East Valley Indivisibles; Ecological Rights Foundation; Elders Action Network; Elders Climate Action; Elmirans and Friends Against Fracking; Emerald Coastkeeper; Endangered Habitats League; Endangered Species Coalition; Englewood Indivisible; Environment America; Environmental Integrity Project; Environmental Protection Information Center; Environmental Youth Council of St. Augustine; E-TAG; Extinction Rebellion - Kentucky; Families Advocating for Chemical and Toxics Safety (FACTS); First Unitarian Universalist of Columbus; Food & Water Watch; For Love of Water (FLOW); Foundation Earth; FracTracker

Alliance; Franciscan Action Network; FreshWater Accountability Project ; Fresnans Against Fracking; Friends Committee on Legislation of California; Friends of Merrymeeting Bay; Friends of the Earth US; Friends of the Harmed; Friends of the Kaw; Friends of the Pogonip; Fund for Wild Nature; Gas Free Seneca; Gasp; Genesis Farm; Global Alliance for Incinerator Alternatives; Good Neighbor Steering Committee; Good Stewards of Rockingham; Great Egg Harbor Watershed Association; Great Lakes Wildlife Alliance; Green America; Green Delaware; Green Party of Nassau County; Greenpeace USA; Gunpowder RIVERKEEPER; Hands Across the Sand; Headwater; Heal the Bay; Healthy Gulf; Honeydew Advisors; Howard County Climate Action (Maryland); Howling For Wolves; Hull Family Foundation; Indivisible Anchorage; indivisible Chicago; Indivisible Clackamas/Oregon Congressional District 5; Indivisible Clackamas/Oregon Congressional District 5; Indivisible Columbus District 3; Indivisible GA 04; Indivisible Harlem; Indivisible Kansas City; Indivisible Napa; Indivisible San Francisco; Indivisible San Jose; Indivisible South Bay; Indivisible Ventura; Inland Empire Waterkeeper; Inland Ocean Coalition; inNative; Inspiration of Sedona; Interfaith Climate Action Network of the Interfaith Council of Contra Costa County; Interfaith Earth Keepers; Interfaith Power & Light; International Marine Mammal Project of Earth Island Institute; Iowa Citizens for Community Improvement; IPSO Incorporated; Jackpine Savage Guide Service; Kentucky Environmental Foundation; Kissimmee Waterkeeper; Labor Network for Sustainability; LEAD Agency, Inc.; League of Conservation Voters; Living Rivers & Colorado Riverkeeper; Louisiana Bucket Brigade; Lower Ohio River Waterkeeper ; Marcellus Protest; Milwaukee Riverkeeper; Mission Blue / Sylvia Earle Alliance; Mother Out Front; MountainTrue; Movement for a People's Party; M-W & Associates, Environmental Policy Consultants; National Advocacy Center of the Sisters of the Good Shepherd; Nature Coast Conservation, Inc.; NC WARN; New Jersey Tenants Organization; New Mexico Interfaith Power and Light; New York Heartwoods; No Sharon Gas Pipeline; North American Climate, Conservation and Environment(NACCE); Northwest Coalition for Responsible Investment; Nuclear Information and Resource Service; NY/NJ Baykeeper; NY4WHALES; NYC H2O; NYCD16-Indivisible; NYH2o; NYPAN-SFL; Oakland Park-Wilton Manors Democratic Club; Occidental Arts and Ecology Center; Ocean Conservation Research; Ocean River Institute, Inc; Oceana; Oceanic Preservation Society; Ogeechee Riverkeeper; Orange County Coastkeeper; OVEC-Ohio Valley Environmental Coalition; Pacific Environment; Partnership for Policy Integrity; Pax Christi Florida; Peace Action New York State; Peace and Freedom Party; Peconic Baykeeper; Pelican Media; PennFuture; People Concerned about Chemical Safety; People for a Healthy Environment; People's Climate Movement; Physicians for Social Responsibility; Physicians for Social Responsibility - Pennsylvania; Physicians for Social Responsibility, AZ Chapter; Physicians for Social Responsibility, San Francisco Bay Area Chapter; Pinelands Preservation Alliance; Plastic Free Sharon; Plastic Pollution Coalition; Post-landfill Action Network; Project Coyote; Protect PT (Penn-Trafford); QEW & Greenebank Consulting; Quad Cities Waterkeeper Inc.; Rachel Carson Council; Rachel's Network; Rainforest Action Network; Raritan Headwaters; RE Sources for Sustainable Communities; Reach Out America; Reconstructionist Rabbinical Association; Redeemer Community Partnership; Resource Renewal Institute; Resources for Organizing and Social Change; Revolution LA; Rio Grande International Study Center; Rio Grande Waterkeeper; River Guardian Foundation; Riverdale Jewish Earth Alliance; Sacred Places Institute for Indigenous Peoples; Safe Climate Campaign;

SalutationSeneca Lake Guardian, a Waterkeeper Alliance Affiliate*; San Antonio Bay Estuarine Waterkeeper; San Francisco Baykeeper; Sane Energy Project; Santa Barbara Progressive Coalition; Santa Clarita Chapter of Citizens' Climate Lobby; Santa Cruz Climate Action Network; Santa Cruz Climate Change Speakers Bureau; Save Our Shores; Save Our Sky Blue Waters; Save the Manatee; Save The River, Upper St. Lawrence Riverkeeper; SBPC; Sears-Swetland Family Foundation; Seneca Lake Guardian, A Waterkeeper Affiliate; Sequoia ForestKeeper®; Sierra Club; Sierra Club - Delta Chapter; Sisters of Mercy of the Americas' Justice Team; Sisters of St. Francis of Philadelphia; Snake River Waterkeeper; SocioEnergetics Foundation; South Asian Fund For Education , Scholarship and Training (SAFEST); South Florida Wildlands Association; South Puget Sound Action Network; South RIVERKEEPER; South Yuba River Citizens League; Spottswoode Winery; St. Johns Riverkeeper; Stand.earth; Stop NY Fracked Gas Pipeline; Sunflower Alliance; Sustainable McDonough; Sustainable Sharon Coalition; Sustainable Tompkins; Sylvia Earle Alliance / Mission Blue; TEJAS; Tennessee Riverkeeper; Texas Campaign for the Environment; Texas Drought Project; The 5 Gyres Institute; The Alliance to Protect Our People and Places We Live; The Azulita Project; The Endocrine Disruption Exchange; The Lands Council; The Last Beach Cleanup; The Last Plastic Straw; The Last Plastic Straw in Sharon MA; The River Project; The Shalom Center; The Shame Free Zone; The Story of Stuff Project; The Whaleman Foundation; Toxics Information Project (TIP); Transition Bay St Margarets; Transition Sebastopol; Trash Free Maryland; Tualatin Riverkeepers ; Turtle Island Restoration Network; Unexpected Wildlife Refuge; Unitarian Universalist FaithAction New Jersey; Unitarian Universalist PA Legislative Advocacy Network; United Native Americans; University of Oregon Climate Justice League; Upper Allegheny Waterkeeper; UPSTREAM ; Urban Bird Foundation; Urban Climate Nexus; U.S. PIRG; Utah Moms for Clean Air; Utah Physicians for a Healthy Environment; UU Congregation of Binghamton, Green Sanctuary; Valley Watch, Inc.; Vote-Climate; Wabash Riverkeeper/Banks of the Wabash Inc.; Wasatch Clean Air Coalition; Waste Reduction Subcommittee of the Tompkins County Environmental Management Council; Waterkeeper Alliance; Waterkeepers Chesapeake; WESPAC Foundation; West 80s Neighborhood Association; West Berkeley Alliance for Clean Air and Safe Jobs; Western Watersheds Project; White Oak-New Riverkeeper Alliance; White Rabbit Grove RDNA; White River Waterkeeper; Wild Hope; Wild Nature Institute; WILDCOAST; WildEarth Guardians; Winyah Rivers Alliance; Wisconsin Network for Peace, Justice & Sustainability; Wishtoyo Chumash Foundation; Women's Empowerment Project; WWALS Watershed Coalition; Xun Biosphere Project.; Yellow Dog Watershed Preserve; Young Democrats of America Environmental Caucus; Zero Waste Washington;

TABLE OF CONTENTS

Executive Summary

Plastic garbage is filling our planet. Gigantic gyres of plastic debris swirl in our oceans, plastic litter lines our rivers and coastlines, and microplastics permeate our waters, soil, and air. But plastic pollution goes beyond the waste we see. The plastics industry is polluting the air in some of the country's poorest communities and fueling the climate crisis with massive amounts of greenhouse gases.

Without major changes to how we use, produce, and regulate plastic, the plastic pollution crisis is about to get much worse. As a first and necessary step to ending the plastic pollution crisis, this petition urges the U.S. Environmental Protection Agency ("EPA") to update the air pollution rules that apply to industrial facilities that create plastic to significantly curtail the damage these plants cause.

The United States already creates more waste per capita than any other country. But over the next decade, the petrochemical industry plans to increase plastics production by at least 35 percent, with more than 300 new projects slated for the United States alone. Using the oversupply of fracked gas, the new and expanded facilities planned by the industry will produce the essential building blocks for an endless deluge of throwaway plastic.

Almost half of the plastic produced is disposable packaging meant to be discarded within minutes. Much of it will end up in landfills and incinerators, where it will emit harmful pollutants and greenhouse gases. Or it will end up in our oceans, where it will choke marine life and travel through the food web all the way to our plates.

The facilities that turn fossil fuels into plastic release a host of toxic pollutants into the air. The impacts of these emissions are myriad and severe. These emissions include hundreds of tons of known human carcinogens such as 1,3-butadiene, acetaldehyde, benzene, ethylene oxide, and formaldehyde, as well as a host of other toxics known to cause asthma and respiratory illnesses, central nervous system impairment, and reproductive and developmental problems.

The toxic byproducts of making plastic include soot and smog-forming pollutants linked to asthma, bronchitis, emphysema and heart disease, as well as ecosystem degradation. Accidents and fires at facilities can lead to acute exposures of these toxics to workers and residents nearby, forcing them to shelter-in-place or evacuate. Nearby communities—often minority and low-income—bear the brunt of acute and long-term exposure to these toxics.

But the impacts from these emissions aren't just localized. Plastic production does incredible damage to the climate. Every step of the process—from fracking for gas, transporting, storing and processing the feedstock, and manufacturing plastic resins and consumer products to their ultimate disposal and slow breakdown—emits vast quantities of greenhouse gases, including carbon dioxide, methane, and nitrogen dioxide. In all, the plastics boom will contribute 1.32 Gigatons of carbon pollution each year by 2030, and it is predicted to double that by 2050, rapidly spending down our carbon budget. Creating these emissions just to make ever-more throwaway plastic is unconscionable in the face of a climate crisis that is already leading to rising sea levels, heat waves, devastating storms, and other extreme weather events.

The Clean Air Act mandates that EPA set emissions limits that protect the public health and welfare and periodically update these limits to reflect technological advances. But EPA has been allowing these facilities to use outdated and inefficient control technologies and work processes, to devastating effect. Despite the clear harms of plastic production, EPA is allowing this industry to expand its poisoning of our nation's air.

In light of the Clean Air Act's stated goal of protecting public health and welfare, Petitioners formally request that EPA update its New Source Performance Standards and National Emissions Standards for Hazardous Air Pollutants that apply to facilities that convert fossil fuels into plastics. Some of these standards have not been updated for decades.

In the meantime, plastic production and pollution have exploded, and monitoring and control technologies have advanced. Prohibiting the flaring of flammable gases will reduce toxic air pollutants in nearby communities. Continuous emissions monitoring and fence-line monitoring can protect frontline communities by ensuring leaks are detected and repaired in a timely fashion and emissions limits are constantly met.

Given the extensive greenhouse gas pollution from natural gas extraction and the breakdown of plastics, EPA should also require plastic plants to be powered by renewable energy sources that do not produce any greenhouse gas emissions ("zero-emission energy").

These regulatory changes will create more jobs and decrease worker exposure to harmful chemicals and toxic air pollution. To the extent that these changes affect production in a manner that impacts employment, just transition policies should be implemented.

An update is long overdue and necessary to comply with the Clean Air Act's requirement that its implementing regulations control harmful air pollutants, reflect updates in science, and ensure new technologies and treatment methods are used to address emerging pollutants of concern. The actions below are necessary to reduce emissions of criteria pollutants, hazardous air pollutants, and greenhouse gases to levels that will protect the public health and welfare.

Primarily, Petitioners request that EPA take **these five actions**:

1. **List ethylene, propylene, polyethylene, and polypropylene production facilities as a source category under Section 111 of the Clean Air Act** and promulgate standards under this section for nitrogen oxides and other pollutants from these sources;

2. **Require all on-site energy needs be met with renewable energy that emits zero greenhouse gas pollutants ("zero-emission energy")**;

3. Update the existing New Source Performance Standards that apply to facilities that produce plastics precursors and resins to **effectively eliminate the emissions of criteria pollutants and volatile organic compounds** from new sources;

4. Update the Generic Maximum Achievable Control Technology Standards for Ethylene Production to **effectively eliminate emissions of hazardous air pollutants** from new and existing facilities; and

5. Update the New Source Performance Standards and National Emissions Standards for Hazardous Air Pollutants to protect impacted communities and **reflect advances in detection and control technologies**.

EPA has the duty and obligation to ensure that air emissions from petro-plastics production facilities do not degrade the health of the country's ecosystems and communities or exacerbate the climate crisis.

I. Notice of Petition

The undersigned organizations hereby petition EPA to control emissions of criteria pollutants and hazardous air pollutants from stationary sources that manufacture plastics precursors and resins as required under Sections 111 and 112 of the Clean Air Act.[1] Specifically, Petitioners urge EPA to promptly review and revise the New Source Performance Standards and National Emission Standard for Hazardous Air Pollutants that apply to the manufacture of plastic precursors and plastic resins, codified at Part 60 Subparts Db, Kb, VVa, NNN, RRR, DDD, and III, and Part 61 Subparts J, V, and FF, respectively, pursuant to the Administrative Procedures Act ("APA")[2] and the Clean Air Act ("CAA").[3] The right to petition the government originates in the First Amendment[4] and is codified and applied to federal agency regulations through the APA's requirement that "[e]ach agency shall give an interested person the right to petition for the issuance, amendment, or repeal of a rule."[5] The APA also imposes an affirmative obligation on EPA to timely respond to this petition, requiring that "[w]ith due regard for the convenience and necessity of the parties or their representatives and within a reasonable time, each agency shall proceed to conclude a matter presented to it."[6] In the event EPA seeks to deny the petition in whole or in part, it must provide "[p]rompt notice" to the petitioners.[7]

While mass production of plastic products only began in the 1950s, plastic production and waste have created a global pollution and health crisis today. All along its lifecycle—from fossil fuel extraction, transport, refining, and polymerization to consumer use, waste disposal, and degradation in the environment—plastic is harming the health of people and the planet.[8] Plastic contaminates species, communities, ecosystems, and food chains at a staggering scale.

Despite these harms, according to the American Chemistry Council, the plastics and chemical industry is investing over $202 billion in the United States for an estimated 333 projects

---

[1] 42 U.S.C. § 7411, 42 U.S.C. § 7412.
[2] Administrative Procedure Act, 5 U.S.C. §§ 551 *et seq*.
[3] Clean Air Act, 42 U.S.C. §§ 7401 *et seq*.
[4] U.S. CONST. amend. I ("Congress shall make no law . . . abridging . . . the right of the people . . . to petition the Government for a redress of grievances").
[5] 5 U.S.C. § 553(e).
[6] *Id*. § 555(b).
[7] *Id*. § 555(e); the APA further grants a right of judicial review to "[a] person suffering legal wrong because of agency action, or adversely affected or aggrieved by agency action," 5 U.S.C. § 702, which is defined to include the "failure to act." *Id*. § 551(13). In the event EPA fails to timely respond or improperly denies the petition in whole or part, courts "shall compel agency action unlawfully withheld or unreasonably delayed," *id*. § 706(1), and "hold unlawful and set aside agency action, findings, and conclusions found to be arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law." *Id*. § 706(2)(A).
[8] Center for International Environmental Law, Plastic & Health: The Hidden Costs of a Plastic Planet ("CIEL Report: Plastic & Health") (2019), http://www.ciel.org/plasticandhealth.

(including new facilities and expansions) designed in large part to convert "plentiful and affordable natural gas" from shale into petrochemical and plastic products.[9] The industry aims to increase North American plastics production by at least 35 percent by 2025.[10] These new plastics will be used to manufacture a variety of products, including water bottles, straws, utensils, food wrappers, packaging, shopping bags, and other single-use items that account for approximately 40 percent of plastic use.[11]

Only a small fraction of these plastic items will be recycled. The majority will be landfilled or incinerated, leading to harmful emissions of pollutants and greenhouse gases such as methane. Much will end up in our oceans, where it will choke sea-life, disrupt marine ecosystems, and make its way up the food chains and onto our plates. If current trends continue, plastics in the ocean could outweigh fish by 2050.[12]

Aside from the legacy of pollution these products create, new and expanded "petro-plastics" facilities emit and discharge a variety of harmful air and water pollutants in the local communities and ecosystems where they are sited. This includes the emissions of smog-forming pollutants, soot, and toxics such as benzene, ethylene oxide, acetaldehyde, and formaldehyde. Many of these pollutants are carcinogens and known to harm human health and the environment. These facilities also emit vast quantities of greenhouse gases, exacerbating the climate crisis at a time when urgent action is needed to curb climate change to avert the most catastrophic of its potential impacts.

Petrochemical companies are locating these plastics facilities near existing fossil fuel infrastructure, which means they are targeting communities in the Gulf Coast and Appalachia that already shoulder a heavy burden of oil and gas industry pollution. Across the United States, these facilities are often located in and have a disproportionate impact on low-income and minority neighborhoods.[13] Studies dating back to the 1970s have documented a consistent pattern of siting facilities disproportionately where low-income people and people of color live.[14] In the fenceline zones around industrial facilities that use or store hazardous chemicals, the

---

[9] American Chemistry Council, U.S. Chemical Industry Investment Linked to Shale Gas Reaches $200 Billion (2018), https://www.americanchemistry.com/Media/PressReleasesTranscripts/ACC-news-releases/US-Chemical-Industry-Investment-Linked-to-Shale-Gas-Reaches-200-Billion.html ("Am Chem Council 2018").

[10] Center for International Environmental Law, *et al*., How Fracked Gas, Cheap Oil, and Unburnable Coal are Driving the Plastics Boom (2017), https://www.ciel.org/wp-content/uploads/2017/09/Fueling-Plastics-How-Fracked-Gas-Cheap-Oil-and-Unburnable-Coal-are-Driving-the-Plastics-Boom.pdf.

[11] Geyer, R., J.R. et al., Production, use, and fate of all plastics ever made, Sci. Adv. 3 (2017): e1700782.

[12] World Economic Forum, Ellen MacArthur Foundation, The new plastics community: Rethinking the future of plastics (2016), *available at* http://www3.weforum.org/docs/WEF_The_New_Plastics_Economy.pdf.

[13] Bullard, Robert D., Dumping in Dixie: Race, Class, and Environmental Quality, Third Edition (Routledge 2018); Collins, M.B. et al., Linking 'toxic outliers' to environmental justice communities, Environ. Res. Lett. 11 (2016), *available at* https://iopscience.iop.org/article/10.1088/1748-9326/11/1/015004.

[14] Brown, P., Race, class, and environmental health: a review and systematization of the literature. 69 Envtl. Res. 15 (1995).

percentage of Latinos is 60 percent greater, and percentage of blacks 75 percent greater, than for the United States as a whole.[15]

EPA regulates harmful air emissions from facilities and process units that produce plastic precursors ("petro-plastic production facilities") and facilities that manufacture plastic resins ("plastics production facilities") under the New Source Performance Standards ("NSPS") and National Emission Standards for Hazardous Air Pollutants ("NESHAPs").

Congress mandates that these standards include emissions limits sufficiently stringent to protect public health and welfare from the dangerous impacts of harmful air pollutants. These limits must reflect technological and work process advances to ensure that emissions are controlled to the maximum extent practicable.[16] Yet many of these standards have not been updated in decades: the NSPS for emissions limits for the synthetic organic chemical manufacturing industry ("SOCMI") distillation operations and reactor processes have not been updated since 1990 and 1993, respectively, and the NSPS for emissions limits for the polymer manufacturing industry have not been updated since 2000. The NESHAPs for fugitive emissions of benzene have not been updated since 1984, and NESHAPs for general fugitive emissions from pumps, compressors, pressure relief devices, sampling connecting systems, and open-ended valves have not been updated since 2000. Further, some of these standards allow industry to employ environmentally-damaging equipment and work processes that are technologically unnecessary—such as open-ended valves and lines that spew pollutants directly into the atmosphere—or needlessly careless—such as allowing weeks or even months to pass until repairs of leaking equipment must be completed. EPA has the authority and duty to rigorously review and update these regulations to ensure full compliance with the CAA and the protection of public health and the environment.

On behalf of our millions of supporters and members, the undersigned organizations petition EPA to promptly review and revise the NSPS, codified at Part 60 Subparts Db, Kb, VVa, NNN, RRR, DDD, and III, and the NESHAPs, codified at Part 61 Subparts J, V, and FF pursuant to the APA[17] and the CAA.[18] Through these rulemakings, Petitioners request that EPA:

- List ethylene, propylene, polyethylene, and polypropylene production facilities as a category of stationary sources that emit air pollution which may reasonably be anticipated to "endanger public health and welfare" in accordance with CAA Section 111(b)(1)(A);[19] establish NSPS for new and modified sources within this newly listed source category in accordance with CAA Section 111(b)(1)(B);[20] and prescribe regulations for state performance standards for existing facilities in this new source category under CAA Section 111(d) if applicable;[21]

---

[15] Environmental Justice and Health Alliance for Chemical Policy Reform, Who's in Danger? Race, Poverty, and Chemical Disasters (2014), https://comingcleaninc.org/assets/media/images/Reports/Who's%20in%20Danger%20Report%20FINAL.pdf.
[16] *See* 42 U.S.C. §§ 7411(b)(1)(A); 7412(f)(2)(A); and 7412(d)(2).
[17] 5 U.S.C. §§ 551 *et seq*.
[18] 42 U.S.C. §§ 7401 *et seq*.
[19] *Id*. § 7411(b)(1)(A).
[20] *Id*.
[21] *Id*. § 7411(d).

- Require that all combustion processes use zero-emission energy;
- Reduce emissions of criteria pollutants and hazardous air pollutants to non-detectable levels through the use of measures including but not limited to:
    - Prohibiting flaring unless necessary solely for safety reasons;
    - Prohibiting open-ended lines and connectors in all instances;
    - Requiring leak-less and seal-less designs for components such as valves and connectors;
    - Requiring that all tanks be internal floating roof tanks connected to control devices; and
    - Requiring that all leak detection and repair programs use Optical Gas Imaging to detect fugitive emissions; and
- Increasing the stringency of monitoring and recordkeeping requirements to ensure compliance and to protect impacted communities by, among other measures:
    - Requiring Continuous Emissions Monitoring Systems for a variety of analytes for all combustion devices except flares; and
    - Requiring fenceline monitoring for a variety of analytes.[22]

II. Factual Background

a. Plastic Production Overview

i. The Current Petrochemical Buildout

Over 99 percent of all plastic in the world is produced from fossil fuels.[23] Crude oil and natural gas can be refined to make ethane and propane, which are key feedstocks for plastics.[24] The petrochemical industry converts ethane and propane into ethylene and propylene (also known as olefins), and then produces the polyethylene and polypropylene polymers (resins) that are the basic building blocks for plastic products.[25] The process of breaking down fossil fuels into plastics precursors is commonly referred to as "cracking." The current oversupply of natural gas from shale deposits in the U.S. has created economic incentives for the domestic and international petrochemical industry to invest in the expansion of new construction of petro-plastics plants.

As a result, the fossil fuel and petrochemical industries are planning a massive expansion of domestic petro-plastics facilities that will rapidly increase plastic production and its associated

---

[22] Note that each of these provisions is severable.

[23] Center for International Environmental Law, Fueling Plastics: Fossils, Plastics, & Petrochemical Feedstocks (accessed Oct. 7, 2019), http://www.ciel.org/wp-content/uploads/2017/09/Fueling-Plastics-Fossils-Plastics-Petrochemical-Feedstocks.pdf. In the U.S., the majority of these plastics will end up as waste. *See e.g.* Gilmour, Jared, The United States is No. 1—when it comes to garbage output, new report finds, The Miami Herald (July 3, 2019), https://www.miamiherald.com/news/nation-world/national/article232260837.html

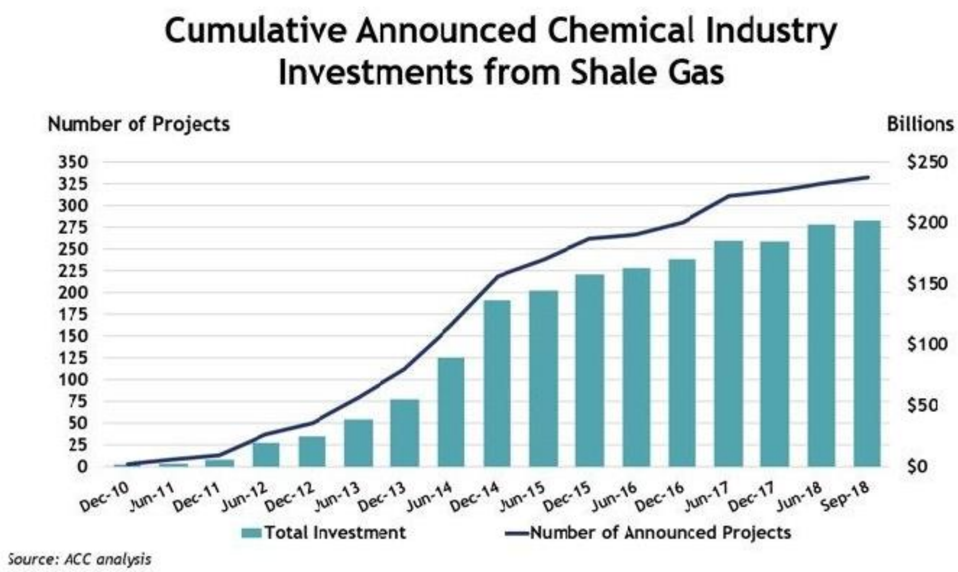
[24] Sadrameli, S.M., Thermal/catalytic cracking of hydrocarbons for the production of olefins: A state-of-the-art review I: Thermal cracking review, 140 Fuel 102 (2015).

[25] International Energy Agency (IEA), The Future of Petrochemicals, Towards more sustainable plastics and fertilisers (2018), https://webstore.iea.org/download/summary/2310?fileName=English-Future-Petrochemicals-ES.pdf.

pollution. In its 2018 Annual Energy Outlook, the U.S. Energy Information Administration projected that natural gas plant liquids production (including predominately ethane and propane) will double between 2017 and 2050, supported by an increase in global petrochemical industry demand and ethane availability in the U.S.[26]

In line with these projections and the oversupply of ethane, the petrochemical industry has been announcing a wave in investments in capacity expansion and new facilities to process ethane since early 2011, with its current tally at $202.4B and 333 projects.[27]

Figure 1. **Cumulative Investment in Petrochemical Buildout**. *Source*: American Chemistry Council, *U.S. Chemical Industry Investment Linked to Shale Gas Reaches $200 Billion* (2018).



In 2015, there were 28 ethylene crackers in the U.S. producing 28.4 million metric tons of ethylene per year.[28] Two years later, there were at least six more new or expanded U.S. crackers—an OxyChem/Mexichem facility in Ingleside, TX; a Shintech facility in Plaquemine, LA; two LyondellBasell plants in Corpus Christi and Channelview, TX; and an Indorama (restart) in Lake Charles, LA.[29] A second wave of U.S. petrochemical projects has emerged since

[26] U.S. Energy Information Administration (EIA), Annual Outlook 2018 (2018) at 50 https://www.eia.gov/outlooks/aeo/pdf/AEO2018.pdf
[27] Am Chem Council 2018.
[28] Koottungal, L., International Survey of Ethylene from Steam Crackers, Oil and Gas Journal (2015), https://www.ogj.com/content/dam/ogj/print-articles/volume-113/jul-6/International-survey-of-ethylene-from-steam-crackers--2015.pdf.
[29] Petrochemical Update, Insights from first wave of US ethylene projects drive second wave decisions (May 5, 2017), http://analysis.petchem-update.com/engineering-and-construction/insights-first-wave-us-ethylene-projects-drive-second-wave-decisions.

that time, which includes expansions into the Appalachian region of the U.S. (starting with Pennsylvania and Ohio, with indications that West Virginia will soon follow).[30]

Table 1. Ten of the largest new and expanded ethylene facilities. *Source*: CBD compilation.

Company	**Location**	**Phase**	**Production (mi Mt/yr)**	**Feedstock**	**Type**
Exxon Mobil Chemical	Mont Belvieu, TX	Operating	2.5	Ethane	Expansion
Formosa	St. James, LA	Pre-construction	2.4	Ethane	Proposed
Exxon Mobil and SABIC	Corpus Christi, TX	Construction	1.8	Ethane	New
Sasol	Lake Charles, LA	Operating	1.54	Ethane	New
NOVA Chemicals	Geismar, LA	Pre-construction	1.5	Ethane	Proposed Expansion
Chevron Phillips Chemical Co.	Baytown, TX	Operating	1.5	Ethane	New
Exxon Mobil Chemical	Baytown, TX	Operating	1.5	Ethane	New
Formosa Chemical	Point Comfort, TX	Construction	1.5	Ethane	Expansion
PTT Global Chemical	Shadyside, OH	Pre-construction	1.5	Ethane	Proposed
Shell Chemical	Monaca, PA	Construction	1.5	Ethane	New
TOTAL			*17.24 million metric tonnes per year*		

According to the U.S. Department of Energy, over 95 percent of U.S. ethylene production capacity is located in either Texas or Louisiana.[31] While the Appalachian region has lagged, it is projected to rapidly grow in the coming years, with other regions to follow.[32] Overall, the U.S. Energy Information Administration projects annual U.S. ethane consumption to grow from an estimated 1.2 million barrels per day in 2017 to 1.6 million in 2019 as new plants and infrastructure ramp up operations.[33]

ii. Air Emissions from Petrochemical Facilities

---

[30] Chang, Joseph, Visibility clears on the 2nd wave of US petrochemical projects, Independent Chemical Information Service (ICIS) (Apr. 13, 2017), https://www.icis.com/explore/resources/news/2017/04/12/10097296/visibility-clears-on-the-2nd-wave-of-us-petrochemical-projects/.
[31] U.S. Department of Energy (DOE), Ethane Storage and Distribution Hub in the United States (2018), *available at* https://www.energy.gov/sites/prod/files/2018/12/f58/Nov%202018%20DOE%20Ethane%20Hub%20Report.pdf.
[32] *Id.*
[33] U.S. Energy Information Administration, U.S. ethane consumption, exports to increase as new petrochemical plants come online (2018), *available at* https://www.eia.gov/todayinenergy/detail.php?id=35012.

Petrochemical production facilities are sometimes co-located with petroleum refineries to facilitate easy access to the refining byproducts that serve as feedstock. Alternatively, petrochemical production facilities are built as stand-alone facilities and obtain their feedstock via pipeline. In each scenario, the feedstock is converted into plastics precursors (primarily ethylene or propylene) using similar processes.

Many of these facilities include resins production process units that turn ethylene monomers into polymers such as low-density polyethylene ("LDPE"), linear low-density polyethylene ("LLDPE"), or high-density polyethylene ("HDPE") that can then be molded into consumer products such as single use bags, plastic packaging, bottles, and piping. Propylene, a monomer derived from propane, can be manufactured into polypropylene ("PP"), another type of plastic resin. Each of these processes has associated air emissions (see Table 2).

Table 2. Petrochemical Production Emissions Sources[34]

Process Types	Emissions Sources
Combustion-Based Processes	Cracking Furnaces
	Natural Gas-Fired Steam Boilers
	Thermal Oxidizers
	Flares (Ground/Stack)
	Emergency Pumps and Generators
Plastic-Specific Processes	Ethylene Manufacturing Process Unit
	HDPE/LDPE/LLDPE Manufacturing Units
Other Processes	Fugitive Equipment and Process Leaks
	Storage Tanks – High Vapor Pressure Products
	Loading Operations – High Vapor Pressure
	Wastewater Treatment Plant
	Facility Roadways
	Cooling Tower

Pursuant to the CAA, EPA regulates the industrial equipment and components that make up these facilities—such as boilers, flares, and manufacturing units—depending on the types of pollutants they emit. NSPS designate performance standards for stationary sources of criteria pollutants, another name for six common pollutants that harm human health and the environment: sulfur dioxide, nitrogen dioxide, carbon monoxide, particulate matter less than 2.5

[34] Tables 1, 2, and 3 are based on an examination of permitting documents obtained from relevant state agencies for the Chevron Phillips Chemical Company ethane cracker in Cedar Bayou, TX; the ExxonMobil ethane cracker in Baytown, TX; the Formosa ethane cracker in Point Comfort, TX; the Enterprise Products Partners propylene dehydrogenation plant in Mont-Belvieu, TX, the Petrologistics LLC propylene dehydrogenation plant in Freeport, TX; the Dow Chemical propylene dehydrogenation plant in Freeport, TX; the Shell Oil Company ethane cracker in Potter Township, PA; the Shintech Inc. ethane cracker in Plaquemine, LA; and the Indorama Ventures Olefins LLC plant in Lake Charles, LA.

microns in diameter ($PM_{2.5}$) and less than 10 microns in diameter (PM_{10}), ozone, and lead. NSPS also regulate smog-forming pollutants such as volatile organic compounds ("VOCs").

In addition, EPA sets performance standards for stationary sources of Hazardous Air Pollutants ("HAPs"), a list of 187 pollutants[35] that cause or may cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental and ecological effects.[36] These performance standards are known as NESHAPs. Depending on the types of pollutants it emits, an industrial component could be regulated under either the NSPS or NESHAPs, or both.

Plastics production generates large quantities of these harmful emissions. Processing and purification of the feedstock produces air pollution at every stage: from treating beds, reaction units, process vents, by-product storage tanks, spent caustic tanks, spent caustic oxidation units, wet air oxidation units, wash oil tanks, and wastewater storage tanks, among others.[37] The vast amounts of heat and energy required to crack and then compress the gas are generated using fossil fuel combustion in utility plants, furnaces, and boilers. These processes emit large quantities of air pollutants and greenhouse gases.[38] The manufacture of monomers releases VOCs and other air pollutants. During the manufacture of resins, major sources of air emissions are monomers, solvents, VOCs emitted during the chemical reaction, sublimed solids, and solvents lost during the storage and handling of thinned resins.[39]

Some emissions vent directly into the atmosphere.[40] Other emissions enter the atmosphere via pollution control mechanisms such as flares, in which by-products are burned and released in order to relieve pressure in the production system, adjust product quality, or to prevent disruptions in operations,[41] or thermal oxidizers, which combust pollutants at high temperatures in order to break them down into carbon dioxide and water.[42]

Still other emissions escape as fugitive emissions from equipment leaks during regular operation, or as excess emissions (relative to emission limits) during maintenance activities, startup and

---

[35] U.S. Environmental Protection Agency, Initial List of Hazardous Air Pollutants with Modifications, https://www.epa.gov/haps/initial-list-hazardous-air-pollutants-modifications (last visited Oct. 3, 2019) ("USEPA HAPS list").
[36] U.S. Environmental Protection Agency, Pollutants and Sources, https://www3.epa.gov/airtoxics/pollsour.html (last visited Oct. 3, 2019) ("USEPA Pollutants and Sources").
[37] *See e.g.* Louisiana Department of Environmental Quality, Office of Environmental Services, FG LLC Statement of Basis submitted to Louisiana Department of Environmental in support of 14 Proposed Title V Operating Permits for the FG LA Complex, AI No. 198351, Activity No. PER20150001 through PER20150015.
[38] *See* discussion in Section IIb.i & iii.
[39] *See. e.g.* U.S. Environmental Protection Agency, Synthetic Fibers, Ch. 6.9 *in* AP 42: Compilation of Air Emissions Factors, Fifth Ed., Vol. 1 (1990); U.S. Environmental Protection Agency, Polypropylene, Ch. 6.6.4-1 *in* AP 42: Compilation of Air Emissions Factors, Fifth Ed., Vol. 1 (1991).
[40] *See supra* FN 37.
[41] *See e.g.*, Clean Air Council, Health Impact Assessment of the Shell Chemical Appalachia Petrochemical Complex, at 35-36 (2014), https://cleanair.org/wp-content/uploads/HIA-Final.pdf.
[42] U.S. Environmental Protection Agency, Thermal Oxidizers, Ch. B-6 *in* Appendix B CAM Illustrations, Revision 1 (January 2005), *available at* https://www3.epa.gov/ttnchie1/mkb/documents/TO_B.pdf ("USEPA B.6 Thermal Oxidizers")

shutdown of facilities, and equipment failures.[43] Ancillary day-in and day-out operations, such as loading the pellets onto railcars or tanker trucks, emit soot and other toxic air pollutants.

Table 3. Air Emissions from Plastics Production[44]

Emissions Sources	Air Pollution Emissions
Cracking Furnaces	Nitrogen oxide (NOx), carbon monoxide (CO), particulate matter ($PM_{2.5}$ and PM_{10}), sulfur dioxide (SO_2), hazardous air pollution (HAPs), volatile organic compounds (VOCs), greenhouse gases* (GHGs)
Natural Gas-Fired Steam Boilers	NOx, VOCs, CO, $PM_{2.5}$, PM_{10}, SO_2, HAPs, GHGs
Thermal Oxidizers	NOx, VOCs, CO, $PM_{2.5}$, PM_{10}, SO_2, HAPs, GHGs
Flares (Ground/Stack)	NOx, VOCs, CO, $PM_{2.5}$, PM_{10}, SO_2, HAPs, GHGs
Emergency Pumps and Generators	NOx, VOCs, CO, $PM_{2.5}$, PM_{10}, SO_2, HAPs, GHGs
Ethylene Manufacturing Process Unit	VOCs and HAPs
HDPE/LDPE/LLDPE Manufacturing Unit	VOCs and HAPs
Fugitive Equipment and Process Leaks	VOCs and HAPs
Storage Tanks – High Vapor Pressure Products	VOCs and HAPs
Loading Operations – High Vapor Pressure	Liquids: VOCs and HAPs
	Solids: $PM_{2.5}$ and PM_{10}
Wastewater Treatment Plant**	VOCs and HAPs
Facility Roadways	$PM_{2.5}$ and PM_{10}
Cooling Tower	$PM_{2.5}$

* including carbon dioxide, methane, and nitrogen oxide
** occasionally, wastewater treatment plants include thermal oxidizers and additional associated emissions

Some of these emissions types refer to categories of pollutants. VOCs include a vast array of chemicals with a high vapor pressure. Some are harmful alone; others react with other gases and air pollutants to form other harmful compounds.[45] HAPs refer to the 187 toxic air pollutants EPA regulates pursuant to Section 112 of the Clean Air Act. Table 3 outlines the HAPs most commonly emitted during plastic production.

---

[43] USEPA B.6 Thermal Oxidizers.
[44] *See supra* FN 33.
[45] American Lung Association, Volatile Organic Compounds, https://www.lung.org/our-initiatives/healthy-air/indoor/indoor-air-pollutants/volatile-organic-compounds.html (last accessed Oct. 3, 2019).

Table 4. HAPs Commonly Emitted During Plastic Resin Production[46]

Organic HAPs	Acetaldehyde
	Formaldehyde
	Dichlorobenzene
	Benzene
	Hexane
	Naphthalene
	Toluene
	Polycyclic organic matter (POM)
	Polycyclic aromatic hydrocarbons (PAHs)
Metal HAPs	Arsenic
	Beryllium
	Cadmium
	Chromium
	Cobalt
	Manganese
	Mercury
	Nickel
	Selenium

EPA has determined that each of these chemicals is "known to cause or may reasonably be anticipated to cause adverse effects to human health or adverse environmental effects."[47] Their impacts are discussed further below.

The air pollutants typically emitted by a plastics facility is illustrated by the petrochemical complex proposed by FG LA, LLC ("Formosa") in St. James Parish, Louisiana, along the Mississippi River. The proposed complex would use natural gas liquid from shale formations in Louisiana and Texas to produce plastics monomers and polymers. The proposed complex would include two ethylene production units, two ethylene glycol production units, two HDPE production units, one LLDPE production unit, one propylene plant, one polypropylene production unit, and one LDPE production unit. Once all production units are built, the complex will produce 2,645,547 tons of polyethylene pellets and 661,387 tons of polypropylene pellets annually.[48] The complex will also include support facilities, including two utility plants, a central wastewater treatment plant, logistics, and storage and loading. Altogether, the complex has fourteen pending Title V air permits, along with a pending Prevention of Significant Deterioration Permit.

---

[46] *See supra* FN 33. Note that this chart identifies pollutants that are commonly emitted from plastics manufacturing but by no means represents an exhaustive list of all pollutants emitted from plastics manufacturing.
[47] 42 U.S.C. § 7412(b)(3)(B).
[48] Hung, Faith, *Formosa expects faster ok for U.S. petrochemical plant under new EPA chief*, REUTERS, Mar. 1, 2017, https://www.reuters.com/article/us-fpcc-investment/formosa-expects-faster-ok-for-u-s-petrochemical-plant-under-new-epa-chief-idUSKBN1683SI.

If approved, these air permits would allow the complex to emit 731 tons per year of $PM_{2.5}$ and PM_{10}, 82.9 tons per year of sulfur dioxide, 1,243 tons per year of nitrogen dioxide, 2,769 tons per year of carbon monoxide, and 1,646 tons per year of VOCs. The complex would emit over 13.6 million tons of greenhouse gases each year—the equivalent of three coal-fired power plants. In addition, the permit would allow emissions of 1,3-butadiene, acetaldehyde, ammonia, benzene, cumene, dibutyl phthalate, dimethyl sulfate, ethyl benzene, ethylene glycol, ethylene oxide, formaldehyde, hydrogen sulfide, methanol, naphthalene, n-hexane, sulfuric acid, phenol, styrene, toluene, xylene, vinyl acetate, and propionaldehyde. Five of these chemicals are known carcinogens; five are probable carcinogens; and others are possible carcinogens, or there is inadequate information with which to make a classification.[49]

And the facility's actual emissions may be much higher than what its design parameters indicate. Formosa has consistently failed to comply with the air pollution standards outlined in its permits. Formosa's polyvinyl-chloride production facility in Baton Rouge, Louisiana has violated the CAA every quarter since 2009.[50] It has been designated a High Priority Violator, which means these violations are of sufficient magnitude or duration to be an enforcement priority—*even though* Formosa entered into a settlement with EPA in 2009 designed to remedy Clean Air Act and other environmental violations. The settlement required Formosa to pay $2.8 million in penalties and spend $10 million on pollution control measures including enhanced leak detection and repair measures to eliminate fugitive benzene waste and vinyl chloride monomer emissions.[51] Apparently, even these remedial measures have been unable to ensure compliance with fundamental clean air laws.

Likewise, Formosa's Point Comfort, Texas plastics production facility has been designated a High Priority Violator for failing to comply with the CAA every quarter since 2009.[52]

b. Plastic Production Endangers Public Health and the Environment

Producing plastic from petrochemical and plastics production plants discharges pollutants that are detrimental to air quality, the climate, and public health.

i. Air Emissions from Plastics Production Endangers Human Health

1. Criteria Pollutants

---

[49] *See* American Cancer Society, Known and Probable Human Carcinogens (last accessed Oct. 7, 2019) https://www.cancer.org/cancer/cancer-causes/general-info/known-and-probable-human-carcinogens.html
[50] U.S. Environmental Protection Agency, Enforcement and Compliance History Online, Detailed Facility Report, Formosa Plastics Louisiana, https://echo.epa.gov/detailed-facility-report?fid=110000597444.
[51] U.S. Environmental Protection Agency, All News Releases By Date, *Formosa Plastics Agrees to Resolve Multiple Environmental Violations at Plants in Texas and Louisiana* (Sept. 29, 2009), https://archive.epa.gov/epapages/newsroom_archive/newsreleases/6aef3a2a3a324b11852576410053a31c.html (last visited Oct 14, 2019); *see also* Plaintiff's Consent Decree #2-2, United States of America v. Formosa Plastics Corp., Texas et al. (U.S.Dist. Ct. So. Dist. of Texas Sept. 29, 2009) *available at* https://www.eli.org/sites/default/files/doj-consent-decrees/r_formosa_plastics_corp_consent_decreefinal.pdf.
[52] U.S. Environmental Protection Agency, Enforcement and Compliance History Online, Detailed Facility Report, Formosa Point Comfort Plant, https://echo.epa.gov/detailed-facility-report?fid=110018925957 (last visited Nov. 26, 2019).

Petrochemical production facilities emit large quantities of criteria pollutants regulated at the federal level because of their negative environmental and health impacts. Each of these pollutants results in varied and severe harms:

> *Particulate matter* (PM) - especially fine particles - contains microscopic solids or liquid droplets that are so small that they can get deep into the lungs and cause serious health problems. Numerous scientific studies have linked particle pollution exposure to a variety of problems, including: premature death in people with heart or lung disease, increased mortality, nonfatal heart attacks, irregular heartbeat, aggravated asthma, decreased lung function, and increased respiratory symptoms, such as irritation of the airways, coughing or difficulty breathing.[53]
>
> *Nitrogen oxides* (NO_x) have been shown to cause or worsen respiratory diseases, such as emphysema and bronchitis, and can aggravate existing heart disease, leading to increased hospital admissions and premature death. NO_x and other compounds react in the presence of heat and sunlight to form ground-level ozone (also known as smog), which has a number of harmful impacts described below.[54]NOx also reacts with moisture and other compounds to form PM.[55]
>
> *Sulfur Dioxide* (SO_2) has been shown to cause an array of adverse respiratory effects including bronchoconstriction and increased asthma symptoms.[56] Studies also show a connection between short-term exposure and increased visits to emergency departments and hospital admissions for respiratory illnesses, particularly in at-risk populations including children, the elderly, and asthmatics.[57]
>
> *Carbon Monoxide* (CO) can cause harmful health effects by reducing oxygen delivery to the body's organs (like the heart and brain) and tissues. At extremely high levels, CO can cause death.[58] Exposure to CO can reduce the oxygen-carrying capacity of the blood. People with several types of heart disease already have a reduced capacity for pumping oxygenated blood to the heart, which can cause them to experience myocardial ischemia

---

[53] U.S. Environmental Protection Agency, Particulate Matter (PM) Pollution, Health and Environmental Effects of Particulate Matter (PM), https://www.epa.gov/pm-pollution/health-and-environmental-effects-particulate-matter-pm (last visited Oct. 30, 2018); Ostro, Bart et al., Long-term Exposure to Constituents of Fine Particulate Air Pollution and Mortality: Results from the California Teachers Study, 118 Environmental Health Perspectives 3 (2010).

[54] Agency for Toxic Substances and Disease Registry, Nitrogen Oxides (2002), https://www.atsdr.cdc.gov/toxfaqs/tfacts175.pdf; U.S. Environmental Protection Agency, Nitrogen Dioxide (NO_2) Pollution, Basic Information about NO_2, https://www.epa.gov/no2-pollution/basic-information-about-no2#Effects (last visited Oct. 30, 2018); Agency for Toxic Substances and Disease Registry, ATSDR A-Z Index, https://www.atsdr.cdc.gov/az/a.html (last visited October 30, 2018).

[55] Hodan, William M. & William R. Barnard, Evaluating the contribution of PM2.5 Precursor Gases and Re-entrained Road Emissions to Mobile Source PM2.5 Particulate Matter Emissions, MACTEC Federal Programs (2004), available at https://www3.epa.gov/ttnchie1/conference/ei13/mobile/hodan.pdf.

[56] U.S. Environmental Protection Agency, Sulfur Dioxide (SO_2) Pollution, Sulfur Dioxide Basics, https://www.epa.gov/so2-pollution/sulfur-dioxide-basics#effects (last visited Nov. 26, 2019).

[57] *Id.*

[58] U.S. Environmental Protection Agency, Carbon Monoxide (CO) Pollution in Outdoor Air, Basic Information about Carbon Monoxide (CO) Outdoor Air Pollution, https://www.epa.gov/co-pollution/basic-information-about-carbon-monoxide-co-outdoor-air-pollution#Effects (last visited Nov. 26, 2019).

(reduced oxygen to the heart), often accompanied by chest pain (angina), when exercising or under increased stress.[59] For these people, short-term CO exposure further affects their body's already compromised ability to respond to the increased oxygen demands of exercise or exertion.[60]

Ozone (O_3) can trigger or worsen asthma and other respiratory ailments.[61] It has been linked to pneumonia, COPD, asthma, bronchitis, emphysema, and premature death. Ground level ozone can have harmful effects on sensitive vegetation and ecosystems. Ozone may also lead to loss of species diversity and changes to habitat quality, water cycles, and nutrient cycles. VOCs can react with PM and NO_x to create ground-level ozone.

2. Hazardous Air Pollutants

HAPs are regulated by EPA because they cause or may cause "cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental and ecological effects."[62] A variety of these toxic chemicals are emitted from plastics production facilities—in fact, many of them are integral to the plastics production process because they are necessary reactor agents or solvents, for example. The proposed Formosa complex in St. James, Louisiana would emit hundreds of tons per year of 19 different HAPs, including five known carcinogens—1,3-butadiene, acetaldehyde, benzene, ethylene oxide, and formaldehyde. Below is a non-comprehensive list of some of the HAPs emitted during the plastics production process and their impacts:

1,3-butadiene can cause irritation of the eyes and throat, headaches, fatigue, decreased blood pressure and pulse, central nervous system damage, and unconsciousness. Long-term exposure can cause cancer and increase the likelihood of leukemia.[63] One Texas study reported that children exposed to higher than average ambient 1,3-butadiene concentrations due to nearby petrochemical plants had higher rates of lymphatic leukemia and acute myeloid leukemia than children living further away.[64]

---

[59] *Id*.
[60] *Id*.
[61] U.S. Environmental Protection Agency, Ground-level Ozone Pollution, Health Effects of Ozone Pollution, https://www.epa.gov/ozone-pollution/health-effects-ozone-pollution (last visited Nov. 26, 2019).
[62] USEPA Pollutants and Sources.
[63] U.S. National Library of Medicine, Compound Summary 1,3-Butadiene, https://pubchem.ncbi.nlm.nih.gov/compound/1_3-butadiene#section=Human-Metabolite-Information (last visited Oct. 1, 2019).
[64] *See* Walker, Kristina M. et al., A Preliminary Investigation of the Association Between Hazardous Air Pollutants and Lymphohematopoietic Cancer Risk Among Residents of Harris County Texas, Univ. of Tex. School of Public Health (2007), https://pdfs.semanticscholar.org/3b67/75f96037b7dd2104a11296784f52d4cddf33.pdf.

Benzene is a known carcinogen that has been linked to blood disorders such as leukemia, immune system damage[65] and chromosomal mutations.[66] Short-term exposure causes headaches, drowsiness, dizziness, as well as eye, skin, and respiratory tract irritation, and, at high levels, unconsciousness.[67] Long-term exposure can lead to harmful health impacts ranging from anemia to leukemia.[68] Studies have shown that communities living near benzene-emitting industrial facilities experience higher incidences of non-Hodgkin lymphoma.[69]

Styrene is a probable carcinogen[70] and has been linked to leukemia.[71] Long-term exposure results in adverse impacts to the central nervous system ("CNS"), such as headaches, fatigue, weakness, CNS depression, dysfunction, hearing loss, and peripheral neuropathy.[72]

Toluene negatively impacts the central nervous system. Short-term exposure can cause fatigue, headaches, nausea, and sleepiness.[73] Long-term exposure can cause irritation of the eyes, nose, and throat, dizziness, headaches, and CNS depression. Studies have reported that the children of pregnant women exposed to high levels of toluene were born with developmental effects, such as neurological impairments, minor physical anomalies, and attention deficits.

Ethylene Oxide is a known carcinogen and has been linked to breast cancer, non-Hodgkin lymphoma, and lymphocytic leukemia.[74] Short-term exposure can lead to CNS depression and irritation of the eyes and nose.[75] Long-term exposure can cause irritation

[65] Centers for Disease Control and Prevention, Emergency Preparedness and Response, Facts About Benzene, https://emergency.cdc.gov/agent/benzene/basics/facts.asp (last visited Oct. 7, 2019).
[66] Xing, Caihong et al., Benzene Exposure Near the U.S. Permissible Limit Is Associated with Sperm Aneuploidy, 118 Environ Health Perspectives 833 (2010), doi:10.1289/ehp.0901531
[67] U.S. Environmental Protection Agency, Benzene (2016), https://www.epa.gov/sites/production/files/2016-09/documents/benzene.pdf.
[68] American Cancer Society, Benzene and Cancer Risk, https://www.cancer.org/cancer/cancer-causes/benzene.html (last visited Sept. 3, 2019).
[69] EurekaAlert!, Higher cancer incidences found in regions near refineries and plants that release benzene, July 29, 2013, https://www.eurekalert.org/pub_releases/2013-07/w-hci072413.php (last visited Oct. 8, 2019).
[70] Aarhus University, After 40 years in limbo: styrene is probably carcinogenic, Science Daily (May 30, 2018), https://www.sciencedaily.com/releases/2018/05/180530113105.htm (last visited Oct. 8, 2019).
[71] U.S. Environmental Protection Agency, Styrene, https://www.epa.gov/sites/production/files/2016-09/documents/styrene.pdf (last visited Oct. 8, 2019).
[72] *Id*.
[73] U.S. Environmental Protection Agency, Toluene, https://www.epa.gov/sites/production/files/2016-09/documents/toluene.pdf (last visited Oct. 8, 2019).
[74] U.S. Environmental Protection Agency, Evaluation of the Inhalation Carcinogenicity of Ethylene Oxide (2016), https://cfpub.epa.gov/ncea/iris/iris_documents/documents/toxreviews/1025tr.pdf (last visited Oct. 8, 2019).
[75] U.S. Environmental Protection Agency, Ethylene Oxide, https://www.epa.gov/sites/production/files/2016-09/documents/ethylene-oxide.pdf (last visited Oct. 8, 2019).

of the eyes, skin, nose, throat, and lungs, and damage to the brain and nervous system.[76] Inhalation of ethylene oxide may also lead to miscarriages in pregnant women.[77]

These are just some of the many dangerous chemicals used as solvents, monomers and chemical intermediates in the plastics production process and subsequently emitted into the air as HAPs. Others include propylene and propylene oxide, methanol, and formaldehyde, to name a few.

3. Observed Health Impacts

Not only have the constituent elements of air emissions from petro-plastics facilities been shown to be harmful to human health and the environment; scientific studies have observed the myriad of health impacts faced by communities living near these facilities. It has been reported that individuals suffer from chronic conditions such as lung cancer, brain damage, allergic dermatitis, and liver and kidney damage; and symptoms of acute toxicity such as vomiting, diarrhea, and cardiovascular diseases. These effects can occur as a result of contact with airborne, solid, or liquid petrochemical compounds, even in small quantities. Children are often the most vulnerable and experience the worst impacts.[78]

In a study of children aged 6 to 12 years living either next to a petrochemical facility (which included polypropylene production), in an urban area with heavy vehicular traffic, or in a semirural or residential area in La Plata, Argentina, it was found that children living next to a plant had higher rates of asthma (24.8% vs. 10.1% to 11.5%), more asthma attacks (6.7 vs. 2.9 to 3.6 per year), more respiratory symptoms (including wheezing and nocturnal cough), and lower lung function than children in the other categories. The area immediately surrounding the petrochemical complex had the highest concentrations of PM and VOCs.[79] Similarly, in a study of children aged 11 to 14 years in Cape Town, South Africa, it was found that rates of asthma and wheezing and coughing were dependent on location relative to a petrochemical refinery.[80]

In two other studies, one in Brazil in 2010 and one in Spain in 2014, it was found that living near refineries or petrochemical plants, including ethylene and polypropylene-producing plants, contributed to nocturnal cough, wheezing, and respiratory hospitalizations in children. In the 2010 study, it was found that respiratory effects occurred even at low levels of atmospheric pollutants (e.g. SO_2, NO_2, O_3, benzene, PM_{10}, and $PM_{2.5}$).[81]

---

[76] *Id*.
[77] *Id*.
[78] Iyer, V.G. and Mastorakis, N.E., Unsafe Petrochemical Refinery Air Pollution and Its Environmental Impact Assessment, Proceedings of the 3rd WSEAS Int. Conf. on Waste Management, Water Pollution, Air Pollution, Indoor Climate (2009).
[79] Wichmann, F.A. et al., Increased asthma and respiratory symptoms in children exposed to petrochemical pollution, 123 J Allergy Clin Immunol 632 (2009).
[80] White, N. et al., Meteorologically estimated exposure but not distance predicts asthma symptoms in schoolchildren in the environs of a petrochemical refinery: a cross-sectional study, 8 Environmental Health (2009), doi: 10.1186/1476-069X-8-45.
[81] Lopes de Moraes, A. C. et al., Wheezing in children and adolescents living next to a petrochemical plant in Rio Grande do Norte, Brazil, 86 Jornal de Pediatria 337 (2010); Rovira, E. et al., Asthma, respiratory symptoms and lung function in children living near a petrochemical site, 133 Environmental Research 156 (2014).

However, adverse health outcomes from petrochemical facility exposures are not exclusive to children. In two Taiwanese studies, one in 1999 and one in 2004, the first found that exposure to refining and petrochemical emissions led to increased lung cancer mortality in women, and the second found an increased risk of preterm delivery.[82] Another study, this time in Brindisi, Italy, found moderate increases in the risk of lung, bladder and lymphohematopoietic cancers in communities within 2 km of the Brindisi petrochemical plant.[83] A study in Kaohsiung, southern Taiwan, likewise found residential petrochemical exposure a significant risk factor for leukemia in adults.[84] There are even more studies that have shown that workers and residents in close proximity to petrochemical complexes have higher incidence rates of brain cancer,[85] bladder cancer,[86] lung cancer,[87] lymphoma,[88] and mesothelioma.[89] This is exemplified by a study involving a naphtha cracking complex in Taiwan where all-cause cancer incidence decreased with distance from the facility.[90]

ii. Air Emissions from Plastics Production Disproportionately Impact Communities of Color and Low-Income Communities

Petrochemical and plastics production facilities are disproportionately sited in environmental justice communities—communities of color and low-income communities that are already overburdened by pollution and other harmful impacts from oil, gas, and chemical facilities.

A 2018 report by the Union of Concerned Scientists on dangerous accidents at chemical facilities--a broad category which includes petrochemical and plastics production facilities--found that "people of color (especially African American and Latino communities) are disproportionately represented in areas close to these facilities, with the percentage of African Americans 75 percent greater, and Latinos 60 percent greater, than for these groups in the United

---

[82] Yang, C-Y. et al., Female Lung Cancer Mortality and Sex Ratios at Birth near a Petroleum Refinery Plant, 83 Environmental Research Section A 33 (2000); Yang, C-Y et al., Increased risk of preterm delivery among people living near the three oil refineries in Taiwan, 30 Environmental International 337 (2004).

[83] Belli, S. et al., Case-control study on cancer risk associated to residence in the neighborhood of a petrochemical plant, 19 European Journal of Epidemiology 49 (2004) ("Belli 2004").

[84] Yu, C-L. et al., Residential Exposure to Petrochemicals and the Risk of Leukemia: Using Geographic Information System Tools to Estimate Individual-Level Residential Exposure, 164 American Journal of Epidemiology 200 (2006).

[85] *See e.g.*, Liu, C-C. et al., Association of Brain Cancer with Residential Exposure to Petrochemical Air Pollution in Taiwan, 71 Journal of Toxicology and Environmental Health, Part A 310 (2008).

[86] *See e.g.*, Marinaccio, A. et al., Residential proximity to industrial sites in the area of Taranto (Southern Italy). A case-control cancer incidence study, 47 Annali dell'Instituto superior di sanita 192 (2011) ("Marinaccio 2011"); Tsai, S-S. et al., Association of Bladder Cancer with Residential Exposure to Petrochemical Air Pollutant Emissions in Taiwan, 72 Journal of Toxicology and Environmental Health, Part A, 53 (2009).

[87] *See e.g.*, Marinaccio 2011; Pasetto, R. et al., Mortality and morbidity study of petrochemical employees in a polluted site, 11 Environmental Health (2012).

[88] *See e.g.*, Belli 2004.

[89] *See e.g.*, Salerno, C. et al., Cancer morbidity of residents living near an oil refinery plant in North-West Italy, 23 International Journal of Environmental Health Research 342 (2013).

[90] Chen, C-F. et al., Increased cancer incidence of Changhua residents living in Taisi Village north to the No. 6 Naphtha Cracking Complex, Journal of the Formosan Medical Association (2018).

States as a whole."[91] In addition, "[t]he poverty rate in the surrounding areas is 50 percent greater than for the United States as a whole."[92] These communities not only bear the brunt of short-term acute exposure during emergencies and disasters, but also suffer from long-term exposure to a variety of harmful air pollutants.

For example, two the huge Formosa ethane crackers proposed in St. James Parish are sited in an area that is disproportionately people of color; EPA's environmental justice mapping online tool, EJScreen, shows that the population within a 3 mile radius of the center of the proposed facility is 84% people of color.[93] For perspective, St. James Parish is 52% people of color, and Louisiana is only 41% people of color on average.[94] EJScreen also shows that the people who live within three miles of the proposed facility site have a greater potential for exposure to PM2.5 than 84% of Louisiana's population, a greater risk of cancer from toxic air pollution than 83% of Louisiana's population, and a greater risk of respiratory illness than 81% of Louisiana's population. The surrounding community has been dubbed "Cancer Alley" because of the devastating health impacts caused by a rash of petrochemical and chemical manufacturing facilities and refineries there. Nearby residents report alarming incidence of cancer-related deaths.[95] "Almost every household has somebody that died with cancer or that's battling cancer," one community member said.[96] Communities of color and low-income communities in Texas and Appalachia—the other areas where the majority of the petro-plastics buildout is planned—face similar disproportionate impacts.[97]

The environmental justice issues presented by the siting of these facilities run counter to EPA's legal obligations. Title VI of the Civil Rights Act of 1964 provides that "[n]o person in the United States shall, on the ground of race, color, or national origin . . . be subjected to

---

[91] White, R., The Impact of Chemical Facilities on Environmental Justice Communities, Union of Concerned Scientists (2018), https://www.ucsusa.org/sites/default/files/attach/2018/08/impact-chemical-facilities-on-environmental-justice-communities-ucs-2018.pdf.
[92] *Id.*
[93] U.S. Environmental Protection Agency, EJScreen, coordinates: 30.05900556, -90.91452222, https://ejscreen.epa.gov/mapper/ (last visited Oct. 8, 2019).
[94] *Id.*
[95] Kardas-Nelson, Mara, *The Petrochemical Industry is Killing Another Black Community in 'Cancer Alley'*, THE NATION, Aug. 26, 2019, https://www.thenation.com/article/st-james-louisiana-plastic-petrochemicals-buy-out/ (last visited Oct. 8, 2019)(last visited Oct. 8, 2019); Shamlian, Janet, *High cancer risk plagues Louisiana town near chemical plants*, CBS NEWS, July 24, 2019, https://www.cbsnews.com/news/cancer-alley-reserve-louisiana-denka-plant-health-risk-higher-national-average-2019-07-24/ (last visited Oct. 8, 2019).
[96] Lartey, Jamiles & Oliver Laughland, *'Almost every household has someone that has died from cancer',* THE GUARDIAN, May 6, 2019, https://www.theguardian.com/us-news/ng-interactive/2019/may/06/cancertown-louisana-reserve-special-report
[97] *See* Yerman, Marcia G., *"Hurricanes Show Us Why Our Children Need a Strong and Independent EPA," says the Father of Environmental Justice,* MOMS CLEAN AIR FORCE, Sept. 18, 2017, https://www.momscleanairforce.org/interview-dr-robert-bullard/ (last visited Oct. 8, 2019); Morrone, Michele, Environmental Justice, Hydraulic Fracturing and Appalachia, TriplePundit (Aug. 11, 2013), https://www.triplepundit.com/story/2013/environmental-justice-hydraulic-fracturing-and-appalachia/59146 (last visited Oct. 8, 2019); Cunningham, Nick, *A Fracking-Driven Industrial Boom Renews Pollution Concerns in Pittsburgh*, YALE ENVIRONMENT 360, Mar. 21, 2019, https://e360.yale.edu/features/a-fracking-driven-industrial-boom-renews-pollution-concerns-in-pittsburgh (last visited Oct. 8, 2019).

discrimination under any program or activity receiving Federal financial assistance."[98] Executive Order 12898 further requires that "each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations."[99] Recipients of federal funds, such as the state agencies that implement the NSPS and NESHAPs, are forbidden from employing "criteria or methods of administering its program or activity which have the effect of subjecting individuals to discrimination because of their race, color, [or] national origin, . . . or have the effect of defeating or substantially impairing accomplishment of the objectives of the program or activity with respect to individuals of a particular race, color, [or] national origin."[100]

At a bare minimum, the NSPS and NESHAPs must be updated to drastically reduce harmful emissions from these facilities and increase accountability and transparency if EPA is to meet its environmental justice mandate.

iii. Plastics Production Exacerbates the Climate Crisis

Plastics production emits massive amounts of a variety of greenhouse gases (including methane, CO_2, and NO_2), directly contributing to the climate crisis. Greenhouse gas ("GHG") emissions, EPA has found, will lead to air quality impacts, temperature increases, extreme weather events, and other impacts that, collectively, "endanger both the public health and welfare of current and future generations."[101] Likewise, the Supreme Court has found that "the harms associated with climate change are serious and well recognized."[102]

To that end, the United States has committed to the climate change target of holding the long-term global average temperature "to well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels"[103] under the Paris Agreement,[104] although the Trump Administration has formally begun the withdrawal process.

---

[98] 42 U.S.C. § 2000d.

[99] U.S. President William Clinton, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, Exec. Order 12898, 59 Fed. Reg. 32 (Feb. 11, 1994), *available at* https://www.archives.gov/files/federal-register/executive-orders/pdf/12898.pdf; *See also* U.S. President William Clinton, Memorandum on Executive Order on Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (Feb. 11, 1994).

[100] *Village of Arlington Heights v. Metropolitan Housing Dev. Corp.*, 429 U.S. 252, 265 (1977); 40 C.F.R. § 7.35(b).

[101] Endangerment and Cause or Contribute Findings for Greenhouse Gases under Section 202(a) of the Clean Air Act, 74 Fed. Reg. 66,496 (Dec. 15, 2009); *see also* U.S. Environmental Protection Agency, Technical Support Document for Endangerment and Cause or Contribute Findings for Greenhouse Gases under Section 202(a) of the Clean Air Act (Dec. 7, 2009) ("USEPA Endangerment TSD"), *available at* https://www.epa.gov/sites/production/files/2016-08/documents/endangerment_tsd.pdf.

[102] *Mass. v. EPA,* 549 U.S. 491, 521 (2007).

[103] U.N. Framework Convention on Climate Change, 21st Sess. Of the Conf. of the Parties, Paris, Fr., Nov. 30-Dec. 11, 2015, Adoption of the Paris Agreement Art. 2, U.N. Doc. FCCC/CP/2015/L.9 (December 12, 2015), *available at* http://unfccc.int/resource/docs/2015/cop21/eng/l09.pdf ("Paris Agreement").

[104] On December 12, 2015, 197 nation-state and supra-national organization parties meeting in Paris at the 2015 United Nations Framework Convention on Climate Change Conference of the Parties consented to the Paris Agreement committing its parties to take action so as to avoid dangerous climate change.

Notably, a 2018 report from the Intergovernmental Panel on Climate Change (IPCC), the authoritative international scientific body for the assessment of climate change, quantified the devastating harms that would occur at 2°C warming, highlighting the necessity of limiting warming to 1.5°C to avoid catastrophic impacts to people and life on Earth.[105]

Immediate and aggressive greenhouse gas emissions reductions are necessary to keep warming to 1.5°C above pre-industrial levels. The IPCC Fifth Assessment Report and other expert assessments have established global carbon budgets, or the total amount of carbon that can be burned while maintaining some probability of staying below a given temperature target. According to the IPCC, total cumulative anthropogenic emissions of CO_2 must remain below about 400 Gigatonnes (Gt) of CO_2 from 2011 onward for a 66 percent probability of limiting warming to 1.5°C.[106] The 1.5°C carbon budget estimate is 590-1,240 $GtCO_2$ from 2015 onward.[107] Given that global CO_2 emissions in 2015 alone totaled 36 $GtCO_2$,[108] humanity is rapidly consuming the remaining carbon budget.

Plastics production is extremely climate-damaging.[109] While lifecycle GHG emissions from plastics production stem from a vast array of upstream sources—such as fracking for natural gas, transporting, storing and processing the feedstock, and producing plastic resins and consumer products—and downstream sources—such as waste incineration, landfilling, recycling, and decomposition in the ocean—this Petition focuses only on the direct GHG emissions from the manufacture of plastic precursors and plastic resins. Further, owners and operators are not required to report direct emissions from malfunctions, leaks, and emergency operations, so this analysis likely understates direct emissions from these processes.

The manufacture of plastic precursors, such as ethylene, emits GHGs via both the production process and fuel combustion. Ethane cracking (also known as steam cracking) involves sending feedstock through steam cracker furnaces, where it is heated to between 750°C and 1,100°C, and mixed with steam to split the hydrocarbon molecules into smaller molecules. Steam cracking for the production of light olefins such as ethylene and propylene "is the most energy consuming

---

[105] Intergovernmental Panel on Climate Change, Global Warming of 1.5°C, an IPCC special report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty (October 6, 2018), http://www.ipcc.ch/report/sr15/.
[106] Intergovernmental Panel on Climate Change, The Physical Science Basis, Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, Summary for Policymakers at 27 (2013); Intergovernmental Panel on Climate Change, Climate Change 2014 Synthesis Report AR 5 Synthesis Report, Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, 63-64 and Table 2.2 (2014).
[107] Rogelj, Joeri et al., Differences between carbon budget estimates unraveled, 6 Nature Climate Change 245 (2016) *at* Table 2.
[108] *See* Le Quéré, Corrine, et al., Global Carbon Budget 2016, 8 Earth Syst. Sci. Data 605 (2016).
[109] *See* Center for International Environmental Law, Plastic & Climate: The Hidden Costs of a Plastic Planet (May 2019), https://www.ciel.org/wp-content/uploads/2019/05/Plastic-and-Climate-FINAL-2019.pdf ("CIEL Plastics and Climate Report").

process in the chemical industry."[110] Currently, fossil fuel combustion is used to meet these energy demands. As a result, about 85 percent of the global petrochemical industry's CO_2 emissions are attributable to fuel combustion, while the remaining 15 percent come from production processes.[111] Process emissions are attributable to fugitive emissions of feedstock and emissions of solvents and other production byproducts.

In 2015, the U.S. was home to 28 industrial facilities that employed steam cracking to produce ethylene.[112] These facilities—including their steam crackers—reported emitting a total of 64.4 million tons per year (tpy) of GHGs, according to EPA's Greenhouse Gas Reporting Program.[113] The planned petro-plastics expansion discussed above means GHG emissions from petrochemical and plastics production facilities will increase significantly. Draft permits for thirteen new cracker projects or expansions of existing projects proposed primarily in the Gulf Coast and Appalachia regions have the potential to directly emit a total of 37 million tpy of CO_2 equivalents.[114] It is bitterly ironic that these regions—particularly Louisiana and the Gulf—will bear many of the worst impacts of climate change, such as sea level rise,[115] flooding[116] and severe storms like Hurricanes Harvey and Katrina.[117]

Table 5: Potential GHG emissions from new and expanded ethylene facilities[118]

Company	Location	Potential CO_2e increase (tons/year)
OxyChem/Mexichem	Ingleside, TX	474,976

[110] Intergovernmental Panel on Climate Change, Climate Change 2014 Mitigation of Climate Change, Working Group III Contribution to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (2014), https://www.ipcc.ch/site/assets/uploads/2018/02/ipcc_wg3_ar5_full.pdf

[111] International Energy Agency, The Future of Petrochemicals: Towards more sustainable plastics and fertilisers (2018) ("IEA Future of Petrochemicals"), *available at* https://webstore.iea.org/download/direct/2310?fileName=The_Future_of_Petrochemicals.pdf.

[112] Koottungal, L., International Survey of Ethylene from Steam Crackers, OIL AND GAS JOURNAL (July 6, 2015), *available at* https://www.ogj.com/refining-processing/petrochemicals/article/17237013/international-survey-of-ethylene-from-steam-crackers-2015

[113] CIEL Plastics & Climate Report *at* p. 46, *citing* U.S. Environmental Protection Agency, GHG Reporting Program Data Sets, Greenhouse Gas Reporting Program, https://www.epa.gov/ghgreporting/ghgreporting-program-data-sets.

[114] EPA Permits as listed at Table 1; *see also* CIEL Plastics & Climate Report, Table 6 *at* p. 49.

[115] Masters, Dr. Jeff, *Highest Sea Level Rises in U.S. are in Texas and Louisiana, Annual Report Finds*, WEATHER UNDERGROUND (March 11, 2019), https://www.wunderground.com/cat6/Highest-Sea-Level-Rises-US-are-Texas-and-Louisiana-Annual-Report-Finds

[116] Upton, John, Louisiana Floods Directly Linked to Climate Change, Climate Central, https://www.climatecentral.org/news/louisiana-floods-directly-linked-to-climate-change-20671 (last visited Oct 9, 2019); Hardy, Steve, *Louisiana's 2016 flood offered as evidence of climate change in new White Hosue environmental report*, THE ADVOCATE (Dec 2, 2018), https://www.theadvocate.com/baton_rouge/news/environment/article_62d3d3aa-f4c1-11e8-b922-1b3817b06f0d.html (last visited Oct 9, 2019).

[117] Greshko, Michael, Climate change likely supercharged Hurricane Harvey, National Geographic (Dec 13, 2017), https://www.nationalgeographic.com/news/2017/12/climate-change-study-hurricane-harvey-flood/; Union of Concerned Scientists, Hurricanes and Climate Change (2008/updated 2019),https://www.ucsusa.org/global-warming/science-and-impacts/impacts/hurricanes-and-climate-change.html.

[118] EPA Permits as listed at Table 1; *see also* CIEL Plastics & Climate Report, Table 6 *at* p. 49.

Dow Chemical	Freeport, TX	2,942,218
ExxonMobil Chemical	Baytown, TX	1,453,293
Chevron Phillips Chemical	Cedar Bayou, TX	1,615,000
Formosa Plastics	Point Comfort, TX	3,868,872
Sasol	Lake Charles, LA	3,955,120
Westlake/Lotte	Axiall/St. Charles, LA	1,155,059
Shintech	Plaquemine, LA	1,403,807
Shell	Monaca, PA	2,248,293
Total/Borealis/Nova	Port Arthur, TX	1,396,476
PTT Global Chemicals America	Dilles Bottom, OH	1,764,765
Exxon/SABIC	Gregory, TX	2,933,595
Formosa	St. James, LA	7,799,956[119]
TOTAL		**31,246,665**

These emissions endanger the environment and public health and welfare and must be significantly reduced if the U.S. has any chance of meeting its international obligations and averting the most devastating impacts of climate change.

III. EPA's Duty to Regulate Petrochemical Facilities under the Clean Air Act

a. NSPS: EPA's Duty to Regulate Criteria Emissions from Stationary Sources

CAA section 111(b) requires EPA to promulgate nationwide emissions standards that apply to newly constructed, reconstructed and modified sources, regardless of the region's ambient air quality. These standards, intended to be forward-looking to speed the development of new technologies to reduce air pollution, are out of date and must be updated in order to adequately protect the public health and welfare from the impacts of plastics production.

CAA section 111(b) requires EPA to establish emission standards for any category of new and modified stationary sources that the Administrator, in his or her judgment, finds "causes, or contributes significantly to, air pollution which may reasonably be anticipated to endanger public health or welfare."[120] EPA has previously made endangerment findings under this section of the CAA for more than 70 stationary source categories and subcategories that are now subject to NSPS.[121] Once EPA has set a NSPS for new and modified sources in a given source category, CAA section 111(d) calls for regulation of existing sources in certain circumstances.[122]

[119] Note that the complex as a whole would emit 13,628,091 tons per year of CO_2 equivalents.
[120] 42 U.S.C. § 7411(b)(1)(A)
[121] U.S. Environmental Protection Agency, New Source Performance Standards, https://www.epa.gov/stationary-sources-air-pollution/new-source-performance-standards (last visited Oct 10, 2019).
[122] 42 U.S.C. § 7411(d).

Under CAA section 111, EPA has significant discretion to identify the affected facilities within a source category that should be regulated. To define the affected facilities, EPA can use size thresholds and create subcategories based on source type, class or size. Emission limits also may be established either for an entire facility or for equipment within a facility.

For listed source categories, EPA must establish "standards of performance" that apply to sources that are constructed, modified or reconstructed after the EPA proposes the NSPS for the relevant source category. CAA section 111(a)(1) provides that NSPS are to reflect the degree of emission limitation achievable through the application of the "best" system of emission reduction which the Administrator determines has been "adequately demonstrated," taking into account the cost of achieving such reduction and any non-air quality health and environmental impact and energy requirements.[123] This level of control is commonly referred to as best demonstrated technology (BDT) or the best system of emission reduction (BSER).

To determine BDT/BSER, EPA typically reviews existing technologies and identifies what emission reduction systems exist and how effective they are at reducing air pollution. This review allows EPA to identify appropriate emission limits. The resultant standard that EPA develops, based on the BSER achievable at that source, is commonly a numerical emissions limit for emissions of criteria pollutants, and/or other pollutants (such as VOCs), expressed as a performance level (i.e., a rate-based standard). The level of control can also take the form of equipment or work process specifications.

The NSPS program does not just require the use of existing common-sense measures; it is also meant to speed the development and deployment of new technologies to reduce pollution. As one court has held, the NSPS program "looks toward what may fairly be projected for the regulated future, rather than the state of the art at present."[124] EPA must revisit and revise these standards every eight years, unless it determines that such review is unnecessary.[125]
To summarize, EPA regulates emissions from new stationary sources or major modifications to existing stationary sources by setting numerical emissions limits or equipment specifications:

- <u>Best demonstrated technology (BDT) or best system of emission reduction (BSER):</u> the best system of emissions reductions, taking into account costs and any nonair quality health and environmental impact and energy requirements the Administrator deems has been adequately demonstrated.[126]

- <u>New Source Performance Standards (NSPS)</u> represent the most stringent controls of criteria or other pollutants attainable through application of BDT or BSER. These standards are codified in Title 40 of the Code of Federal Regulations, Part 60.

---

[123] *Lignite Energy Council v. U.S. E.P.A.*, 198 F.3d 930, 932 (C.A.D.C., 1999); 42 U.S.C. § 7411(a)(1).
[124] *National Asphalt Pavement Ass'n v. Train*, 539 F.2d 775, 785-86 (D.C. Cir. 1976).
[125] 42 USC § 7411(b)(1)(B)
[126] 42 USC § 7411(a)(1)

A variety of NSPS apply to the various process units and facilities that comprise a petro-plastics plant. Many of these are within the SOCMI category, or polymer manufacturing industry category. A complete list is in Table 6.

Table 6: NSPS that apply to petrochemical and plastics production facilities

Code Provision	Standards	Implicated Processes
40 C.F.R. Part 60, Subpart Db	Standards for SO_2, PM, and NOx emissions from natural-gas fired boilers	Natural-Gas Fired Boilers
40 C.F.R. Part 60, Subpart Kb	Standards for VOC emissions from storage vessels	Ethylene Manufacturing Process Unit Thermal Oxidizers Storage Tanks—high vapor pressure products
40 C.F.R. Part 60, Subpart VVa	Standards for VOC emissions from SOCMI equipment leaks	Ethylene Manufacturing Process Unit Fugitive Equipment and Process Leaks Loading operations (railcar and truck) – high vapor pressure
40 C.F.R. Part 60, Subpart NNN	Standards for VOC emissions from SOCMI distillation operations	Ethylene Manufacturing Process Unit Thermal Oxidizer Flare (ground/stack)
40 C.F.R. Part 60, Subpart RRR	Standards for VOC emissions from SOCMI reactor processes	Ethylene Manufacturing Process Unit Thermal Oxidizer Flare (ground/stack)
40 C.F.R. Part 60, Subpart DDD	Standards for VOC emissions from the polymer manufacturing industry	HDPE/LDPE/LLDPE Manufacturing Unit Thermal Oxidizer
40 C.F.R. Part 60, Subpart IIII	Standards of Performance for Stationary Compression Ignition Internal Combustion Engines	Emergency Pumps and Generators

Many of these standards are woefully out of date and do not reflect BSER. The emissions standards in Subpart NNN, governing VOC emissions from SOCMI distillation operations, have not been updated since 1990.[127] Emissions standards in Subpart RRR, governing VOC emissions from SOCMI reactor processes, have not been updated since 1993.[128] Process emissions and fugitive emissions standards in Subpart DDD, governing VOC emissions from the polymer manufacturing industry, have not been updated since 2000.[129] In the intervening years, the health, environmental, and climate impacts of plastics production have intensified while control and process equipment technology has improved. And all NSPS referenced *supra* have failed to adequately protect the public health and welfare from the impacts of plastics production, as discussed above. EPA must update these standards to reflect the best systems of emission controls available.

b. NESHAPs and MACT: EPA's Duty to Regulate Air Toxics from Stationary Sources

In addition to regulating emissions of common pollutants from new sources, EPA controls emissions of HAPs from new and existing sources. EPA has identified 187 different pollutants that "are known to cause or may reasonably be anticipated to cause adverse effects to human health or adverse environmental effects."[130] These pollutants are classified as HAPs.[131] In 1970, the CAA instituted the NESHAP program to establish a nationally uniform method of controlling HAP emissions. The NESHAP program applies to all existing and new or modified sources.

CAA section 112 establishes a two-stage regulatory process to address emissions of HAPs from stationary sources. In the first stage, EPA must identify categories of sources emitting one or more of the HAPs listed in CAA section 112(b).[132] These categories and subcategories largely track those categories established under the NSPS standards but are not identical.[133] EPA has identified over 120 such source categories.[134]

---

[127] *See* Standards of Performance for New Stationary Sources; Volatile Organic Compound (VOC) Emissions From the Synthetic Organic Chemical Manufacturing Industry (SOCMI) Distillation Operations, 55 Fed. Reg. 26942 (June 29, 1990).
[128] *See* Standards of Performance for New Stationary Sources; Volatile Organic Compound (VOC) Emissions From the Synthetic Organic Chemical Manufacturing Industry (SOCMI) Reactor Processes, 58 Fed. Reg. 45964 (Aug. 31, 1993).
[129] *See* Amendments for Testing and Monitoring Provisions, 65 Fed. Reg. 61744 (Oct. 17, 2000).
[130] 42 U.S.C. § 7412(b)(3)(B).
[131] USEPA HAPS List.
[132] Section 112(d) requires EPA to produce a list of all categories and subcategories of the air pollutants in Section 112(b). 42 U.S.C. § 7412(c)(1).
[133] 42 U.S.C. § 7412(c)(1)
[134] U.S. Environmental Protection Agency, National Emission Standards for Hazardous Air Pollutants (NESHAP), https://www.epa.gov/stationary-sources-air-pollution/national-emission-standards-hazardous-air-pollutants-neshap-9 (last visited Oct 10, 2019).

Then, EPA must promulgate standards to control HAP emissions from those sources.[135] The NESHAP program requires health-based standards that "provide an ample margin of safety to protect public health."[136] In addition, the 1990 CAA Amendments require a technology-based standard known as the Maximum Achievable Control Technology ("MACT") standard. MACT standards apply to major sources—that is, facilities with the potential to emit 10 tons per year or more of any single HAP or 25 tons per year of any combination of HAPs. The MACT must reflect "the maximum degree of reduction in emissions of [HAPs] (including a prohibition on such emissions, where achievable) that the Administrator, taking into consideration the cost of achieving such emission reduction, and any non-air quality health and environmental impacts and energy requirements, determines is achievable for new or existing sources in the category or subcategory to which such emission standard applies, through application of measures, processes, methods, systems or techniques."[137] These standards should "reduce the volume of, or eliminate emissions of, such pollutants through process changes, substitution of materials or other modifications" or "enclose systems or processes to eliminate emissions," among other types of measures.[138]

Every eight years, EPA must reevaluate technology-based standards based on MACT to determine whether additional standards are necessary to address any residual risks associated with HAPs emissions.[139] In addition, EPA must reassess standards set under Section 112 "no less often" than every eight years to determine if there are "developments in practices, processes, or control technologies" that may be appropriate to incorporate into the standards.[140]

To summarize, EPA regulates HAPs via:

- National Emissions Standards for Hazardous Air Pollutants (NESHAPs): risk-based standards for emissions of HAPs based on a health-only threshold that provides for an ample margin of safety to protect the public. These standards are codified in Title 40 of the Code of Federal Regulations, Part 61 and apply to all major source categories listed under CAA Section 112(b)(1).

- Maximum Achievable Control Technology (MACT): technology-based standards that apply to all major sources of the 187 HAPs listed in Section 112(b)(1). These sources and categories of sources must meet performance standards that reflect the MACT. For new sources, the MACT must match the performance of the best controlled similar source.[141] For existing sources, the MACT cannot be less stringent than the best performing 12% of

[135] 42 U.S.C. § 7412(c)(2) (helpful background: Petroleum Refinery Sector Risk and Technology Review and New Source Performance Standards, 80 Fed. Reg. 75178 (Dec. 1, 2015), *available at* https://www.govinfo.gov/content/pkg/FR-2015-12-01/pdf/2015-26486.pdf.
[136] 42 U.S.C. § 7412(f)(2)(A).
[137] *Id.* § 7412(d)(2).
[138] *Id.* § 7412(d)(2)(A)-(B).
[139] *Id.* § 7412(f)(2)(C).
[140] *Id.* § 7412(d)(6).
[141] *Id.* § 7412(d)(3).

sources in the category.[142] These standards are codified in Title 40 of the Code of Federal Regulations, Part 63.

The NESHAPs that apply to petro-plastics facilities are for fugitive emissions (leaks), benzene from leaks, and benzene waste operations.

Table 7: NESHAPs that apply to petrochemical and plastics production facilities

Code Provision	Standards	Implicated Processes
40 C.F.R. Part 61, Subpart J	Standards for Equipment Leaks (Fugitive Emission Sources) of Benzene	Ethylene Manufacturing Process Unit Fugitive Equipment and Process Leak
40 C.F.R. Part 61, Subpart V	Standards for Equipment Leaks (Fugitive Emission Sources)	Ethylene Manufacturing Process Unit Fugitive Equipment and Process Leak
40 C.F.R. Part 60, Subpart FF	Standards for Benzene Waste Operations	Thermal Oxidizer Wastewater Treatment Plant

Table 8: MACTs that apply to petrochemical and plastics production facilities[143]

Code Provision	Standards	Implicated Processes
40 C.F.R. Part 63, Subpart U	Standards for Polymers and Resins	HDPE/LDPE/LLDPE Manufacturing Unit
40 C.F.R. Part 63, Subpart YY	Standards for Ethylene Production	Ethylene and Propylene Manufacturing Process Units

Although the CAA mandates that EPA reassess NESHAPs every eight years, many of these standards have not been updated in decades. The emissions standards in Subpart J, governing fugitive emissions of benzene, have not been updated since 1984.[144] The emissions standards for fugitive emissions from pumps, compressors, pressure relief devices, sampling connecting systems, and open-ended valves have not been updated since 2000[145] (and not since 1984 for

[142] *Id.* § 7412(d)(3)(A).
[143] Note: these are some but not all of the MACT standards that apply to petro-plastics facilities.
[144] *See* National Emission Standards for Hazardous Air Pollutants; Benzene Equipment Leaks (Fugitive Emission Sources), 49 Fed. Reg. 23513 (June 6, 1984).
[145] *See* Consolidated Federal Air Rule (CAR): Synthetic Organic Chemical Manufacturing Industry, 65 Fed. Reg. 78268, 78281 (Dec. 14, 2000).

valves).[146] In those decades, there have been many technological and process advances; EPA must incorporate these developments into the NESHAPs to address the risks faced by communities from benzene and other toxic emissions.

IV. Proposed Regulatory Amendments to the NSPS and NESHAPs.

This section identifies the main culprits of emissions from petrochemical and plastics production facilities and proposes specific regulatory changes, summarized in Table 8 below, that together will vastly decrease the quantity of harmful pollutants emitted from these facilities. These changes address equipment specifications, work processes, monitoring and recordkeeping requirements, and process unit efficiency, among other proposals.

In addition, this section requests that EPA list ethylene, propylene, polyethene, and polypropylene production facilities as a category of stationary sources that emit air pollution which may reasonably be anticipated to endanger public health or welfare and establish NSPS for emissions of NOx and other analytes from new and modified sources within the newly listed stationary source category.

Table 9: Summary of recommendations for regulatory amendments to control harmful air emissions from petro-plastics production facilities

Energy Use	**Zero emission energy:** Petrochemical production requires great expenditures of energy, which is currently derived from fossil fuel combustion, and emits vast quantities of harmful air pollutants including greenhouse gases. These facilities should be required to rely on zero emission energy such as wind and photovoltaic solar.
Pollution Control Technologies	**Flares**: Flares are among the largest sources of emissions from petrochemical production facilities and should not be allowed except when required solely for safety reasons in an emergency. To the extent flaring is permitted, all references to flare standards should be to 63.670 and 63.671, from 40 CFR Part 63 Subpart CC and not to 40 CFR 60.18.
Equipment Specifications	**Leak-less and seal-less designs:** To reduce fugitive emissions, require the use of leak-less and seal-less designs for components, such as valves, pumps, and connectors, to the maximum degree possible, especially for components in hard-to-monitor or inaccessible locations. **Open-ended lines and connecters:** Open-ended lines and connectors should be prohibited, except as needed for safety reasons. **Tanks:** Only internal floating roof tanks connected to control devices (such as a catalytic oxidizer) should be permitted, unless the vapor

[146] *See* National Emission Standards for Hazardous Air Pollutants; Benzene Equipment Leaks (Fugitive Emission Sources), 49 Fed. Reg. 23513 (June 6, 1984).

	pressure of the liquid in the tank has a vapor pressure of less than 5 mm Hg under actual storage conditions.
Monitoring and Recording	**Leak detection and repair ("LDAR"):** All LDAR programs should require the use of Optical Gas Imaging monitoring to detect fugitive emissions. **Continuous Emissions Monitoring Systems ("CEMS"):** For all combustion devices except flares, CEMS should be required for NOx, SO_2, CO, and filterable PM. **Fenceline monitoring:** Fenceline monitoring with appropriate target analytes should be required for petrochemical production facilities per the specifications in 40 CFR Part 63, Subpart CC, § 63.658.

a. EPA Must List Ethylene, Propylene, Polyethylene, and Polypropylene Production Facilities as a Source Category under Section 111 of the CAA and Subsequently Promulgate NSPS for This Source Category.

Ethylene, propylene, polyethylene, and polypropylene production facilities are stationary sources that emit air pollution that endangers public health and welfare and therefore must be listed as a source category under CAA Section 111.

CAA Section 111 provides that the Administrator "shall include a category of sources in such list if in his judgment in causes, or contributes significantly to, air pollution which *may reasonably be anticipated* to endanger public health or welfare."[147] The Administrator must, "from time to time," revise this list by adding new stationary sources.[148] A "stationary source" is "any building, structure, facility or installation which emits or may emit any air pollutant."[149] An "air pollutant" is "any air pollution agent or combination of such agents, including any physical, chemical, biological, radioactive….substance or matter which is emitted into or otherwise enters the ambient air."[150] "Welfare" is defined broadly to include, among other things, effects on weather, climate, personal comfort and well-being, and economic values.[151]

The requirement to list stationary sources that "may reasonably be anticipated to endanger public health or welfare" obligates the Administrator to act in a precautionary fashion. The CAA does not require absolute scientific certainty or proof of actual harm when making the determination

[147] 42 U.S.C. § 7411(b)(1)(A)(emphasis added).
[148] *Id.*
[149] 42 U.S.C. § 7411(a)(3).
[150] 42 U.S.C. § 7602(g).
[151] 42 U.S.C. § 7602(h).

to list a stationary source.[152] The legislative history behind Section 111 indicates that Congress intended to "assure that regulatory action can effectively prevent harm before it occurs."[153]

"In determining priorities for promulgating standards for categories of major stationary sources," EPA shall consider "the quantity of air pollutant emissions which each such category will emit, or will be designed to emit" and "the extent to which each such pollutant may reasonably be anticipated to endanger public health or welfare," among other factors.[154]

Ethylene and propylene production facilities—which expend vast amounts of energy to heat up and then "crack" ethane or dehydrogenate propylene molecules into ethylene, polypropylene, and other components—emit harmful air pollutants in quantities that endanger public health and welfare and therefore must be listed as a source category under Section 111 of the CAA. These process units emit NOx, CO, $PM_{2.5}$ and PM_{10}, SO_2, HAPs, VOCs, and GHGs. Polymerization—the production of polyethylene and polypropylene plastic resins from these molecules—is similarly harmful to public health and the environment.

A permit application summary prepared for ASCENT's proposed ethylene production facility in West Virginia shows that the ethane cracking furnaces alone, during normal operations, are predicted to emit 521 tons per year of NOx, 107 tons per year of CO, 9.97 tons per year of SO_2, 26.1 tons per year of VOCs, and 79.5 tons per year of PM_{10} and of $PM_{2.5}$.[155] The quantity of NOx emissions from these process units is particularly problematic.[156] The NOx emitted *only* from the furnaces for the ASCENT plant during normal operations (excluding start-up and shut-down and emergency operations) is the equivalent to the NOx emissions from 1,635,444,239 vehicle miles traveled.[157] As described above, these emissions can be deadly.[158]

EPA has already acknowledged that ethylene and propylene production facilities emit harmful air pollutants that endanger public health and welfare. EPA listed ethylene production as a source category under Section 112 of the CAA in 1996 because they emit one or more HAPs and

---

[152] *Massachusetts v. EPA*, 549 U.S. 497, 506, FN7 (2007),

[153] See *Lead Indus. Ass'n v. Envtl. Prot. Agency*, 647 F.2d 1130, 1152, (D.C. Cir. 1980), citing H.R.Rep.No.95-294 at 49 (1977).

[154] 42 U.S.C. § 7411(f)(2).

[155]*See* Appalachian Shale Cracker Enterprise, LLC, Permit Application Summary, Environmental Resources Management (May 2014) *at* Appendix A, Table 3-1. https://dep.wv.gov/daq/permitting/Documents/Appendix_A_ASCENT_PermitSummary_May122014.pdf

[156] *See e.g.* U.S. Environmental Protection Agency, Alternative Control Techniques Document—NOx Emissions from Process Heaters (Sept. 1993), https://www3.epa.gov/ttn/catc/dir1/procheat.pdf

[157] The average emissions rate for light duty vehicles is .289 grams/mile of NOx as of 2018. *See* U.S. Department of Transportation Bureau of Transportation Statistics, Estimated National Average Vehicle Emissions Rates per Vehicle by Vehicle Type Using Gasoline and Diesel, https://www.bts.gov/content/estimated-national-average-vehicle-emissions-rates-vehicle-vehicle-type-using-gasoline-and (last visited Oct 10, 2019).

[158] *See e.g.* Carrington, Damian, *38,000 people a year die early because of diesel emissions testing failures*, THE GUARDIAN (May 15, 2017), https://www.theguardian.com/environment/2017/may/15/diesel-emissions-test-scandal-causes-38000-early-deaths-year-study (NOx emissions from diesel cars in Europe a public health crisis).

subsequently promulgated a generic MACT to control HAPs from these process units.[159] "Ethylene production" in the NESHAP context is defined as "any chemical production process unit in which ethylene and/or propylene are produced by separation from petroleum refining process streams or by subjecting hydrocarbons to high temperatures in the presence of steam."[160] The source category EPA designates under CAA Section 111 should cover not only these particular process units but also the entire facility; as discussed above, facility-wide emissions pose unacceptable risks for communities.[161]

Although Congress intended that the source categories mirror each other—the list of source categories promulgated pursuant to CAA section 112 should track the list of source categories promulgated pursuant to CAA section 111[162]—ethylene and propylene production facilities have not been listed pursuant to CAA section 111 and no NSPS has been promulgated for them. The new source category should also include polymerization facilities because these processes are generally co-located in petro-plastics complexes, and a comprehensive approach to regulation is needed to protect public health and the environment from these harms, as discussed further in Section IV.c.

Once the Administrator lists ethylene, propylene, polyethylene, and polypropylene facilities as a source category under CAA section 111, it must establish an NSPS for this source category within one year of listing pursuant to CAA section 111(b)(1)(B).[163]

b. Onsite Power Needs Should Be Met with Renewable Energy.

As discussed in Section II.b.iii, greenhouse emissions from fossil fuels must be phased out globally within the next few decades in order to limit temperature increases to 1.5°C above pre-industrial levels. Petrochemical production is an incredibly energy intensive process—about 85 percent of the global petrochemical industry's CO_2 emissions are attributable to fuel combustion, while the remaining 15 percent come from production processes.[164] These GHG emissions "endanger both the public health and welfare of current and future generations."[165] A variety of low-cost energy technologies exist that can power petro-plastics facilities; in light of low-cost wind and photovoltaic energy, combustion of fossil fuel is not BSER.

---

[159] National Emission Standards for Hazardous Air Pollutants; Revision of Initial List of Categories of Sources and Schedule for Standards Under Sections 112(c) and (e) of the Clean Air Act Amendments of 1990, 61 Fed. Reg. 28197 (June 4, 1996); 40 C.F.R. § 63.1103.
[160] 84 Fed. Reg. 54278, 54280 (Oct. 9, 2019).
[161] *See also* National Emission Standards for Hazardous Air Pollutants: Generic Maximum Achievable Control Technology Standards Residual Risk and Technology Review for Ethylene Production, 84 Fed. Reg. 54278, 54310 (Oct. 9, 2019)(describing how facility-wide emissions of HAPs indicate an estimated maximum individual risk rate of 2000-in-1 million, indicating that confining the source category to these particular process units is not adequately protecting public health).
[162] 42 U.S.C. § 7412(c)(1).
[163] 42 U.S.C. § 7411(b)(1)(B).
[164] IEA Future of Petrochemicals.
[165] Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act, 74 Fed. Reg. 66,496 (Dec. 15, 2009); *see also* USEPA Endangerment TSD.

At petrochemical production facilities, all onsite power needs, including for emergency equipment, should be met with renewable energy derived from solar, wind, and other sustainable fuel sources and battery storage. 40 C.F.R. subparts Db and IIII and other applicable subparts should be amended to this effect.

In the alternative, to the extent fossil fuels are used, they should only be permitted during start up and shut-down, or in emergencies, and only gaseous fuels should be allowed to be burned in any process unit located at the affected facility. Combustion of gaseous fuels emits much less PM and SO_2 than does combustion of liquid or solid fuels. No liquid or solid fuels should be allowed to be burned in any boiler or heater located at the affected facility, except during start-up.[166]

c. The MACT for Ethylene and Propylene Production Must Be Reviewed and Revised to Effectively Eliminate Emissions of HAPs from Petro-Plastics Production.

EPA must ensure that any new petro-plastics facilities built in the coming decade are equipped with the most stringent control technology to minimize HAPs emissions. The NESHAPs require EPA to set standards for HAPs emissions that "provide an ample margin of safety to protect public health."[167] EPA should prohibit the discharge of HAPs—especially those HAPs which have been designated as known or probable carcinogens by the International Agency for Research on Cancer—to non-detectable limits.

EPA's NESHAP for the ethylene production source category, initially developed in 2000, [168] resulted in a Generic MACT, promulgated in 2002.[169] This Generic MACT must be updated to ensure public health is protected with an ample margin of safety.

EPA recently issued its Residual Risk Technology Assessment of this Generic MACT, in which the agency evaluated whether the Generic MACT protects public health with an adequate margin of safety.[170] EPA found that, if some relatively minor proposed amendments were instituted, the Generic MACT does so. However, the residual risk analysis understates the risks from these source categories and facilities.

Most glaringly, the risk assessment fails to analyze the risks from cumulative exposure to toxic pollutants. As discussed above, many of the process units that convert ethane and propane into ethylene and propylene are co-located with refineries and polymerization facilities—the Formosa Project in St. James Parish, Louisiana, for example, applied for fourteen different CAA permits to regulate as many different major stationary sources of air pollution. Compounding this is the fact that these facilities are clustered together near feedstock sources and export terminals—

---

[166] See Appendix A for proposed amendments to 40 C.F.R. §§ 60.44b(a); 60.47b; 60.48b(e); 60.49b.
[167] 42 U.S.C. § 7412(f)(2)(A).
[168] *See e.g.* National Emission Standards for Hazardous Air Pollutants: Generic Maximum Achievable Control Technology, 65 Fed. Reg. 76408 (Dec. 6, 2000).
[169] 67 Fed. Reg. 47258 (July 12, 2002).
[170] 84 Fed. Reg. 54278, 54294 (Oct. 9, 2019).

Formosa would be just one addition to an array of petro-chemical plants in an area along the Mississippi dubbed "Cancer Alley" because of the devastating impacts to communities nearby.[171] But the risk assessment does "not attempt to quantify the HAP risk that may be associated with emission from other facilities that do not include the source category,"[172] even though it acknowledges that "facility-wide emissions data indicate the estimated cancer [maximum individual risk] is 2,000-in-1 million," or five times higher than when cancer risk is evaluated from the source category alone.[173] This threshold is 20 times the allowable limit.[174] This fundamental flaw means that the risks from ethylene and propylene production are under-estimated and therefore any updates to the Generic MACT will not adequately protect public health.

In addition, the technological and work process amendments proposed by EPA do not represent MACT. EPA identifies some technological and/or work process updates that would reduce HAP emissions but declines to adopt them.[175] For transfer racks, for example, EPA declines to adopt a viable control mechanism because it would only apply to one member of the source category.[176] Currently, the source category only includes only 31 members—but, as discussed above, many more of such facilities are planned. EPA must ensure the most stringent technology available is in place to address HAP emissions before these new facilities come on-line.

EPA must also eliminate all unlawful malfunction and shutdown exemptions. The proposed rule appropriately proposes to remove "general exemptions" from emissions standards that apply during start-up, shutdown, and malfunction,[177] but simultaneously proposes several new, unlawful exceptions.[178] These new exceptions would allow, for example, pressure relief devices and flares to release unlimited amounts of pollution up to two times every three years, from each device. These releases are unacceptable: each release poses enormous health threats to frontline communities and are eminently preventable with better control devices, maintenance, and monitoring.

There proposed exemption from emissions standards for "force majeure" events, such as natural disasters or loss of power, is similarly unacceptable.[179] EPA must require that facilities *prepare* for such events, by, for example, installing a back-up power system and fortifying their facilities, rather than giving operators a free pass to pollute. Climate change promises that such events will occur with increasing frequency and severity—EPA must require that facilities protect

---

[171] *See e.g.* Younes, Llya et al., *In a Notoriously Polluted Area of the Country, Massive New Chemical Plants Are Still Moving In*, PROPUBLICA, Oct. 30, 2019, https://projects.propublica.org/louisiana-toxic-air/.
[172] *Id.* at 54238.
[173] *Id.* at 54310.
[174] *Id.*
[175] For example, the proposed rule identifies three viable control mechanisms to reduce emissions from storage vessels but only adopts 1 (*Id.* at 54314), and identifies a viable control mechanism to reduce emissions from transfer racks but fails to adopt it. *Id.* at 54316.
[176] *Id.* at 54316.
[177] *Id.* at 54294 (citing *Sierra Club* v. *EPA, 551 F.3d 1019* (D.C. Cir. 2008)).
[178] *Id.* at 54296.
[179] *Id.* at 54304.

communities from toxic air pollutants during such events. In order to fulfill its statutory duty to protect public health with an adequate margin of safety, EPA must revisit the Generic MACT for Ethylene Production to ensure that the risks to impacted communities are adequately addressed by analyzing the cumulative impacts from toxic air emissions. EPA should adopt the most stringent technology available to reduce these HAP emissions to non-detect levels and eliminate unlawful loopholes.

In addition, EPA should consider introducing a new source category to control facility-wide emissions, which mirrors the source category proposed under CAA Section 111 in Section IV.a of this document, or institute a rulemaking to determine how to reduce facility-wide HAP emissions to non-detect levels.

d. Greater Efficiency Should Be Required From Control Devices to Reflect BSER and Certain Control Devices, Such as Flares, Should Not Be Allowed.

i. Flaring should be prohibited except as necessary solely for safety reasons in an emergency.

Flares are used to dispose of waste gases from industrial operations and vented gases from furnaces and boilers. Flares are either situated at ground level (ground flares) or elevated on stacks (elevated flares). Flares use a high-temperature oxidation process to burn the combustible components, including hydrocarbons, of these waste gases. When combusted, these waste gases react with atmospheric oxygen to form CO_2 and water.[180] Flares also emit particulate matter, unburned hydrocarbons, carbon monoxide, NO_x, VOCs, and sometimes (depending on the waste gas composition) SO_2. Besides smoke and harmful air pollution, flares also produce noise pollution, light pollution, and large quantities of heat.[181]

Flaring is an easy way for owners and operators to dispose of waste gases but comes at great expense to public health and the environment. In plastics production these waste gases are largely recoverable. By definition, flare gases must have substantial fuel value in order to be combusted. Petro-plastics facilities should be required to utilize all vent and waste gases in the fuel gas system for these plants. To comply with this requirement, facilities will need to include storage systems so that vent and waste gas generation can be balanced with fuel needs over time. Storage technology exists and is widespread today; for example, Formosa's planned ethylene plants in St. James, Louisiana would use pressurized spheres to store gas from other process units, but these pressurized spheres could also store gas that would otherwise be routed through flares.[182] A prohibition against flaring would drastically reduce air, noise, light, and heat pollution and increase the efficiency of these facilities by combusting waste gases for fuel.

---

[180] U.S. Environmental Protection Agency, Industrial Flares, Ch.13.5 *in* AP 42: Compilation of Air Emissions Factors, Fifth Ed., Vol. 1 (2018), *available at* https://www3.epa.gov/ttn/chief/ap42/ch13/index.html.
[181] U.S. Environmental Protection Agency, Air Pollution Control Technology Fact Sheet (2003) ("EPA-CICA Flare Factsheet"), *available at* https://www3.epa.gov/ttn/catc/dir1/fflare.pdf
[182] The Ethylene 1 plant in the Formosa project uses six of these units to store ethylene. AUC Interest No. 198351 & Proposed Title V Permit No. 3141v0

A narrow exception should be made for flaring that is necessary solely for safety reasons in an emergency—for example, to control a large volume of pollutants resulting from emergency process upsets that might pose a danger to workers or the surrounding community.[183] Some jurisdictions already require similar measures for flaring from petroleum refineries.[184]

As such, Petitioners propose EPA insert the following language into 40 C.F.R. Part 63.670(a):

> Flaring is not permitted unless it is necessary for safety in an emergency.

In addition and as discussed further below, all references to flaring in the NSPS should be to 40 C.F.R. Part 63.670 and 63.671 in lieu of 40 C.F.R. 60.18. Where necessary, other subparts of the 40 Part 60 should be updated to reflect this requirement.

ii. All references to flaring in the NSPS should be to 40 C.F.R. Part CC.

40 C.F.R. Subpart CC codifies the NESHAP MACT requirements for petroleum refineries; parts 63.670 and 63.671 include requirements for flares. These provisions, introduced in 2015 and amended twice since, represent the most up-to-date regulations on flare control devices and work processes and as such reflect the current understanding of parameters that affect flare efficiency.[185] By contrast, the substantive requirements for flares in 40 C.F.R. Part 60.18—the NSPS provision governing general control device and work practices—were last updated in 2000, almost twenty years ago.[186] Technology develops apace—concomitant regulations should as well. In fact, EPA recently recognized that the General Provisions in 40 C.F.R. Part 60.18are "inadequate to ensure proper performance of flares at refineries and other petrochemical facilities (including ethylene production units), particularly when either assist steam or assist air is used."[187] EPA's Residual Risk and Technology Review of the Generic MACT for ethylene production proposes to incorporate many of the operational and monitoring requirements for flaring at refineries into those standards.

---

[183] EPA-CICA Flare Factsheet.

[184] The Bay Area Air Quality Management District prohibits non-emergency flaring from petroleum refineries unless flaring complies with a Flare Minimization Plan. BAAQMD Regulation 12: Miscellaneous Standards of Performance, Rule 12: Flares at Petroleum Refineries (2006), http://www.baaqmd.gov/~/media/dotgov/files/rules/reg-12-rule-12-flares-at-petroleum-refineries/documents/rg1212.pdf?la=en; http://www.baaqmd.gov/~/media/files/communications-and-outreach/publications/news-releases/2007/flareplan_070719.pdf?la=en; *see also* San Joaquin Valley Air Quality Management District, Rule 3411 (Flares) Further Study (2014), *available at* http://valleyair.org/Air_Quality_Plans/docs/R4311.pdf.

[185] *See* Petroleum Refinery Sector Risk and Technology Review and New Source Performance Standards, 80 Fed. Reg. 75178, 75258 (Dec. 1, 2015); National Emission Standards for Hazardous Air Pollutant Emissions: Petroleum Refinery Sector Amendments, 81 Fed. Reg. 45232, 45241 (July 13, 2016); National Emission Standards for Hazardous Air Pollutants and New Source Performance Standards: Petroleum Refinery, Amendments for Testing and Monitoring Provisions, 83 Fed. Reg. 60696, 60720 (Nov. 26, 2018).

[186] *See* Amendments for Testing and Monitoring Provisions, 65 Fed. Reg. 61744, 61752 (Oct. 17, 2000).

[187] National Emission Standards for Hazardous Air Pollutants: Generic Maximum Achievable Control Technology Standards Residual Risk and Technology Review for Ethylene Production, 84 Fed. Reg. 54278, 54294 (Oct. 9, 2018).

In petro-plastics facilities, the requirements in 40 C.F.R. Parts 63.670 and 63.671 represent BSER for flares under the NSPS. The provisions in 40 C.F.R. Parts 63.670 and 63.671 are not performance standards for HAPs emissions but rather equipment and process specifications and monitoring requirements that are equally applicable to the emissions of criteria pollutants governed under the NSPS. Flares are not dependent on the type of facility in which they are installed—flaring technology is the same whether used in petroleum refineries or petrochemical production facilities like ethane crackers.[188] And in fact, many petrochemical production facilities are co-located with refineries—this amendment would ensure consistency across process units and between the NESHAP, MACT, and NSPS standards and considerably reduce emissions of VOCs and HAPs.[189]
As such, all references to 40 C.F.R. Part 60.18 in the NSPS should be amended to refer to 40 C.F.R. Parts 63.670 and 63.671.[190]

iii. Efficiency standards for VOC emissions from closed vent systems and control devices should be updated to reflect the best systems of emissions reductions.

Vapor recovery systems are compression systems used to remove and recover vapors from storage tanks.[191] Currently, vapor recovery systems are required to be designed and operated to recover VOC emissions vented to them with an efficiency of 95 percent or to an exit concentration of not 20 ppm by volume, whichever is less stringent.[192] These efficiency levels do not reflect BSER. Vapor recovery systems are currently designed to achieve much higher levels of efficiency.[193] For example, Formosa designed its latest facility such that thermal oxidizers would achieve a control efficiency of 99.9 percent and vapor combustors would achieve a control efficiency of 98 percent. To reflect this, 40 C.F.R. Part 60.482-10a should be revised so that vapor recovery systems are required to be designed and operated to recover VOC emissions vented to them with an efficiency of 99 percent or greater or to an exit concentration of 5 ppm by volume, whichever is more stringent.[194] In the alternative, vapor recovery systems should be required to be designed and operated to recover VOC emissions vented to them with an efficiency of 98 percent or to an exit concentration of 5 ppm by volume, whichever is greater.[195]

---

[188] *Id.*
[189] *See Id.* at 54301.
[190] The code provisions implicated by these amendments include but are not limited to 40 CFR 60.112b(a)(3)(ii); 60.482-10a; 60.662(b); 60.563-1(a)(1)(i)(C). *See* Appendix A for proposed amendments to these provisions.
[191] Hy-BonEDI, Best Practices for Vapor Recovery Systems to Reduce Venting and Flaring, presentation to USEPA by Jeff Voorhis (2015), https://www.epa.gov/sites/production/files/2016-04/documents/8voorhis.pdf.
[192] 40 C.F.R. § 60.482-10a(b).
[193] *See* Louisiana Department of Environmental Quality Office of Environmental Services, Proposed Permits for FG LA Complex, FG LA, LLC, Welcome, St. James Parish, Louisiana, Agency Interest No. 198351: Proposed Permits Nos. 3145-V0 (Polypropylene plant); 3143-V0 (HDPE plant); 3152-V0 (HDPE plant); 3142-V0 (Ethylene Glycol 1 plant); 3151-V0 (Ethylene Glycol 2 plant); 3144-V0 (LLDPE plant); 3141-V0 (Ethylene 1 plant); 3150-V0 (Ethylene 2 plant); 3145-V0 (propylene plant); 3147-V0 (logistics) (2019) ("Formosa Draft Permits").
[194] *See* Appendix A for proposed language addition to 40 CFR 60.482-10a(b).
[195] *Id.*

Likewise, standards for enclosed combustion devices should be updated because they no longer reflect BSER. Like flares, enclosed combustion devices combust waste and vent gases. Unlike flares, they are enclosed, minimizing smoke emissions.[196] The NSPS currently requires that such devices be designed and operated to recover VOC emissions vented to them with an efficiency of 95 percent or to an exit concentration of 20 ppm by volume, on a dry basis, whichever is less stringent or to provide a minimum residence time of .75 seconds at a minimum temperature of 816 ̊C.[197] Enclosed combustion devices can achieve much higher levels of efficiency, as demonstrated by recently issued petrochemical production facility air permits.[198] As such, the current standard does not reflect BSER. To better reflect BSER, 40 Part 60.482-10a(c) should be revised to require that enclosed combustion devices be designed and operated to recover VOC emissions vented to them with an efficiency of 99 (or in the alternative, 98 percent) or greater or to an exit concentration of 5 ppm by volume, on a dry basis, whichever is less stringent or to provide a minimum residence time of 1.5 seconds at a minimum temperature of 650 ̊C.

iv. Efficiency standards for total organic compound emissions from petrochemical production should be amended to reflect available technology.

Total organic compounds ("TOC") include all VOCs and other pollutants such as toxics, HAPs, and semivolatile compounds. NSPS standards impose efficiency standards for TOC emissions from distillation units and reactor processes.[199]

Distillation units use a physical separation process to convert mixtures of liquids into their constituent components. The emissions from these process units are primarily fugitive emissions; monomers, solvents, and other components escape through leaks.[200] Currently, the NSPS standards require that TOC emissions[201] from SOCMI distillation units be reduced by 98 weight-percent, or to a TOC concentration of 20 parts per million by volume ("ppmv") on a dry basis.[202] However, distillation units can be designed to better control fugitive emissions achieve greater levels of efficiency.[203] This standard should be updated accordingly; for SOCMI distillation operations, TOC emissions should be required to be reduced by 99 weight-percent, or to a TOC concentration of 5 ppmv on a dry basis.[204]

Similarly, standards for SOCMI reactor processes currently require that TOC emissions, except for methane and ethane, be reduced by 98 weight-percent, or to a TOC concentration of 20 ppmv

---

[196] Hy-Bon EDI, Enclosed Vapor Combustors Units and Air Quality Regulations (2017), https://hy-bon.com/blog/enclosed-vapor-combustors-units-and-air-quality-regulations/.
[197] 40 C.F.R. § 60.482-10a(c).
[198] *See* Formosa Draft Permits.
[199] *See* 40 C.F.R. §§ 60.662 and 60.702.
[200] *See e.g.* Seah, Yieng Shing et al., Considering Fugitive Emissions During the Conceptual Design Stage, Chemical Engineering (Nov 1, 2016), https://www.chemengonline.com/considering-fugitive-emissions-conceptual-design-stage/.
[201] Petitioners note that methane and ethane are exempt from the definition of TOC, although both of these pollutants contribute to climate change and negatively impact public health. EPA should remove this loophole.
[202] 40 C.F.R. § 60.662(a).
[203] *See* Section IV.e
[204] *See* Appendix A for proposed language addition to 40 CFR Subpart NNN, § 60.662.

on a dry basis, whichever is more stringent.[205] Fugitive emissions from reactor processes can be better controlled. As such, TOC emissions, except for methane and ethane, from reactor processes should be required to be reduced by 99 weight-percent, or to a TOC concentration of 5 ppmv on a dry basis.[206]

e. Fugitive Emissions and Leaks Should Be Greatly Reduced Through Equipment Specifications That Reflect BSER and Commonsense Improvements in Monitoring and Repair Requirements.

Petro-plastics production facilities are large and complex, with many constituent elements. A single facility might contain dozens of pumps, compressors and pressure relief devices. These process units are connected by miles of pipes, requiring thousands of valves, flanges, and other connectors. Each of these components introduces the possibility of leaks and concomitant fugitive emissions.

Fugitive emissions have a disproportionate impact at a facility. Because these emissions escape from process units at points other than designated release points, they are neither captured nor controlled. They are spread throughout the facility and therefore difficult to detect. The potential cumulative impact of emissions from these components is enormous; EPA has determined that leaking equipment is the largest source of VOC emissions from chemical manufacturing facilities.[207] For a typical SOCMI facility, it is estimated that fugitive emissions could account for up to 69% of total emissions.[208] Consequently, robust leak detection and repair requirements are essential to minimizing harmful air pollutants from these facilities.

However, the NSPS and NESHAP standards for leaks do not reflect BSER and as such expose communities and the environment to many tons of harmful air pollutants.

i. Leak-less or seal-less designs should be required to the maximum degree possible.

As discussed above, a single petrochemical production facility presents thousands if not tens of thousands of opportunities for the uncontrolled emission of harmful air pollutants, totaling potentially hundreds or thousands of tons per year of criteria, VOC, and HAP emissions per plant.

These potential leaks could be drastically reduced via the implementation of leak-less or seal-less designs that obviate the possibility of fugitive emissions. Leak-less or seal-less designs are available for many components, such as pumps and valves, and EPA recommends their use and

---

205 40 C.F.R. § 60.702(a).

206 *See* Appendix A for proposed language addition to 40 CFR, Subpart RRR, § 60.702.

207 U.S. Environmental Protection Agency, Leak Detection and Repair Guide: A Best Practices Guide (2007) ("USEPA Leak Detection Guide"), https://www.epa.gov/sites/production/files/2014-02/documents/ldarguide.pdf, *at* p. 2.

208 Cowen, William, Introduction to Fugitive Emissions Monitoring, North Carolina State University (2000), *available at* https://trainex.org/web_courses/subpart_x/TopicSearch%20pdf%20files/pdf%20docs%20ABC/APTICourse380.pdf

has for over a decade.[209] The NSPS and NESHAPs should require that facilities be designed and operated with leak-less and seal-less components wherever possible but especially for hard-to-monitor components, such as elevated components, or for components in inaccessible locations.

Language reflecting this requirement should be introduced into the NSPS for VOC emissions from SOCMI equipment leaks, codified at 40 C.F.R. Part 60, Subpart VVa and the NESHAP for equipment leaks of benzene, codified at 40 C.F.R. Part 61, Subpart J.

ii. Open-ended valves or lines should be prohibited except when necessary for solely safety reasons.

Currently, the NSPS and NESHAPs allows open-ended valves or lines as part of a facility's standard operating procedure.[210]

These open-ended valves and lines result in large quantities of harmful emissions—about 5-10% of a facility's VOC emissions, by one estimate.[211] Although open-ended valves or lines are required to be equipped with caps, blind flanges, plugs, or a second valve,[212] seals and leaks still result in fugitive emissions at these joinders. Further, facility owners and operators frequently neglect to cap open-ended valves and lines, as evidenced by numerous enforcement actions taken by the Department of Justice. For example, between 2008 and 2016, Lima Refining Company failed to cap 98 open-ended lines and valves at one of its refineries in Texas.[213] Between 2006 and 2008 at one of its Alaska facilities, Tesoro failed to cap open-ended valves and lines at eight unique process units and twelve tanks.[214] Other examples abound.[215]

Further, there is no technological justification for open-ended lines and valves—the fact that they are allowed is a process concession to industry. Clearly, open-ended lines and valves are not BSER. 40 C.F.R. Part 60.482-6a should be amended so that open-ended lines and valves are permitted only when necessary solely for safety purposes.

iii. Owners and operators should be required to use Optical Gas Imaging technology to monitor for fugitive emissions.

---

[209] USEPA Leak Detection Guide, *at* pp. 3, 13.
[210] *See e.g.* 40 C.F.R. §§ 60.482-6a; 61.242-6.
[211] USEPA Leak Detection Guide *at* Table 3-3.
[212] 40 C.F.R. §§ 60.482-6(a)(1), 60.482-6a(a)(1).
[213] Petitioner's Complaint, *United States of America v. Lima Refining Company* Dkt.# 1 (N.D. of Ohio June 22, 2017), *available at* https://www.justice.gov/sites/default/files/pages/attachments/2017/06/29/env_enforcement-2668743-v1-filed_complaint.pdf; *Id. at* paragraph 102.
[214] Petitioner's Complaint, *United States of America et al. v. Tesoro Refining & Marketing Company LLC et al.* Dkt. #1 (W.D of Texas July 18, 2016), *available at* https://www.justice.gov/sites/default/files/enrd/pages/attachments/2016/07/18/1_-_complaint.pdf; *Id. at* paragraph 289.
[215] Petitioner's Complaint, *United States of America et al. v. WRP Refining LP et al.* Dkt. #1 (S.D. of Illinois August 10, 2018), *available at* https://www.justice.gov/enrd/consent-decree/file/1087636/download see paragraph 237; Petitioner's Complaint, *United States of America et al. v. Toledo Refining Company LLC* Dkt#1 (N.D. of Ohio January 30, 2019), *available at* https://www.justice.gov/enrd/consent-decree/file/1127986/download, *at* paragraphs 134-135.

Currently, the NSPS for SOCMI equipment requires owners and operators monitor for fugitive emissions using EPA Method 21.[216] Optical gas imaging ("OGI") is a more efficient method for discovering significant leaks and has the potential to reduce the cost of LDAR compliance. OGI technology directly measures emissions rates compared to Method 21's estimation process that has significant error potential.[217]

The NSPS for crude oil and natural gas facilities requires OGI monitoring but also allows, as an alternative, Method 21 with a repair threshold of 500 ppm to allow at least the level of emissions reductions that would be achieved using OGI.[218] EPA "found OGI to be more cost-effective at detecting fugitive emissions than the traditional protocol for that purpose, Method 21, and the EPA, therefore, identified OGI as the BSER for monitoring fugitive emissions at well sites."[219] Requiring OGI technology for monitoring fugitive emissions (among other requirements), EPA found, would "promote improved compliance and better environmental outcomes" and "provide opportunities for owners and operators to reduce obligations by making particular choices, reduce the burden for both the regulated industry and the agencies providing oversight, and provide greater transparency for all parties, including the public."[220] As such, OGI is BSER and should be required for petrochemical production facilities on a quarterly basis.

The NSPS for the SOCMI and polymer manufacturing industry should be updated to require OGI monitoring.[221] Alternatively, the NSPS for SOCMI and the polymer manufacturing industry should be updated to require OGI monitoring but allow the Administrator to approve Method 21 monitoring with a repair threshold of 500 ppm or less upon written application by the owner or operator.

iv. Owners and operators should be required to use Continuous Emissions Monitoring Systems to determine compliance.

Continuous Emissions Monitoring Systems ("CEMS") is an instrument that continuously measures actual emissions levels from a stationary source. CEMS ensures that stationary sources and categories or sources are continuously complying with emissions limits and allows owners and operators to act quickly when emissions exceedances are detected. CEMS is BSER and should be required to determine compliance with the NSPS for SOCMI units and units in the polymer manufacturing industry.

---

[216] *See* 40 C.F.R. § 60.482-1a(c)(4).

[217] Zeng, Yousheng et al, New Optical Gas Imaging Technology for Quantifying Fugitive Emissions Rates, 2015 LDAR symposium (2015).

[218] Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources, 81 Fed. Reg. 35824, 35857 (June 3, 2016); 40 CFR 60.5397a.

[219] Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources, 81 Fed. Reg. 35824, 35856 (June 3, 2016), *see also* 80 Fed. Reg. 56593, 56636 (Sep. 18, 2015).

[220] *Id. at* 35848 (June 3, 2016).

[221] Amendments to this effect should be introduced to 40 C.F.R. § 60.482-1a and other applicable subparts.

CEMS is a widely available, rapidly advancing technology[222] and consequently has been required in the NSPS beginning in the 1970s. CEMS was required in the NSPS for sulfuric acid plants in 1974,[223] electric utility boilers beginning in 1979,[224] industrial boilers in 1987,[225] commercial boilers in 1990,[226] large municipal waste combustion units in 1991 and 1995,[227] to name a few. There is no technological reason why the NSPS for SOCMI and polymer manufacturing industry process units do not require CEMS.

40 C.F.R. Subparts NNN and DDD should be updated to require continuous, rather than hourly, monitoring for incinerators, flares, boilers or process heaters, HDPE/LDPE/LLDPE units and associated valves, and any other affected process.[228] Associated recordkeeping provisions should be updated to reflect this change.

v. The stringency of detection, monitoring, and repair standards in the NSPS and NESHAPs should be increased to reflect demonstrably achievable limits for equipment leaks for VOCs.

Leaks, once detected, must be fixed. However, for many SOCMI and polymer manufacturing industry process units, leaks are defined as emissions levels that are many times higher than what monitoring technology can feasibly detect, leading to large quantities of undetected emissions that could be detected and then controlled. Increasing the stringency of leak definitions to reflect the emissions levels OGI and other monitoring methodologies can detect will lead to a large magnitude of emissions reductions at relatively low costs and thus represents BSER.

Specifically, leaks from pumps handling polymerizing monomers are currently defined as 5,000 ppm—this definition should be amended so that a leak is defined as 500 ppm.[229] For pumps, valves, and connectors in heavy liquid service and pressure relief devices in light liquid or heavy liquid service, the definition of a leak should be revised from 10,000 ppm to 250 ppm.[230]

Similarly, the de minimis level for all components—the instrument reading that designates a component as having "no detectable emissions"—should be reduced from 500 ppm above background levels to 50 ppm throughout 40 C.F.R. 60, subpart VVa to reflect the capacity of

---

[222] *See e.g.* Gasmet, Continuous Emissions Monitoring System (CEMS II e), https://www.gasmet.com/products/category/emission-monitoring-systems/continuous-emissions-monitoring-system-cems-ii-e/ Gasmet CEMS that can measure TOC; IEEE Global Spec, Continuous Emissions Monitoring Systems (CEMS) Information, https://www.globalspec.com/learnmore/manufacturing_process_equipment/air_quality/continuous_emissions_monitoring_systems_cems (Siemens, Cubic Sensor and Instrument Co., Ltd.)

[223] 40 C.F.R. Part 60, subpart H, *see also* Standards of Performance for New Stationary Sources: Emission Monitoring Requirements and Performance Testing Methods, 39 Fed. Reg. 32852 (Sep. 11, 1974).

[224] 40 C.F.R. Part 60, subpart Da; *see also* Standards of Performance for New Stationary Sources and Emission Guidelines for Existing Sources: Large Municipal Waste Combustors, 72 Fed. Reg. 13016, 13019 (Mar. 20, 2007).

[225] 40 C.F.R. Part 60, subpart Da; *see also* 72 Fed. Reg. 13016, 13019 (Mar. 20, 2007).

[226] 40 C.F.R. Part 60, subparts Ea and Eb; *see also* 72 Fed. Reg. 13016, 13019 (Mar. 20, 2007).

[227] 40 C.F.R. § 60.1225.

[228] *See* Appendix A for proposed amendments to 40 C.F.R. §§ 60.663(a)(2); 60.665(b)(1)(i); 60.663(b)(2); 60.663(c)(1); 60.665(b)(2)(ii); 60.563(a)(3) and 60.563(cd)(1).

[229] *See* Appendix A for proposed amendments to 40 CFR §§ 60.482-2a(b)(1)(i-ii) and 60.482-2a(d)(4)(ii)(A).

[230] See Appendix A for proposed revisions to 40 CFR 60.482-7a(d)(1-2).

monitoring technologies.[231] 40 C.F.R. 61 subpart FF (the NESHAP for benzene waste operations) should be similarly updated.

The NSPS that apply to petrochemical production facilities currently allow long delays after a leak is detected in certain components before repairs must be attempted or completed, resulting in massive quantities of harmful emissions. In some instances, operators are allowed to wait almost a week before even *attempting* to repair a leak. When a leak is detected in a SOCMI compressor, an operator may wait five days until making a "first attempt at repair."[232] Petro-plastics facilities run 24 hours a day, seven days a week. There is no technological or operational reason that can justify such delays. Operators should not be allowed to let malfunctioning equipment languish but rather should be required to repair leaks and malfunctions within a reasonable timeframe.

The delay of repair provisions in 40 C.F.R. subpart VVa should be amended so that delay of repair for equipment for which leaks have been detected is only allowed if repair within 3—not 15—days is technically infeasible without a process unit shutdown. For pumps, repair should be completed within 1—not 6—months after detection.[233]

For leaks identified in SOCMI compressors, valves in gas/vapor service and in light liquid service,[234] pumps, valves, and connectors in heavy liquid service and pressure relief devices in light liquid or heavy liquid service, [235] the first attempt at repair should be required to be made within 1 calendar day after the leak is identified, rather than 5 days as currently allowed. After a pressure release, a new rupture disk should be required to be installed no later than 1 calendar day after the release, rather than 5 days.[236] Once a leak is detected in a pump, valve, or connector, operators should be required to repair it within 3 days of detection, not 15.[237]

The frequency with which valves and connectors must be monitored should be increased. A single plant could include thousands or tens of thousands of connectors and/or valves—leaks from even a small proportion of these components represents massive quantities of emissions. An owner or operator should be required to monitor 100 percent—not half—of the connectors within 2—not 4 years of the start of the monitoring period.[238] When a process unit has already exhibited leaks in some of its components, greater scrutiny is warranted. The threshold for requiring all connectors be monitored within 6 months should be lowered from .35 percent to .1 percent of leaking connectors, and monitoring should be required with 2—not 8—years of the start of the monitoring period.[239] Similarly, new valves in a process unit with leaks should be

---

[231] *See* Appendix A for proposed amendments to these subparts, including but not limited to 40 C.F.R. §§ 60.482-2a, 60.482-3a, 60.482-7a, 60.482-10a, 60.482-11a, 61.341, 61.343, 61.344, and 61.345.
[232] 40 CFR § 60.482-3a(g)(2).
[233] See Appendix A for proposed revisions to 40 C.F.R. §§ 60.482-9a(a) and (d)(2).
[234] See Appendix A for proposed revisions to 40 C.F.R. § 60.482-7a(d)(1) and (2)
[235] See Appendix A for proposed revisions to 40 C.F.R. § 60.482-8a(a)(1-2).
[236] See Appendix A for proposed revisions to 40 C.F.R. § 60.482-4a(d)(2)
[237] See Appendix A for proposed revisions to 40 C.F.R. §§ 60.482-2a(d)(6)(ii-iii); 60.482-7a(d)(1-2); 60.482-8a(a)(1-2)
[238] See Appendix A for proposed revisions to 40 C.F.R. § 60.482-11a(b)(3)(iii)(A).
[239] See Appendix A for proposed revisions to 40 C.F.R. §§ 60.482-as11a(b)(3)(iii)(B-C); 60.482-11a(b)(3)(iii)

monitored frequently. Monitoring should only be allowed at the next scheduled monitoring event or within 90 days when less than .5 percent, not 2.0 percent, of valves in a process unit are leaking.[240]

The NSPS currently exempts equipment leaks from some petrochemical production process units—for example, VOC emissions from equipment leaks from poly(ethylene terephthalate) production—from regulation.[241] There is no technological or process justification for these exemptions and they should be removed to ensure all harmful emissions from petrochemical production are controlled.[242]

Recordkeeping requirements throughout the NSPS and NESHAPs should be updated to reflect continuous monitoring requirements. Continuous recordkeeping will foster transparency and owner/operator accountability and ensure leaks are repaired in a timely fashion so as to reduce harmful emissions from petrochemical production and their impacts to public health and the environment.

f. Allowable Emissions of Total Organic Compounds From HDPE/LDPE/LLDPE Production Units in the Polymer Manufacturing Industry Should Be Reduced to Reflect BSER.

VOC emissions from units that manufacture high density polyethylene ("HDPE"), low density polyethylene ("LDPE"), and linear low density polyethylene ("LLDPE") from ethylene are regulated under 40 C.F.R. 60, subpart DDD. Currently, emissions of total organic compounds ("TOC") (minus methane and ethane) from these units must be reduced by 98 weight percent, or to a concentration of 20 parts per million by volume, whichever is less stringent.[243] However, much greater efficiency gains are practicable. For example, the draft permit for the Formosa plant in St. James Parish, Louisiana, designed its two HDPE units and its LLDPE unit to have a control efficiency of 99.9% for VOCs and HAPs;[244] its LDPE unit is designed with a control efficiency of 99%.[245] EPA should update Subpart DDD of the NSPS apace.

Emissions of TOCs should be required to be reduced by 99 weight or to a concentration of 5 parts per million by volume, whichever is less stringent. The threshold level of TOC emissions allowable from uncontrolled[246] and controlled[247] vent streams should be similarly decreased.

g. Internal Floating Roof Tanks Are BSER and Should Be Required.

---

[240] See Appendix A for proposed revisions to 40 C.F.R. § 60.482-7a(a)(2)(ii)
[241] 40 C.F.R. § 60.450(a)(4).
[242] *See* Appendix A for proposed amendments to 40 C.F.R. Subpart DDD, § 60.560.
[243] 40 C.F.R. § 60.562-1(a)(1)(i)(A).
[244] *See* Formosa Proposed Permits Nos. 3143-V0 (HDPE 1); 3152-V0 (HDPE 1); and 3144-V0 (LLDPE)
[245] *See Id.* at Permit No. 3153-V0 (LDPE);
[246] *See* Appendix A for proposed amendment to 60.562-1(a)(ii).
[247] *See* Appendix A for proposed amendment to 60.562-1(a)(iii).

Storage tanks result in vapor that leaks into the atmosphere via fittings and seals or during filling/emptying operations as harmful emissions.[248]

For storage tanks, internal floating roof tanks are BSER. Internal floating roof tanks have both a permanent fixed roof and a floating roof inside that is either supported by vertical internal support columns or is self-supporting. The floating roof rises and falls with the liquid level, achieving a no vapor zone which both reduces the potential for harmful emissions and accidents.[249]

Internal floating roof tanks date back to the 1950s and have been required in similar regulatory contexts for decades. For example, in 1999 EPA designated internal floating roof tanks and external floating roof tanks as MACT for tanks.[250] Similarly, EPA's proposed amendments to the Generic MACT for Ethylene Production would require that storage tanks that store HAPs route emissions to a closed vent system and pollution control device <u>or</u> use an external floating or internal floating roof tank.[251] However, the Generic MACT proposal does not represent BSER; internal floating roof tanks are more efficient at controlling emissions than external floating roof tanks, and in all instances storage tanks should be required to be connected to a control device. The quantity of harmful VOC emissions from tanks and the efficiency with which internal floating roof tanks can control these emissions render this equipment BSER.

40 C.F.R. 60, Subpart Kb should be amended to require that all tanks which store VOCs and have a vapor pressure of greater than 5 mm Hg under actual conditions should use internal floating roofs and be connected to a control device such as a thermal oxidizer, catalytic oxidizer, carbon adsorber, or flare. In the alternative, all tanks which store VOC at a vapor pressure of greater than 5 mm Hg should be required to be fixed roof and connected to a VOC control device.

h. Fenceline Monitoring Should Be Required at Petro-Plastics Production Facilities.

Fenceline monitoring is a work practice standard that requires a facility to monitor a particular analyte or analytes at the facility perimeter, to evaluate the facility's contribution, and to conduct root cause analysis and take corrective action to minimize emissions if the concentration exceeds the analyte concentration action level. As such, fenceline monitoring can greatly improve the management of fugitive emissions and provide an extra measure of protection for surrounding communities.[252]

---

[248] *See* U.S. Environmental Protection Agency, Compilation of Air Pollutant Emission Factors, Section 7.1 Emission Factor Documentation for AP-42, Organic Liquid Storage Tanks (1997)
[249] *Id.* at 2-2.
[250] *See* National Emission Standards for Hazardous Air Pollutants: Generic Maximum Achievable Control Technology (Generic MACT), 64 Fed. Reg. 34854, 34,918 (June 29, 1999); 40 C.F.R. 63, subpart WW.
[251] 84 Fed. Reg. 54278, 54314 (Oct. 9, 2019).
[252] 80 Fed. Reg. 75178, 75182 (Dec. 1, 2015).

In 2015, EPA determined that requiring fenceline monitoring for benzene at refineries was MACT because it would support EPA's efforts to limit to no higher than 100-in-1 million estimated cancer risk for the already-overburdened communities living near refineries, which EPA acknowledge are more likely to be African-American, Hispanic, multiracial groups, low-income, or have obtained less than a high school diploma than the national average.[253] As discussed above, petrochemical production facilities present significant public health as well as environmental justice concerns. Fenceline monitoring can ensure that exposure in communities stays below allowable limits. "Fenceline" should be defined as the border of all sides of the facility.

The NSPS should be amended to require fenceline monitoring for those units that emit pollutants in quantities that similarly endanger public health in particular and environmental justice communities.

V. Severability

If any provision of this petition is found to be invalid or unenforceable, the invalidity or lack of legal obligation shall not affect other provisions of the petition. Thus, the provisions of this petition are severable.

VI. Conclusion

The petrochemical industry is embarking on a massive expansion of plastics facilities that will drastically increase plastic production in this country and abroad. The associated air pollution and GHG emissions from these plants is expected to skyrocket in tandem, jeopardizing wildlife, nearby ecosystems, surrounding communities, and the climate.

EPA has a duty to minimize air quality hazards and ensure that toxic chemicals do not harm human health and the environment. Accordingly, Petitioners respectfully request EPA to grant this petition and comply with its overdue obligation under the CAA to update its NSPS and NESHAPs from petro-plastics facilities.

EPA must: (1) list ethylene, propylene, polyethylene, and polypropylene production facilities as source categories under CAA Section 111 and promulgate standards for facilities in this new source category; (2) require all on-site energy needs at petro-plastics facilities be met with zero emissions energy; (3) update the existing NSPS that apply to petro-plastics facilities to effectively eliminate the emissions of common pollutants; (4) update the NESHAPs that apply to petro-plastics facility to effectively eliminate HAPs emissions; and (5) update the NSPS and NESHAPs Guidelines to reflect advances in detection and control technologies. Granting these requests will allow EPA to meet the objectives of the CAA and protect public health and the environment from this rapidly expanding and increasingly polluting industry.

[253] 80 Fed. Reg. 75178, 75190 (Dec. 1, 2015); 40 C.F.R. Subpart CC, § 63.658.

Any responses and all correspondence related to this Petition should be directed to the Center for Biological Diversity at the email and address provided below.

Respectfully submitted this 3rd day of December, 2019.

Lauren Packard
Staff Attorney
Center for Biological Diversity

REFERENCES

<u>Formosa Application and Proposed Permit Materials in the following subfolders</u>

- Air Quality Analyses & Modeling
- Environmental Assessment Statements
- PSD
- Title V
- Statement of Basis for All Permits

Aarhus University, After 40 years in limbo: Styrene is probably carcinogenic, Science Daily (May 30, 2018), https://www.sciencedaily.com/releases/2018/05/180530113105.htm

Agency for Toxic Substances and Disease Registry, ATSDR A-Z Index, https://www.atsdr.cdc.gov/az/a.html (last visited October 30, 2018)

Agency for Toxic Substances and Disease Registry, Nitrogen Oxides (2002), https://www.atsdr.cdc.gov/toxfaqs/tfacts175.pdf

American Cancer Society, Benzene and Cancer Risk, https://www.cancer.org/cancer/cancer-causes/benzene.html (last visited Sept. 3, 2019)

American Cancer Society, Known and Probable Human Carcinogens (last accessed Oct. 7, 2019), https://www.cancer.org/cancer/cancer-causes/general-info/known-and-probable-human-carcinogens.html

American Chemistry Council, U.S. Chemical Industry Investment Linked to Shale Gas Reaches $200 Billion (2018), https://www.americanchemistry.com/Media/PressReleasesTranscripts/ACC-news-releases/US-Chemical-Industry-Investment-Linked-to-Shale-Gas-Reaches-200-Billion.html

American Lung Association, Volatile Organic Compounds, https://www.lung.org/our-initiatives/healthy-air/indoor/indoor-air-pollutants/volatile-organic-compounds.html (last accessed Oct. 3, 2019)

Appalachian Shale Cracker Enterprise, LLC, Appendix A - Permit Application Summary, Environmental Resources Management (May 2014)

Bay Area Air Quality Management District, Regulation 12: Miscellaneous Standards of Performance, Rule 12: Flares at Petroleum Refineries (2006)

Belli, S. et al., Case-control study on cancer risk associated to residence in the neighborhood of a petrochemical plant, 19 European Journal of Epidemiology 49 (2004)

Brown, P., Race, class, and environmental health: a review and systematization of the literature,
69 Envtl. Res. 15 (1995)

Bullard, Robert D., Dumping in Dixie: Race, Class, and Environmental Quality, Third Edition (Routledge 2018) (book: not provided)

Carrington, Damian, 38,000 people a year die early because of diesel emissions testing failures, The Guardian (May 15, 2017), https://www.theguardian.com/environment/2017/may/15/diesel-emissions-test-scandal-causes-38000-early-deaths-year-study

Center for International Environmental Law, et al., How Fracked Gas, Cheap Oil, and Unburnable Coal are Driving the Plastics Boom (2017)

Center for International Environmental Law, Fueling Plastics: Fossils, Plastics, & Petrochemical Feedstocks (2017)

Center for International Environmental Law, Plastic & Climate: The Hidden Costs of a Plastic Planet (May 2019)

Center for International Environmental Law, Plastic & Health: The Hidden Costs of a Plastic Planet (2019)

Centers for Disease Control and Prevention, Emergency Preparedness and Response, Facts About Benzene, https://emergency.cdc.gov/agent/benzene/basics/facts.asp (last visited Oct. 7, 2019)

Chang, Joseph, Visibility clears on the 2nd wave of US petrochemical projects, Independent Chemical Information Service (ICIS) (Apr. 13, 2017), https://www.icis.com/explore/resources/news/2017/04/12/10097296/visibility-clears-on-the-2nd-wave-of-us-petrochemical-projects/

Chen, C-F. et al., Increased cancer incidence of Changhua residents living in Taisi Village north to the No. 6 Naphtha Cracking Complex, Journal of the Formosan Medical Association (2018)

Clean Air Council, Health Impact Assessment of the Shell Chemical Appalachia Petrochemical Complex (2014)

Collins, M.B. et al., Linking 'toxic outliers' to environmental justice communities, Environ. Res. Lett. 11 (2016)

Cowen, William, Introduction to Fugitive Emissions Monitoring, North Carolina State University (2000)

Cunningham, Nick, A Fracking-Driven Industrial Boom Renews Pollution Concerns in Pittsburgh, Yale Environment 360, Mar. 21, 2019, https://e360.yale.edu/features/a-fracking-driven-industrial-boom-renews-pollution-concerns-in-pittsburgh (last visited Oct. 8, 2019)

Environmental Justice and Health Alliance for Chemical Policy Reform, Who's in Danger? Race, Poverty, and Chemical Disasters (2014)

EurekaAlert!, Higher cancer incidences found in regions near refineries and plants that release benzene, July 29, 2013, https://www.eurekalert.org/pub_releases/2013-07/w-hci072413.php (last visited Oct. 8, 2019)

Gasmet, Continuous Emissions Monitoring System (CEMS II e), https://www.gasmet.com/products/category/emission-monitoring-systems/continuous-emissions-monitoring-system-cems-ii-e/ (last accessed Nov. 26, 2019)

Geyer, R., J.R. Jambeck, & K.L. Law, Production, use, and fate of all plastics ever made, Sci. Adv. 3:e1700782 (2017)

Gilmour, Jared, The United States is No. 1—when it comes to garbage output, new report finds, The Miami Herald (July 3, 2019), https://www.miamiherald.com/news/nation-world/national/article232260837.html

Greshko, Michael, Climate change likely supercharged Hurricane Harvey, National Geographic (Dec 13, 2017), https://www.nationalgeographic.com/news/2017/12/climate-change-study-hurricane-harvey-flood/

Hardy, Steve, Louisiana's 2016 flood offered as evidence of climate change in new White House environmental report, The Advocate (Dec 2, 2018), https://www.theadvocate.com/baton_rouge/news/environment/article_62d3d3aa-f4c1-11e8-b922-1b3817b06f0d.html

Hodan, William M. & William R. Barnard, Evaluating the contribution of PM2.5 Precursor Gases and Re-entrained Road Emissions to Mobile Source PM2.5 Particulate Matter Emissions, MACTEC Federal Programs (2004)

Hung, Faith, Formosa expects faster ok for U.S. petrochemical plant under new EPA chief, Reuters (Mar. 1, 2017), https://www.reuters.com/article/us-fpcc-investment/formosa-expects-faster-ok-for-u-s-petrochemical-plant-under-new-epa-chief-idUSKBN1683SI

Hy-Bon EDI, Enclosed Vapor Combustors Units and Air Quality Regulations (2017), https://hy-bon.com/blog/enclosed-vapor-combustors-units-and-air-quality-regulations/

Hy-BonEDI, Best Practices for Vapor Recovery Systems to Reduce Venting and Flaring, presentation to USEPA by Jeff Voorhis (2015)

IEEE Global Spec, Continuous Emissions Monitoring Systems (CEMS) Information, https://www.globalspec.com/learnmore/manufacturing_process_equipment/air_quality/continuous_emissions_monitoring_systems_cems

Intergovernmental Panel on Climate Change, The Physical Science Basis, Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, Summary for Policymakers (2013)

Intergovernmental Panel on Climate Change, Climate Change 2014 Mitigation of Climate Change, Working Group III Contribution to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (2014)

Intergovernmental Panel on Climate Change, Climate Change 2014 Synthesis Report AR 5 Synthesis Report, Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, 63-64 and Table 2.2 (2014)

Intergovernmental Panel on Climate Change, Global Warming of 1.5°C, an IPCC special report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty (October 6, 2018), http://www.ipcc.ch/report/sr15/

International Energy Agency, The Future of Petrochemicals, Towards more sustainable plastics and fertilisers, Executive Summary (2018)

Iyer, V.G. and Mastorakis, N.E., Unsafe Petrochemical Refinery Air Pollution and Its Environmental Impact Assessment, Proceedings of the 3rd WSEAS Int. Conf. on Waste Management, Water Pollution, Air Pollution, Indoor Climate (2009)

Kardas-Nelson, Mara, The Petrochemical Industry is Killing Another Black Community in 'Cancer Alley', The Nation (Aug. 26, 2019), https://www.thenation.com/article/st-james-louisiana-plastic-petrochemicals-buy-out/ (last visited Oct. 8, 2019)

Koottungal, L., International Survey of Ethylene from Steam Crackers, Oil and Gas Journal (2015), https://www.ogj.com/content/dam/ogj/print-articles/volume-113/jul-6/International-survey-of-ethylene-from-steam-crackers--2015.pdf

Lartey, Jamiles & Oliver Laughland, ‘Almost every household has someone that has died from cancer’, The Guardian (May 6, 2019), https://www.theguardian.com/us-news/ng-interactive/2019/may/06/cancertown-louisana-reserve-special-report (last visited Oct. 8, 2019

Le Quéré, Corrine, et al., Global Carbon Budget 2016, 8 Earth Syst. Sci. Data 605 (2016)

Liu, C-C. et al., Association of Brain Cancer with Residential Exposure to Petrochemical Air Pollution in Taiwan, 71 Journal of Toxicology and Environmental Health, Part A 310 (2008)

Lopes de Moraes, A. C. et al., Wheezing in children and adolescents living next to a petrochemical plant in Rio Grande do Norte, Brazil, 86 Jornal de Pediatria 337 (2010)

Louisiana Department of Environmental Quality Office of Environmental Services, Draft Permits for FG LA Complex, FG LA, LLC, Welcome, St. James Parish, Louisiana, Agency Interest No. 198351: Proposed Permits Nos. 3145-V0 ; 3143-V0; 3152-V0; 3142-V0; 3151-V0; 3144-V0 ; 3141-V0; 3150-V0; 3145-V0; 3147-V0 (2019)

Louisiana Department of Environmental Quality, Office of Environmental Services, FG LLC Statement of Basis submitted to Louisiana Department of Environmental in support of 14 Proposed Title V Operating Permits for the FG LA Complex, AI No. 198351, Activity No. PER20150001 through PER20150015

Marinaccio, A. et al., Residential proximity to industrial sites in the area of Taranto (Southern Italy): A case-control cancer incidence study, 47 Annali dell’Instituto superior di sanita 192 (2011)

Masters, Dr. Jeff, Highest Sea Level Rises in U.S. are in Texas and Louisiana, Annual Report Finds, Weather Underground (March 11, 2019), https://www.wunderground.com/cat6/Highest-Sea-Level-Rises-US-are-Texas-and-Louisiana-Annual-Report-Finds

Morrone, Michele, Environmental Justice, Hydraulic Fracturing and Appalachia, TriplePundit (Aug. 11, 2013), https://www.triplepundit.com/story/2013/environmental-justice-hydraulic-fracturing-and-appalachia/59146 (last visited Oct. 8, 2019)

Ostro, Bart et al., Long-term Exposure to Constituents of Fine Particulate Air Pollution and Mortality: Results from the California Teachers Study, 118 Environmental Health Perspectives 3 (2010)

Pasetto, R. et al., Mortality and morbidity study of petrochemical employees in a polluted site, 11 Environmental Health (2012)

Petrochemical Update, Insights from first wave of US ethylene projects drive second wave decisions (May 5, 2017), http://analysis.petchem-update.com/engineering-and-construction/insights-first-wave-us-ethylene-projects-drive-second-wave-decisions

Rogelj, Joeri et al., Differences between carbon budget estimates unraveled, 6 Nature Climate Change 245 (2016)

Rovira, E. et al., Asthma, respiratory symptoms and lung function in children living near a petrochemical site, 133 Environmental Research 156 (2014)

Sadrameli, S.M., Thermal/catalytic cracking of hydrocarbons for the production of olefins: A state-of-the-art review I: Thermal cracking review, 140 Fuel 102 (2015)

Salerno, C. et al., Cancer morbidity of residents living near an oil refinery plant in North-West Italy, 23 International Journal of Environmental Health Research 342 (2013)

San Joaquin Valley Air Quality Management District, Rule 3411 (Flares) Further Study (2014)

Seah, Yieng Shing et al., Considering Fugitive Emissions During the Conceptual Design Stage, Chemical Engineering (Nov 1, 2016), https://www.chemengonline.com/considering-fugitive-emissions-conceptual-design-stage/

Shamlian, Janet, High cancer risk plagues Louisiana town near chemical plants, CBS News, July 24, 2019, https://www.cbsnews.com/news/cancer-alley-reserve-louisiana-denka-plant-health-risk-higher-national-average-2019-07-24/ (last visited Oct. 8, 2019)

Tsai, S-S. et al., Association of Bladder Cancer with Residential Exposure to Petrochemical Air Pollutant Emissions in Taiwan, 72 Journal of Toxicology and Environmental Health, Part A, 53 (2009)

U.N. Framework Convention on Climate Change, 21st Sess. Of the Conf. of the Parties, Paris, Fr., Nov. 30-Dec. 11, 2015, Adoption of the Paris Agreement Art. 2, U.N. Doc. FCCC/CP/2015/L.9 (December 12, 2015)

U.S. Deparment of Transportation Bureau of Transportation Statistics, Estimated National Average Vehicle Emissions Rates per Vehicle by Vehicle Type Using Gasoline and Diesel, https://www.bts.gov/content/estimated-national-average-vehicle-emissions-rates-vehicle-vehicle-type-using-gasoline-and (last visited Oct 10, 2019)

U.S. Department of Energy, Ethane Storage and Distribution Hub in the United States (2018)

U.S. Energy Information Administration (EIA), Annual Outlook 2018 (2018)

U.S. Energy Information Administration, U.S. ethane consumption, exports to increase as new petrochemical plants come online (2018), https://www.eia.gov/todayinenergy/detail.php?id=35012

U.S. Environmental Protection Agency, Standards of Performance for New Stationary Sources: Emission Monitoring Requirements and Performance Testing Methods, 39 Fed. Reg. 32852 (Sep. 11, 1974)

U.S. Environmental Protection Agency, Synthetic Fibers, Ch. 6.9 in AP 42: Compilation of Air Emissions Factors, Fifth Ed., Vol. 1 (1990)

U.S. Environmental Protection Agency, Polypropylene, Ch. 6.6.4-1 in AP 42: Compilation of Air Emissions Factors, Fifth Ed., Vol. 1 (1991)

U.S. Environmental Protection Agency, Alternative Control Techniques Document—NOx Emissions from Process Heaters (Sept. 1993)

U.S. Environmental Protection Agency, Compilation of Air Pollutant Emission Factors, Section 7.1 Emission Factor Documentation for AP-42, Organic Liquid Storage Tanks (1997)

U.S. Environmental Protection Agency, Air Pollution Control Technology Fact Sheet (2003)

U.S. Environmental Protection Agency, Thermal Oxidizers, Ch. B-6 in Appendix B CAM Illustrations, Revision 1 (January 2005)

U.S. Environmental Protection Agency, Leak Detection and Repair Guide: A Best Practices Guide (2007)

U.S. Environmental Protection Agency, All News Releases By Date, Formosa Plastics Agrees to Resolve Multiple Environmental Violations at Plants in Texas and Louisiana (Sept. 29, 2009), https://archive.epa.gov/epapages/newsroom_archive/newsreleases/6aef3a2a3a324b11852576410053a31c.html (last visited Oct 14, 2019)

U.S. Environmental Protection Agency, Plaintiff's Consent Decree #2-2, United States of America v. Formosa Plastics Corp., Texas et al. (U.S.Dist. Ct. So. Dist. of Texas Sept. 29, 2009)

U.S. Environmental Protection Agency, Technical Support Document for Endangerment and Cause or Contribute Findings for Greenhouse Gases under Section 202(a) of the Clean Air Act (Dec. 7, 2009)

U.S. Environmental Protection Agency, Benzene (2016)

U.S. Environmental Protection Agency, Ethylene Oxide (2016)

U.S. Environmental Protection Agency, Evaluation of the Inhalation Carcinogenicity of Ethylene Oxide (2016)

U.S. Environmental Protection Agency, Industrial Flares, CH 13.5 *in* AP 42: Compilation of Air Emissions Factors, Fifth Ed., Vol. 1 (2018)

U.S. Environmental Protection Agency, Nitrogen Dioxide (NO2) Pollution, Basic Information about NO2, https://www.epa.gov/no2-pollution/basic-information-about-no2#Effects (last visited Oct. 30, 2018)

U.S. Environmental Protection Agency, Carbon Monoxide (CO) Pollution in Outdoor Air, Basic Information about Carbon Monoxide (CO) Outdoor Air Pollution, https://www.epa.gov/co-pollution/basic-information-about-carbon-monoxide-co-outdoor-air-pollution#Effects (last visited Nov. 26, 2019)

U.S. Environmental Protection Agency, Enforcement and Compliance History Online, Detailed Facility Report, Formosa Plastics Louisiana, https://echo.epa.gov/detailed-facility-report?fid=110000597444 (last visited Oct 11, 2019)

U.S. Environmental Protection Agency, Enforcement and Compliance History Online, Detailed Facility Report, Formosa Point Comfort Plant (last visited Nov 26, 2019)

U.S. Environmental Protection Agency, GHG Reporting Program Data Sets, Greenhouse Gas Reporting Program, https://www.epa.gov/ghgreporting/ghgreporting-program-data-sets

U.S. Environmental Protection Agency, Ground-level Ozone Pollution, Health Effects of Ozone Pollution, https://www.epa.gov/ozone-pollution/health-effects-ozone-pollution (last visited Nov. 26, 2019)

U.S. Environmental Protection Agency, Initial List of Hazardous Air Pollutants with Modifications, https://www.epa.gov/haps/initial-list-hazardous-air-pollutants-modifications (last visited Oct. 10, 2019)

U.S. Environmental Protection Agency, map of coordinates: 30.05900556, -90.91452222, EJScreen (Version 2019), https://ejscreen.epa.gov/mapper/ (last visited Oct. 8, 2019)

U.S. Environmental Protection Agency, National Emission Standards for Hazardous Air Pollutants (NESHAPP, https://www.epa.gov/stationary-sources-air-pollution/national-emission-standards-hazardous-air-pollutants-neshap-9 (last visited Oct 10, 2019)

U.S. Environmental Protection Agency, New Source Performance Standards, https://www.epa.gov/stationary-sources-air-pollution/new-source-performance-standards (last visited Oct 10, 2019)

U.S. Environmental Protection Agency, Particulate Matter (PM) Pollution, Health and Environmental Effects of Particulate Matter (PM), https://www.epa.gov/pm-pollution/health-and-environmental-effects-particulate-matter-pm (last visited Nov. 26, 2019)

U.S. Environmental Protection Agency, Pollutants and Sources, Technology Transfer Network - Air Toxics Web Site, https://www3.epa.gov/airtoxics/pollsour.html (last visited Oct. 3, 2019)

U.S. Environmental Protection Agency, Styrene (2000), https://www.epa.gov/sites/production/files/2016-09/documents/styrene.pdf (last visited Oct. 8, 2019)

U.S. Environmental Protection Agency, Sulfur Dioxide (SO2) Pollution, Sulfur Dioxide Basics, https://www.epa.gov/so2-pollution/sulfur-dioxide-basics#effects (last visited Nov. 26, 2019)

U.S. Environmental Protection Agency, Toluene, https://www.epa.gov/sites/production/files/2016-09/documents/toluene.pdf (last visited Oct. 8, 2019)

U.S. National Library of Medicine, Compound Summary 1,3-Butadiene, https://pubchem.ncbi.nlm.nih.gov/compound/1_3-butadiene#section=Human-Metabolite-Information (last visited Oct. 1, 2019)

U.S. President William Clinton, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, Exec. Order 12898, 59 Fed. Reg. 32 (Feb. 11, 1994)

U.S. President William Clinton, Memorandum on Executive Order on Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (Feb. 11, 1994)

Union of Concerned Scientists, Hurricanes and Climate Change (2008/updated 2019), https://www.ucsusa.org/global-warming/science-and-impacts/impacts/hurricanes-and-climate-change.html

Upton, John, Louisiana Floods Directly Linked to Climate Change, Climate Central, https://www.climatecentral.org/news/louisiana-floods-directly-linked-to-climate-change-20671 (last visited Oct 9, 2019)

Walker, Kristina M. et al., A Preliminary Investigation of the Association Between Hazardous Air Pollutants and Lymphohematopoietic Cancer Risk Among Residents of Harris County Texas, Univ. of Tex. School of Public Health (2007)

White, N. et al., Meteorologically estimated exposure but not distance predicts asthma symptoms in schoolchildren in the environs of a petrochemical refinery: a cross-sectional study, 8 Environmental Health (2009), doi: 10.1186/1476-069X-8-45

White, R., The Impact of Chemical Facilities on Environmental Justice Communities, Union of Concerned Scientists (2018)

Wichmann, F.A. et al., Increased asthma and respiratory symptoms in children exposed to petrochemical pollution, 123 J Allergy Clin Immunol 632 (2009)

World Economic Forum, Ellen MacArthur Foundation, The new plastics community: Rethinking the future of plastics (2016)

Xing, Caihong et al., Benzene Exposure Near the U.S. Permissible Limit Is Associated with Sperm Aneuploidy, 118 Environ Health Perspectives 833 (2010), doi:10.1289/ehp.0901531

Yang, C-Y et al., Increased risk of preterm delivery among people living near the three oil refineries in Taiwan, 30 Environmental International 337 (2004)

Yang, C-Y. et al., Female Lung Cancer Mortality and Sex Ratios at Birth near a Petroleum Refinery Plant, 83 Environmental Research Section A 33 (2000)

Yerman, Marcia G., “Hurricanes Show Us Why Our Children Need a Strong and Independent EPA,” says the Father of Environmental Justice, MOMS clean air FORCE, Sept. 18, 2017, https://www.momscleanairforce.org/interview-dr-robert-bullard/ (last visited Oct. 8, 2019)

Younes, Llya et al., In a Notoriously Polluted Area of the Country, Massive New Chemical Plants Are Still Moving In, PROPUBLICA (Oct. 30, 2019), https://projects.propublica.org/louisiana-toxic-air/

Yu, C-L. et al., Residential Exposure to Petrochemicals and the Risk of Leukemia: Using Geographic Information System Tools to Estimate Individual-Level Residential Exposure, 164 American Journal of Epidemiology 200 (2006)

Zeng, Yousheng et al, New Optical Gas Imaging Technology for Quantifying Fugitive Emissions Rates, 2015 LDAR symposium (2015)

Appendix A:

Proposed Revisions to 40 C.F.R. Part 60

Subpart Kb—Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984

Contents

SOURCE: 52 FR 11429, Apr. 8, 1987, unless otherwise noted.

§60.110b Applicability and designation of affected facility.

(a) Except as provided in paragraph (b) of this section, the affected facility to which this subpart applies is each storage vessel with a capacity greater than or equal to 75 cubic meters (m^3) that is used to store volatile organic liquids (VOL) for which construction, reconstruction, or modification is commenced after July 23, 1984.

(b) This subpart does not apply to storage vessels with a capacity greater than or equal to 151 m^3 storing a liquid with a maximum true vapor pressure less than 3.5 kilopascals (kPa) or with a capacity greater than or equal to 75 m^3 but less than 151 m^3 storing a liquid with a maximum true vapor pressure less than 15.0 kPa.

(c) [Reserved]

(d) This subpart does not apply to the following:

(1) Vessels at coke oven by-product plants.

(2) Pressure vessels designed to operate in excess of 204.9 kPa and without emissions to the atmosphere.

(3) Vessels permanently attached to mobile vehicles such as trucks, railcars, barges, or ships.

(4) Vessels with a design capacity less than or equal to 1,589.874 m^3 used for petroleum or condensate stored, processed, or treated prior to custody transfer.

(5) Vessels located at bulk gasoline plants.

(6) Storage vessels located at gasoline service stations.

(7) Vessels used to store beverage alcohol.

(8) Vessels subject to subpart GGGG of 40 CFR part 63.

(e) *Alternative means of compliance*—(1) *Option to comply with part 65.* Owners or operators may choose to comply with 40 CFR part 65, subpart C, to satisfy the requirements of §§60.112b through 60.117b for storage vessels that are subject to this subpart that meet the specifications in paragraphs (e)(1)(i) and (ii) of this section. When choosing to comply with 40 CFR part 65, subpart C, the monitoring requirements of §60.116b(c), (e), (f)(1), and (g) still apply. Other provisions applying to owners or operators who choose to comply with 40 CFR part 65 are provided in 40 CFR 65.1.

(i) A storage vessel with a design capacity greater than or equal to 151 m^3 containing a VOL that, as stored, has a maximum true vapor pressure equal to or greater than 5.2 kPa; or

(ii) A storage vessel with a design capacity greater than 75 m^3 but less than 151 m^3 containing a VOL that, as stored, has a maximum true vapor pressure equal to or greater than 27.6 kPa.

(2) *Part 60, subpart A.* Owners or operators who choose to comply with 40 CFR part 65, subpart C, must also comply with §§60.1, 60.2, 60.5, 60.6, 60.7(a)(1) and (4), 60.14, 60.15, and 60.16 for those storage vessels. All sections and paragraphs of subpart A of this part that are not mentioned in this paragraph (e)(2) do not apply to owners or operators of storage vessels complying with 40 CFR part 65, subpart C, except that provisions required to be met prior to implementing 40 CFR part 65 still apply. Owners and operators who choose to comply with 40 CFR part 65, subpart C, must comply with 40 CFR part 65, subpart A.

(3) *Internal floating roof report.* If an owner or operator installs an internal floating roof and, at initial startup, chooses to comply with 40 CFR part 65, subpart C, a report shall be furnished to the Administrator stating that the control equipment meets the specifications of 40 CFR 65.43. This report shall be an attachment to the notification required by 40 CFR 65.5(b).

(4) *External floating roof report.* If an owner or operator installs an external floating roof and, at initial startup, chooses to comply with 40 CFR part 65, subpart C, a report shall be furnished to the Administrator stating that the control equipment meets the specifications of 40 CFR 65.44. This report shall be an attachment to the notification required by 40 CFR 65.5(b).

[52 FR 11429, Apr. 8, 1987, as amended at 54 FR 32973, Aug. 11, 1989; 65 FR 78275, Dec. 14, 2000; 68 FR 59332, Oct. 15, 2003]

§60.111b Definitions.

Terms used in this subpart are defined in the Act, in subpart A of this part, or in this subpart as follows:

Bulk gasoline plant means any gasoline distribution facility that has a gasoline throughput less than or equal to 75,700 liters per day. Gasoline throughput shall be the maximum calculated design throughput as may be limited by compliance with an enforceable condition under Federal requirement or Federal, State or local law, and discoverable by the Administrator and any other person.

Condensate means hydrocarbon liquid separated from natural gas that condenses due to changes in the temperature or pressure, or both, and remains liquid at standard conditions.

Custody transfer means the transfer of produced petroleum and/or condensate, after processing and/or treatment in the producing operations, from storage vessels or automatic transfer facilities to pipelines or any other forms of transportation.

Fill means the introduction of VOL into a storage vessel but not necessarily to complete capacity.

Gasoline service station means any site where gasoline is dispensed to motor vehicle fuel tanks from stationary storage tanks.

Maximum true vapor pressure means the equilibrium partial pressure exerted by the volatile organic compounds (as defined in 40 CFR 51.100) in the stored VOL at the temperature equal to the highest calendar-month average of the VOL storage temperature for VOL's stored above or below the ambient temperature or at the local maximum monthly average temperature as reported by the National Weather Service for VOL's stored at the ambient temperature, as determined:

(1) In accordance with methods described in American Petroleum institute Bulletin 2517, Evaporation Loss From External Floating Roof Tanks, (incorporated by reference—see §60.17); or

(2) As obtained from standard reference texts; or

(3) As determined by ASTM D2879-83, 96, or 97 (incorporated by reference—see §60.17);

(4) Any other method approved by the Administrator.

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

Petroleum liquids means petroleum, condensate, and any finished or intermediate products manufactured in a petroleum refinery.

Process tank means a tank that is used within a process (including a solvent or raw material recovery process) to collect material discharged from a feedstock storage vessel or equipment within the process before the material is transferred to other equipment within the process, to a product or by-product storage vessel, or to a vessel used to store recovered solvent or raw material. In many process tanks, unit operations such as reactions and blending are conducted. Other process tanks, such as surge control vessels and bottoms receivers, however, may not involve unit operations.

Reid vapor pressure means the absolute vapor pressure of volatile crude oil and volatile nonviscous petroleum liquids except liquified petroleum gases, as determined by ASTM D323-82 or 94 (incorporated by reference—see §60.17).

Storage vessel means each tank, reservoir, or container used for the storage of volatile organic liquids but does not include:

(1) Frames, housing, auxiliary supports, or other components that are not directly involved in the containment of liquids or vapors;

(2) Subsurface caverns or porous rock reservoirs; or

(3) Process tanks.

Volatile organic liquid (VOL) means any organic liquid which can emit volatile organic compounds (as defined in 40 CFR 51.100) into the atmosphere.

Waste means any liquid resulting from industrial, commercial, mining or agricultural operations, or from community activities that is discarded or is being accumulated, stored, or physically, chemically, or biologically treated prior to being discarded or recycled.

[52 FR 11429, Apr. 8, 1987, as amended at 54 FR 32973, Aug. 11, 1989; 65 FR 61756, Oct. 17, 2000; 68 FR 59333, Oct. 15, 2003]

§60.112b Standard for volatile organic compounds (VOC).

(a) The owner or operator of each storage vessel either with a design capacity greater than or equal to 151 m^3 containing a VOL that, as stored, has a maximum true vapor pressure equal to or greater than 5.2 kPa but less than 76.6 kPa or with a design capacity greater than or equal to 75 m^3 but less than 151 m^3 containing a VOL that, as stored, has a maximum true vapor pressure equal to or greater than 27.6 kPa but less than 76.6 kPa, shall equip each storage vessel with one of the following:

(1) A fixed roof in combination with an internal floating roof meeting the following specifications:

(i) The internal floating roof shall rest or float on the liquid surface (but not necessarily in complete contact with it) inside a storage vessel that has a fixed roof. The internal floating roof shall be floating on the liquid surface at all times, except during initial fill and during those intervals when the storage vessel is completely emptied or subsequently emptied and refilled. When the roof is resting on the leg supports, the process of filling, emptying, or refilling shall be continuous and shall be accomplished as rapidly as possible.

(ii) Each internal floating roof shall be equipped with one of the following closure devices between the wall of the storage vessel and the edge of the internal floating roof:

(A) A foam- or liquid-filled seal mounted in contact with the liquid (liquid-mounted seal). A liquid-mounted seal means a foam- or liquid-filled seal mounted in contact with the liquid between the wall of the storage vessel and the floating roof continuously around the circumference of the tank.

(B) Two seals mounted one above the other so that each forms a continuous closure that completely covers the space between the wall of the storage vessel and the edge of the internal floating roof. The lower seal may be vapor-mounted, but both must be continuous.

(C) A mechanical shoe seal. A mechanical shoe seal is a metal sheet held vertically against the wall of the storage vessel by springs or weighted levers and is connected by braces to the floating roof. A flexible coated fabric (envelope) spans the annular space between the metal sheet and the floating roof.

(iii) Each opening in a noncontact internal floating roof except for automatic bleeder vents (vacuum breaker vents) and the rim space vents is to provide a projection below the liquid surface.

(iv) Each opening in the internal floating roof except for leg sleeves, automatic bleeder vents, rim space vents, column wells, ladder wells, sample wells, and stub drains is to be equipped with a cover or lid which is to be maintained in a closed position at all times (i.e., no visible gap) except when the device is in actual use. The cover or lid shall be equipped with a gasket. Covers on each access hatch and automatic gauge float well shall be bolted except when they are in use.

(v) Automatic bleeder vents shall be equipped with a gasket and are to be closed at all times when the roof is floating except when the roof is being floated off or is being landed on the roof leg supports.

(vi) Rim space vents shall be equipped with a gasket and are to be set to open only when the internal floating roof is not floating or at the manufacturer's recommended setting.

(vii) Each penetration of the internal floating roof for the purpose of sampling shall be a sample well. The sample well shall have a slit fabric cover that covers at least 90 percent of the opening.

(viii) Each penetration of the internal floating roof that allows for passage of a column supporting the fixed roof shall have a flexible fabric sleeve seal or a gasketed sliding cover.

(ix) Each penetration of the internal floating roof that allows for passage of a ladder shall have a gasketed sliding cover.

(2) An external floating roof. An external floating roof means a pontoon-type or double-deck type cover that rests on the liquid surface in a vessel with no fixed roof. Each external floating roof must meet the following specifications:

(i) Each external floating roof shall be equipped with a closure device between the wall of the storage vessel and the roof edge. The closure device is to consist of two seals, one above the other. The lower seal is referred to as the primary seal, and the upper seal is referred to as the secondary seal.

(A) The primary seal shall be either a mechanical shoe seal or a liquid-mounted seal. Except as provided in §60.113b(b)(4), the seal shall completely cover the annular space between the edge of the floating roof and tank wall.

(B) The secondary seal shall completely cover the annular space between the external floating roof and the wall of the storage vessel in a continuous fashion except as allowed in §60.113b(b)(4).

(ii) Except for automatic bleeder vents and rim space vents, each opening in a noncontact external floating roof shall provide a projection below the liquid surface. Except for automatic bleeder vents, rim space vents, roof drains, and leg sleeves, each opening in the roof is to be equipped with a gasketed cover, seal, or lid that is to be maintained in a closed position at all times (i.e., no visible gap) except when the device is in actual use. Automatic bleeder vents are to be closed at all times when the roof is floating except when the roof is being floated off or is being landed on the roof leg supports. Rim vents are to be set to open when the roof is being floated off the roof legs supports or at the manufacturer's recommended setting. Automatic bleeder vents and rim space vents are to be gasketed. Each emergency roof drain is to be provided with a slotted membrane fabric cover that covers at least 90 percent of the area of the opening.

(iii) The roof shall be floating on the liquid at all times (i.e., off the roof leg supports) except during initial fill until the roof is lifted off leg supports and when the tank is completely emptied and subsequently refilled. The process of filling, emptying, or refilling when the roof is resting on the leg supports shall be continuous and shall be accomplished as rapidly as possible.

(3) A closed vent system and control device meeting the following specifications:

(i) The closed vent system shall be designed to collect all VOC vapors and gases discharged from the storage vessel and operated with no detectable emissions as indicated by an instrument reading of less than 500 ppm above background and visual inspections, as determined in part 60, subpart VV, §60.485(b).

(ii) The control device shall be designed and operated to reduce inlet VOC emissions by 95 percent or greater. If a flare is used as the control device, it shall meet the specifications described in the general control device requirements (§60.18) of the General Provisions. **[See General Recommendations]**

(4) A system equivalent to those described in paragraphs (a)(1), (a)(2), or (a)(3) of this section as provided in §60.114b of this subpart.

(b) The owner or operator of each storage vessel with a design capacity greater than or equal to 75 m^3 which contains a VOL that, as stored, has a maximum true vapor pressure greater than or equal to 76.6 kPa shall equip each storage vessel with one of the following:

(1) A closed vent system and control device as specified in §60.112b(a)(3).

(2) A system equivalent to that described in paragraph (b)(1) as provided in §60.114b of this subpart.

(c) *Site-specific standard for Merck & Co., Inc.'s Stonewall Plant in Elkton, Virginia.* This paragraph applies only to the pharmaceutical manufacturing facility, commonly referred to as the Stonewall Plant, located at Route 340 South, in Elkton, Virginia (“site”).

(1) For any storage vessel that otherwise would be subject to the control technology requirements of paragraphs (a) or (b) of this section, the site shall have the option of either complying directly with the requirements of this subpart, or reducing the site-wide total criteria pollutant emissions cap (total emissions cap) in accordance with the procedures set forth in a permit issued pursuant to 40 CFR 52.2454. If the site chooses the option of reducing the total emissions cap in accordance with the procedures set forth in such permit, the requirements of such permit shall apply in lieu of the otherwise applicable requirements of this subpart for such storage vessel.

(2) For any storage vessel at the site not subject to the requirements of 40 CFR 60.112b (a) or (b), the requirements of 40 CFR 60.116b (b) and (c) and the General Provisions (subpart A of this part) shall not apply.

[52 FR 11429, Apr. 8, 1987, as amended at 62 FR 52641, Oct. 8, 1997]

§60.115b Reporting and recordkeeping requirements.

The owner or operator of each storage vessel as specified in §60.112b(a) shall keep records and furnish reports as required by paragraphs (a), (b), or (c) of this section depending upon the control equipment installed to meet the requirements of §60.112b. The owner or operator shall keep copies of all reports and records required by this section, except for the record required by (c)(1), for at least 2 years. The record required by (c)(1) will be kept for the life of the control equipment.

(a) After installing control equipment in accordance with §60.112b(a)(1) (fixed roof and internal floating roof), the owner or operator shall meet the following requirements.

(1) Furnish the Administrator with a report that describes the control equipment and certifies that the control equipment meets the specifications of §60.112b(a)(1) and §60.113b(a)(1). This report shall be an attachment to the notification required by §60.7(a)(3).

(2) Keep a record of each inspection performed as required by §60.113b (a)(1), (a)(2), (a)(3), and (a)(4). Each record shall identify the storage vessel on which the inspection was performed and shall contain the date the vessel was inspected and the observed condition of each component of the control equipment (seals, internal floating roof, and fittings).

(3) If any of the conditions described in §60.113b(a)(2) are detected during the annual visual inspection required by §60.113b(a)(2), a report shall be furnished to the Administrator within 30 days of the inspection. Each report shall identify the storage vessel, the nature of the defects, and the date the storage vessel was emptied or the nature of and date the repair was made.

(4) After each inspection required by §60.113b(a)(3) that finds holes or tears in the seal or seal fabric, or defects in the internal floating roof, or other control equipment defects listed in §60.113b(a)(3)(ii), a report shall be furnished to the Administrator within 30 days of the inspection. The report shall identify the storage vessel and the reason it did not meet the specifications of §61.112b(a)(1) or §60.113b(a)(3) and list each repair made.

(b) After installing control equipment in accordance with §61.112b(a)(2) (external floating roof), the owner or operator shall meet the following requirements.

(1) Furnish the Administrator with a report that describes the control equipment and certifies that the control equipment meets the specifications of §60.112b(a)(2) and

§60.113b(b)(2), (b)(3), and (b)(4). This report shall be an attachment to the notification required by §60.7(a)(3).

(2) Within 60 days of performing the seal gap measurements required by §60.113b(b)(1), furnish the Administrator with a report that contains:

(i) The date of measurement.

(ii) The raw data obtained in the measurement.

(iii) The calculations described in §60.113b (b)(2) and (b)(3).

(3) Keep a record of each gap measurement performed as required by §60.113b(b). Each record shall identify the storage vessel in which the measurement was performed and shall contain:

(i) The date of measurement.

(ii) The raw data obtained in the measurement.

(iii) The calculations described in §60.113b (b)(2) and (b)(3).

(4) After each seal gap measurement that detects gaps exceeding the limitations specified by §60.113b(b)(4), submit a report to the Administrator within 30 days of the inspection. The report will identify the vessel and contain the information specified in paragraph (b)(2) of this section and the date the vessel was emptied or the repairs made and date of repair.

(c) After installing control equipment in accordance with §60.112b (a)(3) or (b)(1) (closed vent system and control device other than a flare), the owner or operator shall keep the following records.

(1) A copy of the operating plan.

(2) A record of the measured values of the parameters monitored in accordance with §60.113b(c)(2).

(d) After installing a closed vent system and flare to comply with §60.112b, the owner or operator shall meet the following requirements.

(1) A report containing the measurements required by §60.18(f) (1), (2), (3), (4), (5), and (6) shall be furnished to the Administrator as required by §60.8 of the General Provisions. This report shall be submitted within 6 months of the initial start-up date.

(2) Records shall be kept of all periods of operation during which the flare pilot flame is absent.

(3) Semiannual reports of all periods recorded under §60.115b(d)(2) in which the pilot flame was absent shall be furnished to the Administrator.

§60.116b Monitoring of operations.

(a) The owner or operator shall keep copies of all records required by this section, except for the record required by paragraph (b) of this section, for at least 2 years. The record required by paragraph (b) of this section will be kept for the life of the source.

(b) The owner or operator of each storage vessel as specified in §60.110b(a) shall keep readily accessible records showing the dimension of the storage vessel and an analysis showing the capacity of the storage vessel.

(c) Except as provided in paragraphs (f) and (g) of this section, the owner or operator of each storage vessel either with a design capacity greater than or equal to 151 m^3 storing a liquid with a maximum true vapor pressure greater than or equal to 3.5 kPa or with a design capacity greater than or equal to 75 m^3 but less than 151 m^3 storing a liquid with a maximum true vapor pressure greater than or equal to 15.0 kPa shall maintain a record of the VOL stored, the period of storage, and the maximum true vapor pressure of that VOL during the respective storage period.

(d) Except as provided in paragraph (g) of this section, the owner or operator of each storage vessel either with a design capacity greater than or equal to 151 m^3 storing a liquid with a maximum true vapor pressure that is normally less than 5.2 kPa or with a design capacity greater than or equal to 75 m^3 but less than 151 m^3storing a liquid with a maximum true vapor pressure that is normally less than 27.6 kPa shall notify the Administrator within 30 days when the maximum true vapor pressure of the liquid exceeds the respective maximum true vapor vapor pressure values for each volume range.

(e) Available data on the storage temperature may be used to determine the maximum true vapor pressure as determined below.

(1) For vessels operated above or below ambient temperatures, the maximum true vapor pressure is calculated based upon the highest expected calendar-month average of the storage temperature. For vessels operated at ambient temperatures, the maximum true vapor pressure is calculated based upon the maximum local monthly average ambient temperature as reported by the National Weather Service.

(2) For crude oil or refined petroleum products the vapor pressure may be obtained by the following:

(i) Available data on the Reid vapor pressure and the maximum expected storage temperature based on the highest expected calendar-month average temperature of the stored product may be used to determine the maximum true vapor pressure from nomographs contained in API Bulletin 2517 (incorporated by reference—see §60.17), unless the

Administrator specifically requests that the liquid be sampled, the actual storage temperature determined, and the Reid vapor pressure determined from the sample(s).

(ii) The true vapor pressure of each type of crude oil with a Reid vapor pressure less than 13.8 kPa or with physical properties that preclude determination by the recommended method is to be determined from available data and recorded if the estimated maximum true vapor pressure is greater than 3.5 kPa.

(3) For other liquids, the vapor pressure:

(i) May be obtained from standard reference texts, or

(ii) Determined by ASTM D2879-83, 96, or 97 (incorporated by reference—see §60.17); or

(iii) Measured by an appropriate method approved by the Administrator; or

(iv) Calculated by an appropriate method approved by the Administrator.

(f) The owner or operator of each vessel storing a waste mixture of indeterminate or variable composition shall be subject to the following requirements.

(1) Prior to the initial filling of the vessel, the highest maximum true vapor pressure for the range of anticipated liquid compositions to be stored will be determined using the methods described in paragraph (e) of this section.

(2) For vessels in which the vapor pressure of the anticipated liquid composition is above the cutoff for monitoring but below the cutoff for controls as defined in §60.112b(a), an initial physical test of the vapor pressure is required; and a physical test at least once every 6 months thereafter is required as determined by the following methods:

(i) ASTM D2879-83, 96, or 97 (incorporated by reference—see §60.17); or

(ii) ASTM D323-82 or 94 (incorporated by reference—see §60.17); or

(iii) As measured by an appropriate method as approved by the Administrator.

(g) The owner or operator of each vessel equipped with a closed vent system and control device meeting the specification of §60.112b or with emissions reductions equipment as specified in 40 CFR 65.42(b)(4), (b)(5), (b)(6), or (c) is exempt from the requirements of paragraphs (c) and (d) of this section.

[52 FR 11429, Apr. 8, 1987, as amended at 65 FR 61756, Oct. 17, 2000; 65 FR 78276, Dec. 14, 2000; 68 FR 59333, Oct. 15, 2003]

Subpart VVa—Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry for Which Construction, Reconstruction, or Modification Commenced After November 7, 2006

Contents

SOURCE: 72 FR 64883, Nov. 16, 2007, unless otherwise noted.

§60.480a Applicability and designation of affected facility.

(a)(1) The provisions of this subpart apply to affected facilities in the synthetic organic chemicals manufacturing industry.

(2) The group of all equipment (defined in §60.481a) within a process unit is an affected facility.

(b) Any affected facility under paragraph (a) of this section that commences construction, reconstruction, or modification after November 7, 2006, shall be subject to the requirements of this subpart.

(c) Addition or replacement of equipment 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)(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 §60.486a(i).

(2) Any affected facility that has the design capacity to produce less than 1,000 Mg/yr (1,102 ton/yr) of a chemical listed in §60.489 is exempt from §§60.482-1a through 60.482-11a.

(3) If an affected facility produces heavy liquid chemicals only from heavy liquid feed or raw materials, then it is exempt from §§60.482-1a through 60.482-11a.

(4) Any affected facility that produces beverage alcohol is exempt from §§60.482-1a through 60.482-11a.

(5) Any affected facility that has no equipment in volatile organic compounds (VOC) service is exempt from §§60.482-1a through 60.482-11a.

(e) *Alternative means of compliance*—(1) *Option to comply with part 65.* (i) Owners or operators may choose to comply with the provisions of 40 CFR part 65, subpart F, to satisfy the requirements of §§60.482-1a through 60.487a for an affected facility. When choosing to comply with 40 CFR part 65, subpart F, the requirements of §§60.485a(d), (e), and (f), and 60.486a(i) and (j) still apply. Other provisions applying to an owner or operator who chooses to comply with 40 CFR part 65 are provided in 40 CFR 65.1.

(ii) *Part 60, subpart A.* Owners or operators who choose to comply with 40 CFR part 65, subpart F must also comply with §§60.1, 60.2, 60.5, 60.6, 60.7(a)(1) and (4), 60.14, 60.15, and 60.16 for that equipment. All sections and paragraphs of subpart A of this part that are not mentioned in this paragraph (e)(1)(ii) do not apply to owners or operators of equipment subject to this subpart complying with 40 CFR part 65, subpart F, except that provisions required to be met prior to implementing 40 CFR part 65 still apply. Owners and operators who choose to comply with 40 CFR part 65, subpart F, must comply with 40 CFR part 65, subpart A.

(2) *Part 63, subpart H.* (i) Owners or operators may choose to comply with the provisions of 40 CFR part 63, subpart H, to satisfy the requirements of §§60.482-1a through 60.487a for an affected facility. When choosing to comply with 40 CFR part 63, subpart H, the requirements of §60.485a(d), (e), and (f), and §60.486a(i) and (j) still apply.

(ii) *Part 60, subpart A.* Owners or operators who choose to comply with 40 CFR part 63, subpart H must also comply with §§60.1, 60.2, 60.5, 60.6, 60.7(a)(1) and (4), 60.14, 60.15, and 60.16 for that equipment. All sections and paragraphs of subpart A of this part that are not mentioned in this paragraph (e)(2)(ii) do not apply to owners or operators of equipment subject to this subpart complying with 40 CFR part 63, subpart H, except that provisions required to be met prior to implementing 40 CFR part 63 still apply. Owners and operators who choose to comply with 40 CFR part 63, subpart H, must comply with 40 CFR part 63, subpart A.

(f) *Stay of standards.* (1) Owners or operators that start a new, reconstructed, or modified affected source prior to November 16, 2007 are not required to comply with the requirements in this paragraph until EPA takes final action to require compliance and publishes a document in the FEDERAL REGISTER.

(i) The definition of "capital expenditure" in §60.481a of this subpart. While the definition of "capital expenditure" is stayed, owners or operators should use the definition found in §60.481 of subpart VV of this part.

(ii) [Reserved]

(2) Owners or operators are not required to comply with the requirements in this paragraph until EPA takes final action to require compliance and publishes a document in the FEDERAL REGISTER.

(i) The definition of "process unit" in §60.481a of this subpart. While the definition of "process unit" is stayed, owners or operators should use the following definition:

Process unit means components assembled to produce, as intermediate or final products, one or more of the chemicals listed in §60.489 of this part. A process unit can operate independently if supplied with sufficient feed or raw materials and sufficient storage facilities for the product.

(ii) The method of allocation of shared storage vessels in §60.482-1a(g) of this subpart.

(iii) The standards for connectors in gas/vapor service and in light liquid service in §60.482-11a of this subpart.

[72 FR 64883, Nov. 16, 2007, as amended at 73 FR 31375, June 2, 2008]

§60.481a Definitions.

As used in this subpart, all terms not defined herein shall have the meaning given them in the Clean Air Act (CAA) or in subpart A of part 60, and the following terms shall have the specific meanings given them.

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, divided by 100 as reflected by the following equation:

$A = Y \times (B \div 100)$;

(2) The percent Y is determined from the following equation: $Y = 1.0 - 0.575 \log X$, where X is 2006 minus 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 VALUE FOR B

Subpart applicable to facility	Value of B to be used in equation
VVa	12.5
GGGa	7.0

Closed-loop system means an enclosed system that returns process fluid to the process.

Closed-purge system means a system or combination of systems and portable containers to capture purged liquids. Containers for purged liquids must be covered or closed when not being filled or emptied.

Closed vent system means a system that is not open to the atmosphere and that is composed of hard-piping, ductwork, connections, and, if necessary, flow-inducing devices that transport gas or vapor from a piece or pieces of equipment to a control device or back to a process.

Connector means flanged, screwed, or other joined fittings used to connect two pipe lines or a pipe line and a piece of process equipment or that close an opening in a pipe that could be connected to another pipe. Joined fittings welded completely around the circumference of the interface are not considered connectors for the purpose of this regulation.

Control device means an enclosed combustion device, vapor recovery system, or flare.

Distance piece means an open or enclosed casing through which the piston rod travels, separating the compressor cylinder from the crankcase.

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.

Duct work means a conveyance system such as those commonly used for heating and ventilation systems. It is often made of sheet metal and often has sections connected by screws or crimping. Hard-piping is not ductwork.

Equipment means each pump, compressor, pressure relief device, sampling connection system, open-ended valve or line, valve, and flange or other connector in VOC service and any devices or systems required by this subpart.

First attempt at repair means to take action for the purpose of stopping or reducing leakage of organic material to the atmosphere using best practices.

Fuel gas means gases that are combusted to derive useful work or heat.

Fuel gas system means the offsite and onsite piping and flow and pressure control system that gathers gaseous stream(s) generated by onsite operations, may blend them with other sources of gas, and transports the gaseous stream for use as fuel gas in combustion devices or in-process combustion equipment, such as furnaces and gas turbines, either singly or in combination.

Hard-piping means pipe or tubing that is manufactured and properly installed using good engineering judgment and standards such as ASME B31.3, Process Piping (available from the American Society of Mechanical Engineers, P.O. Box 2300, Fairfield, NJ 07007-2300).

In gas/vapor service means that the piece of equipment contains process fluid that is in the gaseous state at operating conditions.

In heavy liquid service means that the piece of equipment is not in gas/vapor service or in light liquid service.

In light liquid service means that the piece of equipment contains a liquid that meets the conditions specified in §60.485a(e).

In-situ sampling systems means nonextractive samplers or in-line samplers.

In vacuum service means that equipment is operating at an internal pressure which is at least 5 kilopascals (kPa) (0.7 psia) below ambient pressure.

In VOC service means that the piece of equipment contains or contacts a process fluid that is at least ~~10 percent VOC by weight~~. (The provisions of §60.485a(d) specify how to determine that a piece of equipment is not in VOC service.) **[Recommendation: change to 1% VOC by weight]**

Initial calibration value means the concentration measured during the initial calibration at the beginning of each day required in §60.485a(b)(1), or the most recent calibration if the instrument is recalibrated during the day (i.e., the calibration is adjusted) after a calibration drift assessment.

Liquids dripping means any visible leakage from the seal including spraying, misting, clouding, and ice formation.

Open-ended valve or line means any valve, except safety relief valves, having one side of the valve seat in contact with process fluid and one side open to the atmosphere, either directly or through open piping.

Pressure release means the emission of materials resulting from system pressure being greater than set pressure of the pressure relief device.

Process improvement means routine changes made for safety and occupational health requirements, for energy savings, for better utility, for ease of maintenance and operation, for correction of design deficiencies, for bottleneck removal, for changing product requirements, or for environmental control.

Process unit means the components assembled and connected by pipes or ducts to process raw materials and to produce, as intermediate or final products, one or more of the chemicals listed in §60.489. A process unit can operate independently if supplied with sufficient feed or raw materials and sufficient storage facilities for the product. For the purpose of this subpart, process unit includes any feed, intermediate and final product storage vessels (except as specified in §60.482-1a(g)), product transfer racks, and connected ducts and piping. A process unit includes all equipment as defined in this subpart.

Process unit shutdown means 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 accomplished. The following are not considered process unit shutdowns:

(1) An unscheduled work practice or operational procedure that stops production from a process unit or part of a process unit for less than 24 hours.

(2) An unscheduled work practice or operational procedure that would stop production from a process unit or part of a process unit for a shorter period of time than would be required to clear the process unit or part of the process unit of materials and start up the unit, and would result in greater emissions than delay of repair of leaking components until the next scheduled process unit shutdown.

(3) The use of spare equipment and technically feasible bypassing of equipment without stopping production.

Quarter means a 3-month period; the first quarter concludes on the last day of the last full month during the 180 days following initial startup.

Repaired means that equipment is adjusted, or otherwise altered, in order to eliminate a leak as defined in the applicable sections of this subpart and, except for leaks identified in accordance with §§60.482-2a(b)(2)(ii) and (d)(6)(ii) and (d)(6)(iii), 60.482-3a(f), and 60.482-10a(f)(1)(ii), is re-monitored as specified in §60.485a(b) to verify that emissions from the equipment are below the applicable leak definition.

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

Sampling connection system means an assembly of equipment within a process unit used during periods of representative operation to take samples of the process fluid. Equipment used to take nonroutine grab samples is not considered a sampling connection system.

Sensor means a device that measures a physical quantity or the change in a physical quantity such as temperature, pressure, flow rate, pH, or liquid level.

Storage vessel means a tank or other vessel that is used to store organic liquids that are used in the process as raw material feedstocks, produced as intermediates or final products, or generated as wastes. Storage vessel does not include vessels permanently attached to motor vehicles, such as trucks, railcars, barges or ships.

Synthetic organic chemicals manufacturing industry means the industry that produces, as intermediates or final products, one or more of the chemicals listed in §60.489.

Transfer rack means the collection of loading arms and loading hoses, at a single loading rack, that are used to fill tank trucks and/or railcars with organic liquids.

Volatile organic compounds or VOC means, for the purposes of this subpart, any reactive organic compounds as defined in §60.2 Definitions.

EFFECTIVE DATE NOTE: At 73 FR 31376, June 2, 2008, in §60.481a, the definitions of "capital expenditure" and "process unit" were stayed until further notice.

§60.482-1a Standards: General.

[See General Recommendation. For Level 1, allow for OGI as option in lieu of Method 21; for Level 2, require OGI on a quarterly basis and not Method 21]

(a) Each owner or operator subject to the provisions of this subpart shall demonstrate compliance with the requirements of §§60.482-1a through 60.482-10a or §60.480a(e) for all equipment within 180 days of initial startup.

(b) Compliance with §§60.482-1a to 60.482-10a will be determined by review of records and reports, review of performance test results, and inspection using the methods and procedures specified in §60.485a.

(c)(1) An owner or operator may request a determination of equivalence of a means of emission limitation to the requirements of §§60.482-2a, 60.482-3a, 60.482-5a, 60.482-6a, 60.482-7a, 60.482-8a, and 60.482-10a as provided in §60.484a.

(2) If the Administrator makes a determination that a means of emission limitation is at least equivalent to the requirements of §60.482-2a, §60.482-3a, §60.482-5a, §60.482-6a, §60.482-7a, §60.482-8a, or §60.482-10a, an owner or operator shall comply with the requirements of that determination.

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

(e) Equipment that an owner or operator designates as being in VOC service less than 300 hr/yr is excluded from the requirements of §§60.482-2a through 60.482-11a if it is identified as required in §60.486a(e)(6) and it meets any of the conditions specified in paragraphs (e)(1) through (3) of this section.

(1) The equipment is in VOC service only during startup and shutdown, excluding startup and shutdown between batches of the same campaign for a batch process.

(2) The equipment is in VOC service only during process malfunctions or other emergencies.

(3) The equipment is backup equipment that is in VOC service only when the primary equipment is out of service.

~~(f)(1) If a dedicated batch process unit operates less than 365 days during a year, an owner or operator may monitor to detect leaks from pumps, valves, and open-ended valves or lines at the frequency specified in the following table instead of monitoring as specified in §§60.482-2a, 60.482-7a, and 60.483.2a:~~

~~**Operating time (percent of hours during year)**~~	~~**Equivalent monitoring frequency time in use**~~		
	~~**Monthly**~~	~~**Quarterly**~~	~~**Semiannually**~~
~~0 to <25~~	~~Quarterly~~	~~Annually~~	~~Annually.~~
~~25 to <50~~	~~Quarterly~~	~~Semiannually~~	~~Annually.~~
~~50 to <75~~	~~Bimonthly~~	~~Three quarters~~	~~Semiannually.~~
~~75 to 100~~	~~Monthly~~	~~Quarterly~~	~~Semiannually.~~

(2) Pumps and valves that are shared among two or more batch process units that are subject to this subpart may be monitored at the frequencies specified in paragraph (f)(1) of this section, provided the operating time of all such process units is considered.

(3) The monitoring frequencies specified in paragraph (f)(1) of this section are not requirements for monitoring at specific intervals and can be adjusted to accommodate process operations. An owner or operator may monitor at any time during the specified monitoring period (e.g., month, quarter, year), provided the monitoring is conducted at a reasonable interval after completion of the last monitoring campaign. Reasonable intervals are defined in paragraphs (f)(3)(i) through (iv) of this section.

(i) When monitoring is conducted quarterly, monitoring events must be separated by at least 30 calendar days.

(ii) When monitoring is conducted semiannually (*i.e.*, once every 2 quarters), monitoring events must be separated by at least 60 calendar days.

(iii) When monitoring is conducted in 3 quarters per year, monitoring events must be separated by at least 90 calendar days.

(iv) When monitoring is conducted annually, monitoring events must be separated by at least 120 calendar days.

(g) If the storage vessel is shared with multiple process units, the process unit with the greatest annual amount of stored materials (predominant use) is the process unit the storage vessel is assigned to. If the storage vessel is shared equally among process units, and one of the process units has equipment subject to this subpart, the storage vessel is assigned to that process unit. If the storage vessel is shared equally among process units, none of which have equipment subject to this subpart of this part, the storage vessel is assigned to any process unit subject to subpart VV of this part. If the predominant use of the storage vessel varies from year to year, then the owner or operator must estimate the predominant use initially and reassess every 3 years. The owner or operator must keep records of the information and supporting calculations that show how predominant use is determined. All equipment on the storage vessel must be monitored when in VOC service.

EFFECTIVE DATE NOTE: At 73 FR 31376, June 2, 2008, in §60.482-1a, paragraph (g) was stayed until further notice.

§60.482-2a Standards: Pumps in light liquid service.

(a)(1) Each pump in light liquid service shall be monitored monthly to detect leaks by the methods specified in §60.485a(b), except as provided in §60.482-1a(c) and (f) and paragraphs (d), (e), and (f) of this section. A pump that begins operation in light liquid service after the initial startup date for the process unit must be monitored for the first time within 30 days after the end of its startup period, except for a pump that replaces a leaking pump and except as provided in §60.482-1a(c) and paragraphs (d), (e), and (f) of this section.

(2) Each pump in light liquid service shall be checked by visual inspection each calendar week for indications of liquids dripping from the pump seal, except as provided in §60.482-1a(f).

(b)(1) The instrument reading that defines a leak is specified in paragraphs (b)(1)(i) and (ii) of this section.

(i) **~~5,000~~ [500]** parts per million (ppm) or greater for pumps handling polymerizing monomers;

(ii) **~~2,000~~ [250]** ppm or greater for all other pumps.

(2) If there are indications of liquids dripping from the pump seal, the owner or operator shall follow the procedure specified in either paragraph (b)(2)(i) or (ii) of this section. This requirement does not apply to a pump that was monitored after a previous weekly inspection and the instrument reading was less than the concentration specified in paragraph (b)(1)(i) or (ii) of this section, whichever is applicable.

(i) Monitor the pump within 5 days as specified in §60.485a(b). A leak is detected if the instrument reading measured during monitoring indicates a leak as specified in paragraph (b)(1)(i) or (ii) of this section, whichever is applicable. The leak shall be repaired using the procedures in paragraph (c) of this section.

(ii) Designate the visual indications of liquids dripping as a leak, and repair the leak using either the procedures in paragraph (c) of this section or by eliminating the visual indications of liquids dripping.

(c)(1) When a leak is detected, it shall be repaired as soon as practicable, but not later than 15 calendar days after it is detected, except as provided in §60.482-9a.

(2) A first attempt at repair shall be made no later than 5 calendar days after each leak is detected. First attempts at repair include, but are not limited to, the practices described in paragraphs (c)(2)(i) and (ii) of this section, where practicable.

(i) Tightening the packing gland nuts;

(ii) Ensuring that the seal flush is operating at design pressure and temperature.

(d) Each pump equipped with a dual mechanical seal system that includes a barrier fluid system is exempt from the requirements of paragraph (a) of this section, provided the requirements specified in paragraphs (d)(1) through (6) of this section are met.

(1) Each dual mechanical seal system is:

(i) Operated with the barrier fluid at a pressure that is at all times greater than the pump stuffing box pressure; or

(ii) Equipped with a barrier fluid degassing reservoir that is routed to a process or fuel gas system or connected by a closed vent system to a control device that complies with the requirements of §60.482-10a; or

(iii) Equipped with a system that purges the barrier fluid into a process stream with zero VOC emissions to the atmosphere.

(2) The barrier fluid system is in heavy liquid service or is not in VOC service.

(3) Each barrier fluid system is equipped with a sensor that will detect failure of the seal system, the barrier fluid system, or both.

(4)(i) Each pump is checked by visual inspection, each calendar week, for indications of liquids dripping from the pump seals.

(ii) If there are indications of liquids dripping from the pump seal at the time of the weekly inspection, the owner or operator shall follow the procedure specified in either paragraph (d)(4)(ii)(A) or (B) of this section prior to the next required inspection.

(A) Monitor the pump within 5 days as specified in §60.485a(b) to determine if there is a leak of VOC in the barrier fluid. If an instrument reading of ~~**2,000**~~ **[500]** ppm or greater is measured, a leak is detected.

(B) Designate the visual indications of liquids dripping as a leak.

(5)(i) Each sensor as described in paragraph (d)(3) is checked daily or is equipped with an audible alarm.

(ii) The owner or operator determines, based on design considerations and operating experience, a criterion that indicates failure of the seal system, the barrier fluid system, or both.

(iii) If the sensor indicates failure of the seal system, the barrier fluid system, or both, based on the criterion established in paragraph (d)(5)(ii) of this section, a leak is detected.

(6)(i) When a leak is detected pursuant to paragraph (d)(4)(ii)(A) of this section, it shall be repaired as specified in paragraph (c) of this section.

(ii) A leak detected pursuant to paragraph (d)(5)(iii) of this section shall be repaired within ~~**15**~~ **[3]** days of detection by eliminating the conditions that activated the sensor.

(iii) A designated leak pursuant to paragraph (d)(4)(ii)(B) of this section shall be repaired within ~~15~~ **[3]** days of detection by eliminating visual indications of liquids dripping.

(e) Any pump that is designated, as described in §60.486a(e)(1) and (2), for no detectable emissions, as indicated by an instrument reading of less than ~~500~~ **[50]** ppm above background, is exempt from the requirements of paragraphs (a), (c), and (d) of this section if the pump:

(1) Has no externally actuated shaft penetrating the pump housing;

(2) Is demonstrated to be operating with no detectable emissions as indicated by an instrument reading of less than ~~500~~ **[50]** ppm above background as measured by the methods specified in §60.485a(c); and

(3) Is tested for compliance with paragraph (e)(2) of this section initially upon designation, annually, and at other times requested by the Administrator.

(f) If any pump is equipped with a closed vent system capable of capturing and transporting any leakage from the seal or seals to a process or to a fuel gas system or to a control device that complies with the requirements of §60.482-10a, it is exempt from paragraphs (a) through (e) of this section.

(g) Any pump that is designated, as described in §60.486a(f)(1), as an unsafe-to-monitor pump is exempt from the monitoring and inspection requirements of paragraphs (a) and (d)(4) through (6) of this section if:

(1) The owner or operator of the pump demonstrates that the pump is unsafe-to-monitor because monitoring personnel would be exposed to an immediate danger as a consequence of complying with paragraph (a) of this section; and

(2) The owner or operator of the pump has a written plan that requires monitoring of the pump as frequently as practicable during safe-to-monitor times, but not more frequently than the periodic monitoring schedule otherwise applicable, and repair of the equipment according to the procedures in paragraph (c) of this section if a leak is detected.

(h) Any pump that is located within the boundary of an unmanned plant site is exempt from the weekly visual inspection requirement of paragraphs (a)(2) and (d)(4) of this section, and the daily requirements of paragraph (d)(5) of this section, provided that each pump is visually inspected as often as practicable and at least monthly.

§60.482-3a Standards: Compressors.

(a) Each compressor shall be equipped with a seal system that includes a barrier fluid system and that prevents leakage of VOC to the atmosphere, except as provided in §60.482-1a(c) and paragraphs (h), (i), and (j) of this section.

(b) Each compressor seal system as required in paragraph (a) of this section shall be:

(1) Operated with the barrier fluid at a pressure that is greater than the compressor stuffing box pressure; or

(2) Equipped with a barrier fluid system degassing reservoir that is routed to a process or fuel gas system or connected by a closed vent system to a control device that complies with the requirements of §60.482-10a; or

(3) Equipped with a system that purges the barrier fluid into a process stream with zero VOC emissions to the atmosphere.

(c) The barrier fluid system shall be in heavy liquid service or shall not be in VOC service.

(d) Each barrier fluid system as described in paragraph (a) shall be equipped with a sensor that will detect failure of the seal system, barrier fluid system, or both.

(e)(1) Each sensor as required in paragraph (d) of this section shall be checked daily or shall be equipped with an audible alarm.

(2) The owner or operator shall determine, based on design considerations and operating experience, a criterion that indicates failure of the seal system, the barrier fluid system, or both.

(f) If the sensor indicates failure of the seal system, the barrier system, or both based on the criterion determined under paragraph (e)(2) of this section, a leak is detected.

(g)(1) When a leak is detected, it shall be repaired as soon as practicable, but not later than 15 calendar days after it is detected, except as provided in §60.482-9a.

(2) A first attempt at repair shall be made no later than **~~5~~** **[1]** calendar days after each leak is detected.

(h) A compressor is exempt from the requirements of paragraphs (a) and (b) of this section, if it is equipped with a closed vent system to capture and transport leakage from the compressor drive shaft back to a process or fuel gas system or to a control device that complies with the requirements of §60.482-10a, except as provided in paragraph (i) of this section.

(i) Any compressor that is designated, as described in §60.486a(e)(1) and (2), for no detectable emissions, as indicated by an instrument reading of less than **~~500~~** **[50]** ppm above background, is exempt from the requirements of paragraphs (a) through (h) of this section if the compressor:

(1) Is demonstrated to be operating with no detectable emissions, as indicated by an instrument reading of less than **~~500~~** **[50]** ppm above background, as measured by the methods specified in §60.485a(c); and

(2) Is tested for compliance with paragraph (i)(1) of this section initially upon designation, annually, and at other times requested by the Administrator.

(j) Any existing reciprocating compressor in a process unit which becomes an affected facility under provisions of §60.14 or §60.15 is exempt from paragraphs (a) through (e) and (h) of this section, 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 paragraphs (a) through (e) and (h) of this section.

§60.482-4a Standards: Pressure relief devices in gas/vapor service.

(a) Except during pressure releases, each pressure relief device in gas/vapor service shall be operated with no detectable emissions, as indicated by an instrument reading of less than **~~500~~** **[50]** ppm above background, as determined by the methods specified in §60.485a(c).

(b)(1) After each pressure release, the pressure relief device shall be returned to a condition of no detectable emissions, as indicated by an instrument reading of less than **~~500~~** **[50]** ppm above background, as soon as practicable, but no later than 5 calendar days after the pressure release, except as provided in §60.482-9a.

(2) No later than 5 calendar days after the pressure release, the pressure relief device shall be monitored to confirm the conditions of no detectable emissions, as indicated by an instrument reading of less than **~~500~~** **[50]** ppm above background, by the methods specified in §60.485a(c).

(c) Any pressure relief device that is routed to a process or fuel gas system or equipped with a closed vent system capable of capturing and transporting leakage through the pressure relief device to a control device as described in §60.482-10a is exempted from the requirements of paragraphs (a) and (b) of this section.

(d)(1) Any pressure relief device that is equipped with a rupture disk upstream of the pressure relief device is exempt from the requirements of paragraphs (a) and (b) of this section, provided the owner or operator complies with the requirements in paragraph (d)(2) of this section.

(2) After each pressure release, a new rupture disk shall be installed upstream of the pressure relief device as soon as practicable, but no later than **~~5~~** **[1]** calendar days after each pressure release, except as provided in §60.482-9a.

§60.482-5a Standards: Sampling connection systems.

(a) Each sampling connection system shall be equipped with a closed-purge, closed-loop, or closed-vent system, except as provided in §60.482-1a(c) and paragraph (c) of this section.

(b) Each closed-purge, closed-loop, or closed-vent system as required in paragraph (a) of this section shall comply with the requirements specified in paragraphs (b)(1) through (4) of this section.

(1) Gases displaced during filling of the sample container are not required to be collected or captured.

(2) Containers that are part of a closed-purge system must be covered or closed when not being filled or emptied.

(3) Gases remaining in the tubing or piping between the closed-purge system valve(s) and sample container valve(s) after the valves are closed and the sample container is disconnected are not required to be collected or captured.

(4) Each closed-purge, closed-loop, or closed-vent system shall be designed and operated to meet requirements in either paragraph (b)(4)(i), (ii), (iii), or (iv) of this section.

(i) Return the purged process fluid directly to the process line.

(ii) Collect and recycle the purged process fluid to a process.

(iii) Capture and transport all the purged process fluid to a control device that complies with the requirements of §60.482-10a.

(iv) Collect, store, and transport the purged process fluid to any of the following systems or facilities:

(A) A waste management unit as defined in 40 CFR 63.111, if the waste management unit is subject to and operated in compliance with the provisions of 40 CFR part 63, subpart G, applicable to Group 1 wastewater streams;

(B) A treatment, storage, or disposal facility subject to regulation under 40 CFR part 262, 264, 265, or 266;

(C) A facility permitted, licensed, or registered by a state to manage municipal or industrial solid waste, if the process fluids are not hazardous waste as defined in 40 CFR part 261;

(D) A waste management unit subject to and operated in compliance with the treatment requirements of 40 CFR 61.348(a), provided all waste management units that collect, store, or transport the purged process fluid to the treatment unit are subject to and operated in compliance with the management requirements of 40 CFR 61.343 through 40 CFR 61.347; or

(E) A device used to burn off-specification used oil for energy recovery in accordance with 40 CFR part 279, subpart G, provided the purged process fluid is not hazardous waste as defined in 40 CFR part 261.

(c) In-situ sampling systems and sampling systems without purges are exempt from the requirements of paragraphs (a) and (b) of this section.

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

(a)(1) Each open-ended valve or line shall be equipped with a cap, blind flange, plug, or a second valve, except as provided in §60.482-1a(c) and paragraphs (d) and (e) of this section.

(2) The cap, blind flange, plug, or second valve shall seal the open end at all times except during operations requiring process fluid flow through the open-ended valve or line.

(b) Each open-ended valve or line equipped with a second valve shall be operated in a manner such that the valve on the process fluid end is closed before the second valve is closed.

(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) of this section at all other times.

(d) Open-ended valves or lines in an emergency shutdown system which are designed to open automatically in the event of a process upset are exempt from the requirements of paragraphs (a), (b), and (c) of this section.

(e) Open-ended valves or lines containing materials which would autocatalytically polymerize or would present an explosion, serious overpressure, or other safety hazard if capped or equipped with a double block and bleed system as specified in paragraphs (a) through (c) of this section are exempt from the requirements of paragraphs (a) through (c) of this section.

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

(a)(1) Each valve shall be monitored monthly to detect leaks by the methods specified in §60.485a(b) and shall comply with paragraphs (b) through (e) of this section, except as provided in paragraphs (f), (g), and (h) of this section, §60.482-1a(c) and (f), and §§60.483-1a and 60.483-2a.

(2) A valve that begins operation in gas/vapor service or light liquid service after the initial startup date for the process unit must be monitored according to paragraphs (a)(2)(i) or (ii), except for a valve that replaces a leaking valve and except as provided in paragraphs (f), (g), and (h) of this section, §60.482-1a(c), and §§60.483-1a and 60.483-2a.

(i) Monitor the valve as in paragraph (a)(1) of this section. The valve must be monitored for the first time within ~~30~~ **[7]** days after the end of its startup period to ensure proper installation.

(ii) If the existing valves in the process unit are monitored in accordance with §60.483-1a or §60.483-2a, count the new valve as leaking when calculating the percentage of valves leaking as described in §60.483-2a(b)(5). If less than ~~2.0~~ **[0.5]** percent of the valves are leaking for that process unit, the valve must be monitored for the first time during the next scheduled monitoring event for existing valves in the process unit or within 90 days, whichever comes first.

(b) If an instrument reading of ~~500~~ **[50]** ppm or greater is measured, a leak is detected.

(c)(1)(i) Any valve for which a leak is not detected for 2 successive months may be monitored the first month of every quarter, beginning with the next quarter, until a leak is detected.

(ii) As an alternative to monitoring all of the valves in the first month of a quarter, an owner or operator may elect to subdivide the process unit into two or three subgroups of valves and monitor each subgroup in a different month during the quarter, provided each subgroup is monitored every 3 months. The owner or operator must keep records of the valves assigned to each subgroup.

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

(d)(1) When a leak is detected, it shall be repaired as soon as practicable, but no later than ~~15~~ **[3]** calendar days after the leak is detected, except as provided in §60.482-9a.

(2) A first attempt at repair shall be made no later than ~~5~~ **[1]** calendar days after each leak is detected.

(e) First attempts at repair include, but are not limited to, the following best practices where practicable:

(1) Tightening of bonnet bolts;

(2) Replacement of bonnet bolts;

(3) Tightening of packing gland nuts;

(4) Injection of lubricant into lubricated packing.

(f) Any valve that is designated, as described in §60.486a(e)(2), for no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background, is exempt from the requirements of paragraph (a) of this section if the valve:

(1) Has no external actuating mechanism in contact with the process fluid,

(2) Is operated with emissions less than ~~500~~ **[50]** ppm above background as determined by the method specified in §60.485a(c), and

(3) Is tested for compliance with paragraph (f)(2) of this section initially upon designation, annually, and at other times requested by the Administrator.

(g) Any valve that is designated, as described in §60.486a(f)(1), as an unsafe-to-monitor valve is exempt from the requirements of paragraph (a) of this section if:

(1) The owner or operator of the valve demonstrates that the valve is unsafe to monitor because monitoring personnel would be exposed to an immediate danger as a consequence of complying with paragraph (a) of this section, and

(2) The owner or operator of the valve adheres to a written plan that requires monitoring of the valve as frequently as practicable during safe-to-monitor times.

(h) Any valve that is designated, as described in §60.486a(f)(2), as a difficult-to-monitor valve is exempt from the requirements of paragraph (a) of this section if:

(1) The owner or operator of the valve demonstrates that the valve cannot be monitored without elevating the monitoring personnel more than 2 meters above a support surface.

(2) The process unit within which the valve is located either:

(i) Becomes an affected facility through §60.14 or §60.15 and was constructed on or before January 5, 1981; or

(ii) Has less than 3.0 percent of its total number of valves designated as difficult-to-monitor by the owner or operator.

(3) The owner or operator of the valve follows a written plan that requires monitoring of the valve at least once per calendar year.

§60.482-8a Standards: Pumps, valves, and connectors in heavy liquid service and pressure relief devices in light liquid or heavy liquid service.

(a) If evidence of a potential leak is found by visual, audible, olfactory, or any other detection method at pumps, valves, and connectors in heavy liquid service and pressure relief devices in light liquid or heavy liquid service, the owner or operator shall follow either one of the following procedures:

(1) The owner or operator shall monitor the equipment within ~~5~~ **[1]** days by the method specified in §60.485a(b) and shall comply with the requirements of paragraphs (b) through (d) of this section.

(2) The owner or operator shall eliminate the visual, audible, olfactory, or other indication of a potential leak within ~~5~~ **[1]** calendar days of detection.

(b) If an instrument reading of ~~10,000~~ **[250]** ppm or greater is measured, a leak is detected.

(c)(1) When a leak is detected, it shall be repaired as soon as practicable, but not later than ~~15~~ **[3]** calendar days after it is detected, except as provided in §60.482-9a.

(2) The first attempt at repair shall be made no later than ~~5~~ **[1]** calendar days after each leak is detected.

(d) First attempts at repair include, but are not limited to, the best practices described under §§60.482-2a(c)(2) and 60.482-7a(e).

§60.482-9a Standards: Delay of repair.

(a) Delay of repair of equipment for which leaks have been detected will be allowed if repair within ~~15~~ **[3]** days is technically infeasible without a process unit shutdown. Repair of this equipment shall occur before the end of the next process unit shutdown. Monitoring to verify repair must occur within ~~15~~ **[3]** days after startup of the process unit.

(b) Delay of repair of equipment will be allowed for equipment which is isolated from the process and which does not remain in VOC service.

(c) Delay of repair for valves and connectors will be allowed if:

(1) The owner or operator demonstrates that emissions of purged material resulting from immediate repair are greater than the fugitive emissions likely to result from delay of repair, and

(2) When repair procedures are effected, the purged material is collected and destroyed or recovered in a control device complying with §60.482-10a.

(d) Delay of repair for pumps will be allowed if:

(1) Repair requires the use of a dual mechanical seal system that includes a barrier fluid system, and

(2) Repair is completed as soon as practicable, but not later than ~~6~~ **[1]** months after the leak was detected.

(e) Delay of repair beyond a process unit shutdown will be allowed for a valve, if valve assembly replacement is necessary during the process unit shutdown, valve assembly supplies have been depleted, and valve assembly supplies had been sufficiently stocked before the supplies were depleted. Delay of repair beyond the next process unit shutdown will not be allowed unless the next process unit shutdown occurs sooner than 6 months after the first process unit shutdown.

(f) When delay of repair is allowed for a leaking pump, valve, or connector that remains in service, the pump, valve, or connector may be considered to be repaired and no longer subject to delay of repair requirements if two consecutive monthly monitoring instrument readings are below the leak definition.

§60.482-10a Standards: Closed vent systems and control devices.

(a) Owners or operators of closed vent systems and control devices used to comply with provisions of this subpart shall comply with the provisions of this section.

(b) Vapor recovery systems (for example, condensers and absorbers) shall be designed and operated to recover the VOC emissions vented to them with an efficiency of ~~95~~ **[Level 1 – 98; Level 2 – 99]** percent or greater, or to an exit concentration of ~~20~~ **[5]** parts per million by volume (ppmv), whichever is less stringent.

(c) Enclosed combustion devices shall be designed and operated to reduce the VOC emissions vented to them with an efficiency of ~~95~~ **[Level 1 – 98; Level 2 – 99]** percent or greater, or to an exit concentration of ~~20~~ **[5]** ppmv, on a dry basis, corrected to 3 percent oxygen, whichever is less stringent or to provide a minimum residence time of ~~0.75~~ **[1.5]** seconds at a minimum temperature of ~~816~~ **[650]** °C.

(d) Flares used to comply with this subpart shall comply with the requirements of ~~§60.18.~~ §§ 63.670 and 63.671.

(e) Owners or operators of control devices used to comply with the provisions of this subpart shall monitor these control devices to ensure that they are operated and maintained in conformance with their designs **[and per manufacturers' recommendations].**

(f) Except as provided in paragraphs (i) through (k) of this section, each closed vent system shall be inspected according to the procedures and schedule specified in paragraphs (f)(1) and (2) of this section.

(1) If the vapor collection system or closed vent system is constructed of hard-piping, the owner or operator shall comply with the requirements specified in paragraphs (f)(1)(i) and (ii) of this section:

(i) Conduct an initial inspection according to the procedures in §60.485a(b); and

(ii) Conduct annual visual inspections for visible, audible, or olfactory indications of leaks.

(2) If the vapor collection system or closed vent system is constructed of ductwork, the owner or operator shall:

(i) Conduct an initial inspection according to the procedures in §60.485a(b); and

(ii) Conduct annual inspections according to the procedures in §60.485a(b).

(g) Leaks, as indicated by an instrument reading greater than ~~500~~ **[50]** ppmv above background or by visual inspections, shall be repaired as soon as practicable except as provided in paragraph (h) of this section.

(1) A first attempt at repair shall be made no later than ~~5~~ **[1]** calendar days after the leak is detected.

(2) Repair shall be completed no later than ~~15~~ **[3]** calendar days after the leak is detected.

(h) Delay of repair of a closed vent system for which leaks have been detected is allowed if the repair is technically infeasible without a process unit shutdown or if the owner or operator determines that emissions resulting from immediate repair would be greater than the fugitive emissions likely to result from delay of repair. Repair of such equipment shall be complete ~~by the end of the next process unit shutdown~~ **[no later than 30 days after detecting the leak].**

(i) If a vapor collection system or closed vent system is operated under a vacuum, it is exempt from the inspection requirements of paragraphs (f)(1)(i) and (f)(2) of this section.

(j) Any parts of the closed vent system that are designated, as described in paragraph (l)(1) of this section, as unsafe to inspect are exempt from the inspection requirements of paragraphs (f)(1)(i) and (f)(2) of this section if they comply with the requirements specified in paragraphs (j)(1) and (2) of this section:

(1) The owner or operator determines that the equipment is unsafe to inspect because inspecting personnel would be exposed to an imminent or potential danger as a consequence of complying with paragraphs (f)(1)(i) or (f)(2) of this section; and

(2) The owner or operator has a written plan that requires inspection of the equipment as frequently as practicable during safe-to-inspect times.

(k) Any parts of the closed vent system that are designated, as described in paragraph (l)(2) of this section, as difficult to inspect are exempt from the inspection requirements of paragraphs (f)(1)(i) and (f)(2) of this section if they comply with the requirements specified in paragraphs (k)(1) through (3) of this section:

(1) The owner or operator determines that the equipment cannot be inspected without elevating the inspecting personnel more than 2 meters above a support surface; and

(2) The process unit within which the closed vent system is located 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 closed vent system equipment as difficult to inspect; and

(3) The owner or operator has a written plan that requires inspection of the equipment at least once every ~~5~~ year~~s~~. A closed vent system is exempt from inspection if it is operated under a vacuum.

(l) The owner or operator shall record the information specified in paragraphs (l)(1) through (5) of this section.

(1) Identification of all parts of the closed vent system that are designated as unsafe to inspect, an explanation of why the equipment is unsafe to inspect, and the plan for inspecting the equipment.

(2) Identification of all parts of the closed vent system that are designated as difficult to inspect, an explanation of why the equipment is difficult to inspect, and the plan for inspecting the equipment.

(3) For each inspection during which a leak is detected, a record of the information specified in §60.486a(c).

(4) For each inspection conducted in accordance with §60.485a(b) during which no leaks are detected, a record that the inspection was performed, the date of the inspection, and a statement that no leaks were detected.

(5) For each visual inspection conducted in accordance with paragraph (f)(1)(ii) of this section during which no leaks are detected, a record that the inspection was performed, the date of the inspection, and a statement that no leaks were detected.

(m) Closed vent systems and control devices used to comply with provisions of this subpart shall be operated at all times when emissions may be vented to them.

§60.482-11a Standards: Connectors in gas/vapor service and in light liquid service.

(a) The owner or operator shall initially monitor all connectors in the process unit for leaks by the later of either ~~12~~ **[6]** months after the compliance date or ~~12~~ **[6]** months after initial startup. If all connectors in the process unit have been monitored for leaks prior to the compliance date, no initial monitoring is required provided either no process changes have been made since the monitoring or the owner or operator can determine that the results of the monitoring, with or without adjustments, reliably demonstrate compliance despite process changes. If required to monitor because of a process change, the owner or operator is required to monitor only those connectors involved in the process change.

(b) Except as allowed in §60.482-1a(c), §60.482-10a, or as specified in paragraph (e) of this section, the owner or operator shall monitor all connectors in gas and vapor and light liquid service as specified in paragraphs (a) and (b)(3) of this section.

(1) The connectors shall be monitored to detect leaks by the method specified in §60.485a(b) and, as applicable, §60.485a(c).

(2) If an instrument reading greater than or equal to **~~500~~** **[50]** ppm is measured, a leak is detected.

(3) The owner or operator shall perform monitoring, subsequent to the initial monitoring required in paragraph (a) of this section, as specified in paragraphs (b)(3)(i) through (iii) of this section, and shall comply with the requirements of paragraphs (b)(3)(iv) and (v) of this section. The required period in which monitoring must be conducted shall be determined from paragraphs (b)(3)(i) through (iii) of this section using the monitoring results from the preceding monitoring period. The percent leaking connectors shall be calculated as specified in paragraph (c) of this section.

(i) If the percent leaking connectors in the process unit was greater than or equal to **~~0.5~~** **[0.1]** percent, then monitor within 12 months (1 year).

~~(ii) If the percent leaking connectors in the process unit was greater than or equal to 0.25 percent but less than 0.5 percent, then monitor within 4 years. An owner or operator may comply with the requirements of this paragraph by monitoring at least 40 percent of the connectors within 2 years of the start of the monitoring period, provided all connectors have been monitored by the end~~ of the 4-year monitoring period.

(iii) If the percent leaking connectors in the process unit was less than 0.25 percent, then monitor as provided in paragraph (b)(3)(iii)(A) of this section and either paragraph (b)(3)(iii)(B) or (b)(3)(iii)(C) of this section, as appropriate.

(A) An owner or operator shall monitor **~~at least 50~~** **[100]** percent of the connectors within **4** **[2]** years of the start of the monitoring period.

(B) If the percent of leaking connectors calculated from the monitoring results in paragraph (b)(3)(iii)(A) of this section is greater than or equal to **~~0.35~~** **[0.1]** percent of the monitored connectors, the owner or operator shall monitor as soon as practical, but within the next 6 months, all connectors that have not yet been monitored during the monitoring period. At the conclusion of monitoring, a new monitoring period shall be started pursuant to paragraph (b)(3) of this section, based on the percent of leaking connectors within the total monitored connectors.

(C) If the percent of leaking connectors calculated from the monitoring results in paragraph (b)(3)(iii)(A) of this section is less than ~~0.35~~ **[0.1]** percent of the monitored connectors, the owner or operator shall monitor all connectors that have not yet been monitored within ~~8~~ **[2]** years of the start of the monitoring period.

(iv) If, during the monitoring conducted pursuant to paragraphs (b)(3)(i) through (iii) of this section, a connector is found to be leaking, it shall be re-monitored once within ~~90~~ **[15]** days after repair to confirm that it is not leaking.

(v) The owner or operator shall keep a record of the start date and end date of each monitoring period under this section for each process unit.

(c) For use in determining the monitoring frequency, as specified in paragraphs (a) and (b)(3) of this section, the percent leaking connectors as used in paragraphs (a) and (b)(3) of this section shall be calculated by using the following equation:

$\%C_L = C_L / C_t * 100$

Where:

$\%C_L$ = Percent of leaking connectors as determined through periodic monitoring required in paragraphs (a) and (b)(3)(i) through (iii) of this section.

C_L = Number of connectors measured at ~~500~~ **[50]** ppm or greater, by the method specified in §60.485a(b).

C_t = Total number of monitored connectors in the process unit or affected facility.

(d) When a leak is detected pursuant to paragraphs (a) and (b) of this section, it shall be repaired as soon as practicable, but not later than ~~15~~ **[3]** calendar days after it is detected, except as provided in §60.482-9a. A first attempt at repair as defined in this subpart shall be made no later than ~~5~~ **[1]** calendar days after the leak is detected.

(e) Any connector that is designated, as described in §60.486a(f)(1), as an unsafe-to-monitor connector is exempt from the requirements of paragraphs (a) and (b) of this section if:

(1) The owner or operator of the connector demonstrates that the connector is unsafe-to-monitor because monitoring personnel would be exposed to an immediate danger as a consequence of complying with paragraphs (a) and (b) of this section; and

(2) The owner or operator of the connector has a written plan that requires monitoring of the connector as frequently as practicable during safe-to-monitor times but not more frequently than the periodic monitoring schedule otherwise applicable, and repair of the equipment according to the procedures in paragraph (d) of this section if a leak is detected.

(f) *Inaccessible, ceramic, or ceramic-lined connectors.* (1) Any connector that is inaccessible or that is ceramic or ceramic-lined (e.g., porcelain, glass, or glass-lined), is exempt from the monitoring requirements of paragraphs (a) and (b) of this section, from the leak repair requirements of paragraph (d) of this section, and from the recordkeeping and reporting requirements of §§63.1038 and 63.1039. An inaccessible connector is one that meets any of the provisions specified in paragraphs (f)(1)(i) through (vi) of this section, as applicable:

(i) Buried;

(ii) Insulated in a manner that prevents access to the connector by a monitor probe;

(iii) Obstructed by equipment or piping that prevents access to the connector by a monitor probe;

(iv) Unable to be reached from a wheeled scissor-lift or hydraulic-type scaffold that would allow access to connectors up to 7.6 meters (25 feet) above the ground;

(v) Inaccessible because it would require elevating the monitoring personnel more than 2 meters (7 feet) above a permanent support surface or would require the erection of scaffold; or

(vi) Not able to be accessed at any time in a safe manner to perform monitoring. Unsafe access includes, but is not limited to, the use of a wheeled scissor-lift on unstable or uneven terrain, the use of a motorized man-lift basket in areas where an ignition potential exists, or access would require near proximity to hazards such as electrical lines, or would risk damage to equipment.

(2) If any inaccessible, ceramic, or ceramic-lined connector is observed by visual, audible, olfactory, or other means to be leaking, the visual, audible, olfactory, or other indications of a leak to the atmosphere shall be eliminated as soon as practical.

(g) Except for instrumentation systems and inaccessible, ceramic, or ceramic-lined connectors meeting the provisions of paragraph (f) of this section, identify the connectors subject to the requirements of this subpart. Connectors need not be individually identified if all connectors in a designated area or length of pipe subject to the provisions of this subpart are identified as a group, and the number of connectors subject is indicated.

EFFECTIVE DATE NOTE: At 73 FR 31376, June 2, 2008, §60.482-11a was stayed until further notice.

~~**§60.483-1a Alternative standards for valves—allowable percentage of valves leaking.**~~

~~(a) An owner or operator may elect to comply with an allowable percentage of valves leaking of equal to or less than 2.0 percent.~~

~~(b) The following requirements shall be met if an owner or operator wishes to comply with an allowable percentage of valves leaking:~~

~~(1) An owner or operator must notify the Administrator that the owner or operator has elected to comply with the allowable percentage of valves leaking before implementing this alternative standard, as specified in §60.487a(d).~~

~~(2) A performance test as specified in paragraph (c) of this section shall be conducted initially upon designation, annually, and at other times requested by the Administrator.~~

~~(3) If a valve leak is detected, it shall be repaired in accordance with §60.482-7a(d) and (e).~~

~~(c) Performance tests shall be conducted in the following manner:~~

~~(1) All valves in gas/vapor and light liquid service within the affected facility shall be monitored within 1 week by the methods specified in §60.485a(b).~~

~~(2) If an instrument reading of 500 ppm or greater is measured, a leak is detected.~~

~~(3) The leak percentage shall be determined by dividing the number of valves for which leaks are detected by the number of valves in gas/vapor and light liquid service within the affected facility.~~

~~(d) Owners and operators who elect to comply with this alternative standard shall not have an affected facility with a leak percentage greater than 2.0 percent, determined as described in §60.485a(h).~~

~~§60.483-2a Alternative standards for valves—skip period leak detection and repair.~~

~~(a)(1) An owner or operator may elect to comply with one of the alternative work practices specified in paragraphs (b)(2) and (3) of this section.~~

~~(2) An owner or operator must notify the Administrator before implementing one of the alternative work practices, as specified in §60.487(d)a.~~

~~(b)(1) An owner or operator shall comply initially with the requirements for valves in gas/vapor service and valves in light liquid service, as described in §60.482-7a.~~

~~(2) After 2 consecutive quarterly leak detection periods with the percent of valves leaking equal to or less than 2.0, an owner or operator may begin to skip 1 of the quarterly leak detection periods for the valves in gas/vapor and light liquid service.~~

~~(3) After 5 consecutive quarterly leak detection periods with the percent of valves leaking equal to or less than 2.0, an owner or operator may begin to skip 3 of the quarterly leak detection periods for the valves in gas/vapor and light liquid service.~~

~~(4) If the percent of valves leaking is greater than 2.0, the owner or operator shall comply with the requirements as described in §60.482-7a but can again elect to use this section.~~

~~(5) The percent of valves leaking shall be determined as described in §60.485a(h).~~

~~(6) An owner or operator must keep a record of the percent of valves found leaking during each leak detection period.~~

~~(7) A valve that begins operation in gas/vapor service or light liquid service after the initial startup date for a process unit following one of the alternative standards in this section must be monitored in accordance with §60.482-7a(a)(2)(i) or (ii) before the provisions of this section can be applied to that valve.~~

~~§60.484a Equivalence of means of emission limitation.~~

~~(a) Each owner or operator subject to the provisions of this subpart may apply to the Administrator for determination of equivalence 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.~~

~~(b) Determination of equivalence to the equipment, design, and operational requirements of this subpart will be evaluated by the following guidelines:~~

~~(1) Each owner or operator applying for an equivalence determination shall be responsible for collecting and verifying test data to demonstrate equivalence of means of emission limitation.~~

~~(2) The Administrator will compare test data for demonstrating equivalence of the means of emission limitation to test data for the equipment, design, and operational requirements.~~

~~(3) The Administrator may condition the approval of equivalence on requirements that may be necessary to assure operation and maintenance to achieve the same emission reduction as the equipment, design, and operational requirements.~~

~~(c) Determination of equivalence to the required work practices in this subpart will be evaluated by the following guidelines:~~

~~(1) Each owner or operator applying for a determination of equivalence shall be responsible for collecting and verifying test data to demonstrate equivalence of an equivalent means of emission limitation.~~

~~(2) For each affected facility for which a determination of equivalence is requested, the emission reduction achieved by the required work practice shall be demonstrated.~~

~~(3) For each affected facility, for which a determination of equivalence is requested, the emission reduction achieved by the equivalent means of emission limitation shall be demonstrated.~~

~~(4) Each owner or operator applying for a determination of equivalence shall commit in writing to work practice(s) that provide for emission reductions equal to or greater than the emission reductions achieved by the required work practice.~~

~~(5) The Administrator will compare the demonstrated emission reduction for the equivalent means of emission limitation to the demonstrated emission reduction for the required work practices and will consider the commitment in paragraph (c)(4) of this section.~~

~~(6) The Administrator may condition the approval of equivalence on requirements that may be necessary to assure operation and maintenance to achieve the same emission reduction as the required work practice.~~

~~(d) An owner or operator may offer a unique approach to demonstrate the equivalence of any equivalent means of emission limitation.~~

~~(e)(1) After a request for determination of equivalence is received, the Administrator will publish a notice in the FEDERAL REGISTER and provide the opportunity for public hearing if the Administrator judges that the request may be approved.~~

~~(2) After notice and opportunity for public hearing, the Administrator will determine the equivalence of a means of emission limitation and will publish the determination in the FEDERAL REGISTER.~~

~~(3) Any equivalent means of emission limitations approved under this section shall constitute a required work practice, equipment, design, or operational standard within the meaning of section 111(h)(1) of the CAA.~~

~~(f)(1) Manufacturers of equipment used to control equipment leaks of VOC may apply to the Administrator for determination of equivalence for any equivalent means of emission limitation that achieves a reduction in emissions of VOC achieved by the equipment, design, and operational requirements of this subpart.~~

~~(2) The Administrator will make an equivalence determination according to the provisions of paragraphs (b), (c), (d), and (e) of this section.~~

§60.486a Recordkeeping requirements.

(a)(1) Each owner or operator subject to the provisions of this subpart shall comply with the recordkeeping requirements of this section.

(2) An owner or operator of more than one affected facility subject to the provisions of this subpart may comply with the recordkeeping requirements for these facilities in one recordkeeping system if the system identifies each record by each facility.

(3) The owner or operator shall record the information specified in paragraphs (a)(3)(i) through (v) of this section for each monitoring event required by §§60.482-2a, 60.482-3a, 60.482-7a, 60.482-8a, 60.482-11a, and 60.483-2a.

(i) Monitoring instrument identification.

(ii) Operator identification.

(iii) Equipment identification.

(iv) Date of monitoring.

(v) Instrument reading.

(b) When each leak is detected as specified in §§60.482-2a, 60.482-3a, 60.482-7a, 60.482-8a, 60.482-11a, and 60.483-2a, the following requirements apply:

(1) A weatherproof and readily visible identification, marked with the equipment identification number, shall be attached to the leaking equipment.

(2) The identification on a valve may be removed after it has been monitored for 2 successive months as specified in §60.482-7a(c) and no leak has been detected during those 2 months.

(3) The identification on a connector may be removed after it has been monitored as specified in §60.482-11a(b)(3)(iv) and no leak has been detected during that monitoring.

(4) The identification on equipment, except on a valve or connector, may be removed after it has been repaired.

(c) When each leak is detected as specified in §§60.482-2a, 60.482-3a, 60.482-7a, 60.482-8a, 60.482-11a, and 60.483-2a, the following information shall be recorded in a log and shall be kept for 2 years in a readily accessible location:

(1) The instrument and operator identification numbers and the equipment identification number, except when indications of liquids dripping from a pump are designated as a leak.

(2) The date the leak was detected and the dates of each attempt to repair the leak.

(3) Repair methods applied in each attempt to repair the leak.

(4) Maximum instrument reading measured by Method 21 of appendix A-7 of this part at the time the leak is successfully repaired or determined to be nonrepairable, except when a pump is repaired by eliminating indications of liquids dripping.

(5) "Repair delayed" and the reason for the delay if a leak is not repaired within ~~15~~ **[3]** calendar days after discovery of the leak.

(6) The signature of the owner or operator (or designate) whose decision it was that repair could not be effected without a process shutdown.

(7) The expected date of successful repair of the leak if a leak is not repaired within ~~15~~ **[3]** days.

(8) Dates of process unit shutdowns that occur while the equipment is unrepaired.

(9) The date of successful repair of the leak.

(d) The following information pertaining to the design requirements for closed vent systems and control devices described in §60.482-10a shall be recorded and kept in a readily accessible location:

(1) Detailed schematics, design specifications, and piping and instrumentation diagrams.

(2) The dates and descriptions of any changes in the design specifications.

(3) A description of the parameter or parameters monitored, as required in §60.482-10a(e), to ensure that control devices are operated and maintained in conformance with their design and an explanation of why that parameter (or parameters) was selected for the monitoring.

(4) Periods when the closed vent systems and control devices required in §§60.482-2a, 60.482-3a, 60.482-4a, and 60.482-5a are not operated as designed, including periods when a flare pilot light does not have a flame.

(5) Dates of startups and shutdowns of the closed vent systems and control devices required in §§60.482-2a, 60.482-3a, 60.482-4a, and 60.482-5a.

(e) The following information pertaining to all equipment subject to the requirements in §§60.482-1a to 60.482-11a shall be recorded in a log that is kept in a readily accessible location:

(1) A list of identification numbers for equipment subject to the requirements of this subpart.

(2)(i) A list of identification numbers for equipment that are designated for no detectable emissions under the provisions of §§60.482-2a(e), 60.482-3a(i), and 60.482-7a(f).

(ii) The designation of equipment as subject to the requirements of §60.482-2a(e), §60.482-3a(i), or §60.482-7a(f) shall be signed by the owner or operator. Alternatively, the owner or operator may establish a mechanism with their permitting authority that satisfies this requirement.

(3) A list of equipment identification numbers for pressure relief devices required to comply with §60.482-4a.

(4)(i) The dates of each compliance test as required in §§60.482-2a(e), 60.482-3a(i), 60.482-4a, and 60.482-7a(f).

(ii) The background level measured during each compliance test.

(iii) The maximum instrument reading measured at the equipment during each compliance test.

(5) A list of identification numbers for equipment in vacuum service.

~~(6) A list of identification numbers for equipment that the owner or operator designates as operating in VOC service less than 300 hr/yr in accordance with §60.482-1a(e), a description of the conditions under which the equipment is in VOC service, and rationale supporting the designation that it is in VOC service less than 300 hr/yr.~~

(7) The date and results of the weekly visual inspection for indications of liquids dripping from pumps in light liquid service.

(8) Records of the information specified in paragraphs (e)(8)(i) through (vi) of this section for monitoring instrument calibrations conducted according to sections 8.1.2 and 10 of Method 21 of appendix A-7 of this part and §60.485a(b).

(i) Date of calibration and initials of operator performing the calibration.

(ii) Calibration gas cylinder identification, certification date, and certified concentration.

(iii) Instrument scale(s) used.

(iv) A description of any corrective action taken if the meter readout could not be adjusted to correspond to the calibration gas value in accordance with section 10.1 of Method 21 of appendix A-7 of this part.

(v) Results of each calibration drift assessment required by §60.485a(b)(2) (i.e., instrument reading for calibration at end of monitoring day and the calculated percent difference from the initial calibration value).

(vi) If an owner or operator makes their own calibration gas, a description of the procedure used.

(9) The connector monitoring schedule for each process unit as specified in §60.482-11a(b)(3)(v).

(10) Records of each release from a pressure relief device subject to §60.482-4a.

(f) The following information pertaining to all valves subject to the requirements of §60.482-7a(g) and (h), all pumps subject to the requirements of §60.482-2a(g), and all connectors subject to the requirements of §60.482-11a(e) shall be recorded in a log that is kept in a readily accessible location:

(1) A list of identification numbers for valves, pumps, and connectors that are designated as unsafe-to-monitor, an explanation for each valve, pump, or connector stating why the valve, pump, or connector is unsafe-to-monitor, and the plan for monitoring each valve, pump, or connector.

(2) A list of identification numbers for valves that are designated as difficult-to-monitor, an explanation for each valve stating why the valve is difficult-to-monitor, and the schedule for monitoring each valve.

(g) The following information shall be recorded for valves complying with §60.483-2a:

(1) A schedule of monitoring.

(2) The percent of valves found leaking during each monitoring period.

(h) The following information shall be recorded in a log that is kept in a readily accessible location:

(1) Design criterion required in §§60.482-2a(d)(5) and 60.482-3a(e)(2) and explanation of the design criterion; and

(2) Any changes to this criterion and the reasons for the changes.

(i) The following information shall be recorded in a log that is kept in a readily accessible location for use in determining exemptions as provided in §60.480a(d):

(1) An analysis demonstrating the design capacity of the affected facility,

(2) A statement listing the feed or raw materials and products from the affected facilities and an analysis demonstrating whether these chemicals are heavy liquids or beverage alcohol, and

(3) An analysis demonstrating that equipment is not in VOC service.

(j) Information and data used to demonstrate that a piece of equipment is not in VOC service shall be recorded in a log that is kept in a readily accessible location.

(k) The provisions of §60.7(b) and (d) do not apply to affected facilities subject to this subpart.

§60.487a Reporting requirements.

(a) Each owner or operator subject to the provisions of this subpart shall submit semiannual reports to the Administrator beginning 6 months after the initial startup date.

(b) The initial semiannual report to the Administrator shall include the following information:

(1) Process unit identification.

(2) Number of valves subject to the requirements of §60.482-7a, excluding those valves designated for no detectable emissions under the provisions of §60.482-7a(f).

(3) Number of pumps subject to the requirements of §60.482-2a, excluding those pumps designated for no detectable emissions under the provisions of §60.482-2a(e) and those pumps complying with §60.482-2a(f).

(4) Number of compressors subject to the requirements of §60.482-3a, excluding those compressors designated for no detectable emissions under the provisions of §60.482-3a(i) and those compressors complying with §60.482-3a(h).

(5) Number of connectors subject to the requirements of §60.482-11a.

(c) All semiannual reports to the Administrator shall include the following information, summarized from the information in §60.486a:

(1) Process unit identification.

(2) For each month during the semiannual reporting period,

(i) Number of valves for which leaks were detected as described in §60.482-7a(b) or §60.483-2a,

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

(iii) Number of pumps for which leaks were detected as described in §60.482-2a(b), (d)(4)(ii)(A) or (B), or (d)(5)(iii),

(iv) Number of pumps for which leaks were not repaired as required in §60.482-2a(c)(1) and (d)(6),

(v) Number of compressors for which leaks were detected as described in §60.482-3a(f),

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

(vii) Number of connectors for which leaks were detected as described in §60.482-11a(b)

(viii) Number of connectors for which leaks were not repaired as required in §60.482-11a(d), and

(ix)-(x) [Reserved]

(xi) The facts that explain each delay of repair and, where appropriate, why a process unit shutdown was technically infeasible.

(3) Dates of process unit shutdowns which occurred within the semiannual reporting period.

(4) Revisions to items reported according to paragraph (b) of this section if changes have occurred since the initial report or subsequent revisions to the initial report.

(d) An owner or operator electing to comply with the provisions of §§60.483-1a or 60.483-2a shall notify the Administrator of the alternative standard selected 90 days before implementing either of the provisions.

(e) An owner or operator shall report the results of all performance tests in accordance with §60.8 of the General Provisions. The provisions of §60.8(d) do not apply to affected facilities subject to the provisions of this subpart except that an owner or operator must notify the Administrator of the schedule for the initial performance tests at least 30 days before the initial performance tests.

(f) The requirements of paragraphs (a) through (c) of this section remain in force until and unless EPA, in delegating enforcement authority to a state under section 111(c) of the CAA, approves reporting requirements or an alternative means of compliance surveillance adopted by such state. In that event, affected sources within the state will be relieved of the obligation to comply with the requirements of paragraphs (a) through (c) of this section, provided that they comply with the requirements established by the state.

Subpart NNN—Standards of Performance for Volatile Organic Compound (VOC) Emissions From Synthetic Organic Chemical Manufacturing Industry (SOCMI) Distillation Operations

Contents

SOURCE: 55 FR 26942, June 29, 1990, unless otherwise noted.

§60.660 Applicability and designation of affected facility.

(a) The provisions of this subpart apply to each affected facility designated in paragraph (b) of this section that is part of a process unit that produces any of the chemicals listed in §60.667 as a product, co-product, by-product, or intermediate, except as provided in paragraph (c).

(b) The affected facility is any of the following for which construction, modification, or reconstruction commenced after December 30, 1983:

(1) Each distillation unit not discharging its vent stream into a recovery system.

(2) Each combination of a distillation unit and the recovery system into which its vent stream is discharged.

(3) Each combination of two or more distillation units and the common recovery system into which their vent streams are discharged.

(c) Exemptions from the provisions of paragraph (a) of this section are as follows:

(1) Any distillation unit operating as part of a process unit which produces coal tar or beverage alcohols, or which uses, contains, and produces no VOC is not an affected facility.

(2) Any distillation unit that is subject to the provisions of subpart DDD is not an affected facility.

~~(3) Any distillation unit that is designed and operated as a batch operation is not an affected facility.~~

(4) Each affected facility that has a total resource effectiveness (TRE) index value greater than 8.0 is exempt from all provisions of this subpart except for §§60.662; 60.664 (e), (f), and (g); and 60.665 (h) and (l).

(5) Each affected facility in a process unit with a total design capacity for all chemicals produced within that unit of less than one gigagram per year is exempt from all provisions of this subpart except for the recordkeeping and reporting requirements in paragraphs (j), (l)(6), and (n) of §60.665.

(6) Each affected facility operated with a vent stream flow rate less than 0.008 scm/min is exempt from all provisions of this subpart except for the test method and procedure and the recordkeeping and reporting requirements in §60.664(g) and paragraphs (i), (l)(5), and (o) of §60.665.

~~(d) *Alternative means of compliance*—(1) *Option to comply with part 65*. Owners or operators of process vents that are subject to this subpart may choose to comply with the provisions of 40 CFR part 65, subpart D, to satisfy the requirements of §§60.662 through 60.665 and 60.668. The provisions of 40 CFR part 65 also satisfy the criteria of paragraphs (c)(4) and (6) of this section. Other provisions applying to an owner or operator who chooses to comply with 40 CFR part 65 are provided in 40 CFR 65.1.~~

~~(2) *Part 60, subpart A*. Owners or operators who choose to comply with 40 CFR part 65, subpart D, must also comply with §§60.1, 60.2, 60.5, 60.6, 60.7(a)(1) and (4), 60.14, 60.15, and 60.16 for those process vents. All sections and paragraphs of subpart A of this part that are not mentioned in this paragraph (d)(2) do not apply to owners or operators of process vents complying with 40 CFR part 65, subpart D, except that provisions required to be met prior to implementing 40 CFR part 65 still apply. Owners and operators who choose to comply with 40 CFR part 65, subpart D, must comply with 40 CFR part 65, subpart A.~~

~~(3) *Compliance date*. Owners or operators who choose to comply with 40 CFR part 65, subpart D, at initial startup shall comply with paragraphs (d)(1) and (2) of this section for each vent stream on and after the date on which the initial performance test is completed, but not later than 60 days after achieving the maximum production rate at which the affected facility will be operated, or 180 days after the initial startup, whichever date comes first.~~

(4) *Initial startup notification.* Each owner or operator subject to the provisions of this subpart that chooses to comply with 40 CFR part 65, subpart D, at initial startup shall notify the Administrator of the specific provisions of 40 CFR 65.63(a)(1), (2), or (3), with which the

owner or operator has elected to comply. Notification shall be submitted with the notifications of initial startup required by 40 CFR 65.5(b).

NOTE: The intent of these standards is to minimize the emissions of VOC through the application of best demonstrated technology (BDT). The numerical emission limits in these standards are expressed in terms of total organic compounds (TOC), measured as TOC less methane and ethane. This emission limit reflects the performance of BDT.

[55 FR 26942, June 29, 2000, as amended at 65 FR 78279, Dec. 14, 2000; 79 FR 11251, Feb. 27, 2014]

§60.661 Definitions.

As used in this subpart, all terms not defined here shall have the meaning given them in the Act and in subpart A of part 60, and the following terms shall have the specific meanings given them.

Batch distillation operation means a noncontinuous distillation operation in which a discrete quantity or batch of liquid feed is charged into a distillation unit and distilled at one time. After the initial charging of the liquid feed, no additional liquid is added during the distillation operation.

Boiler means any enclosed combustion device that extracts useful energy in the form of steam.

By compound means by individual stream components, not carbon equivalents.

Continuous recorder means a data recording device recording an instantaneous data value at least once every 15 minutes.

Distillation operation means an operation separating one or more feed stream(s) into two or more exit stream(s), each exit stream having component concentrations different from those in the feed stream(s). The separation is achieved by the redistribution of the components between the liquid and vapor-phase as they approach equilibrium within the distillation unit.

Distillation unit means a device or vessel in which distillation operations occur, including all associated internals (such as trays or packing) and accessories (such as reboiler, condenser, vacuum pump, steam jet, etc.), plus any associated recovery system.

Flame zone means the portion of the combustion chamber in a boiler occupied by the flame envelope.

Flow indicator means a device which indicates whether gas flow is present in a vent stream.

Halogenated vent stream means any vent stream determined to have a total concentration (by volume) of compounds containing halogens of 20 ppmv (by compound) or greater.

Incinerator means any enclosed combustion device that is used for destroying organic compounds and does not extract energy in the form of steam or process heat.

Process heater means a device that transfers heat liberated by burning fuel to fluids contained in tubes, including all fluids except water that is heated to produce steam.

Process unit means equipment assembled and connected by pipes or ducts to produce, as intermediates or final products, one or more of the chemicals in §60.667. A process unit can operate independently if supplied with sufficient fuel or raw materials and sufficient product storage facilities.

Product means any compound or chemical listed in §60.667 that is produced for sale as a final product as that chemical, or for use in the production of other chemicals or compounds. By-products, co-products, and intermediates are considered to be products.

Recovery device means an individual unit of equipment, such as an absorber, carbon adsorber, or condenser, capable of and used for the purpose of recovering chemicals for use, reuse, or sale.

Recovery system means an individual recovery device or series of such devices applied to the same vent stream.

Total organic compounds (TOC) means those compounds measured according to the procedures in §60.664(b)(4). For the purposes of measuring molar composition as required in §60.664(d)(2)(i); hourly emissions rate as required in §60.664(d)(5) and §60.664(e); and TOC concentration as required in §60.665(b)(4) and §60.665(g)(4), those compounds which the Administrator has determined do not contribute appreciably to the formation of ozone are to be excluded. The compounds to be excluded are identified in Environmental Protection Agency's statements on ozone abatement policy for State Implementation Plans (SIP) revisions (42 FR 35314; 44 FR 32042; 45 FR 32424; 45 FR 48942).

TRE index value means a measure of the supplemental total resource requirement per unit reduction of TOC associated with an individual distillation vent stream, based on vent stream flow rate, emission rate of TOC net heating value, and corrosion properties (whether or not the vent stream is halogenated), as quantified by the equation given under §60.664(e).

Vent stream means any gas stream discharged directly from a distillation facility to the atmosphere or indirectly to the atmosphere after diversion through other process equipment. The vent stream excludes relief valve discharges and equipment leaks including, but not limited to, pumps, compressors, and valves.

§60.662 Standards.

Each owner or operator of any affected facility shall comply with paragraph (a), (b), or (c) of this section for each vent stream on and after the date on which the initial performance test required by §§60.8 and 60.664 is completed, but not later than 60 days after achieving the maximum production rate at which the affected facility will be operated, or 180 days after the initial start-up, whichever date comes first. Each owner or operator shall either:

(a) Reduce emissions of TOC (less methane and ethane) by **~~98~~ [Level 2 – 99]** weight-percent, or to a TOC (less methane and ethane) concentration of **~~20~~ [5]** ppmv, on a dry basis corrected to 3 percent oxygen, whichever is less stringent. If a boiler or process heater is used to comply with this paragraph, then the vent stream shall be introduced into the flame zone of the boiler or process heater; or

(b) Combust the emissions in a flare that meets the requirements of **[§§ 63.670 and 63.671].** ~~§60.18~~; or

(c) Maintain a TRE index value greater than 1.0 without use of VOC emission control devices.

§60.663 Monitoring of emissions and operations.

(a) The owner or operator of an affected facility that uses an incinerator to seek to comply with the TOC emission limit specified under §60.662(a) shall install, calibrate, maintain, and operate according to manufacturer's specifications the following equipment:

(1) A temperature monitoring device equipped with a continuous recorder and having an accuracy of ±1 percent of the temperature being monitored expressed in degrees Celsius or ±0.5 °C, whichever is greater.

(i) Where an incinerator other than a catalytic incinerator is used, a temperature monitoring device shall be installed in the firebox.

(ii) Where a catalytic incinerator is used, temperature monitoring devices shall be installed in the gas stream immediately before and after the catalyst bed.

(2) A flow indicator that provides a **[continuous]** record of vent stream flow to the incinerator ~~at least once every hour~~ for each affected facility. The flow indicator shall be installed in the vent stream from each affected facility at a point closest to the inlet of each incinerator and before being joined with any other vent stream.

(b) The owner or operator of an affected facility that uses a flare to seek to comply with §60.662(b) shall install, calibrate, maintain and operate according to manufacturer's specifications the following equipment:

(1) A heat sensing device, such as an ultra-violet beam sensor or thermocouple, at the pilot light to indicate the continuous presence of a flame.

(2) A flow indicator that provides a **[continuous]** record of vent stream flow to the flare ~~at least once every hour~~ for each affected facility. The flow indicator shall be installed in the vent stream from each affected facility at a point closest to the flare and before being joined with any other vent stream.

(c) The owner or operator of an affected facility that uses a boiler or process heater to seek to comply with §60.662(a) shall install, calibrate, maintain and operate according to the manufacturer's specifications the following equipment:

(1) A flow indicator that provides a **[continuous]** record of vent stream flow to the boiler or process heater ~~at least once every hour~~ for each affected facility. The flow indicator shall be installed in the vent stream from each distillation unit within an affected facility at a point closest to the inlet of each boiler or process heater and before being joined with any other vent stream.

(2) A temperature monitoring device in the firebox equipped with a continuous recorder and having an accuracy of ±1 percent of the temperature being measured expressed in degrees Celsius or ±0.5 °C, whichever is greater~~, for boilers or process heaters of less than 44 MW (150 million Btu/hr) heat input design capacity~~.

(d) Monitor and record the periods of operation of the boiler or process ~~heater if the design heat input capacity of the boiler or process heater is 44 MW (150 million Btu/hr) or greater~~. The records must be readily available for inspection.

(e) The owner or operator of an affected facility that seeks to comply with the TRE index value limit specified under §60.662(c) shall install, calibrate, maintain, and operate according to manufacturer's specifications the following equipment, unless alternative monitoring procedures or requirements are approved for that facility by the Administrator:

(1) Where an absorber is the final recovery device in the recovery system:

(i) A scrubbing liquid temperature monitoring device having an accuracy of ±1 percent of the temperature being monitored expressed in degrees Celsius or ±0.5 °C, whichever is greater, and a specific gravity monitoring device having an accuracy of ±0.02 specific gravity units, each equipped with a continuous recorder, or

(ii) An organic monitoring device used to indicate the concentration level of organic compounds exiting the recovery device based on a detection principle such as infrared, photoionization, or thermal conductivity, each equipped with a continuous recorder.

(2) Where a condenser is the final recovery device in the recovery system:

(i) A condenser exit (product side) temperature monitoring device equipped with a continuous recorder and having an accuracy of ±1 percent of the temperature being monitored expressed in degrees Celsius or ±0.5 °C, whichever is greater, or

(ii) An organic monitoring device used to monitor organic compounds exiting the recovery device based on a detection principle such as infra-red, photoionization, or thermal conductivity, each equipped with a continuous recorder.

(3) Where a carbon adsorber is the final recovery device unit in the recovery system:

(i) An integrating steam flow monitoring device having an accuracy of ±10 percent, and a carbon bed temperature monitoring device having an accuracy of ±1 percent of the temperature being monitored expressed in degrees Celsius or ±0.5 °C, whichever is greater, both equipped with a continuous recorder, or

(ii) An organic monitoring device used to indicate the concentration level of organic compounds exiting the recovery device based on a detection principle such as infra-red, photoionization, or thermal conductivity, each equipped with a continuous recorder.

(f) An owner or operator of an affected facility seeking to demonstrate compliance with the standards specified under §60.662 with control devices other than incinerator, boiler, process heater, or flare; or recovery device other than an absorber, condenser, or carbon adsorber shall provide to the Administrator information describing the operation of the control device or recovery device and the process parameter(s) which would indicate proper operation and maintenance of the device. The Administrator may request further information and will specify appropriate monitoring procedures or requirements.

[55 FR 26942, June 29, 1990, as amended at 65 FR 61774, Oct. 17, 2000]

§60.665 Reporting and recordkeeping requirements.

(a) Each owner or operator subject to §60.662 shall notify the Administrator of the specific provisions of §60.662 (§60.662 (a), (b), or (c)) with which the owner or operator has elected to comply. Notification shall be submitted with the notification of initial start-up required by §60.7(a)(3). If an owner or operator elects at a later date to use an alternative provision of §60.662 with which he or she will comply, then the Administrator shall be notified by the owner or operator 90 days before implementing a change and, upon implementing the change, a performance test shall be performed as specified by §60.664 within 180 days.

(b) Each owner or operator subject to the provisions of this subpart shall keep an up-to-date, readily accessible record of the following data measured during each performance test, and also include the following data in the report of the initial performance test required under §60.8. ~~Where a boiler or process heater with a design heat input capacity of 44 MW (150 million Btu/hour) or greater is used to comply with §60.662(a), a report containing performance test data need not be submitted, but a report containing the information in §60.665(b)(2)(i) is required.~~ The same data specified in this section shall be submitted in the reports of all subsequently required performance tests where either the emission control efficiency of a control device, outlet concentration of TOC, or the TRE index value of a vent stream from a recovery system is determined.

(1) Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with §60.662(a) through use of either a thermal or catalytic incinerator:

(i) The average firebox temperature of the incinerator (or the average temperature upstream and downstream of the catalyst bed for a catalytic incinerator), measured **[continuously]** ~~at least every 15 minutes and averaged~~ over the same time period of the performance testing, and

(ii) The percent reduction of TOC determined as specified in §60.664(b) achieved by the incinerator, or the concentration of TOC (ppmv, by compound) determined as specified in §60.664(b) at the outlet of the control device on a dry basis corrected to 3 percent oxygen.

(2) Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with §60.662(a) through use of a boiler or process heater:

(i) A description of the location at which the vent stream is introduced into the boiler or process heater, and

(ii) The average combustion temperature of the boiler or process heater ~~with a design heat input capacity of less than 44 MW (150 million Btu/hr)~~ measured **[continuously]** ~~at least every 15 minutes and averaged~~ over the same time period of the performance testing.

(3) Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with §60.662(b) through use of a smokeless flare, flare design (i.e., steam-assisted, air-assisted or nonassisted), all visible emission readings, heat content determinations, flow rate measurements, and exit velocity determinations made during the performance test, continuous records of the flare pilot flame monitoring, and records of all periods of operations during which the pilot flame is absent.

(4) Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with §60.662(c):

(i) Where an absorber is the final recovery device in the recovery system, the exit specific gravity (or alternative parameter which is a measure of the degree of absorbing liquid saturation, if approved by the Administrator), and average exit temperature, of the absorbing liquid measured at least every 15 minutes and averaged over the same time period of the performance testing (both measured while the vent stream is normally routed and constituted), or

(ii) Where a condenser is the final recovery device in the recovery system, the average exit (product side) temperature measured at least every 15 minutes and averaged over the same time period of the performance testing while the vent stream is routed and constituted normally, or

(iii) Where a carbon adsorber is the final recovery device in the recovery system, the total steam mass flow measured at least every 15 minutes and averaged over the same time period of the performance test (full carbon bed cycle), temperature of the carbon bed after regeneration (and within 15 minutes of completion of any cooling cycle(s)), and duration of the carbon bed steaming cycle (all measured while the vent stream is routed and constituted normally), or

(iv) As an alternative to §60.665(b)(4) ((i), (ii) or (iii), the concentration level or reading indicated by the organics monitoring device at the outlet of the absorber, condenser, or carbon adsorber, measured at least every 15 minutes and averaged over the same time period of the performance testing while the vent stream is normally routed and constituted.

(v) All measurements and calculations performed to determine the TRE index value of the vent stream.

(c) Each owner or operator subject to the provisions of this subpart shall keep up-to-date, readily accessible continuous records of the equipment operating parameters specified to be monitored under §60.663 (a) and (c) as well as up-to-date, readily accessible records of periods of operation during which the parameter boundaries established during the most recent performance test are exceeded. The Administrator may at any time require a report of these data. Where a combustion device is used to comply with §60.662(a), periods of operation during which the parameter boundaries established during the most recent performance tests are exceeded are defined as follows:

(1) For thermal incinerators, all ~~**3**~~ **[1]-**hour periods of operation during which the average combustion temperature was more than 28 °C (50 °F) below the average combustion temperature during the most recent performance test at which compliance with §60.662(a) was determined.

(2) For catalytic incinerators, all ~~**3**~~ **[1]-**hour periods of operation during which the average temperature of the vent stream immediately before the catalyst bed is more than 28 °C (50 °F) below the average temperature of the vent stream during the most recent performance test at which compliance with §60.662(a) was determined. The owner or operator also shall record all ~~**3**~~ **[1]-**hour periods of operation during which the average temperature difference across the catalyst bed is less than 80 percent of the average temperature difference of the device during the most recent performance test at which compliance with §60.662(a) was determined.

(3) All ~~**3**~~ **[1]-**hour periods of operation during which the average combustion temperature was more than 28 °C (50 °F) below the average combustion temperature during the most recent performance test at which compliance with §60.662(a) was determined for boilers or process heaters ~~with a design heat input capacity of less than 44 MW (150 million Btu/hr)~~.

(4) For boilers or process heaters, whenever there is a change in the location at which the vent stream is introduced into the flame zone as required under §60.662(a).

(d) Each owner or operator subject to the provisions of this subpart shall keep up to date, readily accessible continuous records of the flow indication specified under §60.663(a)(2), §60.663(b)(2) and §60.663(c)(1), as well as up-to-date, readily accessible records of all periods when the vent stream is diverted from the control device or has no flow rate.

(e) Each owner or operator subject to the provisions of this subpart who uses a boiler or process heater ~~with a design heat input capacity of 44 MW (150 million Btu/hour) or greater~~ to comply with §60.662(a) shall keep an up-to-date, readily accessible record of all periods of operation of the boiler or process heater. (Examples of such records could include records of steam use, fuel use, or monitoring data collected pursuant to other State or Federal regulatory requirements.)

(f) Each owner or operator subject to the provisions of this subpart shall keep up-to-date, readily accessible continuous records of the flare pilot flame monitoring specified under §60.663(b), as well as up-to-date, readily accessible records of all periods of operations in which the pilot flame is absent.

(g) Each owner or operator subject to the provisions of this subpart shall keep up-to-date, readily accessible continuous records of the equipment operating parameters specified to be monitored under §60.663(e), as well as up-to-date, readily accessible records of periods of operation during which the parameter boundaries established during the most recent performance test are exceeded. The Administrator may at any time require a report of these data. Where an owner or operator seeks to comply with §60.662(c), periods of operation during which the parameter boundaries established during the most recent performance tests are exceeded are defined as follows:

(1) Where an absorber is the final recovery device in a recovery system, and where an organic compound monitoring device is not used:

(i) All 3-hour periods of operation during which the average absorbing liquid temperature was more than 11 °C (20 °F) above the average absorbing liquid temperature during the most recent performance test, or

(ii) All 3-hour periods of operation during which the average absorbing liquid specific gravity was more than 0.1 unit above, or more than 0.1 unit below, the average absorbing liquid specific gravity during the most recent performance test (unless monitoring of an alternative parameter, which is a measure of the degree of absorbing liquid saturation, is approved by the Administrator, in which case he will define appropriate parameter boundaries and periods of operation during which they are exceeded).

(2) Where a condenser is the final recovery device in a system, and where an organic compound monitoring device is not used, all 3-hour periods of operation during which the average exit (product side) condenser operating temperature was more than 6 °C (1 1 °F)

above the average exit (product side) operating temperature during the most recent performance test.

(3) Where a carbon adsorber is the final recovery device in a system, and where an organic compound monitoring device is not used:

(i) All carbon bed regeneration cycles during which the total mass steam flow was more than 10 percent below the total mass steam flow during the most recent performance test, or

(ii) All carbon bed regeneration cycles during which the temperature of the carbon bed after regeneration (and after completion of any cooling cycle(s)) was more than 10 percent greater than the carbon bed temperature (in degrees Celsius) during the most recent performance test.

(4) Where an absorber, condenser, or carbon adsorber is the final recovery device in the recovery system and where an organic compound monitoring device is used, all 3-hour periods of operation during which the average organic compound concentration level or reading of organic compounds in the exhaust gases is more than 20 percent greater than the exhaust gas organic compound concentration level or reading measured by the monitoring device during the most recent performance test.

(h) Each owner or operator of an affected facility subject to the provisions of this subpart and seeking to demonstrate compliance with §60.662(c) shall keep up-to-date, readily accessible records of:

(1) Any changes in production capacity, feedstock type, or catalyst type, or of any replacement, removal or addition of recovery equipment or a distillation unit;

(2) Any recalculation of the TRE index value performed pursuant to §60.664(g); and

(3) The results of any performance test performed pursuant to the methods and procedures required by §60.664(e).

(i) Each owner or operator of an affected facility that seeks to comply with the requirements of this subpart by complying with the flow rate cutoff in §60.660(c)(6) shall keep up-to-date, readily accessible records to indicate that the vent stream flow rate is less than 0.008 scm/min (0.3 scf/min) and of any change in equipment or process operation that increases the operating vent stream flow rate, including a measurement of the new vent stream flow rate.

(j) Each owner or operator of an affected facility that seeks to comply with the requirements of this subpart by complying with the design production capacity provision in §60.660(c)(5) shall keep up-to-date, readily accessible records of any change in equipment or process operation that increases the design production capacity of the process unit in which the affected facility is located.

(k) Each owner and operator subject to the provisions of this subpart is exempt from the quarterly reporting requirements contained in §60.7(c) of the General Provisions.

(l) Each owner or operator that seeks to comply with the requirements of this subpart by complying with the requirements of §60.660 (c)(4), (c)(5), or (c)(6) or §60.662 shall submit to the Administrator semiannual reports of the following recorded information. The initial report shall be submitted within 6 months after the initial start-up date.

(1) Exceedances of monitored parameters recorded under §60.665 (c) and (g).

(2) All periods recorded under §60.665(d) when the vent stream is diverted from the control device or has no flow rate.

(3) All periods recorded under §60.665(e) when the boiler or process heater was not operating.

(4) All periods recorded under §60.665(f) in which the pilot flame of the flare was absent.

(5) Any change in equipment or process operation that increases the operating vent stream flow rate above the low flow exemption level in §60.660(c)(6), including a measurement of the new vent stream flow rate, as recorded under §60.665(i). These must be reported as soon as possible after the change and no later than 180 days after the change. These reports may be submitted either in conjunction with semiannual reports or as a single separate report. A performance test must be completed with the same time period to verify the recalculated flow value and to obtain the vent stream characteristics of heating value and E_{TOC}. The performance test is subject to the requirements of §60.8 of the General Provisions. Unless the facility qualifies for an exemption under the low capacity exemption status in §60.660(c)(5), the facility must begin compliance with the requirements set forth in §60.662.

(6) Any change in equipment or process operation, as recorded under paragraph (j) of this section, that increases the design production capacity above the low capacity exemption level in §60.660(c)(5) and the new capacity resulting from the change for the distillation process unit containing the affected facility. These must be reported as soon as possible after the change and no later than 180 days after the change. These reports may be submitted either in conjunction with semiannual reports or as a single separate report. A performance test must be completed within the same time period to obtain the vent stream flow rate, heating value, and E_{TOC}. The performance test is subject to the requirements of §60.8. The facility must begin compliance with the requirements set forth in §60.660(d) or §60.662. If the facility chooses to comply with §60.662, the facility may qualify for an exemption in §60.660(c)(4) or (6).

(7) Any recalculation of the TRE index value, as recorded under §60.665(h).

(m) The requirements of §60.665(l) remain in force until and unless EPA, in delegating enforcement authority to a State under section 111(c) of the Act, approves reporting requirements or an alternative means of compliance surveillance adopted by such State. In that event, affected sources within the State will be relieved of the obligation to comply with §60.665(l), provided that they comply with the requirements established by the State.

(n) Each owner or operator that seeks to demonstrate compliance with §60.660(c)(5) must submit to the Administrator an initial report detailing the design production capacity of the process unit.

(o) Each owner or operator that seeks to demonstrate compliance with §60.660(c)(6) must submit to the Administrator an initial report including a flow rate measurement using the test methods specified in §60.664.

(p) The Administrator will specify appropriate reporting and recordkeeping requirements where the owner or operator of an affected facility complies with the standards specified under §60.662 other than as provided under §60.663(a), (b), (c) and (d).

[55 FR 26922, June 29, 1990; 55 FR 36932, Sept. 7, 1990, as amended at 60 FR 58237, Nov. 27, 1995; 65 FR 61778, Oct. 17, 2000; 65 FR 78279, Dec. 14, 2000; 79 FR 11251, Feb. 27, 2014]

Ethylene Manufacturing – 40 CFR 60, Subpart RRR

Subpart RRR—Standards of Performance for Volatile Organic Compound Emissions From Synthetic Organic Chemical Manufacturing Industry (SOCMI) Reactor Processes

---

Contents

SOURCE: 58 FR 45962, Aug. 31, 1993, unless otherwise noted.

§60.700 Applicability and designation of affected facility.

(a) The provisions of this subpart apply to each affected facility designated in paragraph (b) of this section that is part of a process unit that produces any of the chemicals listed in

§60.707 as a product, co-product, by-product, or intermediate, except as provided in paragraph (c) of this section.

(b) The affected facility is any of the following for which construction, modification, or reconstruction commenced after June 29, 1990:

(1) Each reactor process not discharging its vent stream into a recovery system.

(2) Each combination of a reactor process and the recovery system into which its vent stream is discharged.

(3) Each combination of two or more reactor processes and the common recovery system into which their vent streams are discharged.

(c) Exemptions from the provisions of paragraph (a) of this section are as follows:

~~(1) Any reactor process that is designed and operated as a batch operation is not an affected facility.~~

(2) Each affected facility that has a total resource effectiveness (TRE) index value greater than 8.0 is exempt from all provisions of this subpart except for §§60.702(c); 60.704 (d), (e), and (f); and 60.705 (g), (l)(1), (l)(6), and (t).

(3) Each affected facility in a process unit with a total design capacity for all chemicals produced within that unit of less than 1 gigagram per year (1,100 tons per year) is exempt from all provisions of this subpart except for the recordkeeping and reporting requirements in §60.705 (i), (l)(5), and (n).

(4) Each affected facility operated with a vent stream flow rate less than 0.011 scm/min is exempt from all provisions of this subpart except for the test method and procedure and the recordkeeping and reporting requirements in §§60.704(g) and 70.705 (h), (l)(4), and (o).

(5) If the vent stream from an affected facility is routed to a distillation unit subject to subpart NNN and has no other releases to the air except for a pressure relief valve, the facility is exempt from all provisions of this subpart except for §60.705(r).

(6) Any reactor process operating as part of a process unit which produces beverage alcohols, or which uses, contains, and produces no VOC is not an affected facility.

(7) Any reactor process that is subject to the provisions of subpart DDD is not an affected facility.

(8) Each affected facility operated with a concentration of total organic compounds (TOC) (less methane and ethane) in the vent stream less than **~~300~~** **[100]** ppmv as measured by Method 18 or a concentration of TOC in the vent stream less than **~~150~~** **[50]** ppmv as measured by Method 25A is exempt from all provisions of this subpart except for the test method and

procedure and the reporting and recordkeeping requirements in §60.704(h) and paragraphs (j), (l)(8), and (p) of §60.705.

~~(d) *Alternative means of compliance*—(1) *Option to comply with part 65*. Owners or operators of process vents that are subject to this subpart may choose to comply with the provisions of 40 CFR part 65, subpart D, to satisfy the requirements of §§60.702 through 60.705 and 60.708. The provisions of 40 CFR part 65 also satisfy the criteria of paragraphs (c)(2), (4), and (8) of this section. Other provisions applying to an owner or operator who chooses to comply with 40 CFR part 65 are provided in 40 CFR 65.1.~~

~~(2) *Part 60, subpart A*. Owners or operators who choose to comply with 40 CFR part 65, subpart D, must also comply with §§60.1, 60.2, 60.5, 60.6, 60.7(a)(1) and (4), 60.14, 60.15, and 60.16 for those process vents. All sections and paragraphs of subpart A of this part that are not mentioned in this paragraph (d)(2) do not apply to owners or operators of process vents complying with 40 CFR part 65, subpart D, except that provisions required to be met prior to implementing 40 CFR part 65 still apply. Owners and operators who choose to comply with 40 CFR part 65, subpart D, must comply with 40 CFR part 65, subpart A.~~

~~(3) *Compliance date*. Owners or operators who choose to comply with 40 CFR part 65, subpart D at initial startup shall comply with paragraphs (d)(1) and (2) of this section for each vent stream on and after the date on which the initial performance test is completed, but not later than 60 days after achieving the maximum production rate at which the affected facility will be operated, or 180 days after the initial startup, whichever date comes first.~~

(4) *Initial startup notification*. Each owner or operator subject to the provisions of this subpart that chooses to comply with 40 CFR part 65, subpart D, at initial startup shall notify the Administrator of the specific provisions of 40 CFR 65.63(a)(1), (2), or (3), with which the owner or operator has elected to comply. Notification shall be submitted with the notifications of initial startup required by 40 CFR 65.5(b).

(NOTE: The intent of these standards is to minimize emissions of VOC through the application of best demonstrated technology (BDT). The numerical emission limits in these standards are expressed in terms of TOC, measured as TOC less methane and ethane. This emission limit reflects the performance of BDT.)

[58 FR 45962, Aug. 31, 1993, as amended at 60 FR 58238, Nov. 27, 1995; 65 FR 78279, Dec. 14, 2000]

§60.701 Definitions.

As used in this subpart, all terms not defined here shall have the meaning given them in the Act and in subpart A of part 60, and the following terms shall have the specific meanings given them.

Batch operation means any noncontinuous reactor process that is not characterized by steady-state conditions and in which reactants are not added and products are not removed simultaneously.

Boiler means any enclosed combustion device that extracts useful energy in the form of steam and is not an incinerator.

By compound means by individual stream components, not carbon equivalents.

Car-seal means a seal that is placed on a device that is used to change the position of a valve (e.g., from opened to closed) in such a way that the position of the valve cannot be changed without breaking the seal.

Combustion device means an individual unit of equipment, such as an incinerator, flare, boiler, or process heater, used for combustion of a vent stream discharged from the process vent.

Continuous recorder means a data recording device recording an instantaneous data value at least once every 15 minutes.

Flame zone means the portion of the combustion chamber in a boiler occupied by the flame envelope.

Flow indicator means a device which indicates whether gas flow is present in a line.

Halogenated vent stream means any vent stream determined to have a total concentration (by volume) of compounds containing halogens of 20 ppmv (by compound) or greater.

Incinerator means an enclosed combustion device that is used for destroying organic compounds. If there is energy recovery, the energy recovery section and the combustion chambers are not of integral design. That is, the energy recovery section and the combustion section are not physically formed into one manufactured or assembled unit but are joined by ducts or connections carrying flue gas.

Primary fuel means the fuel fired through a burner or a number of similar burners. The primary fuel provides the principal heat input to the device, and the amount of fuel is sufficient to sustain operation without the addition of other fuels.

Process heater means a device that transfers heat liberated by burning fuel directly to process streams or to heat transfer liquids other than water.

Process unit means equipment assembled and connected by pipes or ducts to produce, as intermediates or final products, one or more of the chemicals in §60.707. A process unit can operate independently if supplied with sufficient feed or raw materials and sufficient product storage facilities.

Product means any compound or chemical listed in §60.707 which is produced for sale as a final product as that chemical, or for use in the production of other chemicals or compounds. By-products, co-products, and intermediates are considered to be products.

Reactor processes are unit operations in which one or more chemicals, or reactants other than air, are combined or decomposed in such a way that their molecular structures are altered and one or more new organic compounds are formed.

Recovery device means an individual unit of equipment, such as an absorber, carbon adsorber, or condenser, capable of and used for the purpose of recovering chemicals for use, reuse, or sale.

Recovery system means an individual recovery device or series of such devices applied to the same vent stream.

Relief valve means a valve used only to release an unplanned, nonroutine discharge. A relief valve discharge results from an operator error, a malfunction such as a power failure or equipment failure, or other unexpected cause that requires immediate venting of gas from process equipment in order to avoid safety hazards or equipment damage.

Secondary fuel means a fuel fired through a burner other than a primary fuel burner. The secondary fuel may provide supplementary heat in addition to the heat provided by the primary fuel.

Total organic compounds or TOC means those compounds measured according to the procedures in §60.704(b)(4). For the purposes of measuring molar composition as required in §60.704(d)(2)(i) and §60.704(d)(2)(ii), hourly emission rate as required in §60.704(d)(5) and §60.704(e), and TOC concentration as required in §60.705(b)(4) and §60.705(f)(4), those compounds which the Administrator has determined do not contribute appreciably to the formation of ozone are to be excluded.

Total resource effectiveness or TRE index value means a measure of the supplemental total resource requirement per unit reduction of TOC associated with a vent stream from an affected reactor process facility, based on vent stream flow rate, emission rate of TOC, net heating value, and corrosion properties (whether or not the vent stream contains halogenated compounds), as quantified by the equation given under §60.704(e).

Vent stream means any gas stream discharged directly from a reactor process to the atmosphere or indirectly to the atmosphere after diversion through other process equipment. The vent stream excludes relief valve discharges and equipment leaks.

§60.702 Standards.

Each owner or operator of any affected facility shall comply with paragraph (a), (b), or (c) of this section for each vent stream on and after the date on which the initial performance test required by §§60.8 and 60.704 is completed, but not later than 60 days after achieving the maximum production rate at which the affected facility will be operated, or 180 days after the initial start-up, whichever date comes first. Each owner or operator shall either:

(a) Reduce emissions of TOC (less methane and ethane) by **98 [Level 2 – 99]** weight-percent, or to a TOC (less methane and ethane) concentration of **2~~0~~ [5]** ppmv, on a dry basis corrected to 3 percent oxygen, whichever is less stringent. If a boiler or process heater is used to comply with this paragraph, then the vent stream shall be introduced into the flame zone of the boiler or process heater; or

(b) Combust the emissions in a flare that meets the requirements of **[See General Recommendation]** ~~**§60.18**~~; or

(c) Maintain a TRE index value greater than 1.0 without use of a VOC emission control device.

§60.703 Monitoring of emissions and operations.

(a) The owner or operator of an affected facility that uses an incinerator to seek to comply with the TOC emission limit specified under §60.702(a) shall install, calibrate, maintain, and operate according to manufacturer's specifications the following equipment:

(1) A temperature monitoring device equipped with a continuous recorder and having an accuracy of ±1 percent of the temperature being monitored expressed in degrees Celsius or ±0.5 °C, whichever is greater.

(i) Where an incinerator other than a catalytic incinerator is used, a temperature monitoring device shall be installed in the firebox or in the ductwork immediately downstream of the firebox in a position before any substantial heat exchange is encountered.

(ii) Where a catalytic incinerator is used, temperature monitoring devices shall be installed in the gas stream immediately before and after the catalyst bed.

(2) A flow indicator that provides a **[continuous]** record of vent stream flow diverted from being routed to the incinerator ~~at least once every 15 minutes~~ for each affected facility, except as provided in paragraph (a)(2)(ii) of this section.

(i) The flow indicator shall be installed at the entrance to any bypass line that could divert the vent stream from being routed to the incinerator, resulting in its emission to the atmosphere.

(ii) Where the bypass line valve is secured in the closed position with a car-seal or a lock-and-key type configuration, a flow indicator is not required. A visual inspection of the seal or closure mechanism shall be performed at least once every month to ensure that the valve is maintained in the closed position and the vent stream is not diverted through the bypass line.

(b) The owner or operator of an affected facility that uses a flare to seek to comply with §60.702(b) shall install, calibrate, maintain, and operate according to manufacturer's specifications the following equipment:

(1) A heat sensing device, such as an ultraviolet beam sensor or thermocouple, at the pilot light to indicate the continuous presence of a flame.

(2) A flow indicator that provides a **[continuous]** record of vent stream flow diverted from being routed to the flare ~~at least once every 15 minutes~~ for each affected facility, except as provided in paragraph (b)(2)(ii) of this section.

(i) The flow indicator shall be installed at the entrance to any bypass line that could divert the vent stream from being routed to the flare, resulting in its emission to the atmosphere.

(ii) Where the bypass line valve is secured in the closed position with a car-seal or a lock-and-key type configuration, a flow indicator is not required. A visual inspection of the seal or closure mechanism shall be performed at least once every month to ensure that the valve is maintained in the closed position and the vent stream is not diverted through the bypass line.

(c) The owner or operator of an affected facility that uses a boiler or process heater to seek to comply with §60.702(a) shall install, calibrate, maintain and operate according to the manufacturer's specifications the following equipment:

(1) A flow indicator that provides a **[continuous]** record of vent stream flow diverted from being routed to the boiler or process heater ~~at least once every 15 minutes~~ for each affected facility, except as provided in paragraph (c)(1)(ii) of this section.

(i) The flow indicator shall be installed at the entrance to any bypass line that could divert the vent stream from being routed to the boiler or process heater, resulting in its emission to the atmosphere.

(ii) Where the bypass line valve is secured in the closed position with a car-seal or a lock-and-key type configuration, a flow indicator is not required. A visual inspection of the seal or closure mechanism shall be performed at least once every month to ensure that the valve is maintained in the closed position and the vent stream is not diverted through the bypass line.

(2) A temperature monitoring device in the firebox equipped with a continuous recorder and having an accuracy of ±1 percent of the temperature being monitored expressed in degrees Celsius or ±0.5 °C, whichever is greater~~, for boilers or process heaters of less than 44 MW (150 million Btu/hr) design heat input capacity~~. Any vent stream introduced with primary fuel into a boiler or process heater is exempt from this requirement.

(d) The owner or operator of an affected facility that seeks to demonstrate compliance with the TRE index value limit specified under §60.702(c) shall install, calibrate, maintain, and operate according to manufacturer's specifications the following equipment, unless alternative monitoring procedures or requirements are approved for that facility by the Administrator:

(1) Where an absorber is the final recovery device in the recovery system:

(i) A scrubbing liquid temperature monitoring device having an accuracy of ±1 percent of the temperature being monitored expressed in degrees Celsius or ±0.5 °C, whichever is greater, and a specific gravity monitoring device having an accuracy of ±0.02 specific gravity units, each equipped with a continuous recorder; or

(ii) An organic monitoring device used to indicate the concentration level of organic compounds exiting the recovery device based on a detection principle such as infra-red, photoionization, or thermal conductivity, each equipped with a continuous recorder.

(2) Where a condenser is the final recovery device in the recovery system:

(i) A condenser exit (product side) temperature monitoring device equipped with a continuous recorder and having an accuracy of ±1 percent of the temperature being monitored expressed in degrees Celsius or ±0.5 °C, whichever is greater; or

(ii) An organic monitoring device used to indicate the concentration level of organic compounds exiting the recovery device based on a detection principle such as infra-red, photoionization, or thermal conductivity, each equipped with a continuous recorder.

(3) Where a carbon adsorber is the final recovery device unit in the recovery system:

(i) An integrating steam flow monitoring device having an accuracy of ±10 percent, and a carbon bed temperature monitoring device having an accuracy of ±1 percent of the temperature being monitored expressed in degrees Celsius or ±0.5 °C, whichever is greater, both equipped with a continuous recorder; or

(ii) An organic monitoring device used to indicate the concentration level of organic compounds exiting the recovery device based on a detection principle such as infra-red, photoionization, or thermal conductivity, each equipped with a continuous recorder.

(e) An owner or operator of an affected facility seeking to demonstrate compliance with the standards specified under §60.702 with a control device other than an incinerator, boiler, process heater, or flare; or a recovery device other than an absorber, condenser, or carbon adsorber, shall provide to the Administrator information describing the operation of the control device or recovery device and the process parameter(s) which would indicate proper operation and maintenance of the device. The Administrator may request further information and will specify appropriate monitoring procedures or requirements.

§60.705 Reporting and recordkeeping requirements.

(a) Each owner or operator subject to §60.702 shall notify the Administrator of the specific provisions of §60.702 (§60.702 (a), (b), or (c)) with which the owner or operator has elected to comply. Notification shall be submitted with the notification of initial start-up required by §60.7(a)(3). If an owner or operator elects at a later date to use an alternative provision of §60.702 with which he or she will comply, then the Administrator shall be notified by the owner or operator 90 days before implementing a change and, upon implementing the change, a performance test shall be performed as specified by §60.704 no later than 180 days from initial start-up.

(b) Each owner or operator subject to the provisions of this subpart shall keep an up-to-date, readily accessible record of the following data measured during each performance test, and also include the following data in the report of the initial performance test required under §60.8. Where a boiler or process heater ~~with a design heat input capacity of 44 MW (150 million Btu/hour) or greate~~r is used or where the reactor process vent stream is introduced as the primary fuel to any size boiler or process heater to comply with §60.702(a), a report containing performance test data need not be submitted, but a report containing the information in §60.705(b)(2)(i) is required. The same data specified in this section shall be submitted in the reports of all subsequently required performance tests where either the emission control efficiency of a combustion device, outlet concentration of TOC, or the TRE index value of a vent stream from a recovery system is determined.

(1) Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with §60.702(a) through use of either a thermal or catalytic incinerator:

(i) The average firebox temperature of the incinerator (or the average temperature upstream and downstream of the catalyst bed for a catalytic incinerator), measured **[continuously]** ~~at least every 15 minutes and averaged~~ over the same time period of the performance testing, and

(ii) The percent reduction of TOC determined as specified in §60.704(b) achieved by the incinerator, or the concentration of TOC (ppmv, by compound) determined as specified in §60.704(b) at the outlet of the control device on a dry basis corrected to 3 percent oxygen.

(2) Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with §60.702(a) through use of a boiler or process heater:

(i) A description of the location at which the vent stream is introduced into the boiler or process heater, and

(ii) The average combustion temperature of the boiler or process heater ~~with a design heat input capacity of less than 44 MW (150 million Btu/hr)~~ measured **[continuously]** ~~at least every 15 minutes and averaged~~ over the same time period of the performance testing.

(3) Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with §60.702(b) through use of a smokeless flare, flare design (i.e.,

steam-assisted, air-assisted or nonassisted), all visible emission readings, heat content determinations, flow rate measurements, and exit velocity determinations made during the performance test, continuous records of the flare pilot flame monitoring, and records of all periods of operations during which the pilot flame is absent.

(4) Where an owner or operator subject to the provisions of this subpart seeks to demonstrate compliance with §60.702(c):

(i) Where an absorber is the final recovery device in the recovery system, the exit specific gravity (or alternative parameter which is a measure of the degree of absorbing liquid saturation, if approved by the Administrator), and average exit temperature, of the absorbing liquid measured at least every 15 minutes and averaged over the same time period of the performance testing (both measured while the vent stream is normally routed and constituted); or

(ii) Where a condenser is the final recovery device in the recovery system, the average exit (product side) temperature measured at least every 15 minutes and averaged over the same time period of the performance testing while the vent stream is routed and constituted normally; or

(iii) Where a carbon adsorber is the final recovery device in the recovery system, the total steam mass flow measured at least every 15 minutes and averaged over the same time period of the performance test (full carbon bed cycle), temperature of the carbon bed after regeneration [and within 15 minutes of completion of any cooling cycle(s)], and duration of the carbon bed steaming cycle (all measured while the vent stream is routed and constituted normally); or

(iv) As an alternative to §60.705(b)(4) (i), (ii) or (iii), the concentration level or reading indicated by the organics monitoring device at the outlet of the absorber, condenser, or carbon adsorber, measured at least every 15 minutes and averaged over the same time period of the performance testing while the vent stream is normally routed and constituted.

(v) All measurements and calculations performed to determine the TRE index value of the vent stream.

(c) Each owner or operator subject to the provisions of this subpart shall keep up-to-date, readily accessible continuous records of the equipment operating parameters specified to be monitored under §60.703 (a) and (c) as well as up-to-date, readily accessible records of periods of operation during which the parameter boundaries established during the most recent performance test are exceeded. The Administrator may at any time require a report of these data. Where a combustion device is used to comply with §60.702(a), periods of operation during which the parameter boundaries established during the most recent performance tests are exceeded are defined as follows:

(1) For thermal incinerators, all ~~3~~ **[1]-**hour periods of operation during which the average combustion temperature was more than 28 °C (50 °F) below the average combustion

temperature during the most recent performance test at which compliance with §60.702(a) was determined.

(2) For catalytic incinerators, all ~~3~~ **[1]-**hour periods of operation during which the average temperature of the vent stream immediately before the catalyst bed is more than 28 °C (50 °F) below the average temperature of the vent stream during the most recent performance test at which compliance with §60.702(a) was determined. The owner or operator also shall record all ~~3~~ **[1]-**hour periods of operation during which the average temperature difference across the catalyst bed is less than 80 percent of the average temperature difference of the bed during the most recent performance test at which compliance with §60.702(a) was determined.

(3) All ~~3~~ **[1]-**hour periods of operation during which the average combustion temperature was more than 28 °C (50 °F) below the average combustion temperature during the most recent performance test at which compliance with §60.702(a) was determined for boilers or process heaters ~~with a design heat input capacity of less than 44 MW (150 million Btu/hr)~~ where the vent stream is introduced with the combustion air or as a secondary fuel.

(4) For boilers or process heaters, whenever there is a change in the location at which the vent stream is introduced into the flame zone as required under §60.702(a).

(d) Each owner or operator subject to the provisions of this subpart shall keep records of the following:

(1) Up-to-date, readily accessible continuous records of the flow indication specified under §60.703(a)(2)(i), §60.703(b)(2)(i) and §60.703(c)(1)(i), as well as up-to-date, readily accessible records of all periods and the duration when the vent stream is diverted from the control device.

(2) Where a seal mechanism is used to comply with §60.703(a)(2)(ii), §60.703(b)(2)(ii), and §60.703(c)(1)(ii), a record of continuous flow is not required. In such cases, the owner or operator shall keep up-to-date, readily accessible records of all monthly visual inspections of the seals as well as readily accessible records of all periods and the duration when the seal mechanism is broken, the bypass line valve position has changed, the serial number of the broken car-seal has changed, or when the key for a lock-and-key type configuration has been checked out.

(e) Each owner or operator subject to the provisions of this subpart shall keep up-to-date, readily accessible continuous records of the flare pilot flame monitoring specified under §60.703(b), as well as up-to-date, readily accessible records of all periods of operations in which the pilot flame is absent.

(f) Each owner or operator subject to the provisions of this subpart shall keep up-to-date, readily accessible continuous records of the equipment operating parameters specified to be monitored under §60.703(d), as well as up-to-date, readily accessible records of periods of operation during which the parameter boundaries established during the most recent performance test are exceeded. The Administrator may at any time require a report of these data. Where an owner or operator seeks to comply with §60.702(c), periods of operation during which the parameter boundaries established during the most recent performance tests are exceeded are defined as follows:

(1) Where an absorber is the final recovery device in a recovery system, and where an organic compound monitoring device is not used:

(i) All 3-hour periods of operation during which the average absorbing liquid temperature was more than 11 °C (20 °F) above the average absorbing liquid temperature during the most recent performance test, or

(ii) All 3-hour periods of operation during which the average absorbing liquid specific gravity was more than 0.1 unit above, or more than 0.1 unit below, the average absorbing liquid specific gravity during the most recent performance test (unless monitoring of an alternative parameter, which is a measure of the degree of absorbing liquid saturation, is approved by the Administrator, in which case he will define appropriate parameter boundaries and periods of operation during which they are exceeded).

(2) Where a condenser is the final recovery device in a system, and where an organic compound monitoring device is not used, all 3-hour periods of operation during which the average exit (product side) condenser operating temperature was more than 6 °C (11 °F) above the average exit (product side) operating temperature during the most recent performance test.

(3) Where a carbon adsorber is the final recovery device in a system, and where an organic compound monitoring device is not used:

(i) All carbon bed regeneration cycles during which the total mass steam flow was more than 10 percent below the total mass steam flow during the most recent performance test, or

(ii) All carbon bed regeneration cycles during which the temperature of the carbon bed after regeneration (and after completion of any cooling cycle(s)) was more than 10 percent or 5 °C greater, whichever is less stringent, than the carbon bed temperature (in degrees Celsius) during the most recent performance test.

(4) Where an absorber, condenser, or carbon adsorber is the final recovery device in the recovery system and where an organic compound monitoring device is used, all 3-hour periods of operation during which the average organic compound concentration level or reading of organic compounds in the exhaust gases is more than 20 percent greater than the exhaust gas organic compound concentration level or reading measured by the monitoring device during the most recent performance test.

(g) Each owner or operator of an affected facility subject to the provisions of this subpart and seeking to demonstrate compliance with §60.702(c) shall keep up-to-date, readily accessible records of:

(1) Any changes in production capacity, feedstock type, or catalyst type, or of any replacement, removal or addition of recovery equipment or reactors;

(2) Any recalculation of the TRE index value performed pursuant to §60.704(f); and

(3) The results of any performance test performed pursuant to the methods and procedures required by §60.704(d).

(h) Each owner or operator of an affected facility that seeks to comply with the requirements of this subpart by complying with the flow rate cutoff in §60.700(c)(4) shall keep up-to-date, readily accessible records to indicate that the vent stream flow rate is less than 0.011 scm/min and of any change in equipment or process operation that increases the operating vent stream flow rate, including a measurement of the new vent stream flow rate.

(i) Each owner or operator of an affected facility that seeks to comply with the requirements of this subpart by complying with the design production capacity provision in §60.700(c)(3) shall keep up-to-date, readily accessible records of any change in equipment or process operation that increases the design production capacity of the process unit in which the affected facility is located.

(j) Each owner or operator of an affected facility that seeks to comply with the requirements of this subpart by complying with the low concentration exemption in §60.700(c)(8) shall keep up-to-date, readily accessible records of any change in equipment or process operation that increases the concentration of the vent stream of the affected facility.

(k) Each owner or operator subject to the provisions of this subpart is exempt from the quarterly reporting requirements contained in §60.7(c) of the General Provisions.

(l) Each owner or operator that seeks to comply with the requirements of this subpart by complying with the requirements of §60.700 (c)(2), (c)(3), or (c)(4) or §60.702 shall submit to the Administrator semiannual reports of the following recorded information. The initial report shall be submitted within 6 months after the initial start-up date.

(1) Exceedances of monitored parameters recorded under §60.705 (c), (f), and (g).

(2) All periods and duration recorded under §60.705(d) when the vent stream is diverted from the control device to the atmosphere.

(3) All periods recorded under §60.705(f) in which the pilot flame of the flare was absent.

(4) Any change in equipment or process operation that increases the operating vent stream flow rate above the low flow exemption level in §60.700(c)(4), including a measurement of the new vent stream flow rate, as recorded under §60.705(i). These must be reported as soon as possible after the change and no later than 180 days after the change. These reports may be submitted either in conjunction with semiannual reports or as a single separate report. A performance test must be completed within the same time period to verify the

recalculated flow value and to obtain the vent stream characteristics of heating value and E_{TOC}. The performance test is subject to the requirements of §60.8 of the General Provisions. Unless the facility qualifies for an exemption under any of the exemption provisions listed in §60.700(c), except for the total resource effectiveness index greater than 8.0 exemption in §60.700(c)(2), the facility must begin compliance with the requirements set forth in §60.702.

(5) Any change in equipment or process operation, as recorded under paragraph (i) of this section, that increases the design production capacity above the low capacity exemption level in §60.700(c)(3) and the new capacity resulting from the change for the reactor process unit containing the affected facility. These must be reported as soon as possible after the change and no later than 180 days after the change. These reports may be submitted either in conjunction with semiannual reports or as a single separate report. A performance test must be completed within the same time period to obtain the vent stream flow rate, heating value, and E_{TOC}. The performance test is subject to the requirements of §60.8. The facility must begin compliance with the requirements set forth in §60.702 or §60.700(d). If the facility chooses to comply with §60.702, the facility may qualify for an exemption under §60.700(c)(2), (4), or (8).

(6) Any recalculation of the TRE index value, as recorded under §60.705(g).

(7) All periods recorded under §60.705(d) in which the seal mechanism is broken or the by-pass line valve position has changed. A record of the serial number of the car-seal or a record to show that the key to unlock the bypass line valve was checked out must be maintained to demonstrate the period, the duration, and frequency in which the bypass line was operated.

(8) Any change in equipment or process operation that increases the vent stream concentration above the low concentration exemption level in §60.700(c)(8), including a measurement of the new vent stream concentration, as recorded under §60.705(j). These must be reported as soon as possible after the change and no later than 180 days after the change. These reports may be submitted either in conjunction with semiannual reports or as a single separate report. If the vent stream concentration is above **~~300~~ [100]** ppmv as measured using Method 18 or above **~~150~~ [50]** ppmv as measured using Method 25A, a performance test must be completed within the same time period to obtain the vent stream flow rate, heating value, and E_{TOC}. The performance test is subject to the requirements of §60.8 of the General Provisions. Unless the facility qualifies for an exemption under any of the exemption provisions listed in §60.700(c), except for the TRE index greater than 8.0 exemption in §60.700(c)(2), the facility must begin compliance with the requirements set forth in §60.702.

(m) The requirements of §60.705(l) remain in force until and unless EPA, in delegating enforcement authority to a State under section 111(c) of the Act, approves reporting requirements or an alternative means of compliance surveillance adopted by such State. In that event, affected sources within the State will be relieved of the obligation to comply with §60.705(l), provided that they comply with the requirements established by the State.

(n) Each owner or operator that seeks to demonstrate compliance with §60.700(c)(3) must submit to the Administrator an initial report detailing the design production capacity of the process unit.

(o) Each owner or operator that seeks to demonstrate compliance with §60.700(c)(4) must submit to the Administrator an initial report including a flow rate measurement using the test methods specified in §60.704.

(p) Each owner or operator that seeks to demonstrate compliance with §60.700(c)(8) must submit to the Administrator an initial report including a concentration measurement using the test method specified in §60.704.

(q) The Administrator will specify appropriate reporting and recordkeeping requirements where the owner or operator of an affected facility complies with the standards specified under §60.702 other than as provided under §60.703 (a), (b), (c), and (d).

(r) Each owner or operator whose reactor process vent stream is routed to a distillation unit subject to subpart NNN and who seeks to demonstrate compliance with §60.700(c)(5) shall submit to the Administrator a process design description as part of the initial report. This process design description must be retained for the life of the process. No other records or reports would be required unless process changes are made.

(s) Each owner or operator who seeks to demonstrate compliance with §60.702 (a) or (b) using a control device must maintain on file a schematic diagram of the affected vent streams, collection system(s), fuel systems, control devices, and bypass systems as part of the initial report. This schematic diagram must be retained for the life of the system.

(t) Each owner or operator that seeks to demonstrate compliance with §60.700(c)(2) must maintain a record of the initial test for determining the total resource effectiveness index and the results of the initial total resource effectiveness index calculation.

[58 FR 45962, Aug. 31, 1993, as amended at 60 FR 58238, Nov. 27, 1995; 65 FR 78279, Dec. 14, 2000]

HDPE/LDPE/LLDPE Manufacturing – 40 CFR 60, Subpart DDD

Subpart DDD—Standards of Performance for Volatile Organic Compound (VOC) Emissions from the Polymer Manufacturing Industry

---

Contents

SOURCE: 55 FR 51035, Dec. 11, 1990, unless otherwise noted.

§60.560   Applicability and designation of affected facilities.

(a) *Affected facilities.* The provisions of this subpart apply to affected facilities involved in the manufacture of polypropylene, polyethylene, polystyrene, or poly (ethylene terephthalate) as defined in §60.561 of this subpart. The affected facilities designated below for polypropylene and polyethylene are inclusive of all equipment used in the manufacture of these polymers, beginning with raw materials preparation and ending with product storage, and cover all emissions emanating from such equipment.

(1) For process emissions from any polypropylene and polyethylene manufacturing process that uses a continuous process, the affected facilities are each of the following process sections: each raw materials preparation section, each polymerization reaction section, each material recovery section, each product finishing section, and each product storage section. These process sections are affected facilities for process emissions that are emitted continuously and for process emissions that are emitted intermittently.

(2) For process emissions from polystyrene manufacturing processes that use a continuous process, the affected facilities are each material recovery section. These process sections are affected facilities for only those process emissions that are emitted continuously.

(3) For process emissions from poly(ethylene terephthalate) manufacturing processes that use a continuous process, the affected facilities are each polymerization reaction section. If the process uses dimethyl terephthalate, then each material recovery section is also an affected facility. If the process uses terephthalic acid, then each raw materials preparation section is also an affected facility. These process sections are affected facilities for only those process emissions that are emitted continuously.

(4) For VOC emissions from equipment leaks from polypropylene, polyethylene, and polystyrene (including expandable polystyrene) manufacturing processes, the affected facilities are each group of fugitive emissions equipment (as defined in §60.561) within any process unit (as defined in §60.561). ~~This subpart does not apply to VOC emissions from equipment leaks from poly(ethylene terephthalate) manufacturing processes.~~

~~(i) Affected facilities with a design capacity to produce less than 1,000 Mg/yr (1,102 ton/yr) shall be exempt from §60.562-2.~~

(ii) Addition or replacement of equipment for the purposes of improvement which is accomplished without a capital expenditure shall not by itself be considered a modification under §60.562-2.

(b) *Applicability dates.* The applicability date identifies when an affected facility becomes subject to a standard. Usually, a standard has a single applicability date. However, some polypropylene and polyethylene affected facilities have a September 30, 1987, applicability date and others have a January 10, 1989, applicability date. The following paragraphs identify the applicability dates for all affected facilities subject to this subpart.

(1) *Polypropylene and polyethylene.* Each process section in a polypropylene or polyethylene production process is a potential affected facility for both continuous and intermittent emissions. The applicability date depends on when the process section was constructed, modified, or reconstructed and, in some instances, on the type of production process.

(i) The applicability date for any polypropylene or polyethylene affected facility that is constructed, modified, or reconstructed after January 10, 1989, regardless of the type of production process being used, is January 10, 1989.

~~(ii) Only some polypropylene or polyethylene process sections that are constructed, modified, or reconstructed on or before January 10, 1989, but after September 30, 1987, are affected facilities. These process sections (and the type of emissions to be controlled) are identified by an "x" in table 1. The applicability date for the process sections (and the emissions to be controlled) that are identified by an "x" in table 1 is September 30, 1987. Since the affected facilities that have a September 30, 1987, applicability date are determined by the type of production process (e.g., liquid phase, gas phase), each owner or operator shall identify the particular production process that applies to his or her particular process.~~

~~**Polymer**~~	~~**Production process(es)**~~	~~**Process section**~~	~~**Emissions**~~	
			~~**Continuous**~~	~~**Intermittent**~~
~~Polypropylene~~	~~Liquid Phase~~	~~Raw Materials Preparation~~	~~X~~	
~~—~~		~~Polymerization Reaction~~	~~X~~	
~~—~~		~~Material Recovery~~	~~X~~	~~X~~
~~—~~		~~Product Finishing~~	~~X~~	
~~—~~		~~Product Storage~~		
~~Polypropylene~~	~~Gas Phase~~	~~Raw Materials Preparation~~		

~~—~~		~~Polymerization Reaction~~		~~X~~
~~—~~		~~Material Recovery~~	~~X~~	
~~—~~		~~Product Finishing~~		
~~—~~		~~Product Storage~~		
~~Low Density Polyethylene~~	~~High Pressure~~	~~Raw Materials Preparation~~		~~X~~
~~—~~		~~Polymerization Reaction~~		~~X~~
~~—~~		~~Material Recovery~~		~~X~~
~~—~~		~~Product Finishing~~		~~X~~
~~—~~		~~Product Storage~~		~~X~~
~~Low Density Polyethylene~~	~~Low Pressure~~	~~Raw Materials Preparation~~	~~X~~	~~X~~
~~High Density Polyethylene~~	~~Gas Phase~~	~~Polymerization Reaction~~		~~X~~
~~—~~		~~Material Recovery~~		
~~—~~		~~Product Finishing~~	~~X~~	
~~—~~		~~Product Storage~~		
~~High Density Polyethylene~~	~~Liquid Phase Slurry~~	~~Raw Materials Preparation~~		~~X~~
~~—~~		~~Polymerization Reaction~~		
~~—~~		~~Material Recovery~~	~~X~~	
~~—~~		~~Product Finishing~~	~~X~~	
~~—~~		~~Product Storage~~		
~~High Density Polyethylene~~	~~Liquid Phase Solution~~	~~Raw Materials Preparation~~	~~X~~	~~X~~
~~—~~		~~Polymerization Reaction~~		~~X~~
~~—~~		~~Material Recovery~~	~~X~~	~~X~~
~~—~~		~~Product Finishing~~		
~~—~~		~~Product Storage~~		

(2) *Polystyrene.* The applicability date for each polystyrene affected facility is September 30, 1987.

(3) *Poly(ethylene terephthalate).* The applicability date for each poly(ethylene terephthalate) affected facility is September 30, 1987.

(c) Any facility under paragraph (a) of this section that commences construction, modification, or reconstruction after its applicability date as identified under paragraph (b) of this section is subject to the requirements of this subpart, except as provided in paragraphs (d) through (f) of this section.

~~(d) Any polypropylene or polyethylene affected facility with a September 30, 1987, applicability date that commenced construction, modification, or reconstruction after September 30, 1987, and on or before January 10, 1989, with an uncontrolled emission rate (as defined in footnote a to table 2) at or below those identified in table 2 is not subject to the requirements of §60.562-1 unless and until its uncontrolled emission rate exceeds that rate listed for it in table 2 or it is modified or reconstructed after January 10, 1989. At such time, such facility becomes subject to §60.562-1 and the procedures identified in §60.562-1(a) shall be used to determine the control of emissions from the facility.~~

~~TABLE 2—MAXIMUM UNCONTROLLED THRESHOLD EMISSION RATES[a]~~

~~**Production process**~~	~~**Process section**~~	~~**Uncontrolled emission rate, kg TOC/Mg product (See associated footnote)**~~
~~Polypropylene, liquid phase process~~	~~Raw Materials Preparation~~	~~0.15[b]~~
~~—~~	~~Polymerization Reaction~~	~~0.14[b], 0.24[c]~~
~~—~~	~~Material Recovery~~	~~0.19[b]~~
~~—~~	~~Product Finishing~~	~~1.57[b]~~
~~Polypropylene, gas phase process~~	~~Polymerization Reaction~~	~~0.12[c]~~
~~—~~	~~Material Recovery~~	~~0.02[b]~~
~~Low Density Polyethylene, low pressure process~~	~~Raw Materials Preparation~~	~~0.41[d]~~
~~—~~	~~Polymerization Reaction~~	~~(e)~~
~~—~~	~~Material Recovery~~	~~(e)~~

~~—~~	~~Product Finishing~~	~~(e)~~
~~—~~	~~Product Storage~~	~~(e)~~
~~Low Density Polythylene, low pressure process~~	~~Raw Materials Preparation~~	~~0.05[f]~~
~~—~~	~~Polymerization Reaction~~	~~0.03[g]~~
~~—~~	~~Product Finishing~~	~~0.01[b]~~
~~High Density Polyethylene, liquid phase slurry process~~	~~Raw Materials Preparation~~	~~0.25[c]~~
~~—~~	~~Material Recovery~~	~~0.11[b]~~
~~—~~	~~Product Finishing~~	~~0.41[b]~~
~~High Density Polyethylene, liquid phase solution process~~	~~Raw Materials Preparation~~	~~0.24[f]~~
~~—~~	~~Polymerization Reaction~~	~~0.16[c]~~
~~—~~	~~Material Recovery~~	~~1.68[f]~~
~~High Density Polyethylene, gas phase process~~	~~Raw Materials Preparation~~	~~0.05[f]~~
~~—~~	~~Polymerization Reaction~~	~~0.03[g]~~
~~—~~	~~Product Finishing~~	~~0.01[b]~~
~~Polystyrene, continuous process~~	~~Material Recovery~~	~~0.05[b h]~~
~~Poly(ethylene terephalate), dimethyl terephthalate process~~	~~Material Recovery~~	~~0.12[b h]~~
~~—~~	~~Polymerization Reaction~~	~~1.80[h i j]~~
~~Poly(ethlyene terephthalate), terephthalic acid process~~	~~Raw Materials Preparation~~	~~(l)~~
~~—~~	~~Polymerization Reaction~~	~~1.80[h j m]~~
~~—~~		~~3.92[h k m]~~

[a]"Uncontrolled emission rate" refers to the emission rate of a vent stream that vents directly to the atmosphere and to the emission rate of a vent stream to the atmosphere that would occur in the absence of any add-on control devices but after any material recovery

devices that constitute part of the normal material recovery operations in a process line where potential emissions are recovered for recycle or resale.

[b]Emission rate applies to continuous emissions only.

[c]Emission rate applies to intermittent emissions only.

[d]Total emission rate for non-emergency intermittent emissions from raw materials preparation, polymerization reaction, material recovery, product finishing, and product storage process sections.

[e]See footnote d.

[f]Emission rate applies to both continuous and intermittent emissions.

[g]Emission rate applies to non-emergency intermittent emissions only.

[h]Applies to modified or reconstructed affected facilities only.

[i]Includes emissions from the cooling water tower.

[j]Applies to a process line producing low viscosity poly(ethylene terephthlalate).

[k]Applies to a process line producing high viscosity poly(ethylene terephathalate).

[l]See footnote m.

[m]Applies to the sum of emissions to the atmosphere from the polymerization reaction section (including emissions from the cooling tower) and the raw materials preparation section (i.e., the esterifiers).

(e)(1) Modified or reconstructed affected facilities at polystyrene and poly(ethylene terephthalate) plants with uncontrolled emission rates at or below those identified in table 2 are exempt from the requirements of §60.562-1 unless and until its uncontrolled emission rate exceeds that rate listed for it in table 2. This exemption does not apply to new polystyrene or poly(ethylene terephthalate) affected facilities.

(2) Emissions from modified or reconstructed affected facilities that are controlled by an existing control device and that have uncontrolled emission rates greater than the uncontrolled threshold emission rates identified in table 2 are exempt from the requirements of §60.562-1 unless and until the existing control device is modified, reconstructed, or replaced.

(f) No process section of an experimental process line is considered an affected facility for continuous or intermittent process emissions.

(g) Individual vent streams that emit continuous emissions with uncontrolled annual emissions of less than ~~1.6 Mg/yr (1.76~~ **[0.1]** ton/yr or with a weight percent TOC of less than 0.10 percent from a new, modified, or reconstructed polypropylene or polyethylene affected facility are exempt from the requirements of §60.562-1(a)(1). If at a later date, an individual stream's uncontrolled annual emissions become ~~1.6 Mg/yr (1.76~~ **[0.1]** ton/yr or greater (if the stream was exempted on the basis of the uncontrolled annual emissions exemption) or VOC concentration becomes 0.10 weight percent or higher (if the stream was exempted on the basis of the VOC concentration exemption), then the stream is subject to the requirements of §60.562-1.

(h) Emergency vent streams, as defined in §60.561, from a new, modified, or reconstructed polypropylene or polyethylene affected facility are exempt from the requirements of §60.562-1(a)(2).

~~(i) An owner or operator of a polypropylene or polyethylene affected facility that commenced construction, modification, or reconstruction after September 30, 1987, and on or before January 10, 1989, and that is in a process line in which more than one type of polyolefin (i.e., polypropylene, low density polyethylene, high density polyethylene, or their copolymers) is produced shall select one of the polymer/production process combinations in table 1 for purposes of determining applicable affected facilities and uncontrolled threshold emissions rates.~~

~~(j) *Alternative means of compliance*—(1) *Option to comply with part 65.* Owners or operators may choose to comply with 40 CFR part 65, subpart G, for continuous process vents that are subject to this subpart, that choose to comply with §60.562-1(a)(1)(i)(A), (B), or (C) as allowed in §60.562-1(a)(1) and (b)(1)(iii). The requirements of 40 CFR part 65, subpart G, satisfy the requirements of paragraph (c) of this section and §§60.563 through 60.566, except for §60.565(g)(1). Other provisions applying to owners or operators who choose to comply with 40 CFR part 65 are provided in 40 CFR 65.1.~~

~~(2) *Part 60, subpart A.* Owners or operators who choose to comply with 40 CFR part 65, subpart G, must also comply with §§60.1, 60.2, 60.5, 60.6, 60.7(a)(1) and (4), 60.14, 60.15, and 60.16 for those process vents. All sections and paragraphs of subpart A of this part that are not mentioned in this paragraph (j)(2) do not apply to owners or operators of process vents complying with 40 CFR part 65, subpart G, except that provisions required to be met prior to implementing 40 CFR part 65 still apply. Owners and operators who choose to comply with 40 CFR part 65, subpart G, must comply with 40 CFR part 65, subpart A.~~

~~(3) *Initial startup notification.* Each owner or operator subject to the provisions of this subpart that chooses to comply with 40 CFR part 65, subpart G, at initial startup shall notify the Administrator of the specific provisions of 40 CFR part 65, subpart G, with which the owner or operator has elected to comply. Notification shall be submitted with the notification of initial startup required by 40 CFR 65.5(b).~~

(NOTE: The numerical emission limits in these standards are expressed in terms of total organic compounds, measured as total organic compounds less methane and ethane.)

[55 FR 51035, Dec. 11, 1990; 56 FR 12299, Mar. 22, 1991, as amended at 65 FR 61765, Oct. 17, 2000; 65 FR 78278, Dec. 14, 2000]

§60.561 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.

Boiler means any enclosed combustion device that extracts useful energy in the form of steam.

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 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

(a) 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: $A = Y \times (B \div 100)$;

(b) The percent Y is determined from the following equation: $Y = 1.0 - 0.57 \log X$, where X is 1986 minus the year of construction; and

(c) The applicable basic annual asset guideline repair allowance, B, is equal to 12.5.

Car-sealed means, for purposes of these standards, a seal that is placed on the device used to change the position of a valve (e.g., from opened to closed) such that the position of the valve cannot be changed without breaking the seal and requiring the replacement of the old seal once broken with a new seal.

Closed vent system means a system that is not open to the atmosphere and that is composed of piping, connections, and, if necessary, flow inducing devices that transport gas or vapor from a piece or pieces of equipment to a control device.

Continuous emissions means any gas stream containing VOC that is generated essentially continuously when the process line or any piece of equipment in the process line is operating.

Continuous process means a polymerization process in which reactants are introduced in a continuous manner and products are removed either continuously or intermittently at regular intervals so that the process can be operated and polymers produced essentially continuously.

Control device means an enclosed combustion device, vapor recovery system, or flare.

Copolymer means a polymer that has two different repeat units in its chain.

Decomposition means, for the purposes of these standards, an event in a polymerization reactor that advances to the point where the polymerization reaction becomes uncontrollable, the polymer begins to break down (decompose), and it becomes necessary to relieve the reactor instantaneously in order to avoid catastrophic equipment damage or serious adverse personnel safety consequences.

Decomposition emissions refers to those emissions released from a polymer production process as the result of a decomposition or during attempts to prevent a decomposition.

Emergency vent stream means, for the purposes of these standards, an intermittent emission that results from a decomposition, attempts to prevent decompositions, power failure, equipment failure, or other unexpected cause that requires immediate venting of gases from process equipment in order to avoid safety hazards or equipment damage. This includes intermittent vents that occur from process equipment where normal operating parameters (e.g., pressure or temperature) are exceeded such that the process equipment can not be returned to normal operating conditions using the design features of the system and venting must occur to avoid equipment failure or adverse safety personnel consequences and to minimize adverse effects of the runaway reaction. This does not include intermittent vents that are designed into the process to maintain normal operating conditions of process vessels including those vents that regulate normal process vessel pressure.

End finisher means a polymerization reaction vessel operated under very low pressures, typically at pressures of 2 mm Hg (1 in. H_2O) or less, in order to produce high viscosity poly(ethylene terephthalate). An end finisher is preceded in a high viscosity poly(ethylene terephthalate) process line by one or more polymerization vessels operated under less severe vacuums, typically between 5 and 10 mm Hg (3 and 5 in. H_2O). A high viscosity poly(ethylene terephthalate) process line may have one or more end finishers.

Existing control device means, for the purposes of these standards, an air pollution control device that has been in operation on or before September 30, 1987, or that has been in operation between September 30, 1987, and January 10, 1989, on those continuous or intermittent emissions from a process section that is marked by an "—" in table 1 of this subpart.

Existing control device is reconstructed means, for the purposes of these standards, the capital expenditure of at least 50 percent of the replacement cost of the existing control device.

Existing control device is replaced means, for the purposes of these standards, the replacement of an existing control device with another control device.

Expandable polystyrene means a polystyrene bead to which a blowing agent has been added using either an in-situ suspension process or a post-impregnation suspension process.

Experimental process line means a polymer or copolymer manufacturing process line with the sole purpose of operating to evaluate polymer manufacturing processes, technologies, or products. An experimental process line does not produce a polymer or resin that is sold or that is used as a raw material for nonexperimental process lines.

Flame zone means that portion of the combustion chamber in a boiler occupied by the flame envelope.

Fugitive emissions equipment means each pump, compressor, pressure relief device, sampling connection system, open-ended valve or line, valve, and flange or other connector in VOC service and any devices or systems required by subpart VV of this part.

Gas phase process means a polymerization process in which the polymerization reaction is carried out in the gas phase; i.e., the monomer(s) are gases in a fluidized bed of catalyst particles and granular polymer.

High density polyethylene (HDPE) means a thermoplastic polymer or copolymer comprised of at least 50 percent ethylene by weight and having a density of greater than 0.940 $gm/cm^3$3 (58.7 lb/ft^3).

High pressure process means the conventional production process for the manufacture of low density polyethylene in which a reaction pressure of about 15,000 psig (103,000 kPa gauge) or greater is used.

High viscosity poly(ethylene terephthalate) means poly(ethylene terephthalate) that has an intrinsic viscosity of 0.9 or higher and is used in such applications as tire cord and seat belts.

Incinerator means an enclosed combustion device that is used for destroying VOC.

In-situ suspension process means a manufacturing process in which styrene, blowing agent, and other raw materials are added together within a reactor for the production of expandable polystyrene.

Intermittent emissions means those gas streams containing VOC that are generated at intervals during process line operation and includes both planned and emergency releases.

Liquid phase process means a polymerization process in which the polymerization reaction is carried out in the liquid phase; i.e., the monomer(s) and any catalyst are dissolved, or suspended in a liquid solvent.

Liquid phase slurry process means a liquid phase polymerization process in which the monomer(s) are in solution (completely dissolved) in a liquid solvent, but the polymer is in the form of solid particles suspended in the liquid reaction mixture during the polymerization reaction; sometimes called a particle form process.

Liquid phase solution process means a liquid phase polymerization process in which both the monomer(s) and polymer are in solution (completely dissolved) in the liquid reaction mixture.

Low density polyethylene (LDPE) means a thermoplastic polymer or copolymer comprised of at least 50 percent ethylene by weight and having a density of 0.940 g/cm^3 (58.7 lb/ft^3) or less.

Low pressure process means a production process for the manufacture of low density polyethylene in which a reaction pressure markedly below that used in a high pressure process is used. Reaction pressure of current low pressure processes typically go up to about 300 psig (2,070 kPa gauge).

Low viscosity poly(ethylene terephthalate) means a poly(ethylene terephthalate) that has an intrinsic viscosity of less than 0.75 and is used in such applications as clothing, bottle, and film production.

Material recovery section means the equipment that recovers unreacted or by-product materials from any process section for return to the process line, off-site purification or treatment, or sale. Equipment designed to separate unreacted or by-product material from the polymer product are to be included in this process section, provided at least some of the material is recovered for reuse in the process, off-site purification or treatment, or sale, at the time the process section becomes an affected facility. Otherwise such equipment are to be assigned to one of the other process sections, as appropriate. Equipment that treats recovered materials are to be included in this process section, but equipment that also treats raw materials are not to be included in this process section. The latter equipment are to be included in the raw materials preparation section. If equipment is used to return unreacted or by-product material directly to the same piece of process equipment from which it was emitted, then that equipment is considered part of the process section that contains the process equipment. If equipment is used to recover unreacted or by-product material from a process section and return it to another process section or a different piece of process equipment in the same process section or sends it off-site for purification, treatment, or sale, then such equipment are considered part of a material recovery section. Equipment used for the on-site recovery of ethylene glycol from poly(ethylene terephthalate) plants, however, are not included in the material recovery section, but are covered under the standards applicable to the polymerization reaction section (§60.562-1(c)(1)(ii)(A) or (2)(ii)(A)).

Operating day means, for the purposes of these standards, any calendar day during which equipment used in the manufacture of polymer was operating for at least **8 [1]** ~~hours or one labor shift, whichever is shorter~~. Only operating days shall be used in determining compliance with the standards specified in §60.562-1(c)(1)(ii)(B), (1)(ii)(C), (2)(ii)(B), and (2)(ii)(C). Any calendar day in which equipment is used for less than **8 [1]** ~~hours or one labor~~ shift, whichever is less, is not an “operating day” and shall not be used as part of the rolling 14-day period for determining compliance with the standards specified in §60.562-1(c)(1)(ii)(B), (1)(ii)(C), (2)(ii)(B), and (2)(ii)(C).

Polyethylene means a thermoplastic polymer or copolymer comprised of at least 50 percent ethylene by weight; see low density polyethylene and high density polyethylene.

Poly(ethylene terephthalate) (PET) means a polymer or copolymer comprised of at least 50 percent bis-(2-hydroxyethyl)-terephthalate (BHET) by weight.

Poly(ethylene terephthalate) (PET) manufacture using dimethyl terephthalate means the manufacturing of poly(ethylene terephthalate) based on the esterification of dimethyl terephthalate (DMT) with ethylene glycol to form the intermediate monomer bis-(2-hydroxyethyl)-terephthalate (BHET) that is subsequently polymerized to form PET.

Poly(ethylene terephthalate) (PET) manufacture using terephthalic acid means the manufacturing of poly(ethylene terephthalate) based on the esterification reaction of terephthalic acid (TPA) with ethylene glycol to form the intermediate monomer bis-(2-hydroxyethyl)-terephthalate (BHET) that is subsequently polymerized to form PET.

Polymerization reaction section means the equipment designed to cause monomer(s) to react to form polymers, including equipment designed primarily to cause the formation of short polymer chains (oligomers or low polymers), but not including equipment designed to prepare raw materials for polymerization, e.g., esterification vessels. For the purposes of these standards, the polymerization reaction section begins with the equipment used to transfer the materials from the raw materials preparation section and ends with the last vessel in which polymerization occurs. Equipment used for the on-site recovery of ethylene glycol from poly(ethylene terephthalate) plants, however, are included in this process section, rather than in the material recovery process section.

Polypropylene (PP) means a thermoplastic polymer or copolymer comprised of at least 50 percent propylene by weight.

Polystyrene (PS) means a thermoplastic polymer or copolymer comprised of at least 80 percent styrene or para-methylstyrene by weight.

Post-impregnation suspension process means a manufacturing process in which polystyrene beads are first formed in a suspension process, washed, dried, or otherwise finished and then added with a blowing agent to another reactor in which the beads and blowing agent are reacted to produce expandable polystyrene.

Process heater means a device that transfers heat liberated by burning fuel to fluids contained in tubular coils, including all fluids except water that is heated to produce steam.

Process line means a group of equipment assembled that can operate independently if supplied with sufficient raw materials to produce polypropylene, polyethylene, polystyrene, (general purpose, crystal, or expandable) or poly(ethylene terephthalate) or one of their copolymers. A process line consists of the equipment in the following process sections (to the extent that these process sections are present at a plant): raw materials preparation, polymerization reaction, product finishing, product storage, and material recovery.

Process section means the equipment designed to accomplish a general but well-defined task in polymer production. Process sections include raw materials preparation, polymerization reaction, material recovery, product finishing, and product storage and may be dedicated to a single process line or common to more than one process line.

Process unit means equipment assembled to perform any of the physical and chemical operations in the production of polypropylene, polyethylene, polystyrene, (general purpose, crystal, or expandable), or poly(ethylene terephthalate) or one of their copolymers. A process unit can operate independently if supplied with sufficient feed or raw materials and sufficient storage facilities for the product. Examples of process units are raw materials handling and monomer recovery.

Product finishing section means the equipment that treats, shapes, or modifies the polymer or resin to produce the finished end product of the particular facility, including equipment that prepares the product for product finishing. For the purposes of these standards, the product finishing section begins with the equipment used to transfer the polymerized product from the polymerization reaction section and ends with the last piece of equipment that modifies the characteristics of the polymer. Product finishing equipment may accomplish product separation, extruding and pelletizing, cooling and drying, blending, additives introduction, curing, or annealing. Equipment used to separate unreacted or by-product material from the product are to be included in this process section, provided the material separated from the polymer product is not recovered at the time the process section becomes an affected facility. If the material is being recovered, then the separation equipment are to be included in the material recovery section. Product finishing does not include polymerization, the physical mixing of the pellets to obtain a homogenous mixture of the polymer (except as noted below), or the shaping (such as fiber spinning, molding, or fabricating) or modification (such as fiber stretching and crimping) of the finished end product. If physical mixing occurs in equipment located between product finishing equipment (i.e., before all the chemical and physical characteristics have been "set" by virtue of having passed through the last piece of equipment in the product finishing section), then such equipment are to be included in this process section. Equipment used to physically mix the finished product that are located after the last piece of equipment in the product finishing section are part of the product storage section.

Product storage section means the equipment that is designed to store the finished polymer or resin end product of the particular facility. For the purposes of these standards, the product storage section begins with the equipment used to transfer the finished product out of the product finishing section and ends with the containers used to store the final product. Any equipment used after the product finishing section to recover unreacted or by-product material are to be considered part of a material recovery section. Product storage does not include any intentional modification of the characteristics of any polymer or resin product, but does include equipment that provide a uniform mixture of product, provided such equipment are used after the last product finishing piece of equipment. This process section also does not include the shipment of a finished polymer or resin product to another facility for further finishing or fabrication.

Raw materials preparation section means the equipment located at a polymer manufacturing plant designed to prepare raw materials, such as monomers and solvents, for polymerization. For the purposes of these standards, this process section begins with the equipment used to transfer raw materials from storage and recovered material from material recovery process sections, and ends with the last piece of equipment that prepares the material for polymerization. The raw materials preparation section may include equipment that accomplishes purification, drying, or other treatment of raw materials or of raw and recovered materials together, activation of catalysts, and esterification including the formation of some short polymer chains (oligomers), but does not include equipment that is designed primarily to accomplish the formation of oligomers, the treatment of recovered materials alone, or the storage of raw materials.

Recovery system means an individual unit or series of material recovery units, such as absorbers, condensers, and carbon adsorbers, used for recovering volatile organic compounds.

Total organic compounds (TOC) means those compounds measured according to the procedures specified in §60.564.

Vent stream means any gas stream released to the atmosphere directly from an emission source or indirectly either through another piece of process equipment or a material recovery device that constitutes part of the normal recovery operations in a polymer process line where potential emissions are recovered for recycle or resale, and any gas stream directed to an air pollution control device. The emissions released from an air pollution control device are not considered a vent stream unless, as noted above, the control device is part of the normal material recovery operations in a polymer process line where potential emissions are recovered for recycle or resale.

Volatile organic compounds (VOC) means, for the purposes of these standards, any reactive organic compounds as defined in §60.2 Definitions.

[55 FR 51035, Dec. 11, 1990; 56 FR 9178, Mar. 5, 1991; 56 FR 12299, Mar. 22, 1991; 65 FR 61767, Oct. 17, 2000]

§60.562-1 Standards: Process emissions.

(a) Polypropylene, low density polyethylene, and high density polyethylene. Each owner or operator of a polypropylene, low density polyethylene, or high density polyethylene process line containing a process section subject to the provisions of this subpart shall comply with the provisions in this section on and after the date on which the initial performance test required by §60.8 is completed, but not later than 60 days after achieving the maximum production rate at which the affected facility will be operated, or 180 days after initial startup whichever comes first.

(1) *Continuous emissions.* For each vent stream that emits continuous emissions from an affected facility as defined in §60.560(a)(1), the owner or operator shall use the procedures identified in paragraphs (a)(1) (ii) and (iii) of this section for determining which continuous emissions are to be controlled and which level of control listed in paragraph (a)(1)(i) of this section is to be met. The owner or operator shall use the procedures identified in paragraphs (a)(1) (ii) and (iii) of this section each time a process section is constructed, modified, or reconstructed at the plant site.

(i) *Level of control* Continuous emission streams determined to be subject to control pursuant to the procedures identified in paragraphs (a)(1) (ii) and (iii) of this section, as applicable, shall meet one of the control levels identified in paragraphs (a)(1)(i) (A) through (D) of this section. The procedures in paragraphs (a)(1) (ii) and (iii) of this section identify which level of control may be met. The level of control identified in paragraph (a)(1)(i)(D) of this section is limited to certain continuous emission streams, which are identified through the procedures in paragraphs (a)(1) (ii) and (iii) of this section.

(A) Reduce emissions of total organic compounds (minus methane and ethane) (TOC) by 98 **[Level 2 – 99]** weight percent, or to a concentration of ~~20~~ **[5]** parts per million by volume (ppmv) on a dry basis, whichever is less stringent. The TOC is expressed as the sum of the actual compounds, not carbon equivalents. If an owner or operator elects to comply with the ~~20~~ **[5]** ppmv standard, the concentration shall include a correction to 3 percent oxygen only when supplemental combustion air is used to combust the vent stream.

(B) Combust the emissions in a boiler or process heater ~~with a design heat input capacity of 150 million Btu/hour or greater~~ by introducing the vent stream into the flame zone of the boiler or process heater. (Note: A boiler or process heater of lesser design heat capacity may be used, but must demonstrate compliance with paragraph (a)(1)(i)(A) of this section.)

(C) Combust the emissions in a flare that meets the conditions specified in §60.18. If the flare is used to control both continuous and intermittent emissions, the flare shall meet the conditions ~~specified in §60.18~~ **[see General Recommendations]** at all times (i.e., which controlling continuous emissions alone or when controlling both continuous and intermittent emissions).

(D) Vent the emissions to a control device located on the plant site.

(ii) *Uncontrolled Continuous Emissions.* For each vent stream that emits continuous emissions from an affected facility as defined in §60.560(a)(1) and that is not controlled in an existing control device, the owner or operator shall use the procedures identified in table 3 to identify those continuous emissions from each constructed, modified, or reconstructed affected facility that are to be controlled. The owner shall include in the procedure all uncontrolled continuous vent streams from previously constructed, modified, or reconstructed affected facilities at the plant site each time a process section is constructed, modified, or reconstructed at the plant site. In applying the procedures shown in table 3, the stream characteristics may be either measured or calculated as specified in §60.564(d). For modified or reconstructed affected facilities, these stream characteristics are to be determined after a modification or reconstruction determination has been made by the Administrator, but before any actual changes have been undertaken, and then again after the actual changes have been made. Figure 1 provides a summary overview of the control determination procedure described in table 3.

TABLE 3—PROCEDURE FOR DETERMINING CONTROL AND APPLICABLE STANDARD FOR CONTINUOUS EMISSION STREAMS FROM NEW, MODIFIED, OR RECONSTRUCTED POLYPROPYLENE AND POLYETHYLENE AFFECTED FACILITIES

Procedure[a]	Applicable TOC weight percent range	Control/no control criteria	Applicable standard
1. Sum all uncontrolled streams with TOC weight percent within the applicable weight percent range from all affected facilities at a plant site	0.10 < ~~5.5~~ **1.0**	1. If total combined uncontrolled emissions are equal to or greater than the calculated threshold emissions (CTE)[b], control	1. §60.562-1(a)(1)(i)(A), (B), or (C).
2. Calculate total uncontrolled annual emissions for each weight percent range. For modified or affected facilities, use the total uncontrolled emissions after modification or reconstruction		2. If total combined uncontrolled emission are less than the CTE[b], control only individual streams with volume flow rates of 8 scfm or less	2. §60.562-1(a)(1)(i)(A) through (D).
3. Calculate composite TOC concentration (weight percent) for streams in the 0.10 to less than **1.0** ~~5.5~~ weight percent range and for streams in the **1.0** ~~5.5~~ to less than 20 weight percent range. For modified or reconstructed affected facilities, calculate the composite VOC concentration before and after modification and reconstruction	1.0 ~~5.5~~ < 20	1. If total combined uncontrolled emissions are equal to or greater than CTE[b], control	1. §60.562-1(a)(1)(i)(A), (B), or (C) 2. If total combined uncontrolled emissions are less than the CTE[b], control only individual streams with volume flow rates of 8 scfm or less.
4. Select the higher of the two TOC concentrations for each weight	20 to 100	1. If total combined uncontrolled	1. §60.562-1(a)(1)(i)(A), (B), or (C).

percent range for vent streams from a modified or reconstructed affected facility		emissions are equal to or greater than **1** ~~**8.2**~~ ton ~~Mg~~/yr, control	
5. Calculate the threshold emissions for the 0.10 to less than 5.5 weight percent range and for the 5.5 to less than 20 weight percent range using the respective composite TOC concentration selected above		2. If total combined uncontrolled emissions are less than **1 ton** ~~**8.2**~~ ~~Mg~~/yr, control	2. §60.562-1(a)(1)(i)(A) through (D).

[a]Individual streams excluded under §60.560(g) from the requirements of §60.562-1 are to be excluded from all calculations in this table. This paragraph exempts all individual emission streams with individual uncontrolled annual emission rates of less than ~~**1.6 Mg/yr**~~ **[0.1 tons/year]** and all individual emission streams with individual TOC concentrations of less than 0.10 percent TOC by weight.

[b]For the 0.10 to less than **1.0** ~~**5.5**~~ weight percent range, the following equations are used:

If the percent composite TOC concentration is	Use this equation to calculate threshold emissions
0.10<0.12	$(a \times 7.5 \times 10^{6}) + 226$
0.12<0.2	$(b \times 58.3) + 116.8$
0.2<0.3	$(c \times 3020) + 71.8$
0.3<0.4	$(d \times 547) + 54.5$
0.4<0.6	48.3 + 31 (0.6−weight percent TOC)
0.6<**1.0** ~~**5.5**~~	48.3

where: a = $(0.12 - \text{weight percent TOC})^{2\ 5}$.

$$b = \frac{\left\{\frac{0.18}{\text{weight percent TOC}}\right\}^{0.5} - 1}{\text{weight percent TOC}}$$

View or download PDF

c = $(0.3 - \text{weight percent TOC})^{2}$

d = $(0.4 - \text{weight percent TOC})^{1\ 5}$

For the **1.0** ~~5.5~~ to less than 20 weight percent range, the following equations are used.

If the percent composite TOC concentration is	Use this equation to calculate threshold emissions
1.0 ~~5.5~~<7.0	$(e \times 740) + 31$
7.0<9.0	$(f \times 324) + 25.0$
9.0<20	$(g \times 125) + 18.2$

where

$$e = \frac{\left\{\dfrac{7.0}{weight\ \ percent\ TOC}\right\}^{0.5} - 1}{weight\ \ percent\ TOC}$$

$$f = \frac{\left\{\dfrac{9.0}{weight\ \ percent\ TOC}\right\}^{0.5} - 1}{weight\ \ percent\ TOC}$$

$$g = \frac{\left\{\dfrac{20.0}{weight\ \ percent\ TOC}\right\}^{0.5} - 1}{weight\ \ percent\ TOC}$$

View or download PDF

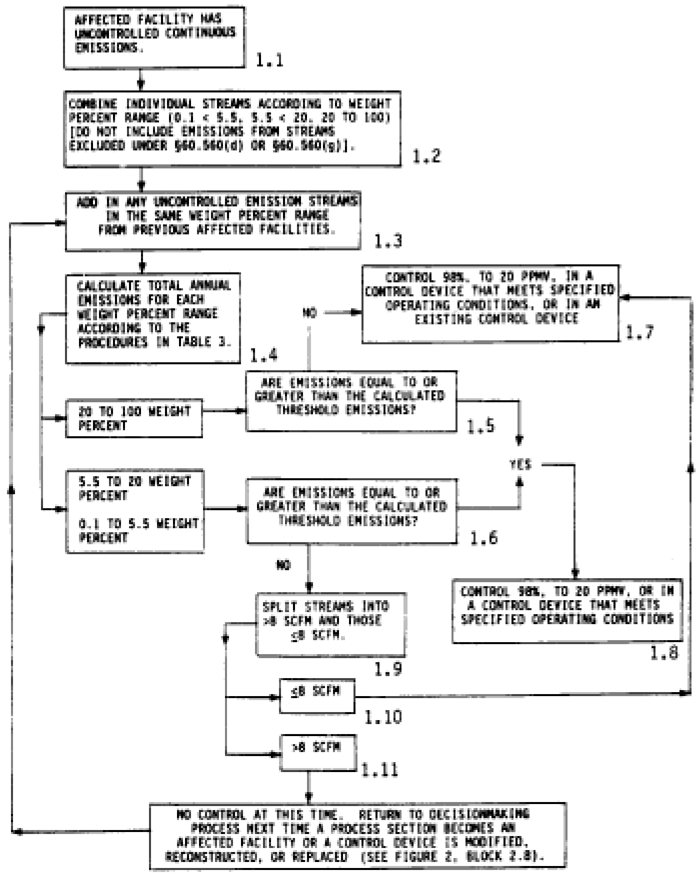
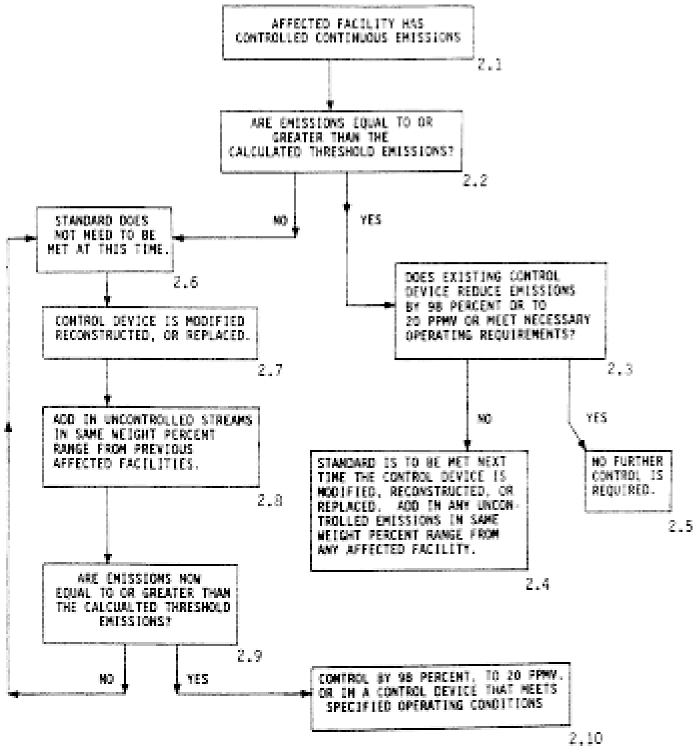


Figure 1. Decisionmaking Process for Uncontrolled Continuous Emissions from Polypropylene and Polyethylene Affected Facilities

View or download PDF

(iii) Controlled Continuous Emissions. For each vent stream that emits continuous emissions from an affected facility as defined in §60.560(a)(1) and that is controlled in an existing control device, each owner or operator shall determine whether the emissions entering the control device are greater than or equal to the calculated threshold emissions (CTE) level, which is to be calculated using the TOC concentration of the inlet vent stream and the equations in footnote b of table 3. If the inlet stream's TOC concentration is equal to or greater than 20 weight percent, the calculated threshold emissions level is ~~18.2 Mg/yr~~ (**1 ton/yr**). If multiple emission streams are vented to the control device, the individual streams are not to be separated into individual weight percent ranges for calculation purposes as would be done for uncontrolled emission streams. Emissions vented to an existing control device are required to be controlled as described in paragraphs (a)(1)(iii) (A) and (B) of this section. Figure 2 illustrates the control determination procedure for controlled continuous emissions.



NOTE: There are no individual stream exemptions for emissions already controlled by existing control devices.

Figure 2. Decisionmaking Process for Continuous Emissions Already Controlled at Polypropylene and Polyethylene Affected Facilities

View or download PDF

(A) If the annual emissions of the stream entering the control device are equal to or greater than the CTE levels, then compliance with one of the requirements identified in §60.562-1(a)(1)(i) (A), (B), or (C) is required at such time the control device is reconstructed or replaced or has its operating conditions modified as a result of State or local regulations (including changes in the operating permit) including those instances where the control device is reconstructed, replaced, or modified in its operation at the same time the existing process section is modified or reconstructed and becomes an affected facility. If the existing control device already complies with one of the requirements identified in §60.562-1(a)(1)(i) (A), (B), or (C), no further control is required.

(B) If the annual emissions of the stream entering the control device are less than the CTE level, then the requirements of §60.562-1(a)(1)(i) (A), (B), or (C) are not applicable at that time. However, if the control device is replaced, reconstructed, or modified at a later date, each owner or operator shall reevaluate the applicability of these standards. This is done by combining with the vent stream entering the control device any uncontrolled vent streams in the same weight percent range as the controlled vent stream and determining whether the annual emissions of the stream entering the control device plus the applicable uncontrolled vent streams are greater than or equal to the CTE level, which is based on the weighted TOC concentration of the controlled vent stream and the uncontrolled vent streams. If the annual emissions entering the control device (including the applicable uncontrolled vent streams) are greater than or equal to the CTE level, then compliance with one of the requirements identified in §60.562-1(a)(1)(i) (A), (B), or (C) is required at that time for both the controlled and uncontrolled vent streams. If the annual emissions are less than the CTE level, compliance with these standards is again not required at such time. However, if the control device is again replaced, reconstructed, or modified, each owner or operator shall repeat this determination procedure.

(2) *Intermittent emissions.* The owner or operator shall control each vent stream that emits intermittent emissions from an affected facility as defined in §60.560-1(a)(1) by meeting one of the control requirements specified in paragraphs (a)(2) (i) and (ii) of this section. If a vent stream that emits intermittent emissions is controlled in an existing flare, incinerator, boiler, or process heater, the requirements of this paragraph are waived until such time the control device is reconstructed or replaced or is modified in its operating conditions as a result of State or local regulation, including changes in the operating permit. This paragraph does not apply to emergency vent streams exempted by §60.560(h) and as defined in §60.561.

(i) Combust the emissions in a flare that is:

(A) Designed for and operated with no visible emissions, except for periods not to exceed a total of 5 minutes during any 2 consecutive hours,

(B) Operated with a flame present at all times, and

(C) Designed to maintain a stable flame.

(ii) Combust the emissions in an incinerator, boiler, or process heater. Such emissions shall be introduced into the flame zone of a boiler or process heater.

(b) *Polystyrene.* Each owner or operator of a polystyrene process line containing process sections subject to the provisions of this subpart shall comply with the provisions in this section on and after the date on which the initial performance test required by §60.8 is completed, but not later than 60 days after achieving the maximum production rate at which the affected facility will be operated, or 180 days after initial startup, whichever comes first. Each owner or operator of a polystyrene process line using a continuous process shall:

(1) Limit the continuous TOC emissions from the material recovery section by complying with one of the following:

(i) Not allow continuous TOC emissions to be greater than 0.0036 kg TOC/Mg (0.0072 lb TOC/ton) product; or

(ii) Not allow the outlet gas stream temperature from each final condenser in the material recovery section to exceed −25 °C (−13 °F). For purposes of this standard, temperature excursions above this limit shall not be considered a violation when such excursions occur during periods of startup, shutdown, or malfunction; or

(iii) Comply with §60.562-1(a)(1)(i) (A), (B), or (C).

(2) If continuous TOC emissions from the material recovery section are routed through an existing emergency vapor recovery system, then compliance with these standards is required when the emergency vapor recovery system undergoes modification, reconstruction, or replacement. In such instances, compliance with these standards shall be achieved no later than 180 days after completion of the modification, reconstruction, or replacement.

(c) *Poly(ethylene terephthalate).* Each owner or operator of a poly(ethylene terephthalate) process line containing process sections subject to the provisions of this subpart shall comply with the provisions in this section on and after the date on which the initial performance test required by §60.8 is completed, but not later than 60 days after achieving the maximum production rate at which the affected facility will be operated, or 180 days after initial startup, whichever comes first.

(1) Each owner or operator of a PET process line using a dimethyl terephthalate process shall:

(i) Limit the continuous TOC emissions from the material recovery section (i.e., methanol recovery) by complying with one of the following:

(A) Not allow the continuous TOC emissions to be greater than 0.018 kg TOC/Mg (0.036 lb TOC/ton) product; or

(B) Not allow the outlet gas stream temperature from each final condenser in the material recovery section (i.e., methanol recovery) to exceed +3 °C (+37 °F). For purposes of this standard, temperature excursions above this limit shall not be considered a violation when such excursions occur during periods of startup, shutdown, or malfunction.

(ii) Limit the continuous TOC emissions and, if steam-jet ejectors are used to provide vacuum to the polymerization reactors, the ethylene glycol concentration from the polymerization reaction section by complying with the appropriate standard set forth below. The ethylene glycol concentration limits specified in paragraphs (c)(1)(ii) (B) and (C) of this section shall be determined by the procedures specified in §60.564(j).

(A) Not allow continuous TOC emissions from the polymerization reaction section (including emissions from any equipment used to further recover the ethylene glycol, but excluding those emissions from the cooling tower) to be greater than 0.02 kg TOC/Mg (0.04 lb TOC/ton) product; and

(B) If steam-jet ejectors are used as vacuum producers and a low viscosity product is being produced using single or multiple end finishers or a high viscosity product is being produced using a single end finisher, maintain the concentration of ethylene glycol in the liquid effluent exiting the vacuum system servicing the polymerization reaction section at or below 0.35 percent by weight, averaged on a daily basis over a rolling 14-day period of operating days; or

(C) If steam-jet ejectors are used as vacuum producers and a high viscosity product is being produced using multiple end finishers, maintain an ethylene glycol concentration in the cooling tower at or below 6.0 percent by weight, averaged on a daily basis over a rolling 14-day period of operating days.

(2) Each owner or operator of a PET process line using a terephthalic acid process shall:

(i) Not allow the continuous TOC emissions from the esterification vessels in the raw materials preparation section to be greater than 0.04 kg TOC/Mg (0.08 lb TOC/ton) product.

(ii) Limit the continuous TOC emissions and, if steam-jet ejectors are used to provide vaccum to the polymerization reactors, the ethylene glycol concentration from the polymerization reaction section by complying with the appropriate standard set forth below. The ethylene glycol concentration limits specified in paragraphs (c)(2)(ii) (B) and (C) of this section shall be determined by the procedures specified in §60.564(j).

(A) Not allow continuous TOC emissions from the polymerization reaction section (including emissions from any equipment used to further recover the ethylene glycol, but excluding those emissions from the cooling tower) to be greater than 0.02 kg TOC/Mg (0.04 lb TOC/ton) product; and

(B) If steam-jet ejectors are used as vacuum producers and a low viscosity product is being produced using single or multiple end finishers or a high viscosity product is being produced using a single end finisher, maintain the concentration of ethylene glycol in the liquid effluent exiting the vacuum system servicing the polymerization reaction section at or below 0.35 percent by weight, averaged on a daily basis over a rolling 14-day period of operating days; or

(C) If steam-jet ejectors are used as vacuum producers and a high viscosity product is being produced using multiple end finishers, maintain an ethylene glycol concentration in the cooling tower at or below 6.0 percent by weight, averaged on a daily basis over a rolling 14-day period of operating days.

(d) Closed vent systems and control devices used to comply with this subpart shall be operated at all times when emissions may be vented to them.

(e) Vent systems that contain valves that could divert a vent stream from a control device shall have car-sealed opened all valves in the vent system from the emission source to the control device and car-sealed closed all valves in vent system that would lead the vent stream to the atmosphere, either directly or indirectly, bypassing the control device.

[55 FR 51035, Dec. 11, 1990; 56 FR 9178, Mar. 5, 1991, as amended at 56 FR 12299, Mar. 22, 1991; 65 FR 61767, Oct. 17, 2000]

§60.562-2 Standards: Equipment leaks of VOC.

(a) Each owner or operator of an affected facility subject to the provisions of this subpart shall comply with the requirements specified in §60.482-1 through §60.482-10 as soon as practicable, but no later than 180 days after initial startup, except that indications of liquids dripping from bleed ports in existing pumps in light liquid service are not considered to be a leak as defined in §60.482-2(b)(2). For purposes of this standard, a “bleed port” is a technologically-required feature of the pump whereby polymer fluid used to provide lubrication and/or cooling of the pump shaft exits the pump, thereby resulting in a visible leak of fluid. This exemption expires when the existing pump is replaced or reconstructed.

(b) An owner or operator may elect to comply with the requirements specified in §§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 specified in §60.484.

(d) Each owner or operator subject to the provisions of this subpart shall comply with the provisions specified in §60.485 except 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 (302 °F) as determined by ASTM Method D86-78, 82, 90, 95, or 96 (incorporated by reference as specified in §60.17).

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

[55 FR 51035, Dec. 11, 1990; 56 FR 12299, Mar. 22, 1991, as amended at 65 FR 61767, Oct. 17, 2000]

§60.563 Monitoring requirements.

(a) Whenever a particular item of monitoring equipment is specified in this section to be installed, the owner or operator shall install, calibrate, maintain, and operate according to manufacturer's specifications that item as follows:

(1) A temperature monitoring device to measure and record continuously the operating temperature to within 1 percent (relative to degrees Celsius) or ±0.5 °C (±0.9 °F), whichever is greater.

(2) A flame monitoring device, such as a thermocouple, an ultraviolet sensor, an infrared beam sensor, or similar device to indicate and record continuously whether a flare or pilot light flame is present, as specified.

(3) A **[continuous]** flow monitoring indicator to indicate and record whether or not flow exists ~~at least once every fifteen minutes~~.

(4) An organic monitoring device (based on a detection principle such as infrared, photoionization, or thermal conductivity) to indicate and record continuously the concentration level of organic compounds.

(5) A specific gravity monitoring device to measure and record continuously to within 0.02 specific gravity unit.

(b) The owner or operator shall install, as applicable, the monitoring equipment for the control means used to comply with §60.562-1, except §60.562-1(a)(1)(i)(D), as follows:

(1) If the control equipment is an incinerator:

(i) For a noncatalytic incinerator, a temperature monitoring device shall be installed in the firebox.

(ii) For a catalytic incinerator, temperature monitoring devices shall be installed in the gas stream immediately before and after the catalytic bed.

(2) If a flare is used:

(i) A flame monitoring device shall be installed to indicate the presence of a flare flame or a flame for each pilot light, if the flare is used to comply with §60.562-1(a)(1), including those flares controlling both continuous and intermittent emissions.

(ii) A thermocouple or equivalent monitoring device to indicate the presence of a flame at each pilot light, if used to comply with §60.562-1(a)(2).

(3) If a boiler or process heater is used:

(i) ~~If the boiler or process heater has a heat input design capacity of less than 150 million Btu/hr,~~ a temperature monitoring device shall be installed between the radiant section and the convection zone for watertube boilers and between the furnace (combustion zone) and the firetubes for firetube boilers.

(ii) ~~If the boiler or process heater has a heat input design capacity of 150 million Btu/hr or greater,~~ such records to indicate the periods of operation of the boiler or process heater shall be maintained. The records must be readily available for inspection.

(4) If an absorber is the final unit in a system:

(i) A temperature monitoring device and a specific gravity monitoring device for the scrubber liquid shall be installed, or

(ii) An organic monitoring device shall be installed at the outlet of the absorber.

(5) If a condenser is the final unit in a system:

(i) A temperature monitoring device shall be installed at the condenser exit (product side), or

(ii) An organic monitoring device shall be installed at the outlet of the condenser.

(6) If a carbon adsorber is the final unit in a system, an organic monitoring device shall be installed at the outlet of the carbon bed.

(c) Owners or operators of control devices used to comply with the provisions of this subpart, except §60.562-1(a)(1)(i)(D), shall monitor these control devices to ensure that they are operated and maintained in conformance with their designs.

(d) Owners or operators using a vent system that contains valves that could divert a vent stream from a control device used to comply with the provisions of this subpart shall do one or a combination of the following:

(1) Install a flow indicator immediately downstream of each valve that if opened would allow a vent stream to bypass the control device and be emitted, either directly or indirectly, to the atmosphere. The flow indicator shall be capable of recording flow **[continuously]** ~~at least once every fifteen minutes.~~

(2) Monitor the valves once a month, checking the position of the valves and the condition of the car seal, and identify all times when the car seals have been broken and the valve position has been changed (i.e., from opened to closed for valves in the vent piping to the control device and from closed to open for valves that allow the stream to be vented directly or indirectly to the atmosphere).

(e) An owner or operator complying with the standards specified under §60.562-1, except §60.562-1(a)(1)(i)(D), with control devices other than an incinerator, boiler, process heater, flare, absorber, condenser, or carbon adsorber or by any other means shall provide to the Administrator information describing the operation of the control device and the process parameter(s) which would indicate proper operation and maintenance of the device. The Administrator may request further information and will specify appropriate monitoring procedures or requirements.

[55 FR 51035, Dec. 11, 1990; 56 FR 12299, Mar. 22, 1991]

§60.565 Reporting and recordkeeping requirements.

(a) Each owner or operator subject to the provisions of this subpart shall keep an up-to-date, readily-accessible record of the following information measured during each performance test, and shall include the following information in the report of the initial performance test in addition to the written results of such performance tests as required under §60.8. Where a control device is used to comply with §60.562-1(a)(1)(i)(D) only, a report containing performance test data need not be submitted, but a report containing the information in §60.565(a)(11) is required. Where a boiler or process heater ~~with a design heat input capacity of 150 million Btu/hour or greater~~ is used to comply with §60.562-1(a), a report containing performance test data need not be submitted, but a report containing the information in §60.565(a)(2)(i) is required. The same information specified in this section shall be submitted in the reports of all subsequently required performance tests where either the emission control efficiency of a combustion device or the outlet concentration of TOC (minus methane and ethane) is determined.

(1) When an incinerator is used to demonstrate compliance with §60.562-1, except §60.562-1(a)(2):

(i) The average firebox temperature of the incinerator (or the average temperature upstream and downstream of the catalyst bed), measured **[continuously]** ~~at least every 15 minutes and averaged~~ over the performance test period, and

(ii) The percent reduction of TOC (minus methane and ethane) achieved by the incinerator, the concentration of TOC (minus methane and ethane) (ppmv, by compound) at the outlet of the control device on a dry basis, or the emission rate in terms of kg TOC (minus methane and ethane) per Mg (lb TOC/ton) of product at the outlet of the control device, whichever is appropriate. If supplemental combustion air is used, the TOC concentration corrected to 3 percent oxygen shall be recorded and reported.

(2) When a boiler or process heater is used to demonstrate compliance with §60.562-1, except §60.562-1(a)(2):

(i) A description of the location at which the vent stream is introduced into the boiler or process heater, and

(ii) For boilers or process heaters ~~with a design heat input capacity of less than 150 million Btu/hr,~~ all 3-hour periods of operation during which the average combustion temperature was more than 28 °C (50 °F) below the average combustion temperature during the most recent performance test at which compliance was determined.

(3) When a flare is used to demonstrate compliance with §60.562-1, except §60.562-1(a)(2):

(i) All visible emission readings, heat content determinations, flow rate measurements, and exit velocity determinations made during the performance test,

(ii) Continuous records of the pilot flame heat-sensing monitoring, and

(iii) Records of all periods of operations during which the pilot flame is absent.

(4) When an incinerator, boiler, or process heater is used to demonstrate compliance with §60.562-1(a)(2), a description of the location at which the vent stream is introduced into the incinerator, boiler, or process heater.

(5) When a flare is used to demonstrate compliance with §60.562-1(a)(2):

(i) All visible emission readings made during the performance test,

(ii) Continuous records of the pilot flame heat-sensing monitoring, and

(iii) Records of all periods of operation during which the pilot flame is absent.

(6) When an absorber is the final unit in a system to demonstrate compliance with §60.562-1, except §60.562-1(a)(2), the specific gravity (or alternative parameter that is a measure of the degree of absorbing liquid saturation, if approved by the Administrator), and average temperature, measured at least every 15 minutes and averaged over the performance test period, of the absorbing liquid (both measured while the vent stream is normally routed and constituted).

(7) When a condenser is the final unit in a system to demonstrate compliance with §60.562-1, except §60.562-1(a)(2), the average exit (product side) temperature, measured at least every 15 minutes and averaged over the performance test period while the vent stream is normally routed and constituted.

(8) Daily measurement and daily average 14-day rolling average of the ethylene glycol concentration in the liquid effluent exiting the vacuum system servicing the polymerization reaction section, if an owner or operator is subject to §60.562-1(c) (1)(ii)(B) or (2)(ii)(B), or of the ethylene glycol concentration in the cooling water in the cooling tower, if subject to §60.562-1(c) (2)(ii)(C) or (2)(iii)(C).

(9) When a carbon adsorber is the final unit in a system to demonstrate compliance with §60.562-1, except §60.562-1(a)(2): the concentration level or reading indicated by the organics monitoring device at the outlet of the adsorber, measured at least every 15 minutes and averaged over the performance test period while the vent stream is normally routed and constituted.

(10) When an owner or operator seeks to comply with the requirements of this subpart by complying with the uncontrolled threshold emission rate cutoff provision in §§60.560 (d) and (e) or with the individual stream exemptions in §60.560(g), each process operation variable

(e.g., pressure, temperature, type of catalyst) that may result in an increase in the uncontrolled emission rate, if §60.560(d) or (e) is applicable, or in an increase in the uncontrolled annual emissions or the VOC weight percent, as appropriate, if §60.560(g) is applicable, should such operating variable be changed.

(11) When an owner or operator uses a control device to comply with §60.562-1(a)(1)(i)(D) alone: all periods when the control device is not operating.

(b)(1) Each owner or operator subject to the provisions of this subpart shall submit with the initial performance test or, if complying with §60.562-1(a)(1)(i)(D), as a separate report, an engineering report describing in detail the vent system used to vent each affected vent stream to a control device. This report shall include all valves and vent pipes that could vent the stream to the atmosphere, thereby bypassing the control device, and identify which valves are car-sealed opened and which valves are car-sealed closed.

(2) If a vent system containing valves that could divert the emission stream away from the control device is used, each owner or operator subject to the provisions of this subpart shall keep for at least two years up-to-date, readily accessible continuous records of:

(i) All periods when flow is indicated if flow indicators are installed under §69.563(d)(1).

(ii) All times when maintenance is performed on car-sealed valves, when the car seal is broken, and when the valve position is changed (i.e., from open to closed for valves in the vent piping to the control device and from closed to open for valves that vent the stream directly or indirectly to the atmosphere bypassing the control device).

(c) Where an incinerator is used to comply with §60.562-1, except §§60.562(a)(1)(i)(D) and (a)(2), each owner or operator subject to the provisions of this subpart shall keep for at least 2 years up-to-date, readily accessible continuous records of:

(1) The temperature measurements specified under §60.563(b)(1).

(2) Records of periods of operation during which the parameter boundaries established during the most recent performance test are exceeded. Periods of operation during which the parameter boundaries established during the most recent performance test are exceeded are defined as follows:

(i) For noncatalytic incinerators, all 3-hour periods of operation during which the average combustion temperature was more than 28 °C (50 °F) below the average combustion temperature during the most recent performance test at which compliance was demonstrated.

(ii) For catalytic incinerators, all 3-hour periods of operation during which the average temperature of the vent stream immediately before the catalyst bed is more than 28 °C (50 °F) below the average temperature of the vent stream during the most recent performance test at which compliance was demonstrated. The owner or operator also shall record all 3-hour periods of operation during which the average temperature difference across the catalyst bed is less than 80 percent of the average temperature difference across the catalyst bed during the most recent performance test at which compliance was demonstrated.

(d) Where a boiler or process heater is used to comply with §60.562-1, except §§60.562-1 (a)(1)(i)(D) and (a)(2), each owner or operator subject to the provisions of this subpart shall keep for at least 2 years up-to-date, readily accessible continuous records of:

(1) Where a boiler or process heater ~~with a heat input design capacity of 150 million Btu/hr or greater is used,~~ all periods of operation of the boiler or process heater. (Examples of such records could include records of steam use, fuel use, or monitoring data collected pursuant to other State or Federal regulatory requirements), and

(2) Where a boiler or process heater ~~with a heat input design capacity of less than 150 million Btu/hr is used~~, all periods of operation during which the parameter boundaries established during the most recent performance test are exceeded. Periods of operation during which the parameter boundaries established during the most recent performance test are exceeded are defined as all 3-hour periods of operation during which the average combustion temperature was more than 28 °C (50 °F) below the average combustion temperature during the most recent performance test at which compliance was demonstrated.

(e) Where a flare is used to comply with §60.562-1, except §60.562-1(a)(1)(i)(D), each owner or operator subject to the provisions of this subpart shall keep for at least 2 years up-to-date, readily accessible continuous records of:

(1) The flare or pilot light flame heat sensing monitoring specified under §60.563(b)(2), and

(2) All periods of operation in which the flare or pilot flame, as appropriate, is absent.

(f) Where an adsorber, condenser, absorber, or a control device other than a flare, incinerator, boiler, or process heater is used to comply with §60.562-1, except §60.562-1(a)(1)(i)(D), each owner or operator subject to the provisions of this subpart shall keep for at least 2 years up-to-date, readily-accessible continuous records of the periods of operation during which the parameter boundaries established during the most recent performance test are exceeded. Where an owner or operator seeks to comply with §60.562-1, periods of operation during which the parameter boundaries established during the most recent performance tests are exceeded are defined as follows:

(1) Where an absorber is the final unit in a system:

(i) All 3-hour periods of operation during which the average absorbing liquid temperature was more than 11 °C (20 °F) above the average absorbing liquid temperature during the most recent performance test at which compliance was demonstrated, and

(ii) All 3-hour periods of operation during which the average absorbing liquid specific gravity was more than 0.1 unit above, or more than 0.1 unit below, the average absorbing liquid specific gravity during the most recent performance test at which compliance was demonstrated (unless monitoring of an alternative parameter that is a measure of the degree of absorbing liquid saturation is approved by the Administrator, in which case he or she will define appropriate parameter boundaries and periods of operation during which they are exceeded).

(2) Where a condenser is the final unit in a system, all 3-hour periods of operation during which the average condenser operating temperature was more than 6 °C (10 °F) above the average operating temperature during the most recent performance test at which compliance was demonstrated.

(3) Where a carbon adsorber is the final unit in a system, all 3-hour periods of operation during which the average organic concentration level in the carbon adsorber gases is more than 20 percent greater than the exhaust gas concentration level or reading measured by the organics monitoring system during the most recent performance test at which compliance was demonstrated.

(g) Each owner or operator of an affected facility subject to the provisions of this subpart and seeking to demonstrate compliance with §60.560(j) or §60.562-1 shall keep up-to-date, readily accessible records of:

(1) Any changes in production capacity, feedstock type, or catalyst type, or of any replacement, removal or addition of product recovery equipment; and

(2) The results of any performance test performed pursuant to the procedures specified by §60.564.

(h) Each owner or operator of an affected facility that seeks to comply with the requirements of this subpart by complying with the uncontrolled threshold emission rate cutoff provision in §§60.560 (d) and (e) or with the individual stream exemptions in §60.560(g) shall keep for at least 2 years up-to-date, readily accessible records of any change in process operation that increases the uncontrolled emission rate of the process line in which the affected facility is located, if §60.560 (d) or (e) is applicable, or that increases the uncontrolled annual emissions or the VOC weight percent of the individual stream, if §60.560(g) is applicable.

(i) Each owner and operator subject to the provisions of this subpart is exempt from §60.7(c) of the General Provisions.

(j) The Administrator will specify appropriate reporting and recordkeeping requirements where the owner or operator of an affected facility complies with the standards specified under §60.562-1 other than as provided under §60.565 (a) through (e).

(k) Each owner or operator that seeks to comply with the requirements of this subpart by complying with the uncontrolled threshold emission rate cutoff provision of §§60.560 (d) and (e), the individual stream exemptions of §60.560(g), or the requirements of §60.562-1 shall submit to the Administrator semiannual reports of the following recorded information, as applicable. The initial report shall be submitted within 6 months after the initial start-up date.

(1) Exceedances of monitored parameters recorded under §§60.565 (c), (d)(2), and (f).

(2) All periods recorded under §60.565(b) when the vent stream has been diverted from the control device.

(3) All periods recorded under §60.565(d) when the boiler or process heater was not operating.

(4) All periods recorded under §60.565(e) in which the flare or pilot flame was absent.

(5) All periods recorded under §60.565(a)(8) when the 14-day rolling average exceeded the standard specified in §60.562-1(c) (1)(ii)(B), (1)(ii)(C), (2)(ii)(B), or (2)(ii)(C), as applicable.

(6) Any change in process operations that increases the uncontrolled emission rate of the process line in which the affected facility is located, as recorded in §60.565(h).

(7) Any change in process operations that increases the uncontrolled annual emissions or the VOC weight percent of the individual stream, as recorded in §60.565(h).

(l) Each owner or operator subject to the provisions of this subpart shall notify the Administrator of the specific provisions of §60.562, §60.560(d), or §60.560(e), as applicable, with which the owner or operator has elected to comply. Notification shall be submitted with the notification of initial startup required by §60.7(a)(3). If an owner or operator elects at a later date to use an alternative provision of §60.562 with which he or she will comply or becomes subject to §60.562 for the first time (i.e., the owner or operator can no longer meet the requirements of this subpart by complying with the uncontrolled threshold emission rate cutoff provision in §60.560 (d) or (e)), then the owner or operator shall notify the Administrator 90 days before implementing a change and, upon implementing a change, a performance test shall be performed as specified in §60.564.

(m) The requirements of this subsection remain in force until and unless EPA, in delegating enforcement authority to a State under section 111(c) of the Act, approves alternative reporting requirements or means of compliance surveillance adopted by such State. In that event, affected sources within the State will be relieved of the obligation to comply with this subsection, provided that they comply with the requirements established by the State.

[55 FR 51035, Dec. 11, 1990; 56 FR 9178, Mar. 5, 1991, as amended at 56 FR 12299, Mar. 22, 1991; 65 FR 61768, Oct. 17, 2000; 65 FR 78278, Dec. 14, 2000]

(NG-Fired) Steam Boilers – 40 CFR 60, Subpart Db

Subpart Db—Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units

Contents

SOURCE: 72 FR 32742, June 13, 2007, unless otherwise noted.

[Recommendation – Only gaseous fuels can be burned in any boiler or heater located at the affected facility. No liquid or solid fuels can be burned in any boiler or heater located at the affected facility.]

§60.40b Applicability and delegation of authority.

(a) The affected facility to which this subpart applies is each steam generating unit that commences construction, modification, or reconstruction after June 19, 1984~~, and that has a heat input capacity from fuels combusted in the steam generating unit of greater than 29 megawatts (MW) (100 million British thermal units per hour (MMBtu/hr))~~.

(b) Any affected facility meeting the applicability requirements under paragraph (a) of this section and commencing construction, modification, or reconstruction after June 19, 1984, but on or before June 19, 1986, is subject to the following standards:

~~(1) Coal-fired affected facilities having a heat input capacity between 29 and 73 MW (100 and 250 MMBtu/hr), inclusive, are subject to the particulate matter (PM) and nitrogen oxides (NO_X) standards under this subpart.~~

~~(2) Coal-fired affected facilities having a heat input capacity greater than 73 MW (250 MMBtu/hr) and meeting the applicability requirements under subpart D (Standards of performance for fossil-fuel-fired steam generators; §60.40) are subject to the PM and~~

~~NO_X standards under this subpart and to the sulfur dioxide (SO_2) standards under subpart D (§60.43).~~

~~(3) Oil-fired affected facilities having a heat input capacity between 29 and 73 MW (100 and 250 MMBtu/hr), inclusive, are subject to the NO_X standards under this subpart.~~

~~(4) Oil-fired affected facilities having a heat input capacity greater than 73 MW (250 MMBtu/hr) and meeting the applicability requirements under subpart D (Standards of performance for fossil-fuel-fired steam generators; §60.40) are also subject to the NO_X standards under this subpart and the PM and SO_2 standards under subpart D (§§60.42 and 60.43).~~

(c) Affected facilities that also meet the applicability requirements under subpart J or subpart Ja of this part are subject to the PM and NO_X standards under this subpart and the SO_2 standards under subpart J or subpart Ja of this part, as applicable.

(d) Affected facilities that also meet the applicability requirements under subpart E (Standards of performance for incinerators; §60.50) are subject to the NO_X and PM standards under this subpart.

~~(e) Steam generating units meeting the applicability requirements under subpart Da (Standards of performance for electric utility steam generating units; §60.40Da) are not subject to this subpart.~~

~~(f) Any change to an existing steam generating unit for the sole purpose of combusting gases containing total reduced sulfur (TRS) as defined under §60.281 is not considered a modification under §60.14 and the steam generating unit is not subject to this subpart.~~

(g) In delegating implementation and enforcement authority to a State under section 111(c) of the Clean Air Act, the following authorities shall be retained by the Administrator and not transferred to a State.

(1) Section 60.44b(f).

(2) Section 60.44b(g).

(3) Section 60.49b(a)(4).

(h) Any affected facility that meets the applicability requirements and is subject to subpart Ea, subpart Eb, subpart AAAA, or subpart CCCC of this part is not subject to this subpart.

(i) Affected facilities (*i.e.*, heat recovery steam generators) that are associated with stationary combustion turbines and that meet the applicability requirements of subpart KKKK of this part are not subject to this subpart. This subpart will continue to apply to all other affected facilities (*i.e.* heat recovery steam generators with duct burners) that are capable of combusting ~~more than 29 MW (100 MMBtu/h) heat input of~~ fossil fuel. If the affected facility (*i.e.* heat recovery steam generator) is subject to this subpart, only emissions resulting from combustion of fuels in the steam generating unit are subject to this subpart. (The stationary combustion turbine emissions are subject to subpart GG or KKKK, as applicable, of this part.)

(j) Any affected facility meeting the applicability requirements under paragraph (a) of this section and commencing construction, modification, or reconstruction after June 19, 1986 is not subject to subpart D (Standards of Performance for Fossil-Fuel-Fired Steam Generators, §60.40).

(k) Any affected facility that meets the applicability requirements and is subject to an EPA approved State or Federal section 111(d)/129 plan implementing subpart Cb or subpart BBBB of this part is not covered by this subpart.

(l) Affected facilities that also meet the applicability requirements under subpart BB of this part (Standards of Performance for Kraft Pulp Mills) are subject to the SO_2 and NO_X standards under this subpart and the PM standards under subpart BB.

~~(m) Temporary boilers are not subject to this subpart.~~

[72 FR 32742, June 13, 2007, as amended at 74 FR 5084, Jan. 28, 2009; 77 FR 9459, Feb. 16, 2012]

§60.41b Definitions.

As used in this subpart, all terms not defined herein shall have the meaning given them in the Clean Air Act and in subpart A of this part.

Annual capacity factor means the ratio between the actual heat input to a steam generating unit from the fuels listed in §60.42b(a), §60.43b(a), or §60.44b(a), as applicable, during a calendar year and the potential heat input to the steam generating unit had it been operated for 8,760 hours during a calendar year at the maximum steady state design heat input capacity. In the case of steam generating units that are rented or leased, the actual heat input shall be determined based on the combined heat input from all operations of the affected facility in a calendar year.

Byproduct/waste means any liquid or gaseous substance produced at chemical manufacturing plants, petroleum refineries, or pulp and paper mills (except natural gas, distillate oil, or residual oil) and combusted in a steam generating unit for heat recovery or for disposal. Gaseous substances with carbon dioxide (CO_2) levels greater than 50 percent or carbon monoxide levels greater than 10 percent are not byproduct/waste for the purpose of this subpart.

Chemical manufacturing plants mean industrial plants that are classified by the Department of Commerce under Standard Industrial Classification (SIC) Code 28.

Coal means all solid fuels classified as anthracite, bituminous, subbituminous, or lignite by the American Society of Testing and Materials in ASTM D388 (incorporated by reference, see §60.17), coal refuse, and petroleum coke. Coal-derived synthetic fuels, including but not limited to solvent refined coal, gasified coal not meeting the definition of natural gas, coal-oil mixtures, coke oven gas, and coal-water mixtures, are also included in this definition for the purposes of this subpart.

Coal refuse means any byproduct of coal mining or coal cleaning operations with an ash content greater than 50 percent, by weight, and a heating value less than 13,900 kJ/kg (6,000 Btu/lb) on a dry basis.

Cogeneration, also known as combined heat and power, means a facility that simultaneously produces both electric (or mechanical) and useful thermal energy from the same primary energy source.

Coke oven gas means the volatile constituents generated in the gaseous exhaust during the carbonization of bituminous coal to form coke.

Combined cycle system means a system in which a separate source, such as a gas turbine, internal combustion engine, kiln, etc., provides exhaust gas to a steam generating unit.

Conventional technology means wet flue gas desulfurization (FGD) technology, dry FGD technology, atmospheric fluidized bed combustion technology, and oil hydrodesulfurization technology.

Distillate oil means fuel oils that contain 0.05 weight percent nitrogen or less and comply with the specifications for fuel oil numbers 1 and 2, as defined by the American Society of Testing and Materials in ASTM D396 (incorporated by reference, see §60.17), diesel fuel oil numbers 1 and 2, as defined by the American Society for Testing and Materials in ASTM D975 (incorporated by reference, see §60.17), kerosine, as defined by the American Society of Testing and Materials in ASTM D3699 (incorporated by reference, see §60.17), biodiesel as defined by the American Society of Testing and Materials in ASTM D6751 (incorporated by reference, see §60.17), or biodiesel blends as defined by the American Society of Testing and Materials in ASTM D7467 (incorporated by reference, see §60.17).

Dry flue gas desulfurization technology means a SO_2 control system that is located downstream of the steam generating unit and removes sulfur oxides from the combustion gases of the steam generating unit by contacting the combustion gases with an alkaline reagent and water, whether introduced separately or as a premixed slurry or solution and forming a dry powder material. This definition includes devices where the dry powder material is subsequently converted to another form. Alkaline slurries or solutions used in dry flue gas desulfurization technology include but are not limited to lime and sodium.

Duct burner means a device that combusts fuel and that is placed in the exhaust duct from another source, such as a stationary gas turbine, internal combustion engine, kiln, etc., to allow the firing of additional fuel to heat the exhaust gases before the exhaust gases enter a steam generating unit.

Emerging technology means any SO_2 control system that is not defined as a conventional technology under this section, and for which the owner or operator of the facility has applied to the Administrator and received approval to operate as an emerging technology under §60.49b(a)(4).

Federally enforceable means all limitations and conditions that are enforceable by the Administrator, including the requirements of 40 CFR parts 60 and 61, requirements within any applicable State Implementation Plan, and any permit requirements established under 40 CFR 52.21 or under 40 CFR 51.18 and 51.24.

Fluidized bed combustion technology means combustion of fuel in a bed or series of beds (including but not limited to bubbling bed units and circulating bed units) of limestone aggregate (or other sorbent materials) in which these materials are forced upward by the flow of combustion air and the gaseous products of combustion.

Fuel pretreatment means a process that removes a portion of the sulfur in a fuel before combustion of the fuel in a steam generating unit.

Full capacity means operation of the steam generating unit at 90 percent or more of the maximum steady-state design heat input capacity.

Gaseous fuel means any fuel that is a gas at ISO conditions. This includes, but is not limited to, natural gas and gasified coal (including coke oven gas).

Gross output means the gross useful work performed by the steam generated. For units generating only electricity, the gross useful work performed is the gross electrical output from the turbine/generator set. For cogeneration units, the gross useful work performed is the gross electrical or mechanical output plus 75 percent of the useful thermal output measured relative to ISO conditions that is not used to generate additional electrical or mechanical output or to enhance the performance of the unit (*i.e.*, steam delivered to an industrial process).

Heat input means heat derived from combustion of fuel in a steam generating unit and does not include the heat derived from preheated combustion air, recirculated flue gases, or exhaust gases from other sources, such as gas turbines, internal combustion engines, kilns, etc.

Heat release rate means the steam generating unit design heat input capacity (in MW or Btu/hr) divided by the furnace volume (in cubic meters or cubic feet); the furnace volume is that volume bounded by the front furnace wall where the burner is located, the furnace side waterwall, and extending to the level just below or in front of the first row of convection pass tubes.

Heat transfer medium means any material that is used to transfer heat from one point to another point.

High heat release rate means a heat release rate greater than 730,000 J/sec-m^3 (70,000 Btu/hr-ft^3).

ISO Conditions means a temperature of 288 Kelvin, a relative humidity of 60 percent, and a pressure of 101.3 kilopascals.

Lignite means a type of coal classified as lignite A or lignite B by the American Society of Testing and Materials in ASTM D388 (incorporated by reference, see §60.17).

Low heat release rate means a heat release rate of 730,000 J/sec-m^3 (70,000 Btu/hr-ft^3) or less.

Mass-feed stoker steam generating unit means a steam generating unit where solid fuel is introduced directly into a retort or is fed directly onto a grate where it is combusted.

Maximum heat input capacity means the ability of a steam generating unit to combust a stated maximum amount of fuel on a steady state basis, as determined by the physical design and characteristics of the steam generating unit.

Municipal-type solid waste means refuse, more than 50 percent of which is waste consisting of a mixture of paper, wood, yard wastes, food wastes, plastics, leather, rubber, and other combustible materials, and noncombustible materials such as glass and rock.

Natural gas means:

(1) A naturally occurring mixture of hydrocarbon and nonhydrocarbon gases found in geologic formations beneath the earth's surface, of which the principal constituent is methane; or

(2) Liquefied petroleum gas, as defined by the American Society for Testing and Materials in ASTM D1835 (incorporated by reference, see §60.17); or

(3) A mixture of hydrocarbons that maintains a gaseous state at ISO conditions. Additionally, natural gas must either be composed of at least 70 percent methane by volume or have a gross calorific value between 34 and 43 megajoules (MJ) per dry standard cubic meter (910 and 1,150 Btu per dry standard cubic foot).

Noncontinental area means the State of Hawaii, the Virgin Islands, Guam, American Samoa, the Commonwealth of Puerto Rico, or the Northern Mariana Islands.

Oil means crude oil or petroleum or a liquid fuel derived from crude oil or petroleum, including distillate and residual oil.

Petroleum refinery means industrial plants as classified by the Department of Commerce under Standard Industrial Classification (SIC) Code 29.

Potential sulfur dioxide emission rate means the theoretical SO_2 emissions (nanograms per joule (ng/J) or lb/MMBtu heat input) that would result from combusting fuel in an uncleaned state and without using emission control systems. For gasified coal or oil that is desulfurized prior to combustion, the *Potential sulfur dioxide emission rate* is the theoretical SO_2 emissions (ng/J or lb/MMBtu heat input) that would result from combusting fuel in a cleaned state without using any post combustion emission control systems.

Process heater means a device that is primarily used to heat a material to initiate or promote a chemical reaction in which the material participates as a reactant or catalyst.

Pulp and paper mills means industrial plants that are classified by the Department of Commerce under North American Industry Classification System (NAICS) Code 322 or Standard Industrial Classification (SIC) Code 26.

Pulverized coal-fired steam generating unit means a steam generating unit in which pulverized coal is introduced into an air stream that carries the coal to the combustion chamber of the steam generating unit where it is fired in suspension. This includes both conventional pulverized coal-fired and micropulverized coal-fired steam generating units. Residual oil means crude oil, fuel oil numbers 1 and 2 that have a nitrogen content greater than 0.05 weight percent, and all fuel oil numbers 4, 5 and 6, as defined by the American Society of Testing and Materials in ASTM D396 (incorporated by reference, see §60.17).

Spreader stoker steam generating unit means a steam generating unit in which solid fuel is introduced to the combustion zone by a mechanism that throws the fuel onto a grate from above. Combustion takes place both in suspension and on the grate.

Steam generating unit means a device that combusts any fuel or byproduct/waste and produces steam or heats water or heats any heat transfer medium. This term includes any municipal-type solid waste incinerator with a heat recovery steam generating unit or any steam generating unit that combusts fuel and is part of a cogeneration system or a combined cycle system. This term does not include process heaters as they are defined in this subpart.

Steam generating unit operating day means a 24-hour period between 12:00 midnight and the following midnight during which any fuel is combusted at any time in the steam generating unit. It is not necessary for fuel to be combusted continuously for the entire 24-hour period.

Temporary boiler means any gaseous or liquid fuel-fired steam generating unit that is designed to, and is capable of, being carried or moved from one location to another by means of, for example, wheels, skids, carrying handles, dollies, trailers, or platforms. A steam generating unit is not a temporary boiler if any one of the following conditions exists:

(1) The equipment is attached to a foundation.

(2) The steam generating unit or a replacement remains at a location for more than 180 consecutive days. Any temporary boiler that replaces a temporary boiler at a location and performs the same or similar function will be included in calculating the consecutive time period.

(3) The equipment is located at a seasonal facility and operates during the full annual operating period of the seasonal facility, remains at the facility for at least 2 years, and operates at that facility for at least 3 months each year.

(4) The equipment is moved from one location to another in an attempt to circumvent the residence time requirements of this definition.

Very low sulfur oil means for units constructed, reconstructed, or modified on or before February 28, 2005, oil that contains no more than 0.5 weight percent sulfur or that, when combusted without SO_2 emission control, has a SO_2 emission rate equal to or less than 215 ng/J (0.5 lb/MMBtu) heat input. For units constructed, reconstructed, or modified after February 28, 2005 and not located in a noncontinental area, *very low sulfur oil*means oil that contains no more than 0.30 weight percent sulfur or that, when combusted without SO_2 emission control, has a SO_2 emission rate equal to or less than 140 ng/J (0.32 lb/MMBtu) heat input. For units constructed, reconstructed, or modified after February 28, 2005 and located in a noncontinental area, *very low sulfur oil*means oil that contains no more than 0.5 weight percent sulfur or that, when combusted without SO_2 emission control, has a SO_2 emission rate equal to or less than 215 ng/J (0.50 lb/MMBtu) heat input.

Wet flue gas desulfurization technology means a SO_2 control system that is located downstream of the steam generating unit and removes sulfur oxides from the combustion gases of the steam generating unit by contacting the combustion gas with an alkaline slurry or solution and forming a liquid material. This definition applies to devices where the aqueous liquid material product of this contact is subsequently converted to other forms. Alkaline reagents used in wet flue gas desulfurization technology include, but are not limited to, lime, limestone, and sodium.

Wet scrubber system means any emission control device that mixes an aqueous stream or slurry with the exhaust gases from a steam generating unit to control emissions of PM or SO_2.

Wood means wood, wood residue, bark, or any derivative fuel or residue thereof, in any form, including, but not limited to, sawdust, sanderdust, wood chips, scraps, slabs, millings, shavings, and processed pellets made from wood or other forest residues.

[72 FR 32742, June 13, 2007, as amended at 74 FR 5084, Jan. 28, 2009; 77 FR 9459, Feb. 16, 2012]

~~§60.42b Standard for sulfur dioxide (SO2).~~

~~(a) Except as provided in paragraphs (b), (c), (d), or (j) of this section, on and after the date on which the performance test is completed or required to be completed under §60.8,~~

~~whichever comes first, no owner or operator of an affected facility that commenced construction, reconstruction, or modification on or before February 28, 2005, that combusts coal or oil shall cause to be discharged into the atmosphere any gases that contain~~ ~~SO_2~~ ~~in excess of 87 ng/J (0.20 lb/MMBtu) or 10 percent (0.10) of the potential~~ ~~SO_2~~ ~~emission rate (90 percent reduction) and the emission limit determined according to the following formula:~~

$$E_s = \frac{(K_a H_a + K_b H_b)}{(H_a + H_b)}$$

~~View or download PDF~~

~~Where:~~

~~E_s = SO_2 emission limit, in ng/J or lb/MMBtu heat input;~~

~~K_a = 520 ng/J (or 1.2 lb/MMBtu);~~

~~K_b = 340 ng/J (or 0.80 lb/MMBtu);~~

~~H_a = Heat input from the combustion of coal, in J (MMBtu); and~~

~~H_b = Heat input from the combustion of oil, in J (MMBtu).~~

~~For facilities complying with the percent reduction standard, only the heat input supplied to the affected facility from the combustion of coal and oil is counted in this paragraph. No credit is provided for the heat input to the affected facility from the combustion of natural gas, wood, municipal-type solid waste, or other fuels or heat derived from exhaust gases from other sources, such as gas turbines, internal combustion engines, kilns, etc.~~

~~(b) On and after the date on which the performance test is completed or required to be completed under §60.8, whichever date comes first, no owner or operator of an affected facility that commenced construction, reconstruction, or modification on or before February 28, 2005, that combusts coal refuse alone in a fluidized bed combustion steam generating unit shall cause to be discharged into the atmosphere any gases that contain~~ ~~SO_2~~ ~~in excess of 87 ng/J (0.20 lb/MMBtu) or 20 percent (0.20) of the potential~~ ~~SO_2~~ ~~emission rate (80 percent reduction) and 520 ng/J (1.2 lb/MMBtu) heat input. If coal or oil is fired with coal refuse, the affected facility is subject to paragraph (a) or (d) of this section, as applicable. For facilities complying with the percent reduction standard, only the heat input supplied to the affected facility from the combustion of coal and oil is counted in this paragraph. No credit is provided for the heat input to the affected facility from the combustion of natural gas, wood, municipal-type solid waste, or other fuels or heat derived from exhaust gases from other sources, such as gas turbines, internal combustion engines, kilns, etc.~~

~~(c) On and after the date on which the performance test is completed or is required to be completed under §60.8, whichever comes first, no owner or operator of an affected facility that combusts coal or oil, either alone or in combination with any other fuel, and that uses an emerging technology for the control of~~ ~~SO_2~~ ~~emissions, shall cause to be discharged into the~~

~~atmosphere any gases that contain SO_2 in excess of 50 percent of the potential SO_2 emission rate (50 percent reduction) and that contain SO_2 in excess of the emission limit determined according to the following formula:~~

$$E_s = \frac{(K_c H_c + K_d H_d)}{(H_c + H_d)}$$

~~View or download PDF~~

~~Where:~~

~~E_s = SO2 emission limit, in ng/J or lb/MM Btu heat input;~~

~~K_c = 260 ng/J (or 0.60 lb/MMBtu);~~

~~K_d = 170 ng/J (or 0.40 lb/MMBtu);~~

~~H_c = Heat input from the combustion of coal, in J (MMBtu); and~~

~~H_d = Heat input from the combustion of oil, in J (MMBtu).~~

~~For facilities complying with the percent reduction standard, only the heat input supplied to the affected facility from the combustion of coal and oil is counted in this paragraph. No credit is provided for the heat input to the affected facility from the combustion of natural gas, wood, municipal-type solid waste, or other fuels, or from the heat input derived from exhaust gases from other sources, such as gas turbines, internal combustion engines, kilns, etc.~~

~~(d) On and after the date on which the performance test is completed or required to be completed under §60.8, whichever comes first, no owner or operator of an affected facility that commenced construction, reconstruction, or modification on or before February 28, 2005 and listed in paragraphs (d)(1), (2), (3), or (4) of this section shall cause to be discharged into the atmosphere any gases that contain SO_2 in excess of 520 ng/J (1.2 lb/MMBtu) heat input if the affected facility combusts coal, or 215 ng/J (0.5 lb/MMBtu) heat input if the affected facility combusts oil other than very low sulfur oil. Percent reduction requirements are not applicable to affected facilities under paragraphs (d)(1), (2), (3) or (4) of this section. For facilities complying with paragraphs (d)(1), (2), or (3) of this section, only the heat input supplied to the affected facility from the combustion of coal and oil is counted in this paragraph. No credit is provided for the heat input to the affected facility from the combustion of natural gas, wood, municipal-type solid waste, or other fuels or heat derived from exhaust gases from other sources, such as gas turbines, internal combustion engines, kilns, etc.~~

~~(1) Affected facilities that have an annual capacity factor for coal and oil of 30 percent (0.30) or less and are subject to a federally enforceable permit limiting the operation of the affected facility to an annual capacity factor for coal and oil of 30 percent (0.30) or less;~~

~~(2) Affected facilities located in a noncontinental area; or~~

~~(3) Affected facilities combusting coal or oil, alone or in combination with any fuel, in a duct burner as part of a combined cycle system where 30 percent (0.30) or less of the heat entering the steam generating unit is from combustion of coal and oil in the duct burner and 70 percent (0.70) or more of the heat entering the steam generating unit is from the exhaust gases entering the duct burner; or~~

~~(4) The affected facility burns coke oven gas alone or in combination with natural gas or very low sulfur distillate oil.~~

~~(e) Except as provided in paragraph (f) of this section, compliance with the emission limits, fuel oil sulfur limits, and/or percent reduction requirements under this section are determined on a 30-day rolling average basis.~~

~~(f) Except as provided in paragraph (j)(2) of this section, compliance with the emission limits or fuel oil sulfur limits under this section is determined on a 24-hour average basis for affected facilities that (1) have a federally enforceable permit limiting the annual capacity factor for oil to 10 percent or less, (2) combust only very low sulfur oil, and (3) do not combust any other fuel.~~

~~(g) Except as provided in paragraph (i) of this section and §60.45b(a), the SO_2 emission limits and percent reduction requirements under this section apply at all times, including periods of startup, shutdown, and malfunction.~~

~~(h) Reductions in the potential SO_2 emission rate through fuel pretreatment are not credited toward the percent reduction requirement under paragraph (c) of this section unless:~~

~~(1) Fuel pretreatment results in a 50 percent or greater reduction in potential SO_2 emissions and~~

~~(2) Emissions from the pretreated fuel (without combustion or post-combustion SO_2 control) are equal to or less than the emission limits specified in paragraph (c) of this section.~~

~~(i) An affected facility subject to paragraph (a), (b), or (c) of this section may combust very low sulfur oil or natural gas when the SO_2 control system is not being operated because of malfunction or maintenance of the SO_2 control system.~~

~~(j) Percent reduction requirements are not applicable to affected facilities combusting only very low sulfur oil. The owner or operator of an affected facility combusting very low sulfur oil shall demonstrate that the oil meets the definition of very low sulfur oil by: (1) Following the performance testing procedures as described in §60.45b(c) or §60.45b(d), and following the monitoring procedures as described in §60.47b(a) or §60.47b(b) to determine SO_2 emission rate or fuel oil sulfur content; or (2) maintaining fuel records as described in §60.49b(r).~~

~~(k)(1) Except as provided in paragraphs (k)(2), (k)(3), and (k)(4) of this section, on and after the date on which the initial performance test is completed or is required to be completed under §60.8, whichever date comes first, no owner or operator of an affected facility that commences construction, reconstruction, or modification after February 28, 2005, and that combusts coal, oil, natural gas, a mixture of these fuels, or a mixture of these fuels with any other fuels shall cause to be discharged into the atmosphere any gases that contain SO_2 in excess of 87 ng/J (0.20 lb/MMBtu) heat input or 8 percent (0.08) of the potential SO_2 emission rate (92 percent reduction) and 520 ng/J (1.2 lb/MMBtu) heat input. For facilities complying with the percent reduction standard and paragraph (k)(3) of this section, only the heat input supplied to the affected facility from the combustion of coal and oil is counted in paragraph (k) of this section. No credit is provided for the heat input to the affected facility from the combustion of natural gas, wood, municipal-type solid waste, or other fuels or heat derived from exhaust gases from other sources, such as gas turbines, internal combustion engines, kilns, etc.~~

~~(2) Units firing only very low sulfur oil, gaseous fuel, a mixture of these fuels, or a mixture of these fuels with any other fuels with a potential SO_2 emission rate of 140 ng/J (0.32 lb/MMBtu) heat input or less are exempt from the SO_2 emissions limit in paragraph (k)(1) of this section.~~

~~(3) Units that are located in a noncontinental area and that combust coal, oil, or natural gas shall not discharge any gases that contain SO_2 in excess of 520 ng/J (1.2 lb/MMBtu) heat input if the affected facility combusts coal, or 215 ng/J (0.50 lb/MMBtu) heat input if the affected facility combusts oil or natural gas.~~

~~(4) As an alternative to meeting the requirements under paragraph (k)(1) of this section, modified facilities that combust coal or a mixture of coal with other fuels shall not cause to be discharged into the atmosphere any gases that contain SO_2 in excess of 87 ng/J (0.20 lb/MMBtu) heat input or 10 percent (0.10) of the potential SO_2emission rate (90 percent reduction) and 520 ng/J (1.2 lb/MMBtu) heat input.~~

~~[72 FR 32742, June 13, 2007, as amended at 74 FR 5084, Jan. 28, 2009; 76 FR 3523, Jan. 20, 2011]~~

~~§60.43b Standard for particulate matter (PM).~~

~~(a) On and after the date on which the initial performance test is completed or is required to be completed under §60.8, whichever comes first, no owner or operator of an affected facility that commenced construction, reconstruction, or modification on or before February 28, 2005 that combusts coal or combusts mixtures of coal with other fuels, shall cause to be discharged into the atmosphere from that affected facility any gases that contain PM in excess of the following emission limits:~~

~~(1) 22 ng/J (0.051 lb/MMBtu) heat input, (i) If the affected facility combusts only coal, or~~

~~(ii) If the affected facility combusts coal and other fuels and has an annual capacity factor for the other fuels of 10 percent (0.10) or less.~~

~~(2) 43 ng/J (0.10 lb/MMBtu) heat input if the affected facility combusts coal and other fuels and has an annual capacity factor for the other fuels greater than 10 percent (0.10) and is subject to a federally enforceable requirement limiting operation of the affected facility to an annual capacity factor greater than 10 percent (0.10) for fuels other than coal.~~

~~(3) 86 ng/J (0.20 lb/MMBtu) heat input if the affected facility combusts coal or coal and other fuels and~~

~~(i) Has an annual capacity factor for coal or coal and other fuels of 30 percent (0.30) or less,~~

~~(ii) Has a maximum heat input capacity of 73 MW (250 MMBtu/hr) or less,~~

~~(iii) Has a federally enforceable requirement limiting operation of the affected facility to an annual capacity factor of 30 percent (0.30) or less for coal or coal and other solid fuels, and~~

~~(iv) Construction of the affected facility commenced after June 19, 1984, and before November 25, 1986.~~

~~(4) An affected facility burning coke oven gas alone or in combination with other fuels not subject to a PM standard under §60.43b and not using a post-combustion technology (except a wet scrubber) for reducing PM or SO_2 emissions is not subject to the PM limits under §60.43b(a).~~

~~(b) On and after the date on which the performance test is completed or required to be completed under §60.8, whichever comes first, no owner or operator of an affected facility that commenced construction, reconstruction, or modification on or before February 28, 2005, and that combusts oil (or mixtures of oil with other fuels) and uses a conventional or emerging technology to reduce SO_2 emissions shall cause to be discharged into the atmosphere from that affected facility any gases that contain PM in excess of 43 ng/J (0.10 lb/MMBtu) heat input.~~

~~(c) On and after the date on which the initial performance test is completed or is required to be completed under §60.8, whichever comes first, no owner or operator of an affected facility that commenced construction, reconstruction, or modification on or before February 28, 2005, and that combusts wood, or wood with other fuels, except coal, shall cause to be discharged from that affected facility any gases that contain PM in excess of the following emission limits:~~

~~(1) 43 ng/J (0.10 lb/MMBtu) heat input if the affected facility has an annual capacity factor greater than 30 percent (0.30) for wood.~~

~~(2) 86 ng/J (0.20 lb/MMBtu) heat input if (i) The affected facility has an annual capacity factor of 30 percent (0.30) or less for wood;~~

~~(ii) Is subject to a federally enforceable requirement limiting operation of the affected facility to an annual capacity factor of 30 percent (0.30) or less for wood; and~~

~~(iii) Has a maximum heat input capacity of 73 MW (250 MMBtu/hr) or less.~~

~~(d) On and after the date on which the initial performance test is completed or is required to be completed under §60.8, whichever date comes first, no owner or operator of an affected facility that combusts municipal-type solid waste or mixtures of municipal-type solid waste with other fuels, shall cause to be discharged into the atmosphere from that affected facility any gases that contain PM in excess of the following emission limits:~~

~~(1) 43 ng/J (0.10 lb/MMBtu) heat input;~~

~~(i) If the affected facility combusts only municipal-type solid waste; or~~

~~(ii) If the affected facility combusts municipal-type solid waste and other fuels and has an annual capacity factor for the other fuels of 10 percent (0.10) or less.~~

~~(2) 86 ng/J (0.20 lb/MMBtu) heat input if the affected facility combusts municipal-type solid waste or municipal-type solid waste and other fuels; and~~

~~(i) Has an annual capacity factor for municipal-type solid waste and other fuels of 30 percent (0.30) or less;~~

~~(ii) Has a maximum heat input capacity of 73 MW (250 MMBtu/hr) or less;~~

~~(iii) Has a federally enforceable requirement limiting operation of the affected facility to an annual capacity factor of 30 percent (0.30) or less for municipal-type solid waste, or municipal-type solid waste and other fuels; and~~

~~(iv) Construction of the affected facility commenced after June 19, 1984, but on or before November 25, 1986.~~

~~(e) For the purposes of this section, the annual capacity factor is determined by dividing the actual heat input to the steam generating unit during the calendar year from the combustion of coal, wood, or municipal-type solid waste, and other fuels, as applicable, by the potential heat input to the steam generating unit if the steam generating unit had been operated for 8,760 hours at the maximum heat input capacity.~~

~~(f) On and after the date on which the initial performance test is completed or is required to be completed under §60.8, whichever date comes first, no owner or operator of an affected facility that combusts coal, oil, wood, or mixtures of these fuels with any other fuels shall cause to be discharged into the atmosphere any gases that exhibit greater than 20 percent~~

~~opacity (6-minute average), except for one 6-minute period per hour of not more than 27 percent opacity. An owner or operator of an affected facility that elects to install, calibrate, maintain, and operate a continuous emissions monitoring system (CEMS) for measuring PM emissions according to the requirements of this subpart and is subject to a federally enforceable PM limit of 0.030 lb/MMBtu or less is exempt from the opacity standard specified in this paragraph.~~

~~(g) The PM and opacity standards apply at all times, except during periods of startup, shutdown, or malfunction.~~

~~(h)(1) Except as provided in paragraphs (h)(2), (h)(3), (h)(4), (h)(5), and (h)(6) of this section, on and after the date on which the initial performance test is completed or is required to be completed under §60.8, whichever date comes first, no owner or operator of an affected facility that commenced construction, reconstruction, or modification after February 28, 2005, and that combusts coal, oil, wood, a mixture of these fuels, or a mixture of these fuels with any other fuels shall cause to be discharged into the atmosphere from that affected facility any gases that contain PM in excess of 13 ng/J (0.030 lb/MMBtu) heat input,~~

~~(2) As an alternative to meeting the requirements of paragraph (h)(1) of this section, the owner or operator of an affected facility for which modification commenced after February 28, 2005, may elect to meet the requirements of this paragraph. On and after the date on which the initial performance test is completed or required to be completed under §60.8, no owner or operator of an affected facility that commences modification after February 28, 2005 shall cause to be discharged into the atmosphere from that affected facility any gases that contain PM in excess of both:~~

~~(i) 22 ng/J (0.051 lb/MMBtu) heat input derived from the combustion of coal, oil, wood, a mixture of these fuels, or a mixture of these fuels with any other fuels; and~~

~~(ii) 0.2 percent of the combustion concentration (99.8 percent reduction) when combusting coal, oil, wood, a mixture of these fuels, or a mixture of these fuels with any other fuels.~~

~~(3) On and after the date on which the initial performance test is completed or is required to be completed under §60.8, whichever date comes first, no owner or operator of an affected facility that commences modification after February 28, 2005, and that combusts over 30 percent wood (by heat input) on an annual basis and has a maximum heat input capacity of 73 MW (250 MMBtu/h) or less shall cause to be discharged into the atmosphere from that affected facility any gases that contain PM in excess of 43 ng/J (0.10 lb/MMBtu) heat input.~~

~~(4) On and after the date on which the initial performance test is completed or is required to be completed under §60.8, whichever date comes first, no owner or operator of an affected facility that commences modification after February 28, 2005, and that combusts over 30 percent wood (by heat input) on an annual basis and has a maximum heat input capacity greater than 73 MW (250 MMBtu/h) shall cause to be discharged into the atmosphere from~~

~~that affected facility any gases that contain PM in excess of 37 ng/J (0.085 lb/MMBtu) heat input.~~

~~(5) On and after the date on which the initial performance test is completed or is required to be completed under §60.8, whichever date comes first, an owner or operator of an affected facility not located in a noncontinental area that commences construction, reconstruction, or modification after February 28, 2005, and that combusts only oil that contains no more than 0.30 weight percent sulfur, coke oven gas, a mixture of these fuels, or either fuel (or a mixture of these fuels) in combination with other fuels not subject to a PM standard in §60.43b and not using a post-combustion technology (except a wet scrubber) to reduce SO_2 or PM emissions is not subject to the PM limits in (h)(1) of this section.~~

~~(6) On and after the date on which the initial performance test is completed or is required to be completed under §60.8, whichever date comes first, an owner or operator of an affected facility located in a noncontinental area that commences construction, reconstruction, or modification after February 28, 2005, and that combusts only oil that contains no more than 0.5 weight percent sulfur, coke oven gas, a mixture of these fuels, or either fuel (or a mixture of these fuels) in combination with other fuels not subject to a PM standard in §60.43b and not using a post-combustion technology (except a wet scrubber) to reduce SO_2 or PM emissions is not subject to the PM limits in (h)(1) of this section.~~

~~[72 FR 32742, June 13, 2007, as amended at 74 FR 5084, Jan. 28, 2009; 77 FR 9459, Feb. 16, 2012]~~

§60.44b Standard for nitrogen oxides (NO_X).

(a) Except as provided under paragraphs (k) and (l) of this section, on and after the date on which the initial performance test is completed or is required to be completed under §60.8, whichever date comes first, no owner or operator of an affected facility that is subject to the provisions of this section and that combusts only coal, oil, or natural gas shall cause to be discharged into the atmosphere from that affected facility any gases that contain NO_X (expressed as NO_2) in excess of the following emission limits:

Fuel/steam generating unit type	Nitrogen oxide emission limits (expressed as NO_2) heat input ng/J	lb/MMBTu
(1) Natural gas ~~and distillate oil~~, except (4):		
(i) Low heat release rate	~~43~~	0.03 ~~0.10~~
(ii) High heat release rate	~~86~~	0.06 ~~0.20~~
~~(2) Residual oil:~~		
~~(i) Low heat release rate~~	~~130~~	~~0.30~~
~~(ii) High heat release rate~~	~~170~~	~~0.40~~

~~(3) Coal:~~		
~~(i) Mass-feed stoker~~	~~210~~	~~0.50~~
~~(ii) Spreader stoker and fluidized bed combustion~~	~~260~~	~~0.60~~
~~(iii) Pulverized coal~~	~~300~~	~~0.70~~
~~(iv) Lignite, except (v)~~	~~260~~	~~0.60~~
~~(v) Lignite mined in North Dakota, South Dakota, or Montana and combusted in a slag tap furnace~~	~~340~~	~~0.80~~
~~(vi) Coal-derived synthetic fuels~~	~~210~~	~~0.50~~
(4) Duct burner used in a combined cycle system:		
(i) Natural gas ~~and distillate oil~~	~~86~~	0.06 ~~0.20~~
~~(ii) Residual oil~~	~~170~~	~~0.40~~

~~(b) Except as provided under paragraphs (k) and (l) of this section, on and after the date on which the initial performance test is completed or is required to be completed under §60.8, whichever date comes first, no owner or operator of an affected facility that simultaneously combusts mixtures of only coal, oil, or natural gas shall cause to be discharged into the atmosphere from that affected facility any gases that contain~~ ~~NO_X~~ ~~in excess of a limit determined by the use of the following formula:~~

$$E_n = \frac{(EL_{go}H_{go}) + (EL_{ro}H_{ro}) + (EL_cH_c)}{(H_{go} + H_{ro} + H_c)}$$

~~View or download PDF~~

~~Where:~~

~~E_n = NO_X emission limit (expressed as NO_2), ng/J (lb/MMBtu);~~

~~EL_{go} = Appropriate emission limit from paragraph (a)(1) for combustion of natural gas or distillate oil, ng/J (lb/MMBtu);~~

~~H_{go} = Heat input from combustion of natural gas or distillate oil, J (MMBtu);~~

~~EL_{ro} = Appropriate emission limit from paragraph (a)(2) for combustion of residual oil, ng/J (lb/MMBtu);~~

~~H_{ro} = Heat input from combustion of residual oil, J (MMBtu);~~

~~EL_c = Appropriate emission limit from paragraph (a)(3) for combustion of coal, ng/J (lb/MMBtu); and~~

~~H_c = Heat input from combustion of coal, J (MMBtu).~~

~~(c) Except as provided under paragraph (d) and (l) of this section, on and after the date on which the initial performance test is completed or is required to be completed under §60.8, whichever date comes first, no owner or operator of an affected facility that simultaneously combusts coal or oil, natural gas (or any combination of the three), and wood, or any other fuel shall cause to be discharged into the atmosphere any gases that contain NO_X in excess of the emission limit for the coal, oil, natural gas (or any combination of the three), combusted in the affected facility, as determined pursuant to paragraph (a) or (b) of this section. This standard does not apply to an affected facility that is subject to and in compliance with a federally enforceable requirement that limits operation of the affected facility to an annual capacity factor of 10 percent (0.10) or less for coal, oil, natural gas (or any combination of the three).~~

~~(d) On and after the date on which the initial performance test is completed or is required to be completed under §60.8, whichever date comes first, no owner or operator of an affected facility that simultaneously combusts natural gas and/or distillate oil with a potential SO_2 emissions rate of 26 ng/J (0.060 lb/MMBtu) or less with wood, municipal-type solid waste, or other solid fuel, except coal, shall cause to be discharged into the atmosphere from that affected facility any gases that contain NO_X in excess of 130 ng/J (0.30 lb/MMBtu) heat input unless the affected facility has an annual capacity factor for natural gas, distillate oil, or a mixture of these fuels of 10 percent (0.10) or less and is subject to a federally enforceable requirement that limits operation of the affected facility to an annual capacity factor of 10 percent (0.10) or less for natural gas, distillate oil, or a mixture of these fuels.~~

~~(e) Except as provided under paragraph (l) of this section, on and after the date on which the initial performance test is completed or is required to be completed under §60.8, whichever date comes first, no owner or operator of an affected facility that simultaneously combusts only coal, oil, or natural gas with byproduct/waste shall cause to be discharged into the atmosphere any gases that contain NO_X in excess of the emission limit determined by the following formula unless the affected facility has an annual capacity factor for coal, oil, and natural gas of 10 percent (0.10) or less and is subject to a federally enforceable requirement that limits operation of the affected facility to an annual capacity factor of 10 percent (0.10) or less:~~

~~(f) Any owner or operator of an affected facility that combusts byproduct/waste with either natural gas or oil may petition the Administrator within 180 days of the initial startup of the affected facility to establish a NO_X emission limit that shall apply specifically to that affected facility when the byproduct/waste is combusted. The petition shall include sufficient and appropriate data, as determined by the Administrator, such as NO_X emissions from the affected facility, waste composition (including nitrogen content), and combustion conditions to allow the Administrator to confirm that the affected facility is unable to comply with the~~

~~emission limits in paragraph (e) of this section and to determine the appropriate emission limit for the affected facility.~~

~~(1) Any owner or operator of an affected facility petitioning for a facility-specific NO_X emission limit under this section shall:~~

~~(i) Demonstrate compliance with the emission limits for natural gas and distillate oil in paragraph (a)(1) of this section or for residual oil in paragraph (a)(2) or (l)(1) of this section, as appropriate, by conducting a 30-day performance test as provided in §60.46b(e). During the performance test only natural gas, distillate oil, or residual oil shall be combusted in the affected facility; and~~

~~(ii) Demonstrate that the affected facility is unable to comply with the emission limits for natural gas and distillate oil in paragraph (a)(1) of this section or for residual oil in paragraph (a)(2) or (l)(1) of this section, as appropriate, when gaseous or liquid byproduct/waste is combusted in the affected facility under the same conditions and using the same technological system of emission reduction applied when demonstrating compliance under paragraph (f)(1)(i) of this section.~~

~~(2) The NO_X emission limits for natural gas or distillate oil in paragraph (a)(1) of this section or for residual oil in paragraph (a)(2) or (l)(1) of this section, as appropriate, shall be applicable to the affected facility until and unless the petition is approved by the Administrator. If the petition is approved by the Administrator, a facility-specific NO_X emission limit will be established at the NO_X emission level achievable when the affected facility is combusting oil or natural gas and byproduct/waste in a manner that the Administrator determines to be consistent with minimizing NO_X emissions. In lieu of amending this subpart, a letter will be sent to the facility describing the facility-specific NO_X limit. The facility shall use the compliance procedures detailed in the letter and make the letter available to the public. If the Administrator determines it is appropriate, the conditions and requirements of the letter can be reviewed and changed at any point.~~

~~(g) Any owner or operator of an affected facility that combusts hazardous waste (as defined by 40 CFR part 261 or 40 CFR part 761) with natural gas or oil may petition the Administrator within 180 days of the initial startup of the affected facility for a waiver from compliance with the NO_X emission limit that applies specifically to that affected facility. The petition must include sufficient and appropriate data, as determined by the Administrator, on NO_X emissions from the affected facility, waste destruction efficiencies, waste composition (including nitrogen content), the quantity of specific wastes to be combusted and combustion conditions to allow the Administrator to determine if the affected facility is able to comply with the NO_X emission limits required by this section. The owner or operator of the affected facility shall demonstrate that when hazardous waste is combusted in the affected facility, thermal destruction efficiency requirements for hazardous waste specified in an applicable federally enforceable requirement preclude compliance with the NO_X emission limits of this section. The NO_X emission limits for natural gas or distillate oil in paragraph (a)(1) of this section or for residual oil in paragraph (a)(2) or (l)(1) of this section, as appropriate, are applicable to the affected facility until and unless the petition is approved by the~~

~~Administrator. (See 40 CFR 761.70 for regulations applicable to the incineration of materials containing polychlorinated biphenyls (PCB's).) In lieu of amending this subpart, a letter will be sent to the facility describing the facility-specific NO_X limit. The facility shall use the compliance procedures detailed in the letter and make the letter available to the public. If the Administrator determines it is appropriate, the conditions and requirements of the letter can be reviewed and changed at any point.~~

(h) For purposes of paragraph (i) of this section, the NO_X standards under this section apply at all times including periods of startup, shutdown, or malfunction.

(i) Except as provided under paragraph (j) of this section, compliance with the emission limits under this section is determined on a 30-day rolling average basis.

~~(j) Compliance with the emission limits under this section is determined on a 24-hour average basis for the initial performance test and on a 3-hour average basis for subsequent performance tests for any affected facilities that:~~

~~(1) Combust, alone or in combination, only natural gas, distillate oil, or residual oil with a nitrogen content of 0.30 weight percent or less;~~

~~(2) Have a combined annual capacity factor of 10 percent or less for natural gas, distillate oil, and residual oil with a nitrogen content of 0.30 weight percent or less; and~~

~~(3) Are subject to a federally enforceable requirement limiting operation of the affected facility to the firing of natural gas, distillate oil, and/or residual oil with a nitrogen content of 0.30 weight percent or less and limiting operation of the affected facility to a combined annual capacity factor of 10 percent or less for natural gas, distillate oil, and residual oil with a nitrogen content of 0.30 weight percent or less.~~

~~(k) Affected facilities that meet the criteria described in paragraphs (j)(1), (2), and (3) of this section, and that have a heat input capacity of 73 MW (250 MMBtu/hr) or less, are not subject to the NO_X emission limits under this section.~~

~~(l) On and after the date on which the initial performance test is completed or is required to be completed under 60.8, whichever date is first, no owner or operator of an affected facility that commenced construction after July 9, 1997 shall cause to be discharged into the atmosphere from that affected facility any gases that contain NOx (expressed as NO2) in excess of the following limits:~~

~~(1) 86 ng/J (0.20 lb/MMBtu) heat input if the affected facility combusts coal, oil, or natural gas (or any combination of the three), alone or with any other fuels. The affected facility is not subject to this limit if it is subject to and in compliance with a federally enforceable requirement that limits operation of the facility to an annual capacity factor of 10 percent (0.10) or less for coal, oil, and natural gas (or any combination of the three); or~~

~~(2) If the affected facility has a low heat release rate and combusts natural gas or distillate oil in excess of 30 percent of the heat input on a 30-day rolling average from the combustion of all fuels, a limit determined by use of the following formula:~~

$$E_n = \frac{(0.10 \times H_{go}) + (0.20 \times H_r)}{(H_{go} + H_r)}$$

~~View or download PDF~~

~~Where:~~

~~E_n = NO_X emission limit, (lb/MMBtu);~~

~~H_{go} = 30-day heat input from combustion of natural gas or distillate oil; and~~

~~H_r = 30-day heat input from combustion of any other fuel.~~

~~(3) After February 27, 2006, units where more than 10 percent of total annual output is electrical or mechanical may comply with an optional limit of 270 ng/J (2.1 lb/MWh) gross energy output, based on a 30-day rolling average. Units complying with this output-based limit must demonstrate compliance according to the procedures of §60.48Da(i) of subpart Da of this part, and must monitor emissions according to §60.49Da(c), (k), through (n) of subpart Da of this part.~~

~~[72 FR 32742, June 13, 2007, as amended at 74 FR 5086, Jan. 28, 2009; 77 FR 9459, Feb. 16, 2012]~~

~~§60.45b Compliance and performance test methods and procedures for sulfur dioxide.~~

~~(a) The SO_2 emission standards in §60.42b apply at all times. Facilities burning coke oven gas alone or in combination with any other gaseous fuels or distillate oil are allowed to exceed the limit 30 operating days per calendar year for SO_2 control system maintenance.~~

~~(b) In conducting the performance tests required under §60.8, the owner or operator shall use the methods and procedures in appendix A (including fuel certification and sampling) of this part or the methods and procedures as specified in this section, except as provided in §60.8(b). Section 60.8(f) does not apply to this section. The 30-day notice required in §60.8(d) applies only to the initial performance test unless otherwise specified by the Administrator.~~

~~(c) The owner or operator of an affected facility shall conduct performance tests to determine compliance with the percent of potential SO_2 emission rate (% P_s) and the SO_2 emission rate (E_s) pursuant to §60.42b following the procedures listed below, except as provided under paragraph (d) and (k) of this section.~~

~~(1) The initial performance test shall be conducted over 30 consecutive operating days of the steam generating unit. Compliance with the SO_2 standards shall be determined using a 30-~~

~~day average. The first operating day included in the initial performance test shall be scheduled within 30 days after achieving the maximum production rate at which the affected facility will be operated, but not later than 180 days after initial startup of the facility.~~

~~(2) If only coal, only oil, or a mixture of coal and oil is combusted, the following procedures are used:~~

~~(i) The procedures in Method 19 of appendix A-7 of this part are used to determine the hourly~~ $\cancel{SO_2}$ ~~emission rate (~~$\cancel{E_{ho}}$~~) and the 30-day average emission rate (~~$\cancel{E_{ao}}$~~). The hourly averages used to compute the 30-day averages are obtained from the CEMS of §60.47b(a) or (b).~~

~~(ii) The percent of potential~~ $\cancel{SO_2}$ ~~emission rate (~~$\cancel{\%P_s}$~~) emitted to the atmosphere is computed using the following formula:~~

$$\%P_s = 100\left(1 - \frac{\%R_g}{100}\right)\left(1 - \frac{\%R_f}{100}\right)$$

~~View or download PDF~~

~~Where:~~

~~%P~~$_s$ ~~= Potential~~ $\cancel{SO_2}$ ~~emission rate, percent;~~

~~%R~~$_g$ ~~=~~ $\cancel{SO_2}$ ~~removal efficiency of the control device as determined by Method 19 of appendix A of this part, in percent; and~~

~~%R~~$_f$ ~~=~~ $\cancel{SO_2}$ ~~removal efficiency of fuel pretreatment as determined by Method 19 of appendix A of this part, in percent.~~

~~(3) If coal or oil is combusted with other fuels, the same procedures required in paragraph (c)(2) of this section are used, except as provided in the following:~~

~~(i) An adjusted hourly~~ $\cancel{SO_2}$ ~~emission rate (~~$\cancel{E_{ho}^{o}}$~~) is used in Equation 19-19 of Method 19 of appendix A of this part to compute an adjusted 30-day average emission rate (~~$\cancel{E_{ao}^{o}}$~~). The Eho° is computed using the following formula:~~

$$E_{ho}^{\circ} = \frac{E_{ho} - E_w(1 - X_1)}{X_1}$$

~~View or download PDF~~

~~Where:~~

$\cancel{E_{ho}^{o}}$ ~~= Adjusted hourly~~ $\cancel{SO_2}$ ~~emission rate, ng/J (lb/MMBtu);~~

~~E_{ho} = Hourly SO_2 emission rate, ng/J (lb/MMBtu);~~

~~E_w = SO_2 concentration in fuels other than coal and oil combusted in the affected facility, as determined by the fuel sampling and analysis procedures in Method 19 of appendix A of this part, ng/J (lb/MMBtu). The value E_w for each fuel lot is used for each hourly average during the time that the lot is being combusted; and~~

~~X_k = Fraction of total heat input from fuel combustion derived from coal, oil, or coal and oil, as determined by applicable procedures in Method 19 of appendix A of this part.~~

~~(ii) To compute the percent of potential SO_2 emission rate (%P_s), an adjusted %R_g (%R_g^o) is computed from the adjusted E_{ao}^o from paragraph (b)(3)(i) of this section and an adjusted average SO_2 inlet rate (E_{ai}^o) using the following formula:~~

$$\%R_g^o = 100\left(1.0 - \frac{E_{ao}^o}{E_{ai}^o}\right)$$

~~View or download PDF~~

~~To compute E_{ai}^o, an adjusted hourly SO_2 inlet rate (E_{hi}^o) is used. The E_{hi}^o is computed using the following formula:~~

$$E_{hi}^o = \frac{E_{hi} - E_w(1 - X_k)}{X_k}$$

~~View or download PDF~~

~~Where:~~

~~E_{hi}^o = Adjusted hourly SO_2 inlet rate, ng/J (lb/MMBtu); and~~

~~E_{hi} = Hourly SO_2 inlet rate, ng/J (lb/MMBtu).~~

~~(4) The owner or operator of an affected facility subject to paragraph (c)(3) of this section does not have to measure parameters E_w or X_k if the owner or operator elects to assume that X_k = 1.0. Owners or operators of affected facilities who assume X_k = 1.0 shall:~~

~~(i) Determine %P_s following the procedures in paragraph (c)(2) of this section; and~~

~~(ii) Sulfur dioxide emissions (E_s) are considered to be in compliance with SO_2 emission limits under §60.42b.~~

~~(5) The owner or operator of an affected facility that qualifies under the provisions of §60.42b(d) does not have to measure parameters E_w or X_k in paragraph (c)(3) of this section if the owner or operator of the affected facility elects to measure SO_2 emission rates of the coal~~

~~or oil following the fuel sampling and analysis procedures in Method 19 of appendix A-7 of this part.~~

~~(d) Except as provided in paragraph (j) of this section, the owner or operator of an affected facility that combusts only very low sulfur oil, natural gas, or a mixture of these fuels, has an annual capacity factor for oil of 10 percent (0.10) or less, and is subject to a federally enforceable requirement limiting operation of the affected facility to an annual capacity factor for oil of 10 percent (0.10) or less shall:~~

~~(1) Conduct the initial performance test over 24 consecutive steam generating unit operating hours at full load;~~

~~(2) Determine compliance with the standards after the initial performance test based on the arithmetic average of the hourly emissions data during each steam generating unit operating day if a CEMS is used, or based on a daily average if Method 6B of appendix A of this part or fuel sampling and analysis procedures under Method 19 of appendix A of this part are used.~~

~~(e) The owner or operator of an affected facility subject to §60.42b(d)(1) shall demonstrate the maximum design capacity of the steam generating unit by operating the facility at maximum capacity for 24 hours. This demonstration will be made during the initial performance test and a subsequent demonstration may be requested at any other time. If the 24-hour average firing rate for the affected facility is less than the maximum design capacity provided by the manufacturer of the affected facility, the 24-hour average firing rate shall be used to determine the capacity utilization rate for the affected facility, otherwise the maximum design capacity provided by the manufacturer is used.~~

~~(f) For the initial performance test required under §60.8, compliance with the SO_2 emission limits and percent reduction requirements under §60.42b is based on the average emission rates and the average percent reduction for SO_2 for the first 30 consecutive steam generating unit operating days, except as provided under paragraph (d) of this section. The initial performance test is the only test for which at least 30 days prior notice is required unless otherwise specified by the Administrator. The initial performance test is to be scheduled so that the first steam generating unit operating day of the 30 successive steam generating unit operating days is completed within 30 days after achieving the maximum production rate at which the affected facility will be operated, but not later than 180 days after initial startup of the facility. The boiler load during the 30-day period does not have to be the maximum design load, but must be representative of future operating conditions and include at least one 24-hour period at full load.~~

~~(g) After the initial performance test required under §60.8, compliance with the SO_2 emission limits and percent reduction requirements under §60.42b is based on the average emission rates and the average percent reduction for SO_2 for 30 successive steam generating unit operating days, except as provided under paragraph (d). A separate performance test is completed at the end of each steam generating unit operating day after the initial performance~~

~~test, and a new 30-day average emission rate and percent reduction for SO_2 are calculated to show compliance with the standard.~~

~~(h) Except as provided under paragraph (i) of this section, the owner or operator of an affected facility shall use all valid SO_2 emissions data in calculating $\%P_s$ and E_{ho} under paragraph (c), of this section whether or not the minimum emissions data requirements under §60.46b are achieved. All valid emissions data, including valid SO_2 emission data collected during periods of startup, shutdown and malfunction, shall be used in calculating $\%P_s$ and E_{ho} pursuant to paragraph (c) of this section.~~

~~(i) During periods of malfunction or maintenance of the SO_2 control systems when oil is combusted as provided under §60.42b(i), emission data are not used to calculate $\%P_s$ or E_s under §60.42b(a), (b) or (c), however, the emissions data are used to determine compliance with the emission limit under §60.42b(i).~~

~~(j) The owner or operator of an affected facility that only combusts very low sulfur oil, natural gas, or a mixture of these fuels with any other fuels not subject to an SO_2 standard is not subject to the compliance and performance testing requirements of this section if the owner or operator obtains fuel receipts as described in §60.49b(r).~~

~~(k) The owner or operator of an affected facility seeking to demonstrate compliance in §§60.42b(d)(4), 60.42b(j), 60.42b(k)(2), and 60.42b(k)(3) (when not burning coal) shall follow the applicable procedures in §60.49b(r).~~

~~[72 FR 32742, June 13, 2007, as amended at 74 FR 5086, Jan. 28, 2009]~~

§60.46b Compliance and performance test methods and procedures ~~for particulate matter and~~ nitrogen oxides.

(a) ~~The PM emission standards and opacity limits under §60.43b apply at all times except during periods of startup, shutdown, or malfunction.~~ The NO_X emission standards under §60.44b apply at all times.

~~(b) Compliance with the PM emission standards under §60.43b shall be determined through performance testing as described in paragraph (d) of this section, except as provided in paragraph (i) of this section.~~

(c) Compliance with the NO_X emission standards under §60.44b shall be determined through performance testing under paragraph (e) or (f), or under paragraphs (g) and (h) of this section, as applicable.

~~(d) To determine compliance with the PM emission limits and opacity limits under §60.43b, the owner or operator of an affected facility shall conduct an initial performance test as required under §60.8, and shall conduct subsequent performance tests as requested by the Administrator, using the following procedures and reference methods:~~

~~(1) Method 3A or 3B of appendix A-2 of this part is used for gas analysis when applying Method 5 of appendix A-3 of this part or Method 17 of appendix A-6 of this part.~~

~~(2) Method 5, 5B, or 17 of appendix A of this part shall be used to measure the concentration of PM as follows:~~

~~(i) Method 5 of appendix A of this part shall be used at affected facilities without wet flue gas desulfurization (FGD) systems; and~~

~~(ii) Method 17 of appendix A-6 of this part may be used at facilities with or without wet scrubber systems provided the stack gas temperature does not exceed a temperature of 160 °C (320 °F). The procedures of sections 8.1 and 11.1 of Method 5B of appendix A-3 of this part may be used in Method 17 of appendix A-6 of this part only if it is used after a wet FGD system. Do not use Method 17 of appendix A-6 of this part after wet FGD systems if the effluent is saturated or laden with water droplets.~~

~~(iii) Method 5B of appendix A of this part is to be used only after wet FGD systems.~~

~~(3) Method 1 of appendix A of this part is used to select the sampling site and the number of traverse sampling points. The sampling time for each run is at least 120 minutes and the minimum sampling volume is 1.7 dscm (60 dscf) except that smaller sampling times or volumes may be approved by the Administrator when necessitated by process variables or other factors.~~

~~(4) For Method 5 of appendix A of this part, the temperature of the sample gas in the probe and filter holder is monitored and is maintained at 160±14 °C (320±25 °F).~~

~~(5) For determination of PM emissions, the oxygen (O_2) or CO_2 sample is obtained simultaneously with each run of Method 5, 5B, or 17 of appendix A of this part by traversing the duct at the same sampling location.~~

~~(6) For each run using Method 5, 5B, or 17 of appendix A of this part, the emission rate expressed in ng/J heat input is determined using:~~

~~(i) The O_2 or CO_2 measurements and PM measurements obtained under this section;~~

~~(ii) The dry basis F factor; and~~

~~(iii) The dry basis emission rate calculation procedure contained in Method 19 of appendix A of this part.~~

~~(7) Method 9 of appendix A of this part is used for determining the opacity of stack emissions.~~

(e) To determine compliance with the emission limits for NO_X required under §60.44b, the owner or operator of an affected facility shall conduct the performance test as required under §60.8 using the continuous system for monitoring NO_X under §60.48(b).

(1) For the initial compliance test, NO_X from the steam generating unit are monitored for 30 successive steam generating unit operating days and the 30-day average emission rate is used to determine compliance with the NO_X emission standards under §60.44b. The 30-day average emission rate is calculated as the average of all hourly emissions data recorded by the monitoring system during the 30-day test period.

~~(2) Following the date on which the initial performance test is completed or is required to be completed in §60.8, whichever date comes first, the owner or operator of an affected facility which combusts coal (except as specified under §60.46b(e)(4)) or which combusts residual oil having a nitrogen content greater than 0.30 weight percent shall determine compliance with the NO_X emission standards in §60.44b on a continuous basis through the use of a 30-day rolling average emission rate. A new 30-day rolling average emission rate is calculated for each steam generating unit operating day as the average of all of the hourly NO_X emission data for the preceding 30 steam generating unit operating days.~~

~~(3) Following the date on which the initial performance test is completed or is required to be completed under §60.8, whichever date comes first, the owner or operator of an affected facility that has a heat input capacity greater than 73 MW (250 MMBtu/hr) and that combusts natural gas, distillate oil, or residual oil having a nitrogen content of 0.30 weight percent or less shall determine compliance with the NO_X standards under §60.44b on a continuous basis through the use of a 30-day rolling average emission rate. A new 30-day rolling average emission rate is calculated each steam generating unit operating day as the average of all of the hourly NO_X emission data for the preceding 30 steam generating unit operating days.~~

~~(4) Following the date on which the initial performance test is completed or required to be completed under §60.8, whichever date comes first, the owner or operator of an affected facility that has a heat input capacity of 73 MW (250 MMBtu/hr) or less and that combusts natural gas, distillate oil, gasified coal, or residual oil having a nitrogen content of 0.30 weight percent or less shall upon request determine compliance with the NO_Xstandards in §60.44b through the use of a 30-day performance test. During periods when performance tests are not requested, NO_X emissions data collected pursuant to §60.48b(g)(1) or §60.48b(g)(2) are used to calculate a 30-day rolling average emission rate on a daily basis and used to prepare excess emission reports, but will not be used to determine compliance with the NO_X emission standards. A new 30-day rolling average emission rate is calculated each steam generating unit operating day as the average of all of the hourly NO_X emission data for the preceding 30 steam generating unit operating days.~~

~~(5) If the owner or operator of an affected facility that combusts residual oil does not sample and analyze the residual oil for nitrogen content, as specified in §60.49b(e), the requirements of §60.48b(g)(1) apply and the provisions of §60.48b(g)(2) are inapplicable.~~

(f) To determine compliance with the emissions limits for NO_X required by §60.44b(a)(4) or §60.44b(l) for duct burners used in combined cycle systems, either of the procedures described in paragraph (f)(1) or (2) of this section may be used:

(1) The owner or operator of an affected facility shall conduct the performance test required under §60.8 as follows:

(i) The emissions rate (E) of NO_X shall be computed using Equation 1 in this section:

$$E = E_{sg} + \left(\frac{H_g}{H_b}\right)(E_{sg} - E_g) \qquad \text{(Eq.1)}$$

View or download PDF

Where:

E = Emissions rate of NO_X from the duct burner, ng/J (lb/MMBtu) heat input;

E_{sg} = Combined effluent emissions rate, in ng/J (lb/MMBtu) heat input using appropriate F factor as described in Method 19 of appendix A of this part;

H_g = Heat input rate to the combustion turbine, in J/hr (MMBtu/hr);

H_b = Heat input rate to the duct burner, in J/hr (MMBtu/hr); and

E_g = Emissions rate from the combustion turbine, in ng/J (lb/MMBtu) heat input calculated using appropriate F factor as described in Method 19 of appendix A of this part.

(ii) Method 7E of appendix A of this part or Method 320 of appendix A of part 63 shall be used to determine the NO_X concentrations. Method 3A or 3B of appendix A of this part shall be used to determine O_2concentration.

(iii) The owner or operator shall identify and demonstrate to the Administrator's satisfaction suitable methods to determine the average hourly heat input rate to the combustion turbine and the average hourly heat input rate to the affected duct burner.

(iv) Compliance with the emissions limits under §60.44b(a)(4) or §60.44b(l) is determined by the three-run average (nominal 1-hour runs) for the initial and subsequent performance tests; or

(2) The owner or operator of an affected facility may elect to determine compliance on a 30-day rolling average basis by using the CEMS specified under §60.48b for measuring NO_X and O_2 and meet the requirements of §60.48b. The sampling site shall be located at the outlet from the steam generating unit. The NO_X emissions rate at the outlet from the steam generating unit shall constitute the NO_X emissions rate from the duct burner of the combined cycle system.

(g) The owner or operator of an affected facility described in §60.44b(j) or §60.44b(k) shall demonstrate the maximum heat input capacity of the steam generating unit by operating the facility at maximum capacity for 24 hours. The owner or operator of an affected facility shall determine the maximum heat input capacity using the heat loss method or the heat input method described in sections 5 and 7.3 of the ASME *Power Test Codes* 4.1 (incorporated by reference, see §60.17). This demonstration of maximum heat input capacity shall be made during the initial performance test for affected facilities that meet the criteria of §60.44b(j). It shall be made within 60 days after achieving the maximum production rate at which the affected facility will be operated, but not later than 180 days after initial start-up of each facility, for affected facilities meeting the criteria of §60.44b(k). Subsequent demonstrations may be required by the Administrator at any other time. If this demonstration indicates that the maximum heat input capacity of the affected facility is less than that stated by the manufacturer of the affected facility, the maximum heat input capacity determined during this demonstration shall be used to determine the capacity utilization rate for the affected facility. Otherwise, the maximum heat input capacity provided by the manufacturer is used.

(h) The owner or operator of an affected facility described in §60.44b(j) ~~that has a heat input capacity greater than 73 MW (250 MMBtu/hr)~~ shall:

(1) Conduct an initial performance test as required under §60.8 over a minimum of 24 consecutive steam generating unit operating hours at maximum heat input capacity to demonstrate compliance with the NO_Xemission standards under §60.44b using Method 7, 7A, or 7E of appendix A of this part, Method 320 of appendix A of part 63 of this chapter, or other approved reference methods; and

(2) Conduct subsequent performance tests once per calendar year or every 400 hours of operation (whichever comes first) to demonstrate compliance with the NO_X emission standards under §60.44b over a minimum of 3 consecutive steam generating unit operating hours at maximum heat input capacity using Method 7, 7A, or 7E of appendix A of this part, Method 320 of appendix A of part 63, or other approved reference methods.

~~(i) The owner or operator of an affected facility seeking to demonstrate compliance with the PM limit in paragraphs §60.43b(a)(4) or §60.43b(h)(5) shall follow the applicable procedures in §60.49b(r).~~

~~(j) In place of PM testing with Method 5 or 5B of appendix A-3 of this part, or Method 17 of appendix A-6 of this part, an owner or operator may elect to install, calibrate, maintain, and operate a CEMS for monitoring PM emissions discharged to the atmosphere and record the output of the system. The owner or operator of an affected facility who elects to continuously monitor PM emissions instead of conducting performance testing using Method 5 or 5B of appendix A-3 of this part or Method 17 of appendix A-6 of this part shall comply with the requirements specified in paragraphs (j)(1) through (j)(14) of this section.~~

~~(1) Notify the Administrator one month before starting use of the system.~~

~~(2) Notify the Administrator one month before stopping use of the system.~~

~~(3) The monitor shall be installed, evaluated, and operated in accordance with §60.13 of subpart A of this part.~~

~~(4) The initial performance evaluation shall be completed no later than 180 days after the date of initial startup of the affected facility, as specified under §60.8 of subpart A of this part or within 180 days of notification to the Administrator of use of the CEMS if the owner or operator was previously determining compliance by Method 5, 5B, or 17 of appendix A of this part performance tests, whichever is later.~~

~~(5) The owner or operator of an affected facility shall conduct an initial performance test for PM emissions as required under §60.8 of subpart A of this part. Compliance with the PM emission limit shall be determined by using the CEMS specified in paragraph (j) of this section to measure PM and calculating a 24-hour block arithmetic average emission concentration using EPA Reference Method 19 of appendix A of this part, section 4.1.~~

~~(6) Compliance with the PM emission limit shall be determined based on the 24-hour daily (block) average of the hourly arithmetic average emission concentrations using CEMS outlet data.~~

~~(7) At a minimum, valid CEMS hourly averages shall be obtained as specified in paragraphs (j)(7)(i) of this section for 75 percent of the total operating hours per 30-day rolling average.~~

~~(i) At least two data points per hour shall be used to calculate each 1-hour arithmetic average.~~

~~(ii) [Reserved]~~

~~(8) The 1-hour arithmetic averages required under paragraph (j)(7) of this section shall be expressed in ng/J or lb/MMBtu heat input and shall be used to calculate the boiler operating day daily arithmetic average emission concentrations. The 1-hour arithmetic averages shall be calculated using the data points required under §60.13(e)(2) of subpart A of this part.~~

~~(9) All valid CEMS data shall be used in calculating average emission concentrations even if the minimum CEMS data requirements of paragraph (j)(7) of this section are not met.~~

~~(10) The CEMS shall be operated according to Performance Specification 11 in appendix B of this part.~~

~~(11) During the correlation testing runs of the CEMS required by Performance Specification 11 in appendix B of this part, PM and O_2 (or CO_2) data shall be collected concurrently (or within a 30-to 60-minute period) by both the continuous emission monitors and performance tests conducted using the following test methods.~~

~~(i) For PM, Method 5 or 5B of appendix A-3 of this part or Method 17 of appendix A-6 of this part shall be used; and~~

~~(ii) For O_2 (or CO_2), Method 3A or 3B of appendix A-2 of this part, as applicable shall be used.~~

~~(12) Quarterly accuracy determinations and daily calibration drift tests shall be performed in accordance with procedure 2 in appendix F of this part. Relative Response Audit's must be performed annually and Response Correlation Audits must be performed every 3 years.~~

~~(13) When PM emissions data are not obtained because of CEMS breakdowns, repairs, calibration checks, and zero and span adjustments, emissions data shall be obtained by using other monitoring systems as approved by the Administrator or EPA Reference Method 19 of appendix A of this part to provide, as necessary, valid emissions data for a minimum of 75 percent of total operating hours per 30-day rolling average.~~

~~(14) As of January 1, 2012, and within 90 days after the date of completing each performance test, as defined in §60.8, conducted to demonstrate compliance with this subpart, you must submit relative accuracy test audit (*i.e.*, reference method) data and performance test (*i.e.*, compliance test) data, except opacity data, electronically to EPA's Central Data Exchange (CDX) by using the Electronic Reporting Tool (ERT) (see *http://www.epa.gov/ttn/chief/ert/ert_tool.html/*) or other compatible electronic spreadsheet. Only data collected using test methods compatible with ERT are subject to this requirement to be submitted electronically into EPA's WebFIRE database.~~

[72 FR 32742, June 13, 2007, as amended at 74 FR 5086, Jan. 28, 2009; 76 FR 3523, Jan. 20, 2011; 77 FR 9460, Feb. 16, 2012; 79 FR 11249, Feb. 27, 2014]

~~§60.47b Emission monitoring for sulfur dioxide.~~

~~(a) Except as provided in paragraphs (b) and (f) of this section, the owner or operator of an affected facility subject to the SO_2 standards in §60.42b shall install, calibrate, maintain, and operate CEMS for measuring SO_2concentrations and either O_2 or CO_2 concentrations and shall record the output of the systems. For units complying with the percent reduction standard, the SO_2 and either O_2 or CO_2 concentrations shall both be monitored at the inlet and outlet of the SO_2 control device. If the owner or operator has installed and certified SO_2 and O_2 or CO_2 CEMS according to the requirements of §75.20(c)(1) of this chapter and appendix A to part 75 of this chapter, and is continuing to meet the ongoing quality assurance requirements of §75.21 of this chapter and appendix B to part 75 of this chapter, those CEMS may be used to meet the requirements of this section, provided that:~~

~~(1) When relative accuracy testing is conducted, SO_2 concentration data and CO_2 (or O_2) data are collected simultaneously; and~~

~~(2) In addition to meeting the applicable SO_2 and CO_2 (or O_2) relative accuracy specifications in Figure 2 of appendix B to part 75 of this chapter, the relative accuracy (RA)~~

~~standard in section 13.2 of Performance Specification 2 in appendix B to this part is met when the RA is calculated on a lb/MMBtu basis; and~~

~~(3) The reporting requirements of §60.49b are met. SO_2 and CO_2 (or O_2) data used to meet the requirements of §60.49b shall not include substitute data values derived from the missing data procedures in subpart D of part 75 of this chapter, nor shall the SO_2 data have been bias adjusted according to the procedures of part 75 of this chapter.~~

~~(b) As an alternative to operating CEMS as required under paragraph (a) of this section, an owner or operator may elect to determine the average SO_2 emissions and percent reduction by:~~

~~(1) Collecting coal or oil samples in an as-fired condition at the inlet to the steam generating unit and analyzing them for sulfur and heat content according to Method 19 of appendix A of this part. Method 19 of appendix A of this part provides procedures for converting these measurements into the format to be used in calculating the average SO_2 input rate, or~~

~~(2) Measuring SO_2 according to Method 6B of appendix A of this part at the inlet or outlet to the SO_2 control system. An initial stratification test is required to verify the adequacy of the sampling location for Method 6B of appendix A of this part. The stratification test shall consist of three paired runs of a suitable SO_2 and CO_2measurement train operated at the candidate location and a second similar train operated according to the procedures in Section 3.2 and the applicable procedures in Section 7 of Performance Specification 2. Method 6B of appendix A of this part, Method 6A of appendix A of this part, or a combination of Methods 6 and 3 or 3B of appendix A of this part or Methods 6C or Method 320 of appendix A of part 63 of this chapter and 3A of appendix A of this part are suitable measurement techniques. If Method 6B of appendix A of this part is used for the second train, sampling time and timer operation may be adjusted for the stratification test as long as an adequate sample volume is collected; however, both sampling trains are to be operated similarly. For the location to be adequate for Method 6B of appendix A of this part, 24-hour tests, the mean of the absolute difference between the three paired runs must be less than 10 percent.~~

~~(3) A daily SO_2 emission rate, E_D, shall be determined using the procedure described in Method 6A of appendix A of this part, section 7.6.2 (Equation 6A-8) and stated in ng/J (lb/MMBtu) heat input.~~

~~(4) The mean 30-day emission rate is calculated using the daily measured values in ng/J (lb/MMBtu) for 30 successive steam generating unit operating days using equation 19-20 of Method 19 of appendix A of this part.~~

~~(c) The owner or operator of an affected facility shall obtain emission data for at least 75 percent of the operating hours in at least 22 out of 30 successive boiler operating days. If this minimum data requirement is not met with a single monitoring system, the owner or operator of the affected facility shall supplement the emission data with data collected with other~~

~~monitoring systems as approved by the Administrator or the reference methods and procedures as described in paragraph (b) of this section.~~

~~(d) The 1-hour average SO_2 emission rates measured by the CEMS required by paragraph (a) of this section and required under §60.13(h) is expressed in ng/J or lb/MMBtu heat input and is used to calculate the average emission rates under §60.42(b). Each 1-hour average SO_2 emission rate must be based on 30 or more minutes of steam generating unit operation. The hourly averages shall be calculated according to §60.13(h)(2). Hourly SO_2 emission rates are not calculated if the affected facility is operated less than 30 minutes in a given clock hour and are not counted toward determination of a steam generating unit operating day.~~

~~(e) The procedures under §60.13 shall be followed for installation, evaluation, and operation of the CEMS.~~

~~(1) Except as provided for in paragraph (e)(4) of this section, all CEMS shall be operated in accordance with the applicable procedures under Performance Specifications 1, 2, and 3 of appendix B of this part.~~

~~(2) Except as provided for in paragraph (e)(4) of this section, quarterly accuracy determinations and daily calibration drift tests shall be performed in accordance with Procedure 1 of appendix F of this part.~~

~~(3) For affected facilities combusting coal or oil, alone or in combination with other fuels, the span value of the SO_2 CEMS at the inlet to the SO_2 control device is 125 percent of the maximum estimated hourly potential SO_2 emissions of the fuel combusted, and the span value of the CEMS at the outlet to the SO_2 control device is 50 percent of the maximum estimated hourly potential SO_2 emissions of the fuel combusted. Alternatively, SO_2 span values determined according to section 2.1.1 in appendix A to part 75 of this chapter may be used.~~

~~(4) As an alternative to meeting the requirements of requirements of paragraphs (e)(1) and (e)(2) of this section, the owner or operator may elect to implement the following alternative data accuracy assessment procedures:~~

~~(i) For all required CO_2 and O_2 monitors and for SO_2 and NO_X monitors with span values greater than or equal to 100 ppm, the daily calibration error test and calibration adjustment procedures described in sections 2.1.1 and 2.1.3 of appendix B to part 75 of this chapter may be followed instead of the CD assessment procedures in Procedure 1, section 4.1 of appendix F to this part.~~

~~(ii) For all required CO_2 and O_2 monitors and for SO_2 and NO_X monitors with span values greater than 30 ppm, quarterly linearity checks may be performed in accordance with section 2.2.1 of appendix B to part 75 of this chapter, instead of performing the cylinder gas audits (CGAs) described in Procedure 1, section 5.1.2 of appendix F to this part. If this option is selected: The frequency of the linearity checks shall be as specified in section 2.2.1 of appendix B to part 75 of this chapter; the applicable linearity specifications in section 3.2 of appendix A to part 75 of this chapter shall be met; the data validation and out-of-control~~

~~criteria in section 2.2.3 of appendix B to part 75 of this chapter shall be followed instead of the excessive audit inaccuracy and out-of-control criteria in Procedure 1, section 5.2 of appendix F to this part; and the grace period provisions in section 2.2.4 of appendix B to part 75 of this chapter shall apply. For the purposes of data validation under this subpart, the cylinder gas audits described in Procedure 1, section 5.1.2 of appendix F to this part shall be performed for SO_2 and NO_X span values less than or equal to 30 ppm; and~~

~~(iii) For SO_2, CO_2, and O_2 monitoring systems and for NO_X emission rate monitoring systems, RATAs may be performed in accordance with section 2.3 of appendix B to part 75 of this chapter instead of following the procedures described in Procedure 1, section 5.1.1 of appendix F to this part. If this option is selected: The frequency of each RATA shall be as specified in section 2.3.1 of appendix B to part 75 of this chapter; the applicable relative accuracy specifications shown in Figure 2 in appendix B to part 75 of this chapter shall be met; the data validation and out-of-control criteria in section 2.3.2 of appendix B to part 75 of this chapter shall be followed instead of the excessive audit inaccuracy and out-of-control criteria in Procedure 1, section 5.2 of appendix F to this part; and the grace period provisions in section 2.3.3 of appendix B to part 75 of this chapter shall apply. For the purposes of data validation under this subpart, the relative accuracy specification in section 13.2 of Performance Specification 2 in appendix B to this part shall be met on a lb/MMBtu basis for SO_2(regardless of the SO_2 emission level during the RATA), and for NO_X when the average NO_X emission rate measured by the reference method during the RATA is less than 0.100 lb/MMBtu.~~

~~(f) The owner or operator of an affected facility that combusts very low sulfur oil or is demonstrating compliance under §60.45b(k) is not subject to the emission monitoring requirements under paragraph (a) of this section if the owner or operator maintains fuel records as described in §60.49b(r).~~

~~[72 FR 32742, June 13, 2007, as amended at 74 FR 5087, Jan. 28, 2009; 79 FR 11249, Feb. 27, 2014]~~

§60.48b Emission monitoring for particulate matter and nitrogen oxides.

~~(a) Except as provided in paragraph (j) of this section, the owner or operator of an affected facility subject to the opacity standard under §60.43b shall install, calibrate, maintain, and operate a continuous opacity monitoring systems (COMS) for measuring the opacity of emissions discharged to the atmosphere and record the output of the system. The owner or operator of an affected facility subject to an opacity standard under §60.43b and meeting the conditions under paragraphs (j)(1), (2), (3), (4), (5), or (6) of this section who elects not to use a COMS shall conduct a performance test using Method 9 of appendix A-4 of this part and the procedures in §60.11 to demonstrate compliance with the applicable limit in §60.43b by April 29, 2011, within 45 days of stopping use of an existing COMS, or within 180 days after initial startup of the facility, whichever is later, and shall comply with either paragraphs (a)(1), (a)(2), or (a)(3) of this section. The observation period for Method 9 of appendix A-4 of this part performance tests may be reduced from 3 hours to 60 minutes if all 6-minute averages are less~~

~~than 10 percent and all individual 15-second observations are less than or equal to 20 percent during the initial 60 minutes of observation.~~

~~(1) Except as provided in paragraph (a)(2) and (a)(3) of this section, the owner or operator shall conduct subsequent Method 9 of appendix A-4 of this part performance tests using the procedures in paragraph (a) of this section according to the applicable schedule in paragraphs (a)(1)(i) through (a)(1)(iv) of this section, as determined by the most recent Method 9 of appendix A-4 of this part performance test results.~~

~~(i) If no visible emissions are observed, a subsequent Method 9 of appendix A-4 of this part performance test must be completed within 12 calendar months from the date that the most recent performance test was conducted or within 45 days of the next day that fuel with an opacity standard is combusted, whichever is later;~~

~~(ii) If visible emissions are observed but the maximum 6-minute average opacity is less than or equal to 5 percent, a subsequent Method 9 of appendix A-4 of this part performance test must be completed within 6 calendar months from the date that the most recent performance test was conducted or within 45 days of the next day that fuel with an opacity standard is combusted, whichever is later;~~

~~(iii) If the maximum 6-minute average opacity is greater than 5 percent but less than or equal to 10 percent, a subsequent Method 9 of appendix A-4 of this part performance test must be completed within 3 calendar months from the date that the most recent performance test was conducted or within 45 days of the next day that fuel with an opacity standard is combusted, whichever is later; or~~

~~(iv) If the maximum 6-minute average opacity is greater than 10 percent, a subsequent Method 9 of appendix A-4 of this part performance test must be completed within 45 calendar days from the date that the most recent performance test was conducted.~~

~~(2) If the maximum 6-minute opacity is less than 10 percent during the most recent Method 9 of appendix A-4 of this part performance test, the owner or operator may, as an alternative to performing subsequent Method 9 of appendix A-4 of this part performance tests, elect to perform subsequent monitoring using Method 22 of appendix A-7 of this part according to the procedures specified in paragraphs (a)(2)(i) and (ii) of this section.~~

~~(i) The owner or operator shall conduct 10 minute observations (during normal operation) each operating day the affected facility fires fuel for which an opacity standard is applicable using Method 22 of appendix A-7 of this part and demonstrate that the sum of the occurrences of any visible emissions is not in excess of 5 percent of the observation period (*i.e.*, 30 seconds per 10 minute period). If the sum of the occurrence of any visible emissions is greater than 30 seconds during the initial 10 minute observation, immediately conduct a 30 minute observation. If the sum of the occurrence of visible emissions is greater than 5 percent of the observation period (*i.e.*, 90 seconds per 30 minute period), the owner or operator shall either document and adjust the operation of the facility and demonstrate within 24 hours that the sum of the occurrence of visible emissions is equal to or less than 5 percent during a 30 minute~~

~~observation (*i.e.*, 90 seconds) or conduct a new Method 9 of appendix A-4 of this part performance test using the procedures in paragraph (a) of this section within 45 calendar days according to the requirements in §60.46d(d)(7).~~

~~(ii) If no visible emissions are observed for 10 operating days during which an opacity standard is applicable, observations can be reduced to once every 7 operating days during which an opacity standard is applicable. If any visible emissions are observed, daily observations shall be resumed.~~

~~(3) If the maximum 6-minute opacity is less than 10 percent during the most recent Method 9 of appendix A-4 of this part performance test, the owner or operator may, as an alternative to performing subsequent Method 9 of appendix A-4 performance tests, elect to perform subsequent monitoring using a digital opacity compliance system according to a site-specific monitoring plan approved by the Administrator. The observations shall be similar, but not necessarily identical, to the requirements in paragraph (a)(2) of this section. For reference purposes in preparing the monitoring plan, see OAQPS "Determination of Visible Emission Opacity from Stationary Sources Using Computer-Based Photographic Analysis Systems." This document is available from the U.S. Environmental Protection Agency (U.S. EPA); Office of Air Quality and Planning Standards; Sector Policies and Programs Division; Measurement Policy Group (D243-02), Research Triangle Park, NC 27711. This document is also available on the Technology Transfer Network (TTN) under Emission Measurement Center Preliminary Methods.~~

(b) Except as provided under paragraphs (g), (h), and (i) of this section, the owner or operator of an affected facility subject to a NO_X standard under §60.44b shall comply with either paragraphs (b)(1) or (b)(2) of this section.

(1) Install, calibrate, maintain, and operate CEMS for measuring NO_X and O_2 (or CO_2) emissions discharged to the atmosphere, and shall record the output of the system; or

(2) If the owner or operator has installed a NO_X emission rate CEMS to meet the requirements of part 75 of this chapter and is continuing to meet the ongoing requirements of part 75 of this chapter, that CEMS may be used to meet the requirements of this section, except that the owner or operator shall also meet the requirements of §60.49b. Data reported to meet the requirements of §60.49b shall not include data substituted using the missing data procedures in subpart D of part 75 of this chapter, nor shall the data have been bias adjusted according to the procedures of part 75 of this chapter.

(c) The CEMS required under paragraph (b) of this section shall be operated and data recorded during all periods of operation of the affected facility except for CEMS breakdowns and repairs. Data is recorded during calibration checks, and zero and span adjustments.

(d) The 1-hour average NO_X emission rates measured by the continuous NO_X monitor required by paragraph (b) of this section and required under §60.13(h) shall be expressed in ng/J or lb/MMBtu heat input and shall be used to calculate the average emission rates under

§60.44b. The 1-hour averages shall be calculated using the data points required under §60.13(h)(2).

(e) The procedures under §60.13 shall be followed for installation, evaluation, and operation of the continuous monitoring systems.

~~(1) For affected facilities combusting coal, wood or municipal-type solid waste, the span value for a COMS shall be between 60 and 80 percent.~~

(2) For affected facilities combusting ~~coal, oil, or~~ natural gas, the span value for NO_X is determined using one of the following procedures:

(i) Except as provided under paragraph (e)(2)(ii) of this section, NO_X span values shall be determined as follows:

Fuel	**Span values for NO_X (ppm)**
Natural gas	500.
~~Oil~~	~~500.~~
~~Coal~~	~~1,000.~~
~~Mixtures~~	~~500 (x + y) + 1,000z.~~

Where:

~~x = Fraction of total heat input derived from natural gas;~~

~~y = Fraction of total heat input derived from oil; and~~

~~z = Fraction of total heat input derived from coal.~~

(ii) As an alternative to meeting the requirements of paragraph (e)(2)(i) of this section, the owner or operator of an affected facility may elect to use the NO_X span values determined according to section 2.1.2 in appendix A to part 75 of this chapter.

(3) All span values computed under paragraph (e)(2)(i) of this section for combusting mixtures of regulated fuels are rounded to the nearest 500 ppm. Span values computed under paragraph (e)(2)(ii) of this section shall be rounded off according to section 2.1.2 in appendix A to part 75 of this chapter.

(f) When NO_X emission data are not obtained because of CEMS breakdowns, repairs, calibration checks and zero and span adjustments, emission data will be obtained by using standby monitoring systems, Method 7 of appendix A of this part, Method 7A of appendix A of this part, or other approved reference methods to provide emission data for a minimum of

75 percent of the operating hours in each steam generating unit operating day, in at least 22 out of 30 successive steam generating unit operating days.

~~(g) The owner or operator of an affected facility that has a heat input capacity of 73 MW (250 MMBtu/hr) or less, and that has an annual capacity factor for residual oil having a nitrogen content of 0.30 weight percent or less, natural gas, distillate oil, gasified coal, or any mixture of these fuels, greater than 10 percent (0.10) shall:~~

~~(1) Comply with the provisions of paragraphs (b), (c), (d), (e)(2), (e)(3), and (f) of this section; or~~

~~(2) Monitor steam generating unit operating conditions and predict NO_X emission rates as specified in a plan submitted pursuant to §60.49b(c).~~

~~(h) The owner or operator of a duct burner, as described in §60.41b, that is subject to the NO_X standards in §60.44b(a)(4), §60.44b(e), or §60.44b(l) is not required to install or operate a continuous emissions monitoring system to measure NO_X emissions.~~

~~(i) The owner or operator of an affected facility described in §60.44b(j) or §60.44b(k) is not required to install or operate a CEMS for measuring NO_X emissions.~~

~~(j) The owner or operator of an affected facility that meets the conditions in either paragraph (j)(1), (2), (3), (4), (5), (6), or (7) of this section is not required to install or operate a COMS if:~~

~~(1) The affected facility uses a PM CEMS to monitor PM emissions; or~~

~~(2) The affected facility burns only liquid (excluding residual oil) or gaseous fuels with potential SO_2emissions rates of 26 ng/J (0.060 lb/MMBtu) or less and does not use a post-combustion technology to reduce SO_2 or PM emissions. The owner or operator must maintain fuel records of the sulfur content of the fuels burned, as described under §60.49b(r); or~~

~~(3) The affected facility burns coke oven gas alone or in combination with fuels meeting the criteria in paragraph (j)(2) of this section and does not use a post-combustion technology to reduce SO_2 or PM emissions; or~~

~~(4) The affected facility does not use post-combustion technology (except a wet scrubber) for reducing PM, SO_2, or carbon monoxide (CO) emissions, burns only gaseous fuels or fuel oils that contain less than or equal to 0.30 weight percent sulfur, and is operated such that emissions of CO to the atmosphere from the affected facility are maintained at levels less than or equal to 0.15 lb/MMBtu on a steam generating unit operating day average basis. Owners and operators of affected facilities electing to comply with this paragraph must demonstrate compliance according to the procedures specified in paragraphs (j)(4)(i) through (iv) of this section; or~~

(i) You must monitor CO emissions using a CEMS according to the procedures specified in paragraphs (j)(4)(i)(A) through (D) of this section.

(A) The CO CEMS must be installed, certified, maintained, and operated according to the provisions in §60.58b(i)(3) of subpart Eb of this part.

(B) Each 1-hour CO emissions average is calculated using the data points generated by the CO CEMS expressed in parts per million by volume corrected to 3 percent oxygen (dry basis).

(C) At a minimum, valid 1-hour CO emissions averages must be obtained for at least 90 percent of the operating hours on a 30-day rolling average basis. The 1-hour averages are calculated using the data points required in §60.13(h)(2).

(D) Quarterly accuracy determinations and daily calibration drift tests for the CO CEMS must be performed in accordance with procedure 1 in appendix F of this part.

(ii) You must calculate the 1-hour average CO emissions levels for each steam generating unit operating day by multiplying the average hourly CO output concentration measured by the CO CEMS times the corresponding average hourly flue gas flow rate and divided by the corresponding average hourly heat input to the affected source. The 24-hour average CO emission level is determined by calculating the arithmetic average of the hourly CO emission levels computed for each steam generating unit operating day.

(iii) You must evaluate the preceding 24-hour average CO emission level each steam generating unit operating day excluding periods of affected source startup, shutdown, or malfunction. If the 24-hour average CO emission level is greater than 0.15 lb/MMBtu, you must initiate investigation of the relevant equipment and control systems within 24 hours of the first discovery of the high emission incident and, take the appropriate corrective action as soon as practicable to adjust control settings or repair equipment to reduce the 24-hour average CO emission level to 0.15 lb/MMBtu or less.

(iv) You must record the CO measurements and calculations performed according to paragraph (j)(4) of this section and any corrective actions taken. The record of corrective action taken must include the date and time during which the 24-hour average CO emission level was greater than 0.15 lb/MMBtu, and the date, time, and description of the corrective action.

~~(5) The affected facility uses a bag leak detection system to monitor the performance of a fabric filter (baghouse) according to the most current requirements in section §60.48Da of this part; or~~

~~(6) The affected facility uses an ESP as the primary PM control device and uses an ESP predictive model to monitor the performance of the ESP developed in accordance and operated according to the most current requirements in section §60.48Da of this part; or~~

~~(7) The affected facility burns only gaseous fuels or fuel oils that contain less than or equal to 0.30 weight percent sulfur and operates according to a written site-specific monitoring plan approved by the permitting authority. This monitoring plan must include procedures and criteria for establishing and monitoring specific parameters for the affected facility indicative of compliance with the opacity standard.~~

~~(k) Owners or operators complying with the PM emission limit by using a PM CEMS must calibrate, maintain, operate, and record the output of the system for PM emissions discharged to the atmosphere as specified in §60.46b(j). The CEMS specified in paragraph §60.46b(j) shall be operated and data recorded during all periods of operation of the affected facility except for CEMS breakdowns and repairs. Data is recorded during calibration checks, and zero and span adjustments.~~

~~(l) An owner or operator of an affected facility that is subject to an opacity standard under §60.43b(f) is not required to operate a COMS provided that the unit burns only gaseous fuels and/or liquid fuels (excluding residue oil) with a potential SO_2 emissions rate no greater than 26 ng/J (0.060 lb/MMBtu), and the unit operates according to a written site-specific monitoring plan approved by the permitting authority is not required to operate a COMS. This monitoring plan must include procedures and criteria for establishing and monitoring specific parameters for the affected facility indicative of compliance with the opacity standard. For testing performed as part of this site-specific monitoring plan, the permitting authority may require as an alternative to the notification and reporting requirements specified in §§60.8 and 60.11 that the owner or operator submit any deviations with the excess emissions report required under §60.49b(h).~~

[72 FR 32742, June 13, 2007, as amended at 74 FR 5087, Jan. 28, 2009; 76 FR 3523, Jan. 20, 2011; 77 FR 9460, Feb. 16, 2012]

§60.49b Reporting and recordkeeping requirements.

(a) The owner or operator of each affected facility shall submit notification of the date of initial startup, as provided by §60.7. This notification shall include:

(1) The design heat input capacity of the affected facility and identification of the fuels to be combusted in the affected facility;

~~(2) If applicable, a copy of any federally enforceable requirement that limits the annual capacity factor for any fuel or mixture of fuels under §60.42b(d)(1), §60.43b(a)(2), (a)(3)(iii), (c)(2)(ii), (d)(2)(iii), §60.44b(c), (d), (e), (i), (j), (k), §60.45b(d), (g), §60.46b(h), or §60.48b(i);~~

(3) The annual capacity factor at which the owner or operator anticipates operating the facility based on all fuels fired and based on each individual fuel fired; and

~~(4) Notification that an emerging technology will be used for controlling emissions of SO_2. The Administrator will examine the description of the emerging technology and will determine whether the technology qualifies as an emerging technology. In making this~~

~~determination, the Administrator may require the owner or operator of the affected facility to submit additional information concerning the control device. The affected facility is subject to the provisions of §60.42b(a) unless and until this determination is made by the Administrator.~~

(b) The owner or operator of each affected facility subject to the ~~SO_2, PM, and/or~~ NO_X emission limits under §§60.42b, 60.43b, and 60.44b shall submit to the Administrator the performance test data from the initial performance test and the performance evaluation of the CEMS using the applicable performance specifications in appendix B of this part. The owner or operator of each affected facility described in §60.44b(j) or §60.44b(k) shall submit to the Administrator the maximum heat input capacity data from the demonstration of the maximum heat input capacity of the affected facility.

(c) The owner or operator of each affected facility subject to the NO_X standard in §60.44b who seeks to demonstrate compliance with those standards through the monitoring of steam generating unit operating conditions in the provisions of §60.48b(g)(2) shall submit to the Administrator for approval a plan that identifies the operating conditions to be monitored in §60.48b(g)(2) and the records to be maintained in §60.49b(g). This plan shall be submitted to the Administrator for approval within 360 days of the initial startup of the affected facility. An affected facility burning coke oven gas alone or in combination with other gaseous fuels or distillate oil shall submit this plan to the Administrator for approval within 360 days of the initial startup of the affected facility or by November 30, 2009, whichever date comes later. If the plan is approved, the owner or operator shall maintain records of predicted nitrogen oxide emission rates and the monitored operating conditions, including steam generating unit load, identified in the plan. The plan shall:

(1) Identify the specific operating conditions to be monitored and the relationship between these operating conditions and NO_X emission rates (*i.e.*, ng/J or lbs/MMBtu heat input). Steam generating unit operating conditions include, but are not limited to, the degree of staged combustion (*i.e.*, the ratio of primary air to secondary and/or tertiary air) and the level of excess air (*i.e.*, flue gas O_2 level);

(2) Include the data and information that the owner or operator used to identify the relationship between NO_X emission rates and these operating conditions; and

(3) Identify how these operating conditions, including steam generating unit load, will be monitored under §60.48b(g) on an hourly basis by the owner or operator during the period of operation of the affected facility; the quality assurance procedures or practices that will be employed to ensure that the data generated by monitoring these operating conditions will be representative and accurate; and the type and format of the records of these operating conditions, including steam generating unit load, that will be maintained by the owner or operator under §60.49b(g).

(d) Except as provided in paragraph (d)(2) of this section, the owner or operator of an affected facility shall record and maintain records as specified in paragraph (d)(1) of this section.

(1) The owner or operator of an affected facility shall record and maintain records of the amounts of each fuel combusted during each day ~~and calculate the annual capacity factor individually for coal, distillate oil, residual oil, natural gas, wood, and municipal-type solid waste for the reporting period~~. The annual capacity factor is determined on a 12-month rolling average basis with a new annual capacity factor calculated at the end of each calendar month.

~~(2) As an alternative to meeting the requirements of paragraph (d)(1) of this section, the owner or operator of an affected facility that is subject to a federally enforceable permit restricting fuel use to a single fuel such that the facility is not required to continuously monitor any emissions (excluding opacity) or parameters indicative of emissions may elect to record and maintain records of the amount of each fuel combusted during each calendar month.~~

~~(e) For an affected facility that combusts residual oil and meets the criteria under §60.46b(e)(4), §60.44b(j), or (k), the owner or operator shall maintain records of the nitrogen content of the residual oil combusted in the affected facility and calculate the average fuel nitrogen content for the reporting period. The nitrogen content shall be determined using ASTM Method D4629 (incorporated by reference, see §60.17), or fuel suppliers. If residual oil blends are being combusted, fuel nitrogen specifications may be prorated based on the ratio of residual oils of different nitrogen content in the fuel blend.~~

~~(f) For an affected facility subject to the opacity standard in §60.43b, the owner or operator shall maintain records of opacity. In addition, an owner or operator that elects to monitor emissions according to the requirements in §60.48b(a) shall maintain records according to the requirements specified in paragraphs (f)(1) through (3) of this section, as applicable to the visible emissions monitoring method used.~~

~~(1) For each performance test conducted using Method 9 of appendix A-4 of this part, the owner or operator shall keep the records including the information specified in paragraphs (f)(1)(i) through (iii) of this section.~~

~~(i) Dates and time intervals of all opacity observation periods;~~

~~(ii) Name, affiliation, and copy of current visible emission reading certification for each visible emission observer participating in the performance test; and~~

~~(iii) Copies of all visible emission observer opacity field data sheets;~~

~~(2) For each performance test conducted using Method 22 of appendix A-4 of this part, the owner or operator shall keep the records including the information specified in paragraphs (f)(2)(i) through (iv) of this section.~~

~~(i) Dates and time intervals of all visible emissions observation periods;~~

~~(ii) Name and affiliation for each visible emission observer participating in the performance test;~~

~~(iii) Copies of all visible emission observer opacity field data sheets; and~~

~~(iv) Documentation of any adjustments made and the time the adjustments were completed to the affected facility operation by the owner or operator to demonstrate compliance with the applicable monitoring requirements.~~

~~(3) For each digital opacity compliance system, the owner or operator shall maintain records and submit reports according to the requirements specified in the site-specific monitoring plan approved by the Administrator.~~

(g) Except as provided under paragraph (p) of this section, the owner or operator of an affected facility subject to the NO_X standards under §60.44b shall maintain records of the following information for each steam generating unit operating day:

(1) Calendar date;

(2) The average hourly NO_X emission rates (expressed as NO_2) (ng/J or lb/MMBtu heat input) measured or predicted;

(3) The 30-day average NO_X emission rates (ng/J or lb/MMBtu heat input) calculated at the end of each steam generating unit operating day from the measured or predicted hourly nitrogen oxide emission rates for the preceding 30 steam generating unit operating days;

(4) Identification of the steam generating unit operating days when the calculated 30-day average NO_X emission rates are in excess of the NO_X emissions standards under §60.44b, with the reasons for such excess emissions as well as a description of corrective actions taken;

(5) Identification of the steam generating unit operating days for which pollutant data have not been obtained, including reasons for not obtaining sufficient data and a description of corrective actions taken;

(6) Identification of the times when emission data have been excluded from the calculation of average emission rates and the reasons for excluding data;

(7) Identification of "F" factor used for calculations, method of determination, and type of fuel combusted;

(8) Identification of the times when the pollutant concentration exceeded full span of the CEMS;

(9) Description of any modifications to the CEMS that could affect the ability of the CEMS to comply with Performance Specification 2 or 3; and

(10) Results of daily CEMS drift tests and quarterly accuracy assessments as required under appendix F, Procedure 1 of this part.

(h) The owner or operator of any affected facility in any category listed in paragraphs (h)(1) or (2) of this section is required to submit excess emission reports for any excess emissions that occurred during the reporting period.

(1) Any affected facility subject to the opacity standards in §60.43b(f) or to the operating parameter monitoring requirements in §60.13(i)(1).

(2) Any affected facility that is subject to the NO_X standard of §60.44b, and that:

~~(i) Combusts natural gas, distillate oil, gasified coal, or residual oil with a nitrogen content of 0.3 weight percent or less; or~~

~~(ii) Has a heat input capacity of 73 MW (250 MMBtu/hr) or less and is required to monitor~~ $\cancel{NO_X}$ ~~emissions on a continuous basis under §60.48b(g)(1) or steam generating unit operating conditions under §60.48b(g)(2).~~

~~(3) For the purpose of §60.43b, excess emissions are defined as all 6-minute periods during which the average opacity exceeds the opacity standards under §60.43b(f).~~

(4) For purposes of §60.48b(g)(1), excess emissions are defined as any calculated 30-day rolling average NO_Xemission rate, as determined under §60.46b(e), that exceeds the applicable emission limits in §60.44b.

(i) The owner or operator of any affected facility subject to the continuous monitoring requirements for NO_Xunder §60.48(b) shall submit reports containing the information recorded under paragraph (g) of this section.

~~(j) The owner or operator of any affected facility subject to the~~ $\cancel{SO_2}$ ~~standards under §60.42b shall submit reports.~~

(k) For each affected facility subject to the compliance and performance testing requirements of §60.45b and the reporting requirement in paragraph (j) of this section, the following information shall be reported to the Administrator:

(1) Calendar dates covered in the reporting period;

~~(2) Each 30-day average~~ $\cancel{SO_2}$ ~~emission rate (ng/J or lb/MMBtu heat input) measured during the reporting period, ending with the last 30-day period; reasons for noncompliance with the emission standards; and a description of corrective actions taken; For an exceedance due to maintenance of the~~ $\cancel{SO_2}$ ~~control system covered in paragraph 60.45b(a), the report shall identify the days on which the maintenance was performed and a description of the maintenance;~~

~~(3) Each 30-day average percent reduction in SO_2 emissions calculated during the reporting period, ending with the last 30-day period; reasons for noncompliance with the emission standards; and a description of corrective actions taken;~~

~~(4) Identification of the steam generating unit operating days that coal or oil was combusted and for which SO_2 or diluent (O_2 or CO_2) data have not been obtained by an approved method for at least 75 percent of the operating hours in the steam generating unit operating day; justification for not obtaining sufficient data; and description of corrective action taken;~~

~~(5) Identification of the times when emissions data have been excluded from the calculation of average emission rates; justification for excluding data; and description of corrective action taken if data have been excluded for periods other than those during which coal or oil were not combusted in the steam generating unit;~~

~~(6) Identification of "F" factor used for calculations, method of determination, and type of fuel combusted;~~

~~(7) Identification of times when hourly averages have been obtained based on manual sampling methods;~~

~~(8) Identification of the times when the pollutant concentration exceeded full span of the CEMS;~~

~~(9) Description of any modifications to the CEMS that could affect the ability of the CEMS to comply with Performance Specification 2 or 3;~~

~~(10) Results of daily CEMS drift tests and quarterly accuracy assessments as required under appendix F, Procedure 1 of this part; and~~

~~(11) The annual capacity factor of each fired as provided under paragraph (d) of this section.~~

(l) For each affected facility subject to the compliance and performance testing requirements of §60.45b(d) and the reporting requirements of paragraph (j) of this section, the following information shall be reported to the Administrator:

(1) Calendar dates when the facility was in operation during the reporting period;

~~(2) The 24-hour average SO_2 emission rate measured for each steam generating unit operating day during the reporting period that coal or oil was combusted, ending in the last 24-hour period in the quarter; reasons for noncompliance with the emission standards; and a description of corrective actions taken;~~

~~(3) Identification of the steam generating unit operating days that coal or oil was combusted for which $S0_2$ or diluent (O_2 or CO_2) data have not been obtained by an approved~~

~~method for at least 75 percent of the operating hours; justification for not obtaining sufficient data; and description of corrective action taken;~~

~~(4) Identification of the times when emissions data have been excluded from the calculation of average emission rates; justification for excluding data; and description of corrective action taken if data have been excluded for periods other than those during which coal or oil were not combusted in the steam generating unit;~~

(5) Identification of "F" factor used for calculations, method of determination, and type of fuel combusted;

(6) Identification of times when hourly averages have been obtained based on manual sampling methods;

(7) Identification of the times when the pollutant concentration exceeded full span of the CEMS;

(8) Description of any modifications to the CEMS that could affect the ability of the CEMS to comply with Performance Specification 2 or 3; and

(9) Results of daily CEMS drift tests and quarterly accuracy assessments as required under Procedure 1 of appendix F 1 of this part. If the owner or operator elects to implement the alternative data assessment procedures described in §§60.47b(e)(4)(i) through (e)(4)(iii), each data assessment report shall include a summary of the results of all of the RATAs, linearity checks, CGAs, and calibration error or drift assessments required by §§60.47b(e)(4)(i) through (e)(4)(iii).

(m) For each affected facility subject to the SO_2 standards in §60.42(b) for which the minimum amount of data required in §60.47b(c) were not obtained during the reporting period, the following information is reported to the Administrator in addition to that required under paragraph (k) of this section:

(1) The number of hourly averages available for outlet emission rates and inlet emission rates;

(2) The standard deviation of hourly averages for outlet emission rates and inlet emission rates, as determined in Method 19 of appendix A of this part, section 7;

(3) The lower confidence limit for the mean outlet emission rate and the upper confidence limit for the mean inlet emission rate, as calculated in Method 19 of appendix A of this part, section 7; and

(4) The ratio of the lower confidence limit for the mean outlet emission rate and the allowable emission rate, as determined in Method 19 of appendix A of this part, section 7.

~~(n) If a percent removal efficiency by fuel pretreatment (*i.e.*, %R_f) is used to determine the overall percent reduction (*i.e.*, %R_o) under §60.45b, the owner or operator of the affected facility shall submit a signed statement with the report.~~

~~(1) Indicating what removal efficiency by fuel pretreatment (*i.e.*, %R_f) was credited during the reporting period;~~

~~(2) Listing the quantity, heat content, and date each pre-treated fuel shipment was received during the reporting period, the name and location of the fuel pretreatment facility; and the total quantity and total heat content of all fuels received at the affected facility during the reporting period;~~

~~(3) Documenting the transport of the fuel from the fuel pretreatment facility to the steam generating unit; and~~

~~(4) Including a signed statement from the owner or operator of the fuel pretreatment facility certifying that the percent removal efficiency achieved by fuel pretreatment was determined in accordance with the provisions of Method 19 of appendix A of this part and listing the heat content and sulfur content of each fuel before and after fuel pretreatment.~~

(o) All records required under this section shall be maintained by the owner or operator of the affected facility for a period of 2 years following the date of such record.

(p) The owner or operator of an affected facility described in §60.44b(j) or (k) shall maintain records of the following information for each steam generating unit operating day:

(1) Calendar date;

(2) The number of hours of operation; and

(3) A record of the hourly steam load.

(q) The owner or operator of an affected facility described in §60.44b(j) or §60.44b(k) shall submit to the Administrator a report containing:

(1) The annual capacity factor over the previous 12 months;

(2) The average fuel nitrogen content during the reporting period, if residual oil was fired; and

(3) If the affected facility meets the criteria described in §60.44b(j), the results of any NO_X emission tests required during the reporting period, the hours of operation during the reporting period, and the hours of operation since the last NO_X emission test.

~~(r) The owner or operator of an affected facility who elects to use the fuel based compliance alternatives in §60.42b or §60.43b shall either:~~

~~(1) The owner or operator of an affected facility who elects to demonstrate that the affected facility combusts only very low sulfur oil, natural gas, wood, a mixture of these fuels, or any of these fuels (or a mixture of these fuels) in combination with other fuels that are known to contain an insignificant amount of sulfur in §60.42b(j) or §60.42b(k) shall obtain and maintain at the affected facility fuel receipts (such as a current, valid purchase contract, tariff sheet, or transportation contract) from the fuel supplier that certify that the oil meets the definition of distillate oil and gaseous fuel meets the definition of natural gas as defined in §60.41b and the applicable sulfur limit. For the purposes of this section, the distillate oil need not meet the fuel nitrogen content specification in the definition of distillate oil. Reports shall be submitted to the Administrator certifying that only very low sulfur oil meeting this definition, natural gas, wood, and/or other fuels that are known to contain insignificant amounts of sulfur were combusted in the affected facility during the reporting period; or~~

~~(2) The owner or operator of an affected facility who elects to demonstrate compliance based on fuel analysis in §60.42b or §60.43b shall develop and submit a site-specific fuel analysis plan to the Administrator for review and approval no later than 60 days before the date you intend to demonstrate compliance. Each fuel analysis plan shall include a minimum initial requirement of weekly testing and each analysis report shall contain, at a minimum, the following information:~~

~~(i) The potential sulfur emissions rate of the representative fuel mixture in ng/J heat input;~~

~~(ii) The method used to determine the potential sulfur emissions rate of each constituent of the mixture. For distillate oil and natural gas a fuel receipt or tariff sheet is acceptable;~~

~~(iii) The ratio of different fuels in the mixture; and~~

~~(iv) The owner or operator can petition the Administrator to approve monthly or quarterly sampling in place of weekly sampling.~~

~~(s) Facility specific NO_X standard for Cytec Industries Fortier Plant's C.AOG incinerator located in Westwego, Louisiana:~~

~~(1) *Definitions.*~~

~~*Oxidation zone* is defined as the portion of the C.AOG incinerator that extends from the inlet of the oxidizing zone combustion air to the outlet gas stack.~~

~~*Reducing zone* is defined as the portion of the C.AOG incinerator that extends from the burner section to the inlet of the oxidizing zone combustion air.~~

~~*Total inlet air* is defined as the total amount of air introduced into the C.AOG incinerator for combustion of natural gas and chemical by-product waste and is equal to the sum of the air flow into the reducing zone and the air flow into the oxidation zone.~~

~~(2) *Standard for nitrogen oxides.* (i) When fossil fuel alone is combusted, the NO_X emission limit for fossil fuel in §60.44b(a) applies.~~

~~(ii) When natural gas and chemical by-product waste are simultaneously combusted, the NO_X emission limit is 289 ng/J (0.67 lb/MMBtu) and a maximum of 81 percent of the total inlet air provided for combustion shall be provided to the reducing zone of the C.AOG incinerator.~~

~~(3) *Emission monitoring.* (i) The percent of total inlet air provided to the reducing zone shall be determined at least every 15 minutes by measuring the air flow of all the air entering the reducing zone and the air flow of all the air entering the oxidation zone, and compliance with the percentage of total inlet air that is provided to the reducing zone shall be determined on a 3-hour average basis.~~

~~(ii) The NO_X emission limit shall be determined by the compliance and performance test methods and procedures for NO_X in §60.46b(i).~~

~~(iii) The monitoring of the NO_X emission limit shall be performed in accordance with §60.48b.~~

~~(4) *Reporting and recordkeeping requirements.* (i) The owner or operator of the C.AOG incinerator shall submit a report on any excursions from the limits required by paragraph (a)(2) of this section to the Administrator with the quarterly report required by paragraph (i) of this section.~~

~~(ii) The owner or operator of the C.AOG incinerator shall keep records of the monitoring required by paragraph (a)(3) of this section for a period of 2 years following the date of such record.~~

~~(iii) The owner of operator of the C.AOG incinerator shall perform all the applicable reporting and recordkeeping requirements of this section.~~

~~(t) Facility-specific NO_X standard for Rohm and Haas Kentucky Incorporated's Boiler No. 100 located in Louisville, Kentucky:~~

~~(1) *Definitions.*~~

~~*Air ratio control damper* is defined as the part of the low NO_X burner that is adjusted to control the split of total combustion air delivered to the reducing and oxidation portions of the combustion flame.~~

~~*Flue gas recirculation line* is defined as the part of Boiler No. 100 that recirculates a portion of the boiler flue gas back into the combustion air.~~

~~(2) *Standard for nitrogen oxides.* (i) When fossil fuel alone is combusted, the NO_X emission limit for fossil fuel in §60.44b(a) applies.~~

~~(ii) When fossil fuel and chemical by-product waste are simultaneously combusted, the NO_X emission limit is 473 ng/J (1.1 lb/MMBtu), and the air ratio control damper tee handle shall be at a minimum of 5 inches (12.7 centimeters) out of the boiler, and the flue gas recirculation line shall be operated at a minimum of 10 percent open as indicated by its valve opening position indicator.~~

~~(3) *Emission monitoring for nitrogen oxides.* (i) The air ratio control damper tee handle setting and the flue gas recirculation line valve opening position indicator setting shall be recorded during each 8-hour operating shift.~~

~~(ii) The NO_X emission limit shall be determined by the compliance and performance test methods and procedures for NO_X in §60.46b.~~

~~(iii) The monitoring of the NO_X emission limit shall be performed in accordance with §60.48b.~~

~~(4) *Reporting and recordkeeping requirements.* (i) The owner or operator of Boiler No. 100 shall submit a report on any excursions from the limits required by paragraph (b)(2) of this section to the Administrator with the quarterly report required by §60.49b(i).~~

~~(ii) The owner or operator of Boiler No. 100 shall keep records of the monitoring required by paragraph (b)(3) of this section for a period of 2 years following the date of such record.~~

~~(iii) The owner of operator of Boiler No. 100 shall perform all the applicable reporting and recordkeeping requirements of §60.49b.~~

~~(u) *Site-specific standard for Merck & Co., Inc.'s Stonewall Plant in Elkton, Virginia.* (1) This paragraph (u) applies only to the pharmaceutical manufacturing facility, commonly referred to as the Stonewall Plant, located at Route 340 South, in Elkton, Virginia ("site") and only to the natural gas-fired boilers installed as part of the powerhouse conversion required pursuant to 40 CFR 52.2454(g). The requirements of this paragraph shall apply, and the requirements of §§60.40b through 60.49b(t) shall not apply, to the natural gas-fired boilers installed pursuant to 40 CFR 52.2454(g).~~

~~(i) The site shall equip the natural gas-fired boilers with low NO_X technology.~~

~~(ii) The site shall install, calibrate, maintain, and operate a continuous monitoring and recording system for measuring NO_X emissions discharged to the atmosphere and opacity using a continuous emissions monitoring system or a predictive emissions monitoring system.~~

~~(iii) Within 180 days of the completion of the powerhouse conversion, as required by 40 CFR 52.2454, the site shall perform a performance test to quantify criteria pollutant emissions.~~

~~(2) [Reserved]~~

(v) The owner or operator of an affected facility may submit electronic quarterly reports for ~~SO_2 and/or~~ NO_X ~~and/or opacity~~ in lieu of submitting the written reports required under paragraphs (h), (i), (j), (k) or (l) of this section. The format of each quarterly electronic report shall be coordinated with the permitting authority. The electronic report(s) shall be submitted no later than 30 days after the end of the calendar quarter and shall be accompanied by a certification statement from the owner or operator, indicating whether compliance with the applicable emission standards and minimum data requirements of this subpart was achieved during the reporting period. Before submitting reports in the electronic format, the owner or operator shall coordinate with the permitting authority to obtain their agreement to submit reports in this alternative format.

(w) The reporting period for the reports required under this subpart is each 6 month period. All reports shall be submitted to the Administrator and shall be postmarked by the 30th day following the end of the reporting period.

~~(x) Facility-specific NO_X standard for Weyerhaeuser Company's No. 2 Power Boiler located in New Bern, North Carolina:~~

~~(1) *Standard for nitrogen oxides.* (i) When fossil fuel alone is combusted, the NO_X emission limit for fossil fuel in §60.44b(a) applies.~~

~~(ii) When fossil fuel and chemical by-product waste are simultaneously combusted, the NO_X emission limit is 215 ng/J (0.5 lb/MMBtu).~~

~~(2) *Emission monitoring for nitrogen oxides.* (i) The NO_X emissions shall be determined by the compliance and performance test methods and procedures for NO_X in §60.46b.~~

~~(ii) The monitoring of the NO_X emissions shall be performed in accordance with §60.48b.~~

~~(3) *Reporting and recordkeeping requirements.* (i) The owner or operator of the No. 2 Power Boiler shall submit a report on any excursions from the limits required by paragraph (x)(2) of this section to the Administrator with the quarterly report required by §60.49b(i).~~

~~(ii) The owner or operator of the No. 2 Power Boiler shall keep records of the monitoring required by paragraph (x)(3) of this section for a period of 2 years following the date of such record.~~

~~(iii) The owner or operator of the No. 2 Power Boiler shall perform all the applicable reporting and recordkeeping requirements of §60.49b.~~

~~(y) Facility-specific NO_X standard for INEOS USA's AOGI located in Lima, Ohio:~~

~~(1) *Standard for NO_X.* (i) When fossil fuel alone is combusted, the NO_X emission limit for fossil fuel in §60.44b(a) applies.~~

~~(ii) When fossil fuel and chemical byproduct/waste are simultaneously combusted, the NO_X emission limit is 645 ng/J (1.5 lb/MMBtu).~~

~~(2) *Emission monitoring for NO_X.* (i) The NO_X emissions shall be determined by the compliance and performance test methods and procedures for NO_X in §60.46b.~~

~~(ii) The monitoring of the NO_X emissions shall be performed in accordance with §60.48b.~~

~~(3) *Reporting and recordkeeping requirements.* (i) The owner or operator of the AOGI shall submit a report on any excursions from the limits required by paragraph (y)(2) of this section to the Administrator with the quarterly report required by paragraph (i) of this section.~~

~~(ii) The owner or operator of the AOGI shall keep records of the monitoring required by paragraph (y)(3) of this section for a period of 2 years following the date of such record.~~

~~(iii) The owner or operator of the AOGI shall perform all the applicable reporting and recordkeeping requirements of this section.~~

[72 FR 32742, June 13, 2007, as amended at 74 FR 5089, Jan. 28, 2009; 77 FR 9461, Feb. 16, 2012]

Emergency Diesel Engines – 40 CFR 60, Subpart IIII

Subpart IIII—Standards of Performance for Stationary Compression Ignition Internal Combustion Engines

---

Contents

~~Emission Standards for Manufacturers~~

Emission Standards for Owners and Operators

Fuel Requirements for Owners and Operators

Other Requirements for Owners and Operators

Compliance Requirements

~~Testing Requirements for Owners and Operators~~

SOURCE: 71 FR 39172, July 11, 2006, unless otherwise noted.

WHAT THIS SUBPART COVERS

§60.4200 Am I subject to this subpart?

(a) The provisions of this subpart are applicable to manufacturers, owners, and operators of stationary compression ignition (CI) internal combustion engines (ICE) and other persons as specified in paragraphs (a)(1) through (4) of this section. For the purposes of this subpart, the date that construction commences is the date the engine is ordered by the owner or operator.

(1) Manufacturers of stationary CI ICE with a displacement of less than 30 liters per cylinder where the model year is:

(i) 2007 or later, for engines that are not fire pump engines;

(ii) The model year listed in Table 3 to this subpart or later model year, for fire pump engines.

(2) Owners and operators of stationary CI ICE that commence construction after July 11, 2005, where the stationary CI ICE are:

(i) Manufactured after April 1, 2006, and are not fire pump engines, or

(ii) Manufactured as a certified National Fire Protection Association (NFPA) fire pump engine after July 1, 2006.

(3) Owners and operators of any stationary CI ICE that are modified or reconstructed after July 11, 2005 and any person that modifies or reconstructs any stationary CI ICE after July 11, 2005.

(4) The provisions of §60.4208 of this subpart are applicable to all owners and operators of stationary CI ICE that commence construction after July 11, 2005.

(b) The provisions of this subpart are not applicable to stationary CI ICE being tested at a stationary CI ICE test cell/stand.

(c) If you are an owner or operator of an area source subject to this subpart, you are exempt from the obligation to obtain a permit under 40 CFR part 70 or 40 CFR part 71, provided you are not required to obtain a permit under 40 CFR 70.3(a) or 40 CFR 71.3(a) for a reason other than your status as an area source under this subpart. Notwithstanding the previous sentence, you must continue to comply with the provisions of this subpart applicable to area sources.

(d) Stationary CI ICE may be eligible for exemption from the requirements of this subpart as described in 40 CFR part 1068, subpart C (or the exemptions described in 40 CFR part 89, subpart J and 40 CFR part 94, subpart J, for engines that would need to be certified to standards in those parts), except that owners and operators, as well as manufacturers, may be eligible to request an exemption for national security.

(e) Owners and operators of facilities with CI ICE that are acting as temporary replacement units and that are located at a stationary source for less than 1 year and that have been properly certified as meeting the standards that would be applicable to such engine under the appropriate nonroad engine provisions, are not required to meet any other provisions under this subpart with regard to such engines.

[71 FR 39172, July 11, 2006, as amended at 76 FR 37967, June 28, 2011]

EMISSION STANDARDS FOR OWNERS AND OPERATORS

§60.4205 What emission standards must I meet for emergency engines if I am an owner or operator of a stationary CI internal combustion engine?

(a) Owners and operators of pre-2007 model year emergency stationary CI ICE with a displacement of less than 10 liters per cylinder that are not fire pump engines must comply with the emission standards in Table 1 to this subpart. Owners and operators of pre-2007 model year emergency stationary CI ICE with a displacement of greater than or equal to 10 liters per cylinder and less than 30 liters per cylinder that are not fire pump engines must comply with the emission standards in 40 CFR 94.8(a)(1).

(b) Owners and operators of 2007 model year and later emergency stationary CI ICE with a displacement of less than 30 liters per cylinder that are not fire pump engines must comply with the emission standards for new nonroad CI engines in §60.4202, for all pollutants, for the same model year and maximum engine power for their 2007 model year and later emergency stationary CI ICE.

(c) Owners and operators of fire pump engines with a displacement of less than 30 liters per cylinder must comply with the emission standards in table 4 to this subpart, for all pollutants.

(d) Owners and operators of emergency stationary CI engines with a displacement of greater than or equal to 30 liters per cylinder must meet the requirements in this section.

(1) For engines installed prior to January 1, 2012, limit the emissions of NO_X in the stationary CI internal combustion engine exhaust to the following:

(i) 17.0 g/KW-hr (12.7 g/HP-hr) when maximum engine speed is less than 130 rpm;

(ii) $45 \cdot n^{-0.2}$ g/KW-hr ($34 \cdot n^{-0.2}$ g/HP-hr) when maximum engine speed is 130 or more but less than 2,000 rpm, where n is maximum engine speed; and

(iii) 9.8 g/kW-hr (7.3 g/HP-hr) when maximum engine speed is 2,000 rpm or more.

(2) For engines installed on or after January 1, 2012, limit the emissions of NO_X in the stationary CI internal combustion engine exhaust to the following:

(i) 14.4 g/KW-hr (10.7 g/HP-hr) when maximum engine speed is less than 130 rpm;

(ii) $44 \cdot n^{-0.23}$ g/KW-hr ($33 \cdot n^{-0.23}$ g/HP-hr) when maximum engine speed is greater than or equal to 130 but less than 2,000 rpm and where n is maximum engine speed; and

(iii) 7.7 g/KW-hr (5.7 g/HP-hr) when maximum engine speed is greater than or equal to 2,000 rpm.

(3) Limit the emissions of PM in the stationary CI internal combustion engine exhaust to 0.40 g/KW-hr (0.30 g/HP-hr).

(e) Owners and operators of emergency stationary CI ICE with a displacement of less than 30 liters per cylinder who conduct performance tests in-use must meet the NTE standards as indicated in §60.4212.

(f) Owners and operators of any modified or reconstructed emergency stationary CI ICE subject to this subpart must meet the emission standards applicable to the model year, maximum engine power, and displacement of the modified or reconstructed CI ICE that are specified in paragraphs (a) through (e) of this section.

[71 FR 39172, July 11, 2006, as amended at 76 FR 37969, June 28, 2011]

§60.4206 How long must I meet the emission standards if I am an owner or operator of a stationary CI internal combustion engine?

Owners and operators of stationary CI ICE must operate and maintain stationary CI ICE that achieve the emission standards as required in §§60.4204 and 60.4205 over the entire life of the engine.

[76 FR 37969, June 28, 2011]

FUEL REQUIREMENTS FOR OWNERS AND OPERATORS

§60.4207 What fuel requirements must I meet if I am an owner or operator of a stationary CI internal combustion engine subject to this subpart?

(a) Beginning October 1, 2007, owners and operators of stationary CI ICE subject to this subpart that use diesel fuel must use diesel fuel that meets the requirements of 40 CFR 80.510(a).

(b) Beginning October 1, 2010, owners and operators of stationary CI ICE subject to this subpart with a displacement of less than 30 liters per cylinder that use diesel fuel must use diesel fuel that meets the requirements of 40 CFR 80.510(b) for nonroad diesel fuel, except that any existing diesel fuel purchased (or otherwise obtained) prior to October 1, 2010, may be used until depleted.

(c) [Reserved]

(d) Beginning June 1, 2012, owners and operators of stationary CI ICE subject to this subpart with a displacement of greater than or equal to 30 liters per cylinder are no longer subject to the requirements of paragraph (a) of this section, and must use fuel that meets a maximum per-gallon sulfur content of 1,000 parts per million (ppm).

(e) Stationary CI ICE that have a national security exemption under §60.4200(d) are also exempt from the fuel requirements in this section.

[71 FR 39172, July 11, 2006, as amended at 76 FR 37969, June 28, 2011; 78 FR 6695, Jan. 30, 2013]

OTHER REQUIREMENTS FOR OWNERS AND OPERATORS

§60.4209 What are the monitoring requirements if I am an owner or operator of a stationary CI internal combustion engine?

If you are an owner or operator, you must meet the monitoring requirements of this section. In addition, you must also meet the monitoring requirements specified in §60.4211.

(a) If you are an owner or operator of an emergency stationary CI internal combustion engine that does not meet the standards applicable to non-emergency engines, you must install a non-resettable hour meter prior to startup of the engine.

(b) If you are an owner or operator of a stationary CI internal combustion engine equipped with a diesel particulate filter to comply with the emission standards in §60.4204, the diesel particulate filter must be installed with a backpressure monitor that notifies the owner or operator when the high backpressure limit of the engine is approached.

[71 FR 39172, July 11, 2006, as amended at 76 FR 37969, June 28, 2011]

COMPLIANCE REQUIREMENTS

§60.4211 What are my compliance requirements if I am an owner or operator of a stationary CI internal combustion engine?

(a) If you are an owner or operator and must comply with the emission standards specified in this subpart, you must do all of the following, except as permitted under paragraph (g) of this section:

(1) Operate and maintain the stationary CI internal combustion engine and control device according to the manufacturer's emission-related written instructions;

(2) Change only those emission-related settings that are permitted by the manufacturer; and

(3) Meet the requirements of 40 CFR parts 89, 94 and/or 1068, as they apply to you.

(b) If you are an owner or operator of a pre-2007 model year stationary CI internal combustion engine and must comply with the emission standards specified in §§60.4204(a) or 60.4205(a), or if you are an owner or operator of a CI fire pump engine that is manufactured prior to the model years in table 3 to this subpart and must comply with the emission standards specified in §60.4205(c), you must demonstrate compliance according to one of the methods specified in paragraphs (b)(1) through (5) of this section.

(1) Purchasing an engine certified according to 40 CFR part 89 or 40 CFR part 94, as applicable, for the same model year and maximum engine power. The engine must be installed and configured according to the manufacturer's specifications.

(2) Keeping records of performance test results for each pollutant for a test conducted on a similar engine. The test must have been conducted using the same methods specified in this subpart and these methods must have been followed correctly.

(3) Keeping records of engine manufacturer data indicating compliance with the standards.

(4) Keeping records of control device vendor data indicating compliance with the standards.

(5) Conducting an initial performance test to demonstrate compliance with the emission standards according to the requirements specified in §60.4212, as applicable.

(c) If you are an owner or operator of a 2007 model year and later stationary CI internal combustion engine and must comply with the emission standards specified in §60.4204(b) or §60.4205(b), or if you are an owner or operator of a CI fire pump engine that is manufactured during or after the model year that applies to your fire pump engine power rating in table 3 to this subpart and must comply with the emission standards specified in §60.4205(c), you must comply by purchasing an engine certified to the emission standards in §60.4204(b), or §60.4205(b) or (c), as applicable, for the same model year and maximum (or in the case of fire pumps, NFPA nameplate) engine power. The engine must be installed and configured according to the manufacturer's emission-related specifications, except as permitted in paragraph (g) of this section.

(d) If you are an owner or operator and must comply with the emission standards specified in §60.4204(c) or §60.4205(d), you must demonstrate compliance according to the requirements specified in paragraphs (d)(1) through (3) of this section.

(1) Conducting an initial performance test to demonstrate initial compliance with the emission standards as specified in §60.4213.

(2) Establishing operating parameters to be monitored continuously to ensure the stationary internal combustion engine continues to meet the emission standards. The owner or operator must petition the Administrator for approval of operating parameters to be monitored

continuously. The petition must include the information described in paragraphs (d)(2)(i) through (v) of this section.

(i) Identification of the specific parameters you propose to monitor continuously;

(ii) A discussion of the relationship between these parameters and NO_X and PM emissions, identifying how the emissions of these pollutants change with changes in these parameters, and how limitations on these parameters will serve to limit NO_X and PM emissions;

(iii) A discussion of how you will establish the upper and/or lower values for these parameters which will establish the limits on these parameters in the operating limitations;

(iv) A discussion identifying the methods and the instruments you will use to monitor these parameters, as well as the relative accuracy and precision of these methods and instruments; and

(v) A discussion identifying the frequency and methods for recalibrating the instruments you will use for monitoring these parameters.

(3) For non-emergency engines with a displacement of greater than or equal to 30 liters per cylinder, conducting annual performance tests to demonstrate continuous compliance with the emission standards as specified in §60.4213.

(e) If you are an owner or operator of a modified or reconstructed stationary CI internal combustion engine and must comply with the emission standards specified in §60.4204(e) or §60.4205(f), you must demonstrate compliance according to one of the methods specified in paragraphs (e)(1) or (2) of this section.

(1) Purchasing, or otherwise owning or operating, an engine certified to the emission standards in §60.4204(e) or §60.4205(f), as applicable.

(2) Conducting a performance test to demonstrate initial compliance with the emission standards according to the requirements specified in §60.4212 or §60.4213, as appropriate. The test must be conducted within 60 days after the engine commences operation after the modification or reconstruction.

(f) If you own or operate an emergency stationary ICE, you must operate the emergency stationary ICE according to the requirements in paragraphs (f)(1) through (3) of this section. In order for the engine to be considered an emergency stationary ICE under this subpart, any operation other than emergency operation, maintenance and testing, emergency demand response, and operation in non-emergency situations for 50 hours per year, as described in paragraphs (f)(1) through (3) of this section, is prohibited. If you do not operate the engine according to the requirements in paragraphs (f)(1) through (3) of this section, the engine will not be considered an emergency engine under this subpart and must meet all requirements for non-emergency engines.

(1) There is no time limit on the use of emergency stationary ICE in emergency situations.

(2) You may operate your emergency stationary ICE for any combination of the purposes specified in paragraphs (f)(2)(i) through (iii) of this section for a maximum of 100 hours per calendar year. Any operation for non-emergency situations as allowed by paragraph (f)(3) of this section counts as part of the 100 hours per calendar year allowed by this paragraph (f)(2).

(i) Emergency stationary ICE may be operated for maintenance checks and readiness testing, provided that the tests are recommended by federal, state or local government, the manufacturer, the vendor, the regional transmission organization or equivalent balancing authority and transmission operator, or the insurance company associated with the engine. The owner or operator may petition the Administrator for approval of additional hours to be used for maintenance checks and readiness testing, but a petition is not required if the owner or operator maintains records indicating that federal, state, or local standards require maintenance and testing of emergency ICE beyond 100 hours per calendar year.

(ii) Emergency stationary ICE may be operated for emergency demand response for periods in which the Reliability Coordinator under the North American Electric Reliability Corporation (NERC) Reliability Standard EOP-002-3, Capacity and Energy Emergencies (incorporated by reference, see §60.17), or other authorized entity as determined by the Reliability Coordinator, has declared an Energy Emergency Alert Level 2 as defined in the NERC Reliability Standard EOP-002-3.

(iii) Emergency stationary ICE may be operated for periods where there is a deviation of voltage or frequency of 5 percent or greater below standard voltage or frequency.

(3) Emergency stationary ICE may be operated for up to 50 hours per calendar year in non-emergency situations. The 50 hours of operation in non-emergency situations are counted as part of the 100 hours per calendar year for maintenance and testing and emergency demand response provided in paragraph (f)(2) of this section. Except as provided in paragraph (f)(3)(i) of this section, the 50 hours per calendar year for non-emergency situations cannot be used for peak shaving or non-emergency demand response, or to generate income for a facility to an electric grid or otherwise supply power as part of a financial arrangement with another entity.

(i) The 50 hours per year for non-emergency situations can be used to supply power as part of a financial arrangement with another entity if all of the following conditions are met:

(A) The engine is dispatched by the local balancing authority or local transmission and distribution system operator;

(B) The dispatch is intended to mitigate local transmission and/or distribution limitations so as to avert potential voltage collapse or line overloads that could lead to the interruption of power supply in a local area or region.

(C) The dispatch follows reliability, emergency operation or similar protocols that follow specific NERC, regional, state, public utility commission or local standards or guidelines.

(D) The power is provided only to the facility itself or to support the local transmission and distribution system.

(E) The owner or operator identifies and records the entity that dispatches the engine and the specific NERC, regional, state, public utility commission or local standards or guidelines that are being followed for dispatching the engine. The local balancing authority or local transmission and distribution system operator may keep these records on behalf of the engine owner or operator.

(ii) [Reserved]

(g) If you do not install, configure, operate, and maintain your engine and control device according to the manufacturer's emission-related written instructions, or you change emission-related settings in a way that is not permitted by the manufacturer, you must demonstrate compliance as follows:

(1) If you are an owner or operator of a stationary CI internal combustion engine with maximum engine power less than 100 HP, you must keep a maintenance plan and records of conducted maintenance to demonstrate compliance and must, to the extent practicable, maintain and operate the engine in a manner consistent with good air pollution control practice for minimizing emissions. In addition, if you do not install and configure the engine and control device according to the manufacturer's emission-related written instructions, or you change the emission-related settings in a way that is not permitted by the manufacturer, you must conduct an initial performance test to demonstrate compliance with the applicable emission standards within 1 year of such action.

(2) If you are an owner or operator of a stationary CI internal combustion engine greater than or equal to 100 HP and less than or equal to 500 HP, you must keep a maintenance plan and records of conducted maintenance and must, to the extent practicable, maintain and operate the engine in a manner consistent with good air pollution control practice for minimizing emissions. In addition, you must conduct an initial performance test to demonstrate compliance with the applicable emission standards within 1 year of startup, or within 1 year after an engine and control device is no longer installed, configured, operated, and maintained in accordance with the manufacturer's emission-related written instructions, or within 1 year after you change emission-related settings in a way that is not permitted by the manufacturer.

(3) If you are an owner or operator of a stationary CI internal combustion engine greater than 500 HP, you must keep a maintenance plan and records of conducted maintenance and

must, to the extent practicable, maintain and operate the engine in a manner consistent with good air pollution control practice for minimizing emissions. In addition, you must conduct an initial performance test to demonstrate compliance with the applicable emission standards within 1 year of startup, or within 1 year after an engine and control device is no longer installed, configured, operated, and maintained in accordance with the manufacturer's emission-related written instructions, or within 1 year after you change emission-related settings in a way that is not permitted by the manufacturer. You must conduct subsequent performance testing every 8,760 hours of engine operation or 3 years, whichever comes first, thereafter to demonstrate compliance with the applicable emission standards.

(h) The requirements for operators and prohibited acts specified in 40 CFR 1039.665 apply to owners or operators of stationary CI ICE equipped with AECDs for qualified emergency situations as allowed by 40 CFR 1039.665.

[71 FR 39172, July 11, 2006, as amended at 76 FR 37970, June 28, 2011; 78 FR 6695, Jan. 30, 2013; 81 FR 44219, July 7, 2016]

NOTIFICATION, REPORTS, AND RECORDS FOR OWNERS AND OPERATORS

§60.4214 What are my notification, reporting, and recordkeeping requirements if I am an owner or operator of a stationary CI internal combustion engine?

(a) Owners and operators of non-emergency stationary CI ICE that are greater than 2,237 KW (3,000 HP), or have a displacement of greater than or equal to 10 liters per cylinder, or are pre-2007 model year engines that are greater than 130 KW (175 HP) and not certified, must meet the requirements of paragraphs (a)(1) and (2) of this section.

(1) Submit an initial notification as required in §60.7(a)(1). The notification must include the information in paragraphs (a)(1)(i) through (v) of this section.

(i) Name and address of the owner or operator;

(ii) The address of the affected source;

(iii) Engine information including make, model, engine family, serial number, model year, maximum engine power, and engine displacement;

(iv) Emission control equipment; and

(v) Fuel used.

(2) Keep records of the information in paragraphs (a)(2)(i) through (iv) of this section.

(i) All notifications submitted to comply with this subpart and all documentation supporting any notification.

(ii) Maintenance conducted on the engine.

(iii) If the stationary CI internal combustion is a certified engine, documentation from the manufacturer that the engine is certified to meet the emission standards.

(iv) If the stationary CI internal combustion is not a certified engine, documentation that the engine meets the emission standards.

(b) If the stationary CI internal combustion engine is an emergency stationary internal combustion engine, the owner or operator is not required to submit an initial notification. Starting with the model years in table 5 to this subpart, if the emergency engine does not meet the standards applicable to non-emergency engines in the applicable model year, the owner or operator must keep records of the operation of the engine in emergency and non-emergency service that are recorded through the non-resettable hour meter. The owner must record the time of operation of the engine and the reason the engine was in operation during that time.

(c) If the stationary CI internal combustion engine is equipped with a diesel particulate filter, the owner or operator must keep records of any corrective action taken after the backpressure monitor has notified the owner or operator that the high backpressure limit of the engine is approached.

(d) If you own or operate an emergency stationary CI ICE with a maximum engine power more than 100 HP that operates or is contractually obligated to be available for more than 15 hours per calendar year for the purposes specified in §60.4211(f)(2)(ii) and (iii) or that operates for the purposes specified in §60.4211(f)(3)(i), you must submit an annual report according to the requirements in paragraphs (d)(1) through (3) of this section.

(1) The report must contain the following information:

(i) Company name and address where the engine is located.

(ii) Date of the report and beginning and ending dates of the reporting period.

(iii) Engine site rating and model year.

(iv) Latitude and longitude of the engine in decimal degrees reported to the fifth decimal place.

(v) Hours operated for the purposes specified in §60.4211(f)(2)(ii) and (iii), including the date, start time, and end time for engine operation for the purposes specified in §60.4211(f)(2)(ii) and (iii).

(vi) Number of hours the engine is contractually obligated to be available for the purposes specified in §60.4211(f)(2)(ii) and (iii).

(vii) Hours spent for operation for the purposes specified in §60.4211(f)(3)(i), including the date, start time, and end time for engine operation for the purposes specified in §60.4211(f)(3)(i). The report must also identify the entity that dispatched the engine and the situation that necessitated the dispatch of the engine.

(2) The first annual report must cover the calendar year 2015 and must be submitted no later than March 31, 2016. Subsequent annual reports for each calendar year must be submitted no later than March 31 of the following calendar year.

(3) The annual report must be submitted electronically using the subpart specific reporting form in the Compliance and Emissions Data Reporting Interface (CEDRI) that is accessed through EPA's Central Data Exchange (CDX) (*www.epa.gov/cdx*). However, if the reporting form specific to this subpart is not available in CEDRI at the time that the report is due, the written report must be submitted to the Administrator at the appropriate address listed in §60.4.

(e) Owners or operators of stationary CI ICE equipped with AECDs pursuant to the requirements of 40 CFR 1039.665 must report the use of AECDs as required by 40 CFR 1039.665(e).

[71 FR 39172, July 11, 2006, as amended at 78 FR 6696, Jan. 30, 2013; 81 FR 44219, July 7, 2016]

GENERAL PROVISIONS

§60.4218 What parts of the General Provisions apply to me?

Table 8 to this subpart shows which parts of the General Provisions in §§60.1 through 60.19 apply to you.

DEFINITIONS

§60.4219 What definitions apply to this subpart?

As used in this subpart, all terms not defined herein shall have the meaning given them in the CAA and in subpart A of this part.

Alaska Railbelt Grid means the service areas of the six regulated public utilities that extend from Fairbanks to Anchorage and the Kenai Peninsula. These utilities are Golden Valley Electric Association; Chugach Electric Association; Matanuska Electric Association; Homer Electric Association; Anchorage Municipal Light & Power; and the City of Seward Electric System.

Certified emissions life means the period during which the engine is designed to properly function in terms of reliability and fuel consumption, without being remanufactured, specified as a number of hours of operation or calendar years, whichever comes first. The values for certified emissions life for stationary CI ICE with a displacement of less than 10 liters per cylinder are given in 40 CFR 1039.101(g). The values for certified emissions life for stationary CI ICE with a displacement of greater than or equal to 10 liters per cylinder and less than 30 liters per cylinder are given in 40 CFR 94.9(a).

Combustion turbine means all equipment, including but not limited to the turbine, the fuel, air, lubrication and exhaust gas systems, control systems (except emissions control equipment), and any ancillary components and sub-components comprising any simple cycle combustion turbine, any regenerative/recuperative cycle combustion turbine, the combustion turbine portion of any cogeneration cycle combustion system, or the combustion turbine portion of any combined cycle steam/electric generating system.

Compression ignition means relating to a type of stationary internal combustion engine that is not a spark ignition engine.

Date of manufacture means one of the following things:

(1) For freshly manufactured engines and modified engines, date of manufacture means the date the engine is originally produced.

(2) For reconstructed engines, date of manufacture means the date the engine was originally produced, except as specified in paragraph (3) of this definition.

(3) Reconstructed engines are assigned a new date of manufacture if the fixed capital cost of the new and refurbished components exceeds 75 percent of the fixed capital cost of a comparable entirely new facility. An engine that is produced from a previously used engine block does not retain the date of manufacture of the engine in which the engine block was previously used if the engine is produced using all new components except for the engine block. In these cases, the date of manufacture is the date of reconstruction or the date the new engine is produced.

Diesel fuel means any liquid obtained from the distillation of petroleum with a boiling point of approximately 150 to 360 degrees Celsius. One commonly used form is number 2 distillate oil.

Diesel particulate filter means an emission control technology that reduces PM emissions by trapping the particles in a flow filter substrate and periodically removes the collected particles by either physical action or by oxidizing (burning off) the particles in a process called regeneration.

Emergency stationary internal combustion engine means any stationary reciprocating internal combustion engine that meets all of the criteria in paragraphs (1) through (3) of this definition. All emergency stationary ICE must comply with the requirements specified in §60.4211(f) in order to be considered emergency stationary ICE. If the engine does not comply with the requirements specified in §60.4211(f), then it is not considered to be an emergency stationary ICE under this subpart.

(1) The stationary ICE is operated to provide electrical power or mechanical work during an emergency situation. Examples include stationary ICE used to produce power for critical networks or equipment (including power supplied to portions of a facility) when electric power from the local utility (or the normal power source, if the facility runs on its own power production) is interrupted, or stationary ICE used to pump water in the case of fire or flood, etc.

(2) The stationary ICE is operated under limited circumstances for situations not included in paragraph (1) of this definition, as specified in §60.4211(f).

(3) The stationary ICE operates as part of a financial arrangement with another entity in situations not included in paragraph (1) of this definition only as allowed in §60.4211(f)(2)(ii) or (iii) and §60.4211(f)(3)(i).

Engine manufacturer means the manufacturer of the engine. See the definition of "manufacturer" in this section.

Fire pump engine means an emergency stationary internal combustion engine certified to NFPA requirements that is used to provide power to pump water for fire suppression or protection.

Freshly manufactured engine means an engine that has not been placed into service. An engine becomes freshly manufactured when it is originally produced.

Installed means the engine is placed and secured at the location where it is intended to be operated.

Manufacturer has the meaning given in section 216(1) of the Act. In general, this term includes any person who manufactures a stationary engine for sale in the United States or otherwise introduces a new stationary engine into commerce in the United States. This includes importers who import stationary engines for sale or resale.

Maximum engine power means maximum engine power as defined in 40 CFR 1039.801.

Model year means the calendar year in which an engine is manufactured (see "date of manufacture"), except as follows:

(1) Model year means the annual new model production period of the engine manufacturer in which an engine is manufactured (see "date of manufacture"), if the annual new model production period is different than the calendar year and includes January 1 of the calendar year for which the model year is named. It may not begin before January 2 of the previous calendar year and it must end by December 31 of the named calendar year.

(2) For an engine that is converted to a stationary engine after being placed into service as a nonroad or other non-stationary engine, model year means the calendar year or new model production period in which the engine was manufactured (see “date of manufacture”).

Other internal combustion engine means any internal combustion engine, except combustion turbines, which is not a reciprocating internal combustion engine or rotary internal combustion engine.

Reciprocating internal combustion engine means any internal combustion engine which uses reciprocating motion to convert heat energy into mechanical work.

~~*Remote areas of Alaska* means areas of Alaska that meet either paragraph (1) or (2) of this definition.~~

~~(1) Areas of Alaska that are not accessible by the Federal Aid Highway System (FAHS).~~

~~(2) Areas of Alaska that meet all of the following criteria:~~

~~(i) The only connection to the FAHS is through the Alaska Marine Highway System, or the stationary CI ICE operation is within an isolated grid in Alaska that is not connected to the statewide electrical grid referred to as the Alaska Railbelt Grid.~~

~~(ii) At least 10 percent of the power generated by the stationary CI ICE on an annual basis is used for residential purposes.~~

~~(iii) The generating capacity of the source is less than 12 megawatts, or the stationary CI ICE is used exclusively for backup power for renewable energy.~~

Rotary internal combustion engine means any internal combustion engine which uses rotary motion to convert heat energy into mechanical work.

Spark ignition means relating to a gasoline, natural gas, or liquefied petroleum gas fueled engine or any other type of engine with a spark plug (or other sparking device) and with operating characteristics significantly similar to the theoretical Otto combustion cycle. Spark ignition engines usually use a throttle to regulate intake air flow to control power during normal operation. Dual-fuel engines in which a liquid fuel (typically diesel fuel) is used for CI and gaseous fuel (typically natural gas) is used as the primary fuel at an annual average ratio of less than 2 parts diesel fuel to 100 parts total fuel on an energy equivalent basis are spark ignition engines.

Stationary internal combustion engine means any internal combustion engine, except combustion turbines, that converts heat energy into mechanical work and is not mobile. Stationary ICE differ from mobile ICE in that a stationary internal combustion engine is not a nonroad engine as defined at 40 CFR 1068.30 (excluding paragraph (2)(ii) of that definition), and is not used to propel a motor vehicle, aircraft, or a vehicle used solely for competition.

Stationary ICE include reciprocating ICE, rotary ICE, and other ICE, except combustion turbines.

Subpart means 40 CFR part 60, subpart IIII.

[71 FR 39172, July 11, 2006, as amended at 76 FR 37972, June 28, 2011; 78 FR 6696, Jan. 30, 2013; 81 FR 44219, July 7, 2016]

Table 2 to Subpart IIII of Part 60—Emission Standards for 2008 Model Year and Later Emergency Stationary CI ICE <37 KW (50 HP) With a Displacement of <10 Liters per Cylinder

[As stated in §60.4202(a)(1), you must comply with the following emission standards]

Engine power	Emission standards for 2008 model year and later emergency stationary CI ICE <37 KW (50 HP) with a displacement of <10 liters per cylinder in g/KW-hr (g/HP-hr)			
	Model year(s)	**NO_X + NMHC**	**CO**	**PM**
KW<8 (HP<11)	2008 +	7.5 (5.6)	8.0 (6.0)	0.40 (0.30)
8≤KW<19 (11≤HP<25)	2008 +	7.5 (5.6)	6.6 (4.9)	0.40 (0.30)
19≤KW<37 (25≤HP<50)	2008 +	7.5 (5.6)	5.5 (4.1)	0.30 (0.22)

Table 4 to Subpart IIII of Part 60—Emission Standards for Stationary Fire Pump Engines

[As stated in §§60.4202(d) and 60.4205(c), you must comply with the following emission standards for stationary fire pump engines]

Maximum engine power	Model year(s)	NMHC + NO_X	CO	PM
KW<8 (HP<11)	2010 and earlier	10.5 (7.8)	8.0 (6.0)	1.0 (0.75)
	2011 +	7.5 (5.6)		0.40 (0.30)
8≤KW<19 (11≤HP<25)	2010 and earlier	9.5 (7.1)	6.6 (4.9)	0.80 (0.60)
	2011 +	7.5 (5.6)		0.40 (0.30)
19≤KW<37 (25≤HP<50)	2010 and earlier	9.5 (7.1)	5.5 (4.1)	0.80 (0.60)
	2011 +	7.5 (5.6)		0.30 (0.22)
37≤KW<56 (50≤HP<75)	2010 and earlier	10.5 (7.8)	5.0 (3.7)	0.80 (0.60)
	2011 +[1]	4.7 (3.5)		0.40 (0.30)

56≤KW<75 (75≤HP<100)	2010 and earlier	10.5 (7.8)	5.0 (3.7)	0.80 (0.60)
	2011 +[1]	4.7 (3.5)		0.40 (0.30)
75≤KW<130 (100≤HP<175)	2009 and earlier	10.5 (7.8)	5.0 (3.7)	0.80 (0.60)
	2010 +[2]	4.0 (3.0)		0.30 (0.22)
130≤KW<225 (175≤HP<300)	2008 and earlier	10.5 (7.8)	3.5 (2.6)	0.54 (0.40)
	2009 +[3]	4.0 (3.0)		0.20 (0.15)
225≤KW<450 (300≤HP<600)	2008 and earlier	10.5 (7.8)	3.5 (2.6)	0.54 (0.40)
	2009 +[3]	4.0 (3.0)		0.20 (0.15)
450≤KW≤560 (600≤HP≤750)	2008 and earlier	10.5 (7.8)	3.5 (2.6)	0.54 (0.40)
	2009 +	4.0 (3.0)		0.20 (0.15)
KW>560 (HP>750)	2007 and earlier	10.5 (7.8)	3.5 (2.6)	0.54 (0.40)
	2008 +	6.4 (4.8)		0.20 (0.15)

[1]For model years 2011-2013, manufacturers, owners and operators of fire pump stationary CI ICE in this engine power category with a rated speed of greater than 2,650 revolutions per minute (rpm) may comply with the emission limitations for 2010 model year engines.

[2]For model years 2010-2012, manufacturers, owners and operators of fire pump stationary CI ICE in this engine power category with a rated speed of greater than 2,650 rpm may comply with the emission limitations for 2009 model year engines.

[3]In model years 2009-2011, manufacturers of fire pump stationary CI ICE in this engine power category with a rated speed of greater than 2,650 rpm may comply with the emission limitations for 2008 model year engines.

APPENDIX B:

PROPOSED REVISIONS TO 40 C.F.R. PART 61

40 CFR 61 Subpart J—National Emission Standard for Equipment Leaks (Fugitive Emission Sources) of Benzene

---

Contents

SOURCE: 49 FR 23513, June 6, 1984, unless otherwise noted.

§61.110 Applicability and designation of sources.

(a) The provisions of this subpart apply to each of the following sources that are intended to operate in benzene service: pumps, compressors, pressure relief devices, sampling connection systems, open-ended valves or lines, valves, connectors, surge control vessels, bottoms receivers, and control devices or systems required by this subpart.

(b) The provisions of this subpart do not apply to sources located in coke by-product plants.

(c)(1) If an owner or operator applies for one of the exemptions in this paragraph, then the owner or operator shall maintain records as required in §61.246(i).

(2) Any equipment in benzene service that is located at a plant site designed to produce or use less than 1,000 megagrams (1,102 tons) of benzene per year is exempt from the requirements of §61.112.

(3) Any process unit (defined in §61.241) that has no equipment in benzene service is exempt from the requirements of §61.112.

(d) While the provisions of this subpart are effective, a source to which this subpart applies that is also subject to the provisions of 40 CFR part 60 only will be required to comply with the provisions of this subpart.

[49 FR 23513, June 6, 1984, as amended at 65 FR 62156, Oct. 17, 2000; 65 FR 78280, Dec. 14, 2000]

§61.111 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 61, or in subpart V of part 61, and the following terms shall have the specific meanings given them:

In benzene service means that a piece of equipment either contains or contacts a fluid (Liquid or gas) that is at least 10 percent benzene by weight as determined according to the provisions of §61.245(d). The provisions of §61.245(d) also specify how to determine that a piece of equipment is not in benzene service.

Semiannual means a 6-month period; the first semiannual period concludes on the last day of the last month during the 180 days following initial startup for new sources; and the first semiannual period concludes on the last day of the last full month during the 180 days after June 6, 1984 for existing sources.

§61.112 Standards.

(a) Each owner or operator subject to the provisions of this subpart shall comply with the requirements of subpart V of this part.

(b) An owner or operator may elect to comply with the requirements of §§61.243-1 and 61.243-2.

~~(c) An owner or operator may apply to the Administrator for a determination of an alternative means of emission limitation that achieves a reduction in emissions of benzene at least equivalent to the reduction in emissions of benzene achieved by the controls required in this subpart. In doing so, the owner or operator shall comply with requirements of §61.244.~~

~~40 CFR 61 Subpart V—National Emission Standard for Equipment Leaks (Fugitive Emission Sources)~~

~~**Contents**~~

~~SOURCE: 49 FR 23513, June 6, 1984, unless otherwise noted.~~

~~§61.240 Applicability and designation of sources.~~

~~(a) The provisions of this subpart apply to each of the following sources that are intended to operate in volatile hazardous air pollutant (VHAP) service: pumps, compressors, pressure relief devices, sampling connection systems, open-ended valves or lines, valves, connectors, surge control vessels, bottoms receivers, and control devices or systems required by this subpart.~~

~~(b) The provisions of this subpart apply to the sources listed in paragraph (a) after the date of promulgation of a specific subpart in part 61.~~

~~(c) While the provisions of this subpart are effective, a source to which this subpart applies that is also subject to the provisions of 40 CFR part 60 only will be required to comply with the provisions of this subpart.~~

~~(d) *Alternative means of compliance*—(1) *Option to comply with part 65*. Owners or operators may choose to comply with 40 CFR part 65 to satisfy the requirements of §§61.242-1 through 61.247 for equipment that is subject to this subpart and that is part of the same process unit. When choosing to comply with 40 CFR part 65, the requirements of §§61.245(d) and 61.246(i) and (j) still apply. Other provisions applying to owners or operators who choose to comply with 40 CFR part 65 are provided in 40 CFR 65.1.~~

~~(2) *Part 65, subpart C or F*. For owners or operators choosing to comply with 40 CFR part 65, each surge control vessel and bottoms receiver subject to this subpart that meets the conditions specified in table 1 or table 2 of this subpart shall meet the requirements for storage vessels in 40 CFR part 65, subpart C; all other equipment subject to this subpart shall meet the requirements in 40 CFR part 65, subpart F.~~

~~(3) *Part 61, subpart A*. Owners or operators who choose to comply with 40 CFR part 65, subpart C or F, must also comply with §§61.01, 61.02, 61.05 through 61.08, 61.10(b) through (d), 61.11, and 61.15 for that equipment. All sections and paragraphs of subpart A of this part that are not mentioned in this paragraph (d)(3) do not apply to owners or operators of equipment subject to this subpart complying with 40 CFR part 65, subpart C or F, except that provisions required to be met prior to implementing 40 CFR part 65 still apply. Owners and operators who choose to comply with 40 CFR part 65, subpart C or F, must comply with 40 CFR part 65, subpart A.~~

~~(4) *Rules referencing this subpart.* Owners or operators referenced to this subpart from subpart F or J of this part may choose to comply with 40 CFR part 65 for all equipment listed in paragraph (a) of this section.~~

~~[49 FR 23513, June 6, 1984, as amended at 65 FR 78280, Dec. 14, 2000]~~

~~§61.241 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 61, or in specific subparts of part 61; and the following terms shall have specific meaning given them:~~

~~*Bottoms receiver* means a tank that collects distillation bottoms before the stream is sent for storage or for further downstream processing.~~

~~*Closed-vent system* means a system that is not open to atmosphere and that is composed of hard-piping, ductwork, connections, and, if necessary, flow-inducing devices that transport gas or vapor from a piece or pieces of equipment to a control device or back to a process.~~

~~*Connector* means flanged, screwed, welded, or other joined fittings used to connect two pipe lines or a pipe line and a piece of equipment. For the purpose of reporting and recordkeeping, connector means flanged fittings that are not covered by insulation or other materials that prevent location of the fittings.~~

~~*Control device* means an enclosed combustion device, vapor recovery system, or flare.~~

~~*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.~~

~~*Duct work* means a conveyance system such as those commonly used for heating and ventilation systems. It is often made of sheet metal and often has sections connected by screws or crimping. Hard-piping is not ductwork.~~

~~*Equipment* means each pump, compressor, pressure relief device, sampling connection system, open-ended valve or line, valve, connector, surge control vessel, bottoms receiver in VHAP service, and any control devices or systems required by this subpart.~~

~~*First attempt at repair* means to take rapid action for the purpose of stopping or reducing leakage of organic material to atmosphere using best practices.~~

~~*In gas/vapor service* means that a piece of equipment contains process fluid that is in the gaseous state at operating conditions.~~

~~*Fuel gas* means gases that are combusted to derive useful work or heat.~~

~~*Fuel gas system* means the offsite and onsite piping and flow and pressure control system that gathers gaseous stream(s) generated by onsite operations, may blend them with other sources of gas, and transports the gaseous stream for use as fuel gas in combustion devices or in-process combustion equipment, such as furnaces and gas turbines, either singly or in combination.~~

~~*Hard-piping* means pipe or tubing that is manufactured and properly installed using good engineering judgement and standards such as ASME B31.3, Process Piping (available from the American Society of Mechanical Engineers, PO Box 2900, Fairfield, NJ 07007-2900).~~

~~*In liquid service* means that a piece of equipment is not in gas/vapor service.~~

~~*In-situ* sampling systems means nonextractive samplers or in-line samplers.~~

~~*In vacuum service* means that equipment is operating at an internal pressure which is at least 5 kilopascals (kPa) (0.7 psia) below ambient pressure.~~

~~*In VHAP service* means that a piece of equipment either contains or contacts a fluid (liquid or gas) that is at least 10 percent by weight a volatile hazardous air pollutant (VHAP) as determined according to the provisions of §61.245(d). The provisions of §61.245(d) also specify how to determine that a piece of equipment is not in VHAP service.~~

~~*In VOC service* means, for the purposes of this subpart, that (a) the piece of equipment contains or contacts a process fluid that is at least 10 percent VOC by weight (see 40 CFR 60.2 for the definition of volatile organic compound or VOC and 40 CFR 60.485(d) to determine whether a piece of equipment is not in VOC service) and (b) the piece of equipment is not in heavy liquid service as defined in 40 CFR 60.481.~~

~~*Maximum true vapor pressure* means the equilibrium partial pressure exerted by the total VHAP in the stored or transferred liquid at the temperature equal to the highest calendar-month average of the liquid storage or transfer temperature for liquids stored or transferred above or below the ambient temperature or at the local maximum monthly average temperature as reported by the National Weather Service for liquids stored or transferred at the ambient temperature, as determined:~~

~~(1) In accordance with methods described in American Petroleum Institute Publication 2517, Evaporative Loss From External Floating-Roof Tanks (incorporated by reference as specified in §61.18); or~~

~~(2) As obtained from standard reference texts; or~~

~~(3) As determined by the American Society for Testing and Materials Method D2879-83, Standard Test Method for Vapor Pressure-Temperature Relationship and Initial Decomposition Temperature of Liquids by Isoteniscope (incorporated by reference as specified in §61.18); or~~

~~(4) Any other method approved by the Administrator.~~

~~*Open-ended valve or line* means any valve, except pressure relief valves, having one side of the valve seat in contact with process fluid and one side open to atmosphere, either directly or through open piping.~~

~~*Pressure release* means the emission of materials resulting from the system pressure being greater than the set pressure of the pressure relief device.~~

~~*Process unit* means equipment assembled to produce a VHAP or its derivatives as intermediates or final products, or equipment assembled to use a VHAP in the production of a product. A process unit can operate independently if supplied with sufficient feed or raw materials and sufficient product storage facilities.~~

~~*Process unit shutdown* means a work practice or operational procedure that stops production from a process unit or part of a process unit. An unscheduled work practice or operational procedure that stops production from a process unit or part of a process unit for less than 24 hours is not a process unit shutdown. The use of spare equipment and technically feasible bypassing of equipment without stopping production are not process unit shutdowns.~~

~~*Repaired* means that equipment is adjusted, or otherwise altered, to eliminate a leak.~~

~~*Sampling connection system* means an assembly of equipment within a process unit used during periods of representative operation to take samples of the process fluid. Equipment used to take non-routine grab samples is not considered a sampling connection system.~~

~~*Semiannual* means a 6-month period; the first semiannual period concludes on the last day of the last month during the 180 days following initial startup for new sources; and the first semiannual period concludes on the last day of the last full month during the 180 days after the effective date of a specific subpart that references this subpart for existing sources.~~

~~*Sensor* means a device that measures a physical quantity or the change in a physical quantity, such as temperature, pressure, flow rate, pH, or liquid level.~~

~~*Stuffing box pressure* means the fluid (liquid or gas) pressure inside the casing or housing of a piece of equipment, on the process side of the inboard seal.~~

~~*Surge control vessel* means feed drums, recycle drums, and intermediate vessels. Surge control vessels are used within a process unit when in-process storage, mixing, or management of flow rates of volumes is needed on a recurring or ongoing basis to assist in production of a product.~~

~~*Volatile hazardous air pollutant* or *VHAP* means a substance regulated under this part for which a standard for equipment leaks of the substance has been proposed and promulgated. Benzene is a VHAP. Vinyl chloride is a VHAP.~~

~~[49 FR 23513, June 6, 1984; 49 FR 38946, Oct. 2, 1984, as amended at 51 FR 34915, Sept. 30, 1986; 54 FR 38076, Sept. 14, 1989; 65 FR 62158, Oct. 17, 2000; 65 FR 78280, Dec. 14, 2000]~~

~~§61.242-1 Standards: General.~~

~~(a) Each owner or operator subject to the provisions of this subpart shall demonstrate compliance with the requirements of §§61.242-1 to 61.242-11 for each new and existing source as required in 40 CFR 61.05, except as provided in §§61.243 and 61.244.~~

~~(b) Compliance with this subpart will be detemined by review of records, review of performance test results, and inspection using the methods and procedures specified in §61.245.~~

~~(c)(1) An owner or operator may request a determination of alternative means of emission limitation to the requirements of §§61.242-2, 61.242-3, 61.242-5, 61.242-6, 61.242-7, 61.242-8, 61.242-9 and 61.242-11 as provided in §61.244.~~

~~(2) If the Administrator makes a determination that a means of emission limitation is at least a permissible alternative to the requirements of §61.242-2, 61.242-3, 61.242-5, 61.242-6, 61.242-7, 61.242-8, 61.242-9 or 61.242-11, an owner or operator shall comply with the requirements of that determination.~~

~~(d) Each piece of equipment to which this subpart applies shall be marked in such a manner that it can be distinquished readily from other pieces of equipment.~~

~~(e) Equipment that is in vacuum service is excluded from the requirements of §61.242-2, to §61.242-11 if it is identified as required in §61.246(e)(5).~~

~~[49 FR 23513, June 6, 1984; 49 FR 38946, Oct. 2, 1984]~~

~~§61.242-2 Standards: Pumps.~~

~~(a)(1) Each pump shall be monitored monthly to detect leaks by the methods specified in §61.245(b), except as provided in §61.242-1(c) and paragraphs (d), (e), (f) and (g) of this section.~~

~~(2) Each pump shall be checked by visual inspection each calendar week for indications of liquids dripping from the pump seal.~~

~~(b)(1) If an instrument reading of 10,000 ppm or greater is measured, a leak is detected.~~

~~(2) If there are indications of liquids dripping from the pump seal, a leak is detected.~~

~~(c)(1) When a leak is detected, it shall be repaired as soon as practicable, but not later than 15 calendar days after it is detected, except as provided in §61.242-10.~~

~~(2) A first attempt at repair shall be made no later than 5 calendar days after each leak is detected.~~

~~(d) Each pump equipped with a dual mechanical seal system that includes a barrier fluid system is exempt from the requirements of paragraphs (a) and (b) of this section, provided the following requirements are met:~~

~~(1) Each dual mechanical seal system is:~~

~~(i) Operated with the barrier fluid at a pressure that is at all times greater than the pump stuffing box pressure; or~~

~~(ii) Equipped with a barrier fluid degassing reservoir that is routed to a process or fuel gas system or connected by a closed-vent system to a control device that complies with the requirements of §61.242-11; or~~

~~(iii) Equipped with a system that purges the barrier fluid into a process stream with zero VHAP emissions to atmosphere.~~

~~(2) The barrier fluid is not in VHAP service and, if the pump is covered by standards under 40 CFR part 60, is not in VOC service.~~

~~(3) Each barrier fluid system is equipped with a sensor that will detect failure of the seal system, the barrier fluid system, or both.~~

~~(4) Each pump is checked by visual inspection each calendar week for indications of liquids dripping from the pump seal.~~

~~(i) If there are indications of liquid dripping from the pump seal at the time of the weekly inspection, the pump shall be monitored as specified in §61.245 to determine the presence of VOC and VHAP in the barrier fluid.~~

~~(ii) If the monitor reading (taking into account any background readings) indicates the presence of VHAP, a leak is detected. For the purpose of this paragraph, the monitor may be calibrated with VHAP, or may employ a gas chromatography column to limit the response of the monitor to VHAP, at the option of the owner or operator.~~

~~(iii) If an instrument reading of 10,000 ppm or greater (total VOC) is measured, a leak is detected.~~

~~(5) Each sensor as described in paragraph (d)(3) of this section is checked daily or is equipped with an audible alarm.~~

~~(6)(i) The owner or operator determines, based on design considerations and operating experience, criteria applicable to the presence and frequency of drips and to the sensor that indicates failure of the seal system, the barrier fluid system, or both.~~

~~(ii) If indications of liquids dripping from the pump seal exceed the criteria established in paragraph (d)(6)(i) of this section, or if, based on the criteria established in paragraph (d)(6)(i) of this section, the sensor indicates failure of the seal system, the barrier fluid system, or both, a leak is detected.~~

~~(iii) When a leak is detected, it shall be repaired as soon as practicable, but no later than 15 calendar days after it is detected, except as provided in §61.242-10.~~

~~(iv) A first attempt at repair shall be made no later than five calendar days after each leak is detected.~~

~~(e) Any pump that is designated, as described in §61.246(e)(2), for no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background, is exempt from the requirements of paragraphs (a), (c), and (d) if the pump:~~

~~(1) Has no externally actuated shaft penetrating the pump housing,~~

~~(2) Is demonstrated to be operating with no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background, as measured by the method specified in §61.245(c), and~~

~~(3) Is tested for compliance with paragraph (e)(2) initially upon designation, annually, and at other times requested by the Administrator.~~

~~(f) If any pump is equipped with a closed-vent system capable of capturing and transporting any leakage from the seal or seals to a process or fuel gas system or to a control device that complies with the requirements of §61.242-11, it is exempt from the requirements of paragraphs (a) through (e) of this section.~~

~~(g) Any pump that is designated, as described in §61.246(f)(1), as an unsafe-to-monitor pump is exempt from the monitoring and inspection requirements of paragraphs (a) and (d)(4) through (6) of this section if:~~

~~(1) The owner or operator of the pump demonstrates that the pump is unsafe-to-monitor because monitoring personnel would be exposed to an immediate danger as a consequence of complying with paragraph (a) of this section; and~~

~~(2) The owner or operator of the pump has a written plan that requires monitoring of the pump as frequently as practicable during safe-to-monitor times but not more frequently than the periodic monitoring schedule otherwise applicable, and repair of the equipment according to the procedures in paragraph (c) of this section if a leak is detected.~~

~~(h) Any pump that is located within the boundary of an unmanned plant site is exempt from the weekly visual inspection requirement of paragraphs (a)(2) and (d)(4) of this section, and the daily requirements of paragraph (d)(5) of this section, provided that each pump is visually inspected as often as practicable and at least monthly.~~

~~[49 FR 23513, June 6, 1984, as amended at 49 FR 38946, Oct. 2, 1984; 55 FR 28349, July 10, 1990; 65 FR 78281, Dec. 14, 2000]~~

~~§61.242-3 Standards: Compressors.~~

~~(a) Each compressor shall be equipped with a seal system that includes a barrier fluid system and that prevents leakage of process fluid to atmosphere, except as provided in §61.242-1(c) and paragraphs (h) and (i) of this section.~~

~~(b) Each compressor seal system as required in paragraph (a) shall be:~~

~~(1) Operated with the barrier fluid at a pressure that is greater than the compressor stuffing box pressure; or~~

~~(2) Equipped with a barrier fluid system degassing reservoir that is routed to a process or fuel gas system or connected by a closed-vent system to a control device that complies with the requirements of §61.242-11; or~~

~~(3) Equipped with a system that purges the barrier fluid into a process stream with zero VHAP emissions to atmosphere.~~

~~(c) The barrier fluid shall not be in VHAP service and, if the compressor is covered by standards under 40 CFR part 60, shall not be in VOC service.~~

~~(d) Each barrier fluid system as described in paragraphs (a)-(c) of this section shall be equipped with a sensor that will detect failure of the seal system, barrier fluid system, or both.~~

~~(e)(1) Each sensor as required in paragraph (d) of this section shall be checked daily or shall be equipped with an audible alarm unless the compressor is located within the boundary of an unmanned plant site.~~

~~(2) The owner or operator shall determine, based on design considerations and operating experience, a criterion that indicates failure of the seal system, the barrier fluid system, or both.~~

~~(f) If the sensor indicates failure of the seal system, the barrier fluid system, or both based on the criterion determined under paragraph (e)(2) of this section, a leak is detected.~~

~~(g)(1) When a leak is detected, it shall be repaired as soon as practicable, but not later than 15 calendar days after it is detected, except as provided in §61.242-10.~~

~~(2) A first attempt at repair shall be made no later than 5 calendar days after each leak is detected.~~

~~(h) A compressor is exempt from the requirements of paragraphs (a) and (b) of this section if it is equipped with a closed-vent system to capture and transport leakage from the compressor drive shaft back to a process or fuel gas system or to a control device that complies with the requirements of §61.242-11, except as provided in paragraph (i) of this section.~~

~~(i) Any Compressor that is designated, as described in §61.246(e)(2), for no detectable emission as indicated by an instrument reading of less than 500 ppm above background is exempt from the requirements of paragraphs (a)-(h) if the compressor:~~

~~(1) Is demonstrated to be operating with no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background, as measured by the method specified in §61.245(c); and~~

~~(2) Is tested for compliance with paragraph (i)(1) initially upon designation, annually, and at other times requested by the Administrator.~~

~~[49 FR 23513, June 6, 1984; 49 FR 38946, Oct. 2, 1984, as amended at 65 FR 78281, Dec. 14, 2000]~~

~~**§61.242-4 Standards: Pressure relief devices in gas/vapor service.**~~

~~(a) Except during pressure releases, each pressure relief device in gas/vapor service shall be operated with no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background, as measured by the method specified in §61.245(c).~~

~~(b)(1) After each pressure release, the pressure relief device shall be returned to a condition of no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background, as soon as practicable, but no later than 5 calendar days after each pressure release, except as provided in §61.242-10.~~

~~(2) No later than 5 calendar days after the pressure release, the pressure relief device shall be monitored to confirm the condition of no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background, as measured by the method specified in §61.245(c).~~

~~(c) Any pressure relief device that is routed to a process or fuel gas system or equipped with a closed-vent system capable of capturing and transporting leakage from the pressure relief device to a control device as described in §61.242-11 is exempt from the requirements of paragraphs (a) and (b) of this section.~~

~~(d)(1) Any pressure relief device that is equipped with a rupture disk upstream of the pressure relief device is exempt from the requirements of paragraphs (a) and (b) of this section,~~

~~provided the owner or operator complies with the requirements in paragraph (d)(2) of this section.~~

~~(2) After each pressure release, a new rupture disk shall be installed upstream of the pressure relief device as soon as practicable, but no later than 5 calendar days after each pressure release, except as provided in §61.242-10.~~

~~[49 FR 23513, June 6, 1984; 49 FR 38946, Oct. 2, 1984, as amended at 65 FR 78281, Dec. 14, 2000]~~

~~§61.242-5 Standards: Sampling connecting systems.~~

~~(a) Each sampling connection system shall be equipped with a closed-purge, closed-loop, or closed vent system, except as provided in §61.242-1(c). Gases displaced during filling of the sample container are not required to be collected or captured.~~

~~(b) Each closed-purge, closed-loop, or closed vent system as required in paragraph (a) of this section shall comply with the requirements specified in paragraphs (b)(1) through (4) of this section:~~

~~(1) Return the purged process fluid directly to the process line; or~~

~~(2) Collect and recycle the purged process fluid; or~~

~~(3) Be designed and operated to capture and transport all the purged process fluid to a control device that complies with the requirements of §61.242-11; or~~

~~(4) Collect, store, and transport the purged process fluid to any of the following systems or facilities:~~

~~(i) A waste management unit as defined in 40 CFR 63.111 if the waste management unit is subject to and operated in compliance with the provisions of 40 CFR part 63, subpart G, applicable to Group 1 wastewater streams; or~~

~~(ii) A treatment, storage, or disposal facility subject to regulation under 40 CFR part 262, 264, 265, or 266; or~~

~~(iii) A facility permitted, licensed, or registered by a State to manage municipal or industrial solid waste, if the process fluids are not hazardous waste as defined in 40 CFR part 261.~~

~~(c) In-situ sampling systems and sampling systems without purges are exempt from the requirements of paragraphs (a) and (b) of this section.~~

~~[65 FR 78281, Dec. 14, 2000]~~

~~§61.242-6 Standards: Open-ended valves or lines.~~

~~(a)(1) Each open-ended valve or line shall be equipped with a cap, blind flange, plug, or a second valve, except as provided in §61.242-1(c).~~

~~(2) The cap, blind flange, plug, or second valve shall seal the open end at all times except during operations requiring process fluid flow through the open-ended valve or line.~~

~~(b) Each open-ended valve or line equipped with a second valve shall be operated in a manner such that the valve on the process fluid end is closed before the second valve is closed.~~

~~(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.~~

~~(d) Open-ended valves or lines in an emergency shutdown system which are designed to open automatically in the event of a process upset are exempt from the requirements of paragraphs (a), (b) and (c) of this section.~~

~~(e) Open-ended valves or lines containing materials which would autocatalytically polymerize or would present an explosion, serious overpressure, or other safety hazard if capped or equipped with a double block and bleed system as specified in paragraphs (a) through (c) of this section are exempt from the requirements of paragraphs (a) through (c) of this section.~~

~~[49 FR 23513, June 6, 1984, as amended at 65 FR 78282, Dec. 14, 2000]~~

~~§61.242-7 Standards: Valves.~~

~~(a) Each valve shall be monitored monthly to detect leaks by the method specified in §61.245(b) and shall comply with paragraphs (b)-(e), except as provided in paragraphs (f), (g), and (h) of this section, §61.243-1 or §61.243-2, and §61.242-1(c).~~

~~(b) If an instrument reading of 10,000 ppm or greater is measured, a leak is detected.~~

~~(c)(1) Any valve for which a leak is not detected for 2 successive months may be monitored the first month of every quarter, beginning with the next quarter, until a leak is detected.~~

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

~~(d)(1) When a leak is detected, it shall be repaired as soon as practicable, but no later than 15 calendar days after the leak is detected, except as provided in §61.242-10.~~

~~(2) A first attempt at repair shall be made no later than 5 calendar days after each leak is detected.~~

~~(e) First attempts at repair include, but are not limited to, the following best practices where practicable:~~

~~(1) Tightening of bonnet bolts;~~

~~(2) Replacement of bonnet bolts;~~

~~(3) Tightening of packing gland nuts; and~~

~~(4) Injection of lubricant into lubricated packing.~~

~~(f) Any valve that is designated, as described in §61.246(e)(2), for no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background, is exempt from the requirements of paragraph (a) if the valve:~~

~~(1) Has no external actuating mechanism in contact with the process fluid;~~

~~(2) Is operated with emissions less than 500 ppm above background, as measured by the method specified in §61.245(c); and~~

~~(3) Is tested for compliance with paragraph (f)(2) initially upon designation, annually, and at other times requested by the Administrator.~~

~~(g) Any valve that is designated, as described in §61.246(f)(1), as an unsafe-to-monitor valve is exempt from the requirements of paragraph (a) if:~~

~~(1) The owner or operator of the valve demonstrates that the valve is unsafe to monitor because monitoring personnel would be exposed to an immediate danger as a consequence of complying with paragraph (a); and~~

~~(2) The owner or operator of the valve has a written plan that requires monitoring of the valve as frequent as practicable during safe-to-monitor times.~~

~~(h) Any valve that is designated, as described in §61.246(f)(2), as a difficult-to-monitor valve is exempt from the requirements of paragraph (a) if:~~

~~(1) The owner or operator of the valve demonstrates that the valve cannot be monitored without elevating the monitoring personnel more than 2 meters above a support surface;~~

~~(2) The process unit within which the valve is located is an existing process unit; and~~

~~(3) The owner or operator of the valve follows a written plan that requires monitoring of the valve at least once per calendar year.~~

~~§61.242-8 Standards: Pressure relief services in liquid service and connectors.~~

~~(a) If evidence of a potential leak is found by visual, audible, olfactory, or any other detection method at pressure relief devices in liquid service and connectors, the owner or operator shall follow either one of the following procedures, except as provided in §61.242-1(c):~~

~~(1) The owner or operator shall monitor the equipment within 5 days by the method specified in §61.245(b) and shall comply with the requirements of paragraphs (b) through (d) of this section.~~

~~(2) The owner or operator shall eliminate the visual, audible, olfactory, or other indication of a potential leak.~~

~~(b) If an instrument reading of 10,000 ppm or greater is measured, a leak is detected.~~

~~(c)(1) When a leak is detected, it shall be repaired as soon as practicable, but not later than 15 calendar days after it is detected, except as provided in §61.242-10.~~

~~(2) The first attempt at repair shall be made no later than 5 calendar days after each leak is detected.~~

~~(d) First attempts at repair include, but are not limited to, the best practices described under §61.242-7(e).~~

~~[49 FR 23513, June 6, 1984; 49 FR 38946, Oct. 2, 1984, as amended at 65 FR 78282, Dec. 14, 2000]~~

~~§61.242-9 Standards: Surge control vessels and bottoms receivers.~~

~~Each surge control vessel or bottoms receiver that is not routed back to the process and that meets the conditions specified in table 1 or table 2 of this subpart shall be equipped with a closed-vent system capable of capturing and transporting any leakage from the vessel back to the process or to a control device as described in §61.242-11, except as provided in §61.242-1(c); or comply with the requirements of 40 CFR 63.119(b) or (c).~~

~~[65 FR 78282, Dec. 14, 2000]~~

~~§61.242-10 Standards: Delay of repair.~~

~~(a) Delay of repair of equipment for which leaks have been detected will be allowed if repair within 15 days is technically infeasible without a process unit shutdown. Repair of this equipment shall occur before the end of the next process unit shutdown.~~

~~(b) Delay of repair of equipment for which leaks have been detected will be allowed for equipment that is isolated from the process and that does not remain in VHAP service.~~

~~(c) Delay of repair for valves will be allowed if:~~

~~(1) The owner or operator demonstrates that emissions of purged material resulting from immediate repair are greater than the fugitive emissions likely to result from delay of repair, and~~

~~(2) When repair procedures are effected, the purged material is collected and destroyed or recovered in a control device complying with §61.242-11.~~

~~(d) Delay of repair for pumps will be allowed if:~~

~~(1) Repair requires the use of a dual mechanical seal system that includes a barrier fluid system, and~~

~~(2) Repair is completed as soon as practicable, but not later than 6 months after the leak was detected.~~

~~(e) Delay of repair beyond a process unit shutdown will be allowed for a valve if valve assembly replacement is necessary during the process unit shutdown, valve assembly supplies have been depleted, and valve assembly supplies had been sufficiently stocked before the supplies were depleted. Delay of repair beyond the next process unit shutdown will not be allowed unless the next process unit shutdown occurs sooner than 6 months after the first process unit shutdown.~~

~~[49 FR 23513, June 6, 1984, as amended at 65 FR 78282, Dec. 14, 2000]~~

~~§61.242-11 Standards: Closed-vent systems and control devices.~~

~~(a) Owners or operators of closed-vent systems and control devices used to comply with provisions of this subpart shall comply with the provisions of this section, except as provided in §61.242-1(c).~~

~~(b) Vapor recovery systems (for example, condensers and absorbers) shall be designed and operated to recover the organic vapors vented to them with an efficiency of 95 percent or greater, or to an exit concentration of 20 parts per million by volume, whichever is less stringent.~~

~~(c) Enclosed combustion devices shall be designed and operated to reduce the VHAP emissions vented to them with an efficiency of 95 percent or greater, or to an exit~~

~~concentration of 20 parts per million by volume, on a dry basis, corrected to 3 percent oxygen, whichever is less stringent, or to provide a minimum residence time of 0.50 seconds at a minimum temperature of 760 °C.~~

~~(d) Flares shall used to comply with this subpart shall comply with the requirements of §60.18.~~

~~(e) Owners or operators of control devices that are used to comply with the provisions of this subpart shall monitor these control devices to ensure that they are operated and maintained in conformance with their design.~~

~~(f) Except as provided in paragraphs (i) through (k) of this section, each closed vent system shall be inspected according to the procedures and schedule specified in paragraph (f)(1) or (2) of this section, as applicable.~~

~~(1) If the vapor collection system or closed vent system is constructed of hard-piping, the owner or operator shall comply with the following requirements:~~

~~(i) Conduct an initial inspection according to the procedures in §61.245(b); and~~

~~(ii) Conduct annual visual inspections for visible, audible, or olfactory indications of leaks.~~

~~(2) If the vapor collection system or closed vent system is constructed of ductwork, the owner or operator shall:~~

~~(i) Conduct an initial inspection according to the procedures in §61.245(b); and~~

~~(ii) Conduct annual inspections according to the procedures in §61.245(b).~~

~~(g) Leaks, as indicated by an instrument reading greater than 500 parts per million by volume above background or by visual inspections, shall be repaired as soon as practicable except as provided in paragraph (h) of this section.~~

~~(1) A first attempt at repair shall be made no later than 5 calendar days after the leak is detected.~~

~~(2) Repair shall be completed no later than 15 calendar days after the leak is detected.~~

~~(h) Delay of repair of a closed vent system for which leaks have been detected is allowed if the repair is technically infeasible without a process unit shutdown, or if the owner or operator determines that emissions resulting from immediate repair would be greater than the fugitive emissions likely to result from delay of repair. Repair of such equipment shall be complete by the end of the next process unit shutdown.~~

~~(i) If a vapor collection system or closed vent system is operated under a vacuum, it is exempt from the inspection requirements of paragraphs (f)(1)(i) and (2) of this section.~~

~~(j) Any parts of the closed vent system that are designated, as described in paragraph (l)(1) of this section, as unsafe-to-inspect are exempt from the inspection requirements of paragraphs (f)(1)(i) and (2) of this section if they comply with the following requirements:~~

~~(1) The owner or operator determines that the equipment is unsafe-to-inspect because inspecting personnel would be exposed to an imminent or potential danger as a consequence of complying with paragraph (f)(1)(i) or (2) of this section; and~~

~~(2) The owner or operator has a written plan that requires inspection of the equipment as frequently as practicable during safe-to-inspect times.~~

~~(k) Any parts of the closed vent system that are designated, as described in paragraph (l)(2) of this section, as difficult-to-inspect are exempt from the inspection requirements of paragraphs (f)(1)(i) and (2) of this section if they comply with the following requirements:~~

~~(1) The owner or operator determines that the equipment cannot be inspected without elevating the inspecting personnel more than 2 meters above a support surface; and~~

~~(2) The owner or operator has a written plan that requires inspection of the equipment at least once every 5 years. A closed vent system is exempt from inspection if it is operated under a vacuum.~~

~~(l) The owner or operator shall record the following information:~~

~~(1) Identification of all parts of the closed vent system that are designated as unsafe-to-inspect, an explanation of why the equipment is unsafe-to-inspect, and the plan for inspecting the equipment.~~

~~(2) Identification of all parts of the closed vent system that are designated as difficult-to-inspect, an explanation of why the equipment is difficult-to-inspect, and the plan for inspecting the equipment.~~

~~(3) For each inspection during which a leak is detected, a record of the information specified in §61.246(c).~~

~~(4) For each inspection conducted in accordance with §61.245(b) during which no leaks are detected, a record that the inspection was performed, the date of the inspection, and a statement that no leaks were detected.~~

~~(5) For each visual inspection conducted in accordance with paragraph (f)(1)(ii) of this section during which no leaks are detected, a record that the inspection was performed, the date of the inspection, and a statement that no leaks were detected.~~

~~(m) Closed vent systems and control devices used to comply with provisions of this subpart shall be operated at all times when emissions may be vented to them.~~

~~[49 FR 23513, June 6, 1984; 49 FR 38946, Oct. 2, 1984, as amended at 51 FR 2702, Jan. 21, 1986; 65 FR 62158, Oct. 17, 2000; 65 FR 78282, Dec. 14, 2000]~~

~~§61.243-1 Alternative standards for valves in VHAP service—allowable percentage of valves leaking.~~

~~(a) An owner or operator may elect to have all valves within a process unit to comply with an allowable percentage of valves leaking of equal to or less than 2.0 percent.~~

~~(b) The following requirements shall be met if an owner or operator decides to comply with an allowable percentage of valves leaking:~~

~~(1) An owner or operator must notify the Administrator that the owner or operator has elected to have all valves within a process unit to comply with the allowable percentage of valves leaking before implementing this alternative standard, as specified in §61.247(d).~~

~~(2) A performance test as specified in paragraph (c) of this section shall be conducted initially upon designation, annually, and at other times requested by the Administrator.~~

~~(3) If a valve leak is detected, it shall be repaired in accordance with §61.242-7(d) and (e).~~

~~(c) Performance tests shall be conducted in the following manner:~~

~~(1) All valves in VHAP service within the process unit shall be monitored within 1 week by the methods specified in §61.245(b).~~

~~(2) If an instrument reading of 10,000 ppm or greater is measured, a leak is detected.~~

~~(3) The leak percentage shall be determined by dividing the number of valves in VHAP service for which leaks are detected by the number of valves in VHAP service within the process unit.~~

~~(d) Owner or operators who elect to have all valves comply with this alternative standard shall not have a process unit with a leak percentage greater than 2.0 percent.~~

~~(e) If an owner or operator decides no longer to comply with §61.243-1, the owner or operator must notify the Administrator in writing that the work practice standard described in §61.242-7(a)-(e) will be followed.~~

~~§61.243-2 Alternative standards for valves in VHAP service—skip period leak detection and repair.~~

~~(a)(1) An owner or operator may elect for all valves within a process unit to comply with one of the alternative work practices specified in paragraphs (b)(2) and (3) of this section.~~

~~(2) An owner or operator must notify the Administrator before implementing one of the alternative work practices, as specified in §61.247(d).~~

~~(b)(1) An owner or operator shall comply initially with the requirements for valves, as described in §61.242-7.~~

~~(2) After 2 consecutive quarterly leak detection periods with the percentage of valves leaking equal to or less than 2.0, an owner or operator may begin to skip one of the quarterly leak detection periods for the valves in VHAP service.~~

~~(3) After five consecutive quarterly leak detection periods with the percentage of valves leaking equal to or less than 2.0, an owner or operator may begin to skip three of the quarterly leak detection periods for the valves in VHAP service.~~

~~(4) If the percentage of valves leaking is greater than 2.0, the owner or operator shall comply with the requirements as described in §61.242-7 but may again elect to use this section.~~

~~[49 FR 23513, June 6, 1984, as amended at 65 FR 62158, Oct. 17, 2000]~~

~~§61.244 Alternative means of emission limitation.~~

~~(a) Permission to use an alternative means of emission limitation under section 112(e)(3) of the Clean Air Act shall be governed by the following procedures:~~

~~(b) Where the standard is an equipment, design, or operational requirement:~~

~~(1) Each owner or operator applying for permission shall be responsible for collecting and verifying test data for an alternative means of emission limitation to test data for the equipment, design, and operational requirements.~~

~~(2) The Administrator may condition the permission on requirements that may be necessary to assure operation and maintenance to achieve the same emission reduction as the equipment, design, and operational requirements.~~

~~(c) Where the standard is a work practice:~~

~~(1) Each owner or operator applying for permission shall be responsible for collecting and verifying test data for an alternative means of emission limitation.~~

~~(2) For each source for which permission is requested, the emission reduction achieved by the required work practices shall be demonstrated for a minimum period of 12 months.~~

~~(3) For each source for which permission is requested, the emission reduction achieved by the alternative means of emission limitation shall be demonstrated.~~

~~(4) Each owner or operator applying for permission shall commit in writing each source to work practices that provide for emission reductions equal to or greater than the emission reductions achieved by the required work practices.~~

~~(5) The Administrator will compare the demonstrated emission reduction for the alternative means of emission limitation to the demonstrated emission reduction for the required work practices and will consider the commitment in paragraph (c)(4).~~

~~(6) The Administrator may condition the permission on requirements that may be necessary to assure operation and maintenance to achieve the same emission reduction as the required work practices of this subpart.~~

~~(d) An owner or operator may offer a unique approach to demonstrate the alternative means of emission limitation.~~

~~(e)(1) Manufacturers of equipment used to control equipment leaks of a VHAP may apply to the Administrator for permission for an alternative means of emission limitation that achieves a reduction in emissions of the VHAP achieved by the equipment, design, and operational requirements of this subpart.~~

~~(2) The Administrator will grant permission according to the provisions of paragraphs (b), (c), and (d).~~

~~[49 FR 23513, June 6, 1984, as amended at 65 FR 62158, Oct. 17, 2000]~~

~~§61.246 Recordkeeping requirements.~~

~~(a)(1) Each owner or operator subject to the provisions of this subpart shall comply with the recordkeeping requirements of this section.~~

~~(2) An owner or operator of more than one process unit subject to the provisions of this subpart may comply with the recordkeeping requirements for these process units in one recordkeeping system if the system identifies each record by each process unit.~~

~~(b) When each leak is detected as specified in §§61.242-2, 61.242-3, 61.242-7, 61.242-8, and 61.135, the following requirements apply:~~

~~(1) A weatherproof and readily visible identification, marked with the equipment identification number, shall be attached to the leaking equipment.~~

~~(2) The identification on a valve may be removed after it has been monitored for 2 successive months as specified in §61.242-7(c) and no leak has been detected during those 2 months.~~

~~(3) The identification on equipment, except on a valve, may be removed after it has been repaired.~~

~~(c) When each leak is detected as specified in §§61.242-2, 61.242-3. 61.242-7, 61.242-8, and 61.135, the following information shall be recorded in a log and shall be kept for 2 years in a readily accessible location:~~

~~(1) The instrument and operator identification numbers and the equipment identification number.~~

~~(2) The date the leak was detected and the dates of each attempt to repair the leak.~~

~~(3) Repair methods applied in each attempt to repair the leak.~~

~~(4) "Above 10,000" if the maximum instrument reading measured by the methods specified in §61.245(a) after each repair attempt is equal to or greater than 10,000 ppm.~~

~~(5) "Repair delayed" and the reason for the delay if a leak is not repaired within 15 calendar days after discovery of the leak.~~

~~(6) The signature of the owner or operator (or designate) whose decision it was that repair could not be effected without a process shutdown.~~

~~(7) The expected date of successful repair of the leak if a leak is not repaired within 15 calendar days.~~

~~(8) Dates of process unit shutdowns that occur while the equipment is unrepaired.~~

~~(9) The date of successful repair of the leak.~~

~~(d) The following information pertaining to the design requirements for closed-vent systems and control devices described in §61.242-11 shall be recorded and kept in a readily accessible location:~~

~~(1) Detailed schematics, design specifications, and piping and instrumentation diagrams.~~

~~(2) The dates and descriptions of any changes in the design specifications.~~

~~(3) A description of the parameter or parameters monitored, as required in §61.242-11(e), to ensure that control devices are operated and maintained in conformance with their design and an explanation of why that parameter (or parameters) was selected for the monitoring.~~

~~(4) Periods when the closed-vent systems and control devices required in §§61.242-2, 61.242-3, 61.242-4, 61.242-5 and 61.242-9 are not operated as designed, including periods when a flare pilot light does not have a flame.~~

~~(5) Dates of startups and shutdowns of the closed-vent systems and control devices required in §§61.242-2, 61.242-3, 61.242-4, 61.242-5 and 61.242-9.~~

~~(e) The following information pertaining to all equipment to which a standard applies shall be recorded in a log that is kept in a readily accessible location:~~

~~(1) A list of identification numbers for equipment (except welded fittings) subject to the requirements of this subpart.~~

~~(2)(i) A list of identification numbers for equipment that the owner or operator elects to designate for no detectable emissions as indicated by an instrument reading of less than 500 ppm above background.~~

~~(ii) The designation of this equipment for no detectable emissions shall be signed by the owner or operator.~~

~~(3) A list of equipment identification numbers for pressure relief devices required to comply with §61.242-4(a).~~

~~(4)(i) The dates of each compliance test required in §§61.242-2(e), 61.242-3(i), 61.242-4, 61.242-7(f), and 61.135(g).~~

~~(ii) The background level measured during each compliance test.~~

~~(iii) The maximum instrument reading measured at the equipment during each compliance test.~~

~~(5) A list of identification numbers for equipment in vacuum service.~~

~~(f) The following information pertaining to all valves subject to the requirements of §61.242-7(g) and (h) and to all pumps subject to the requirements of §61.242-2(g) shall be recorded in a log that is kept in a readily accessible location:~~

~~(1) A list of identification numbers for valves and pumps that are designated as unsafe to monitor, an explanation for each valve or pump stating why the valve or pump is unsafe to monitor, and the plan for monitoring each valve or pump.~~

~~(2) A list of identification numbers for valves that are designated as difficult to monitor, an explanation for each valve stating why the valve is difficult to monitor, and the planned schedule for monitoring each valve.~~

~~(g) The following information shall be recorded for valves complying with §61.243-2:~~

~~(1) A schedule of monitoring.~~

~~(2) The percent of valves found leaking during each monitoring period.~~

~~(h) The following information shall be recorded in a log that is kept in a readily accessible location:~~

~~(1) Design criterion required in §§61.242-2(d)(5), 61.242-3(e)(2), and 61.135(e)(4) and an explanation of the design criterion; and~~

~~(2) Any changes to this criterion and the reasons for the changes.~~

~~(i) The following information shall be recorded in a log that is kept in a readily accessible location for use in determining exemptions as provided in the applicability section of this subpart and other specific subparts:~~

~~(1) An analysis demonstrating the design capacity of the process unit, and~~

~~(2) An analysis demonstrating that equipment is not in VHAP service.~~

~~(j) Information and data used to demonstrate that a piece of equipment is not in VHAP service shall be recorded in a log that is kept in a readily accessible location.~~

~~[49 FR 23513, June 6, 1984, as amended at 49 FR 38946, Oct. 2, 1984; 54 FR 38077, Sept. 14, 1989; 65 FR 78283, Dec. 14, 2000]~~

~~§61.247 Reporting requirements.~~

~~(a)(1) An owner or operator of any piece of equipment to which this subpart applies shall submit a statement in writing notifying the Administrator that the requirements of §§61.242, 61.245, 61.246, and 61.247 are being implemented.~~

~~(2) In the case of an existing source or a new source which has an initial startup date preceding the effective date, the statement is to be submitted within 90 days of the effective date, unless a waiver of compliance is granted under §61.11, along with the information required under §61.10. If a waiver of compliance is granted, the statement is to be submitted on a date scheduled by the Administrator.~~

~~(3) In the case of new sources which did not have an initial startup date preceding December 14, 2000, the statement required under paragraph (a)(1) of this section shall be submitted with the application for approval of construction, as described in §61.07.~~

~~(4) For owners and operators complying with 40 CFR part 65, subpart C or F, the statement required under paragraph (a)(1) of this section shall notify the Administrator that the requirements of 40 CFR part 65, subpart C or F, are being implemented.~~

~~(5) The statement is to contain the following information for each source:~~

~~(i) Equipment identification number and process unit identification.~~

~~(ii) Type of equipment (for example, a pump or pipeline valve).~~

~~(iii) Percent by weight VHAP in the fluid at the equipment.~~

~~(iv) Process fluid state at the equipment (gas/vapor or liquid).~~

~~(v) Method of compliance with the standard (for example, "monthly leak detection and repair" or "equipped with dual mechanical seals").~~

~~(b) A report shall be submitted to the Administrator semiannually starting 6 months after the initial report required in paragraph (a) of this section, that includes the following information:~~

~~(1) Process unit identification.~~

~~(2) For each month during the semiannual reporting period,~~

~~(i) Number of valves for which leaks were detected as described in §61.242-7(b) of §61.243-2.~~

~~(ii) Number of valves for which leaks were not repaired as required in §61.242-7(d).~~

~~(iii) Number of pumps for which leaks were detected as described in §61.242-2 (b) and (d)(6).~~

~~(iv) Number of pumps for which leaks were not repaired as required in §61.242-2 (c) and (d)(6).~~

~~(v) Number of compressors for which leaks were detected as described in §61.242-3(f).~~

~~(vi) Number of compressors for which leaks were not repaired as required in §61.242-3(g).~~

~~(vii) The facts that explain any delay of repairs and, where appropriate, why a process unit shutdown was technically infeasible.~~

~~(3) Dates of process unit shutdowns which occurred within the semiannual reporting period.~~

~~(4) Revisions to items reported according to paragraph (a) if changes have occurred since the initial report or subsequent revisions to the initial report.~~

~~NOTE: Compliance with the requirements of §61.10(c) is not required for revisions documented under this paragraph.~~

~~(5) The results of all performance tests and monitoring to determine compliance with no detectable emissions and with §§61.243-1 and 61.243-2 conducted within the semiannual reporting period.~~

~~(c) In the first report submitted as required in paragraph (a) of this section, the report shall include a reporting schedule stating the months that semiannual reports shall be submitted. Subsequent reports shall be submitted according to that schedule, unless a revised schedule has been submitted in a previous semiannual report.~~

~~(d) An owner or operator electing to comply with the provisions of §§61.243-1 and 61.243-2 shall notify the Administrator of the alternative standard selected 90 days before implementing either of the provisions.~~

~~(e) An application for approval of construction or modification, §§61.05(a) and 61.07, will not be required if —~~

~~(1) The new source complies with the standard, §61.242;~~

~~(2) The new source is not part of the construction of a process unit; and~~

~~(3) In the next semiannual report required by paragraph (b) of this section, the information in paragraph (a)(5) of this section is reported.~~

~~(f) For owners or operators choosing to comply with 40 CFR part 65, subpart C or F, an application for approval of construction or modification, as required under §§61.05 and 61.07 will not be required if:~~

~~(1) The new source complies with 40 CFR 65.106 through 65.115 and with 40 CFR part 65, subpart C, for surge control vessels and bottoms receivers;~~

~~(2) The new source is not part of the construction of a process unit; and~~

~~(3) In the next semiannual report required by 40 CFR 65.120(b) and 65.48(b), the information in paragraph (a)(5) of this section is reported.~~

~~[49 FR 23513, June 6, 1984, as amended at 49 FR 38947, Oct. 2, 1984; 54 FR 38077, Sept. 14, 1989; 65 FR 78283, Dec. 14, 2000]~~

~~Table 1 to Subpart V of Part 61—Surge Control Vessels and Bottoms Receivers at Existing Sources~~

~~Vessel capacity (cubic meters)~~	~~Vapor pressure[1] (kilopascals)~~
~~75 ≤capacity <151~~	~~≥13.1~~
~~151 ≤capacity~~	~~≥5.2~~

~~[1]Maximum true vapor pressure as defined in §61.241.~~

~~[65 FR 78283, Dec. 14, 2000]~~

~~Table 2 to Subpart V of Part 61—Surge Control Vessels and Bottoms Receivers at New Sources~~

~~Vessel capacity (cubic meters)~~	~~Vapor pressure[1] (kilopascals)~~
~~38 ≤capacity <151~~	~~≥13.1~~
~~151 ≤capacity~~	~~≥0.7~~

~~[1]Maximum true vapor pressure as defined in §61.241.~~

~~[65 FR 78283, Dec. 14, 2000]~~

40 CFR 61 Subpart FF—National Emission Standard for Benzene Waste Operations

Contents

SOURCE: 55 FR 8346, Mar. 7, 1990, unless otherwise noted.

§61.340 Applicability.

(a) The provisions of this subpart apply to owners and operators of chemical manufacturing plants, coke by-product recovery plants, and petroleum refineries.

(b) The provisions of this subpart apply to owners and operators of hazardous waste treatment, storage, and disposal facilities that treat, store, or dispose of hazardous waste generated by any facility listed in paragraph (a) of this section. The waste streams at hazardous waste treatment, storage, and disposal facilities subject to the provisions of this subpart are the benzene-containing hazardous waste from any facility listed in paragraph (a) of this section. A hazardous waste treatment, storage, and disposal facility is a facility that must obtain a hazardous waste management permit under subtitle C of the Solid Waste Disposal Act.

(c) At each facility identified in paragraph (a) or (b) of this section, the following waste is exempt from the requirements of this subpart:

(1) Waste in the form of gases or vapors that is emitted from process fluids:

(2) Waste that is contained in a segregated stormwater sewer system.

(d) At each facility identified in paragraph (a) or (b) of this section, any gaseous stream from a waste management unit, treatment process, or wastewater treatment system routed to a fuel gas system, as defined in §61.341, is exempt from this subpart. No testing, monitoring, recordkeeping, or reporting is required under this subpart for any gaseous stream from a waste management unit, treatment process, or wastewater treatment unit routed to a fuel gas system.

[55 FR 8346, Mar. 7, 1990, as amended at 55 FR 37231, Sept. 10, 1990; 58 FR 3095, Jan. 7, 1993; 67 FR 68531, Nov. 12, 2002]

§61.341 Definitions.

Benzene concentration means the fraction by weight of benzene in a waste as determined in accordance with the procedures specified in §61.355 of this subpart.

Car-seal means a seal that is placed on a device that is used to change the position of a valve (e.g., from opened to closed) in such a way that the position of the valve cannot be changed without breaking the seal.

Chemical manufacturing plant means any facility engaged in the production of chemicals by chemical, thermal, physical, or biological processes for use as a product, co-product, by-product, or intermediate including but not limited to industrial organic chemicals, organic pesticide products, pharmaceutical preparations, paint and allied products, fertilizers, and agricultural chemicals. Examples of chemical manufacturing plants include facilities at which process units are operated to produce one or more of the following chemicals: benzenesulfonic acid, benzene, chlorobenzene, cumene, cyclohexane, ethylene, ethylbenzene, hydroquinone, linear alklylbenzene, nitrobenzene, resorcinol, sulfolane, or styrene.

Closed-vent system means a system that is not open to the atmosphere and is composed of piping, ductwork, connections, and, if necessary, flow inducing devices that transport gas or vapor from an emission source to a control device.

Coke by-product recovery plant means any facility designed and operated for the separation and recovery of coal tar derivatives (by-products) evolved from coal during the coking process of a coke oven battery.

Container means any portable waste management unit in which a material is stored, transported, treated, or otherwise handled. Examples of containers are drums, barrels, tank trucks, barges, dumpsters, tank cars, dump trucks, and ships.

Control device means an enclosed combustion device, vapor recovery system, or flare.

Cover means a device or system which is placed on or over a waste placed in a waste management unit so that the entire waste surface area is enclosed and sealed to minimize air emissions. A cover may have openings necessary for operation, inspection, and maintenance of the waste management unit such as access hatches, sampling ports, and gauge wells provided that each opening is closed and sealed when not in use. Example of covers include a fixed roof installed on a tank, a lid installed on a container, and an air-supported enclosure installed over a waste management unit.

External floating roof means a pontoon-type or double-deck type cover with certain rim sealing mechanisms that rests on the liquid surface in a waste management unit with no fixed roof.

Facility means all process units and product tanks that generate waste within a stationary source, and all waste management units that are used for waste treatment, storage, or disposal within a stationary source.

Fixed roof means a cover that is mounted on a waste management unit in a stationary manner and that does not move with fluctuations in liquid level.

Floating roof means a cover with certain rim sealing mechanisms consisting of a double deck, pontoon single deck, internal floating cover or covered floating roof, which rests upon and is supported by the liquid being contained, and is equipped with a closure seal or seals to close the space between the roof edge and unit wall.

Flow indicator means a device which indicates whether gas flow is present in a line or vent system.

Fuel gas system means the offsite and onsite piping and control system that gathers gaseous streams generated by facility operations, may blend them with sources of gas, if available, and transports the blended gaseous fuel at suitable pressures for use as fuel in heaters, furnaces, boilers, incinerators, gas turbines, and other combustion devices located within or outside the facility. The fuel is piped directly to each individual combustion device, and the system typically operates at pressures over atmospheric.

Individual drain system means the system used to convey waste from a process unit, product storage tank, or waste management unit to a waste management unit. The term includes all process drains and common junction boxes, together with their associated sewer lines and other junction boxes, down to the receiving waste management unit.

Internal floating roof means a cover that rests or floats on the liquid surface inside a waste management unit that has a fixed roof.

Liquid-mounted seal means a foam or liquid-filled primary seal mounted in contact with the liquid between the waste management unit wall and the floating roof continuously around the circumference.

Loading means the introduction of waste into a waste management unit but not necessarily to complete capacity (also referred to as filling).

Maximum organic vapor pressure means the equilibrium partial pressure exerted by the waste at the temperature equal to the highest calendar-month average of the waste storage temperature for waste stored above or below the ambient temperature or at the local maximum monthly average temperature as reported by the National Weather Service for waste stored at the ambient temperature, as determined:

(1) In accordance with §60.17(c); or

(2) As obtained from standard reference texts; or

(3) In accordance with §60.17(a)(37); or

(4) Any other method approved by the Administrator.

No detectable emissions means less than ~~**500**~~ **[50]** parts per million by volume (ppmv) above background levels, as measured by a detection instrument reading in accordance with the procedures specified in §61.355(h) of this subpart.

Oil-water separator means a waste management unit, generally a tank or surface impoundment, used to separate oil from water. An oil-water separator consists of not only the separation unit but also the forebay and other separator basins, skimmers, weirs, grit chambers, sludge hoppers, and bar screens that are located directly after the individual drain system and prior to additional treatment units such as an air flotation unit, clarifier, or biological treatment unit. Examples of an oil-water separator incude an API separator, parallel-plate interceptor, and corrugated-plate interceptor with the associated ancillary equipment.

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.

Point of waste generation means the location where the waste stream exits the process unit component or storage tank prior to handling or treatment in an operation that is not an integral part of the production process, or in the case of waste management units that generate new wastes after treatment, the location where the waste stream exits the waste management unit component.

Process unit means equipment assembled and connected by pipes or ducts to produce intermediate or final products. A process unit can be operated independently if supplied with sufficient fuel or raw materials and sufficient product storage facilities.

Process unit turnaround means the shutting down of the operations of a process unit, the purging of the contents of the process unit, the maintenance or repair work, followed by restarting of the process.

Process unit turnaround waste means a waste that is generated as a result of a process unit turnaround.

Process wastewater means water which comes in contact with benzene during manufacturing or processing operations conducted within a process unit. Process wastewater is not organic wastes, process fluids, product tank drawdown, cooling tower blowdown, steam trap condensate, or landfill leachate.

Process wastewater stream means a waste stream that contains only process wastewater.

Product tank means a stationary unit that is designed to contain an accumulation of materials that are fed to or produced by a process unit, and is constructed primarily of non-earthen materials (e.g., wood, concrete, steel, plastic) which provide structural support.

Product tank drawdown means any material or mixture of materials discharged from a product tank for the purpose of removing water or other contaminants from the product tank.

Safety device means a closure device such as a pressure relief valve, frangible disc, fusible plug, or any other type of device which functions exclusively to prevent physical damage or permanent deformation to a unit or its air emission control equipment by venting gases or vapors directly to the atmosphere during unsafe conditions resulting from an unplanned, accidental, or emergency event. For the purpose of this subpart, a safety device is not used for routine venting of gases or vapors from the vapor headspace underneath a cover such as during filling of the unit or to adjust the pressure in this vapor headspace in response to normal daily diurnal ambient temperature fluctuations. A safety device is designed to remain in a closed position during normal operations and open only when the internal pressure, or another relevant parameter, exceeds the device threshold setting applicable to the air emission control equipment as determined by the owner or operator based on manufacturer recommendations, applicable regulations, fire protection and prevention codes, standard engineering codes and practices, or other requirements for the safe handling of flammable, ignitable, explosive, reactive, or hazardous materials.

Segregated stormwater sewer system means a drain and collection system designed and operated for the sole purpose of collecting rainfall runoff at a facility, and which is segregated from all other individual drain systems.

Sewer line means a lateral, trunk line, branch line, or other enclosed conduit used to convey waste to a downstream waste management unit.

Slop oil means the floating oil and solids that accumulate on the surface of an oil-water separator.

Sour water stream means a stream that:

(1) Contains ammonia or sulfur compounds (usually hydrogen sulfide) at concentrations of 10 ppm by weight or more;

(2) Is generated from separation of water from a feed stock, intermediate, or product that contained ammonia or sulfur compounds; and

(3) Requires treatment to remove the ammonia or sulfur compounds.

Sour water stripper means a unit that:

(1) Is designed and operated to remove ammonia or sulfur compounds (usually hydrogen sulfide) from sour water streams;

(2) Has the sour water streams transferred to the stripper through hard piping or other enclosed system; and

(3) Is operated in such a manner that the offgases are sent to a sulfur recovery unit, processing unit, incinerator, flare, or other combustion device.

Surface impoundment means a waste management unit which is a natural topographic depression, man-made excavation, or diked area formed primarily of earthen materials (although it may be lined with man-made materials), which is designed to hold an accumulation of liquid wastes or waste containing free liquids, and which is not an injection well. Examples of surface impoundments are holding, storage, settling, and aeration pits, ponds, and lagoons.

Tank means a stationary waste management unit that is designed to contain an accumulation of waste and is constructed primarily of nonearthen materials (e.g., wood, concrete, steel, plastic) which provide structural support.

Treatment process means a stream stripping unit, thin-film evaporation unit, waste incinerator, or any other process used to comply with §61.348 of this subpart.

Vapor-mounted seal means a foam-filled primary seal mounted continuously around the perimeter of a waste management unit so there is an annular vapor space underneath the seal. The annular vapor space is bounded by the bottom of the primary seal, the unit wall, the liquid surface, and the floating roof.

Waste means any material resulting from industrial, commercial, mining or agricultural operations, or from community activities that is discarded or is being accumulated, stored, or physically, chemically, thermally, or biologically treated prior to being discarded, recycled, or discharged.

Waste management unit means a piece of equipment, structure, or transport mechanism used in handling, storage, treatment, or disposal of waste. Examples of a waste management unit include a tank, surface impoundment, container, oil-water separator, individual drain system, steam stripping unit, thin-film evaporation unit, waste incinerator, and landfill.

Waste stream means the waste generated by a particular process unit, product tank, or waste management unit. The characteristics of the waste stream (e.g., flow rate, benzene concentration, water content) are determined at the point of waste generation. Examples of a waste stream include process wastewater, product tank drawdown, sludge and slop oil removed from waste management units, and landfill leachate.

Wastewater treatment system means any component, piece of equipment, or installation that receives, manages, or treats process wastewater, product tank drawdown, or landfill leachate prior to direct or indirect discharge in accordance with the National Pollutant Discharge Elimination System permit regulations under 40 CFR part 122. These systems typically include individual drain systems, oil-water separators, air flotation units, equalization tanks, and biological treatment units.

Water seal controls means a seal pot, p-leg trap, or other type of trap filled with water (e.g., flooded sewers that maintain water levels adequate to prevent air flow through the system) that creates a water barrier between the sewer line and the atmosphere. The water level of the seal must be maintained in the vertical leg of a drain in order to be considered a water seal.

[55 FR 8346, Mar. 7, 1990; 55 FR 12444, Apr. 3, 1990, as amended at 58 FR 3095, Jan. 7, 1993; 67 FR 68531, Nov. 12, 2002]

§61.342 Standards: General.

(a) An owner or operator of a facility at which the total annual benzene quantity from facility waste is less than 10 megagrams per year (Mg/yr) (11 ton/yr) shall be exempt from the requirements of paragraphs (b) and (c) of this section. The total annual benzene quantity from facility waste is the sum of the annual benzene quantity for each waste stream at the facility that has a flow-weighted annual average water content greater than 10 percent or that is mixed with water, or other wastes, at any time and the mixture has an annual average water content greater than 10 percent. The benzene quantity in a waste stream is to be counted only once without multiple counting if other waste streams are mixed with or generated from the original waste stream. Other specific requirements for calculating the total annual benzene waste quantity are as follows:

(1) Wastes that are exempted from control under §§61.342(c)(2) and 61.342(c)(3) are included in the calculation of the total annual benzene quantity if they have an annual average water content greater than 10 percent, or if they are mixed with water or other wastes at any time and the mixture has an annual average water content greater than 10 percent.

(2) The benzene in a material subject to this subpart that is sold is included in the calculation of the total annual benzene quantity if the material has an annual average water content greater than 10 percent.

(3) Benzene in wastes generated by remediation activities conducted at the facility, such as the excavation of contaminated soil, pumping and treatment of groundwater, and the recovery of product from soil or groundwater, are not included in the calculation of total annual benzene quantity for that facility. If the facility's total annual benzene quantity is 10 Mg/yr (11 ton/yr) or more, wastes generated by remediation activities are subject to the requirements of paragraphs (c) through (h) of this section. If the facility is managing remediation waste generated offsite, the benzene in this waste shall be included in the calculation of total annual benzene quantity in facility waste, if the waste streams have an annual average water content greater than 10 percent, or if they are mixed with water or other wastes at any time and the mixture has an annual average water content greater than 10 percent.

(4) The total annual benzene quantity is determined based upon the quantity of benzene in the waste before any waste treatment occurs to remove the benzene except as specified in §61.355(c)(1)(i) (A) through (C).

(b) Each owner or operator of a facility at which the total annual benzene quantity from facility waste is equal to or greater than 10 Mg/yr (11 ton/yr) as determined in paragraph (a) of this section shall be in compliance with the requirements of paragraphs (c) through (h) of this section no later than 90 days following the effective date, unless a waiver of compliance has been obtained under §61.11, or by the initial startup for a new source with an initial startup after the effective date.

(1) The owner or operator of an existing source unable to comply with the rule within the required time may request a waiver of compliance under §61.10.

(2) As part of the waiver application, the owner or operator shall submit to the Administrator a plan under §61.10(b)(3) that is an enforceable commitment to obtain environmental benefits to mitigate the benzene emissions that result from extending the compliance date. The plan shall include the following information:

(i) A description of the method of compliance, including the control approach, schedule for installing controls, and quantity of the benzene emissions that result from extending the compliance date;

(ii) If the control approach involves a compliance strategy designed to obtain integrated compliance with multiple regulatory requirements, a description of the other regulations involved and their effective dates; and

(iii) A description of the actions to be taken at the facility to obtain mitigating environmental benefits, including how the benefits will be obtained, the schedule for these actions, and an estimate of the quantifiable benefits that directly result from these actions.

(c) Each owner or operator of a facility at which the total annual benzene quantity from facility waste is equal to or greater than 10 Mg/yr (11 ton/yr) as determined in paragraph (a) of this section shall manage and treat the facility waste as follows:

(1) For each waste stream that contains benzene, including (but not limited to) organic waste streams that contain less than 10 percent water and aqueous waste streams, even if the wastes are not discharged to an individual drain system, the owner or operator shall:

(i) Remove or destroy the benzene contained in the waste using a treatment process or wastewater treatment system that complies with the standards specified in §61.348 of this subpart.

(ii) Comply with the standards specified in §§61.343 through 61.347 of this subpart for each waste management unit that receives or manages the waste stream prior to and during treatment of the waste stream in accordance with paragraph (c)(1)(i) of this section.

(iii) Each waste management unit used to manage or treat waste streams that will be recycled to a process shall comply with the standards specified in §§61.343 through 61.347. Once the waste stream is recycled to a process, including to a tank used for the storage of production process feed, product, or product intermediates, unless this tank is used primarily for the storage of wastes, the material is no longer subject to paragraph (c) of this section.

(2) A waste stream is exempt from paragraph (c)(1) of this section provided that the owner or operator demonstrates initially and, thereafter, at least once per year that the flow-weighted annual average benzene concentration for the waste stream is less than 10 ppmw as determined by the procedures specified in §61.355(c)(2) or §61.355(c)(3).

(3) A waste stream is exempt from paragraph (c)(1) of this section provided that the owner or operator demonstrates initially and, thereafter, at least once per year that the conditions specified in either paragraph (c)(3)(i) or (c)(3)(ii) of this section are met.

(i) The waste stream is process wastewater that has a flow rate less than 0.02 liters per minute (0.005 gallons per minute) or an annual wastewater quantity of less than 10 Mg/yr (11 ton/yr); or

(ii) All of the following conditions are met:

(A) The owner or operator does not choose to exempt process wastewater under paragraph (c)(3)(i) of this section,

(B) The total annual benzene quantity in all waste streams chosen for exemption in paragraph (c)(3)(ii) of this section does not exceed 2.0 Mg/yr (2.2 ton/yr) as determined in the procedures in §61.355(j), and

(C) The total annual benzene quantity in a waste stream chosen for exemption, including process unit turnaround waste, is determined for the year in which the waste is generated.

(d) As an alternative to the requirements specified in paragraphs (c) and (e) of this section, an owner or operator of a facility at which the total annual benzene quantity from facility waste is equal to or greater than 10 Mg/yr (11 ton/yr) as determined in paragraph (a) of this section may elect to manage and treat the facility waste as follows:

(1) The owner or operator shall manage and treat facility waste other than process wastewater in accordance with the requirements of paragraph (c)(1) of this section.

(2) The owner or operator shall manage and treat process wastewater in accordance with the following requirements:

(i) Process wastewater shall be treated to achieve a total annual benzene quantity from facility process wastewater less than 1 Mg/yr (1.1 ton/yr). Total annual benzene from facility process wastewater shall be determined by adding together the annual benzene quantity at the point of waste generation for each untreated process wastewater stream plus the annual benzene quantity exiting the treatment process for each process wastewater stream treated in accordance with the requirements of paragraph (c)(1)(i) of this section.

(ii) Each treated process wastewater stream identified in paragraph (d)(2)(i) of this section shall be managed and treated in accordance with paragraph (c)(1) of this section.

(iii) Each untreated process wastewater stream identified in paragraph (d)(2)(i) of this section is exempt from the requirements of paragraph (c)(1) of this section.

(e) As an alternative to the requirements specified in paragraphs (c) and (d) of this section, an owner or operator of a facility at which the total annual benzene quantity from facility waste is equal to or greater than 10 Mg/yr (11 ton/yr) as determined in paragraph (a) of this section may elect to manage and treat the facility waste as follows:

(1) The owner or operator shall manage and treat facility waste with a flow-weighted annual average water content of less than 10 percent in accordance with the requirements of paragraph (c)(1) of this section; and

(2) The owner or operator shall manage and treat facility waste (including remediation and process unit turnaround waste) with a flow-weighted annual average water content of 10 percent or greater, on a volume basis as total water, and each waste stream that is mixed with water or wastes at any time such that the resulting mixture has an annual water content greater than 10 percent, in accordance with the following:

(i) The benzene quantity for the wastes described in paragraph (e)(2) of this section must be equal to or less than 6.0 Mg/yr (6.6 ton/yr), as determined in §61.355(k). Wastes as described in paragraph (e)(2) of this section that are transferred offsite shall be included in the determination of benzene quantity as provided in §61.355(k). The provisions of paragraph (f) of this section shall not apply to any owner or operator who elects to comply with the provisions of paragraph (e) of this section.

(ii) The determination of benzene quantity for each waste stream defined in paragraph (e)(2) of this section shall be made in accordance with §61.355(k).

(f) Rather than treating the waste onsite, an owner or operator may elect to comply with paragraph (c)(1)(i) of this section by transferring the waste offsite to another facility where the waste is treated in accordance with the requirements of paragraph (c)(1)(i) of this section. The owner or operator transferring the waste shall:

(1) Comply with the standards specified in §§61.343 through 61.347 of this subpart for each waste management unit that receives or manages the waste prior to shipment of the waste offsite.

(2) Include with each offsite waste shipment a notice stating that the waste contains benzene which is required to be managed and treated in accordance with the provisions of this subpart.

(g) Compliance with this subpart will be determined by review of facility records and results from tests and inspections using methods and procedures specified in §61.355 of this subpart.

(h) Permission to use an alternative means of compliance to meet the requirements of §§61.342 through 61.352 of this subpart may be granted by the Administrator as provided in §61.353 of this subpart.

[55 FR 8346, Mar. 7, 1990, as amended at 58 FR 3095, Jan. 7, 1993; 65 FR 62159, 62160, Oct. 17, 2000]

§61.343 Standards: Tanks.

(a) Except as provided in paragraph (b) of this section and in §61.351, the owner or operator must meet the standards in paragraph (a)(1) or (2) of this section for each tank in which the waste stream is placed in accordance with §61.342 (c)(1)(ii). The standards in this section apply to the treatment and storage of the waste stream in a tank, including dewatering.

(1) The owner or operator shall install, operate, and maintain a fixed-roof and closed-vent system that routes all organic vapors vented from the tank to a control device.

(i) The fixed-roof shall meet the following requirements:

(A) The cover and all openings (e.g., access hatches, sampling ports, and gauge wells) shall be designed to operate with no detectable emissions as indicated by an instrument reading of less than **~~500~~ [50]** ppmv above background, as determined initially and thereafter at least once per year by the methods specified in §61.355(h) of this subpart.

(B) Each opening shall be maintained in a closed, sealed position (e.g., covered by a lid that is gasketed and latched) at all times that waste is in the tank except when it is necessary to use the opening for waste sampling or removal, or for equipment inspection, maintenance, or repair.

(C) If the cover and closed-vent system operate such that the tank is maintained at a pressure less than atmospheric pressure, then paragraph (a)(1)(i)(B) of this section does not apply to any opening that meets all of thefollowing conditions:

(*1*) The purpose of the opening is to provide dilution air to reduce the explosion hazard;

(*2*) The opening is designed to operate with no detectable emissions as indicated by an instrument reading of less than **~~500~~ [50]** ppmv above background, as determined initially and thereafter at least once per year by the methods specified in §61.355(h); and

(*3*) The pressure is monitored continuously to ensure that the pressure in the tank remains below atmospheric pressure.

(ii) The closed-vent system and control device shall be designed and operated in accordance with the requirements of §61.349 of this subpart.

(2) The owner or operator must install, operate, and maintain an enclosure and closed-vent system that routes all organic vapors vented from the tank, located inside the enclosure, to a control device in accordance with the requirements specified in paragraph (e) of this section.

(b) For a tank that meets all the conditions specified in paragraph (b)(1) of this section, the owner or operator may elect to comply with paragraph (b)(2) of this section as an alternative to the requirements specified in paragraph (a)(1) of this section.

(1) The waste managed in the tank complying with paragraph (b)(2) of this section shall meet all of the following conditions:

(i) Each waste stream managed in the tank must have a flow-weighted annual average water content less than or equal to 10 percent water, on a volume basis as total water.

(ii) The waste managed in the tank either:

(A) Has a maximum organic vapor pressure less than 5.2 kilopascals (kPa) (0.75 pounds per square inch (psi));

(B) Has a maximum organic vapor pressure less than 27.6 kPa (4.0 psi) and is managed in a tank having design capacity less than 151 m^3 (40,000 gal); or

(C) Has a maximum organic vapor pressure less than 76.6 kPa (11.1 psi) and is managed in a tank having a design capacity less than 75 m^3 (20,000 gal).

(2) The owner or operator shall install, operate, and maintain a fixed roof as specified in paragraph (a)(1)(i).

(3) For each tank complying with paragraph (b) of this section, one or more devices which vent directly to the atmosphere may be used on the tank provided each device remains in a closed, sealed position during normal operations except when the device needs to open to prevent physical damage or permanent deformation of the tank or cover resulting from filling or emptying the tank, diurnal temperature changes, atmospheric pressure changes or malfunction of the unit in accordance with good engineering and safety practices for handling flammable, explosive, or other hazardous materials.

(c) Each fixed-roof, seal, access door, and all other openings shall be checked by visual inspection initially and quarterly thereafter to ensure that no cracks or gaps occur and that access doors and other openings are closed and gasketed properly.

(d) Except as provided in §61.350 of this subpart, when a broken seal or gasket or other problem is identified, or when detectable emissions are measured, first efforts at repair shall be made as soon as practicable, but not later than 45 calendar days after identification.

(e) Each owner or operator who controls air pollutant emissions by using an enclosure vented through a closed-vent system to a control device must meet the requirements specified in paragraphs (e)(1) through (4) of this section.

(1) The tank must be located inside a total enclosure. The enclosure must be designed and operated in accordance with the criteria for a permanent total enclosure as specified in "Procedure T—Criteria for and Verification of a Permanent or Temporary Total Enclosure" in 40 CFR 52.741, appendix B. The enclosure may have permanent or temporary openings to allow worker access; passage of material into or out of the enclosure by conveyor, vehicles, or other mechanical means; entry of permanent mechanical or electrical equipment; or direct airflow into the enclosure. The owner or operator must perform the verification procedure for the enclosure as specified in section 5.0 of Procedure T initially when the enclosure is first installed and, thereafter, annually. A facility that has conducted an initial compliance demonstration and that performs annual compliance demonstrations in accordance with the requirements for Tank Level 2 control requirements 40 CFR 264.1084(i) or 40 CFR 265(i) is not required to make repeat demonstrations of initial and continuous compliance for the purposes of this subpart.

(2) The enclosure must be vented through a closed-vent system to a control device that is designed and operated in accordance with the standards for control devices specified in §61.349.

(3) Safety devices, as defined in this subpart, may be installed and operated as necessary on any enclosure, closed-vent system, or control device used to comply with the requirements of paragraphs (e)(1) and (2) of this section.

(4) The closed-vent system must be designed and operated in accordance with the requirements of §61.349.

[55 FR 8346, Mar. 7, 1990, as amended at 55 FR 18331, May 2, 1990; 58 FR 3096, Jan. 7, 1993; 67 FR 68532, Nov. 12, 2002; 68 FR 6082, Feb. 6, 2003; 68 FR 67935, Dec. 4, 2003]

§61.344 Standards: Surface impoundments.

(a) The owner or operator shall meet the following standards for each surface impoundment in which waste is placed in accordance with §61.342(c)(1)(ii) of this subpart:

(1) The owner or operator shall install, operate, and maintain on each surface impoundment a cover (e.g., air-supported structure or rigid cover) and closed-vent system that routes all organic vapors vented from the surface impoundment to a control device.

(i) The cover shall meet the following requirements:

(A) The cover and all openings (e.g., access hatches, sampling ports, and gauge wells) shall be designed to operate with no detectable emissions as indicated by an instrument reading of less than ~~**500**~~ **[50]** ppmv above background, initially and thereafter at least once per year by the methods specified in §61.355(h) of this subpart.

(B) Each opening shall be maintained in a closed, sealed position (e.g., covered by a lid that is gasketed and latched) at all times that waste is in the surface impoundment except when it is necessary to use the opening for waste sampling or removal, or for equipment inspection, maintenance, or repair.

(C) If the cover and closed-vent system operate such that the enclosure of the surface impoundment is maintained at a pressure less than atmospheric pressure, then paragraph (a)(1)(i)(B) of this section does not apply to any opening that meets all of the following conditions:

(*1*) The purpose of the opening is to provide dilution air to reduce the explosion hazard;

(*2*) The opening is designed to operate with no detectable emissions as indicated by an instrument reading of less than ~~**500**~~ **[50]** ppmv above background, as determined initially and thereafter at least once per year by the methods specified in §61.355(h) of this subpart; and

(*3*) The pressure is monitored continuously to ensure that the pressure in the enclosure of the surface impoundment remains below atmospheric pressure.

(D) The cover shall be used at all times that waste is placed in the surface impoundment except during removal of treatment residuals in accordance with 40 CFR 268.4 or closure of the surface impoundment in accordance with 40 CFR 264.228. (Note: the treatment residuals generated by these activities may be subject to the requirements of this part.)

(ii) The closed-vent system and control device shall be designed and operated in accordance with §61.349 of this subpart.

(b) Each cover seal, access hatch, and all other openings shall be checked by visual inspection initially and quarterly thereafter to ensure that no cracks or gaps occur and that access hatches and other openings are closed and gasketed properly.

(c) Except as provided in §61.350 of this subpart, when a broken seal or gasket or other problem is identified, or when detectable emissions are measured, first efforts at repair shall be made as soon as practicable, but not later than 15 calendar days after identification.

[55 FR 8346, Mar. 7, 1990, as amended at 58 FR 3097, Jan. 7, 1993]

§61.345 Standards: Containers.

(a) The owner or operator shall meet the following standards for each container in which waste is placed in accordance with §61.342(c)(1)(ii) of this subpart:

(1) The owner or operator shall install, operate, and maintain a cover on each container used to handle, transfer, or store waste in accordance with the following requirements:

(i) The cover and all openings (e.g., bungs, hatches, and sampling ports) shall be designed to operate with no detectable emissions as indicated by an instrument reading of less than **~~500~~** **[50]** ppmv above background, initially and thereafter at least once per year by the methods specified in §61.355(h) of this subpart.

(ii) Except as provided in paragraph (a)(4) of this section, each opening shall be maintained in a closed, sealed position (e.g., covered by a lid that is gasketed and latched) at all times that waste is in the container except when it is necessary to use the opening for waste loading, removal, inspection, or sampling.

(2) When a waste is transferred into a container by pumping, the owner or operator shall perform the transfer using a submerged fill pipe. The submerged fill pipe outlet shall extend to within two fill pipe diameters of the bottom of the container while the container is being loaded. During loading of the waste, the cover shall remain in place and all openings shall be maintained in a closed, sealed position except for those openings required for the submerged fill pipe, those openings required for venting of the container to prevent physical damage or

permanent deformation of the container or cover, and any openings complying with paragraph (a)(4) of this section.

(3) Treatment of a waste in a container, including aeration, thermal or other treatment, must be performed by the owner or operator in a manner such that while the waste is being treated the container meets the standards specified in paragraphs (a)(3)(i) through (iii) of this section, except for covers and closed-vent systems that meet the requirements in paragraph (a)(4) of this section.

(i) The owner or operator must either:

(A) Vent the container inside a total enclosure which is exhausted through a closed-vent system to a control device in accordance with the requirements of paragraphs (a)(3)(ii)(A) and (B) of this section; or

(B) Vent the covered or closed container directly through a closed-vent system to a control device in accordance with the requirements of paragraphs (a)(3)(ii)(B) and (C) of this section.

(ii) The owner or operator must meet the following requirements, as applicable to the type of air emission control equipment selected by the owner or operator:

(A) The total enclosure must be designed and operated in accordance with the criteria for a permanent total enclosure as specified in section 5 of the "Procedure T—Criteria for and Verification of a Permanent or Temporary Total Enclosure" in 40 CFR 52.741, appendix B. The enclosure may have permanent or temporary openings to allow worker access; passage of containers through the enclosure by conveyor or other mechanical means; entry of permanent mechanical or electrical equipment; or direct airflow into the enclosure. The owner or operator must perform the verification procedure for the enclosure as specified in section 5.0 of "Procedure T—Criteria for and Verification of a Permanent or Temporary Total Enclosure" initially when the enclosure is first installed and, thereafter, annually. A facility that has conducted an initial compliance demonstration and that performs annual compliance demonstrations in accordance with the Container Level 3 control requirements in 40 CFR 264.1086(e)(2)(i) or 40 CFR 265.1086(e)(2)(i) is not required to make repeat demonstrations of initial and continuous compliance for the purposes of this subpart.

(B) The closed-vent system and control device must be designed and operated in accordance with the requirements of §61.349.

(C) For a container cover, the cover and all openings (*e.g.*, doors, hatches) must be designed to operate with no detectable emissions as indicated by an instrument reading of less than **~~500~~** **[50]** ppmv above background, initially and thereafter at least once per year by the methods specified in §61.355(h).

(iii) Safety devices, as defined in this subpart, may be installed and operated as necessary on any container, enclosure, closed-vent system, or control device used to comply with the requirements of paragraph (a)(3)(i) of this section.

(4) If the cover and closed-vent system operate such that the container is maintained at a pressure less than atmospheric pressure, the owner or operator may operate the system with an opening that is not sealed and kept closed at all times if the following conditions are met:

(i) The purpose of the opening is to provide dilution air to reduce the explosion hazard;

(ii) The opening is designed to operate with no detectable emissions as indicated by an instrument reading of less than **~~500~~** **[50]** ppmv above background, as determined initially and thereafter at least once per year by methods specified in §61.355(h); and

(iii) The pressure is monitored continuously to ensure that the pressure in the container remains below atmospheric pressure.

(b) Each cover and all openings shall be visually inspected initially and quarterly thereafter to ensure that they are closed and gasketed properly.

(c) Except as provided in §61.350 of this subpart, when a broken seal or gasket or other problem is identified, first efforts at repair shall be made as soon as practicable, but not later than 15 calendar days after identification.

[55 FR 8346, Mar. 7, 1990, as amended at 58 FR 3097, Jan. 7, 1993; 67 FR 68532, Nov. 12, 2002; 68 FR 67936, Dec. 4, 2003]

§61.346 Standards: Individual drain systems.

(a) Except as provided in paragraph (b) of this section, the owner or operator shall meet the following standards for each individual drain system in which waste is placed in accordance with §61.342(c)(1)(ii) of this subpart:

(1) The owner or operator shall install, operate, and maintain on each drain system opening a cover and closed-vent system that routes all organic vapors vented from the drain system to a control device.

(i) The cover shall meet the following requirements:

(A) The cover and all openings (e.g., access hatches, sampling ports) shall be designed to operate with no detactable emissions as indicated by an instrument reading of less than **~~500~~** **[50]** ppmv above background, initially and thereafter at least once per year by the methods specified in §61.355(h) of this subpart.

(B) Each opening shall be maintained in a closed, sealed position (e.g., covered by a lid that is gasketed and latched) at all times that waste is in the drain system except when it is necessary to use the opening for waste sampling or removal, or for equipment inspection, maintenance, or repair.

(C) If the cover and closed-vent system operate such that the individual drain system is maintained at a pressure less than atmospheric pressure, then paragraph (a)(1)(i)(B) of this section does not apply to any opening that meets all of the following conditions:

(*1*) The purpose of the opening is to provide dilution air to reduce the explosion hazard;

(*2*) The opening is designed to operate with no detectable emissions as indicated by an instrument reading of less than **~~500~~** **[50]** ppmv above background, as determined initially and thereafter at least once per year by the methods specified in §61.355(h); and

(*3*) The pressure is monitored continuously to ensure that the pressure in the individual drain system remains below atmospheric pressure.

(ii) The closed-vent system and control device shall be designed and operated in accordance with §61.349 of this subpart.

(2) Each cover seal, access hatch, and all other openings shall be checked by visual inspection initially and quarterly thereafter to ensure that no cracks or gaps occur and that access hatches and other openings are closed and gasketed properly.

(3) Except as provided in §61.350 of this subpart, when a broken seal or gasket or other problem is identified, or when detectable emissions are measured, first efforts at repair shall be made as soon as practicable, but not later than 15 calendar days after identification.

(b) As an alternative to complying with paragraph (a) of this section, an owner or operator may elect to comply with the following requirements:

(1) Each drain shall be equipped with water seal controls or a tightly sealed cap or plug.

(2) Each junction box shall be equipped with a cover and may have a vent pipe. The vent pipe shall be at least 90 cm (3 ft) in length and shall not exceed 10.2 cm (4 in) in diameter.

(i) Junction box covers shall have a tight seal around the edge and shall be kept in place at all times, except during inspection and maintenance.

(ii) One of the following methods shall be used to control emissions from the junction box vent pipe to the atmosphere:

(A) Equip the junction box with a system to prevent the flow of organic vapors from the junction box vent pipe to the atmosphere during normal operation. An example of such a system includes use of water seal controls on the junction box. A flow indicator shall be installed, operated, and maintained on each junction box vent pipe to ensure that organic vapors are not vented from the junction box to the atmosphere during normal operation.

(B) Connect the junction box vent pipe to a closed-vent system and control device in accordance with §61.349 of this subpart.

(3) Each sewer line shall not be open to the atmosphere and shall be covered or enclosed in a manner so as to have no visual gaps or cracks in joints, seals, or other emission interfaces.

(4) Equipment installed in accordance with paragraphs (b)(1), (b)(2), or (b)(3) of this section shall be inspected as follows:

(i) Each drain using water seal controls shall be checked by visual or physical inspection initially and thereafter quarterly for indications of low water levels or other conditions that would reduce the effectiveness of water seal controls.

(ii) Each drain using a tightly sealed cap or plug shall be visually inspected initially and thereafter quarterly to ensure caps or plugs are in place and properly installed.

(iii) Each junction box shall be visually inspected initially and thereafter quarterly to ensure that the cover is in place and to ensure that the cover has a tight seal around the edge.

(iv) The unburied portion of each sewer line shall be visually inspected initially and thereafter quarterly for indication of cracks, gaps, or other problems that could result in benzene emissions.

(5) Except as provided in §61.350 of this subpart, when a broken seal, gap, crack or other problem is identified, first efforts at repair shall be made as soon as practicable, but not later than 15 calendar days after identification.

[55 FR 8346, Mar. 7, 1990, as amended at 55 FR 37231, Sept. 10, 1990; 58 FR 3097, Jan. 7, 1993]

§61.347 Standards: Oil-water separators.

(a) Except as provided in §61.352 of this subpart, the owner or operator shall meet the following standards for each oil-water separator in which waste is placed in accordance with §61.342(c)(1)(ii) of this subpart:

(1) The owner or operator shall install, operate, and maintain a fixed-roof and closed-vent system that routes all organic vapors vented from the oil-water separator to a control device.

(i) The fixed-roof shall meet the following requirements:

(A) The cover and all openings (e.g., access hatches, sampling ports, and gauge wells) shall be designed to operate with no detectable emissions as indicated by an instrument reading of less than ~~500~~ **[50]** ppmv above background, as determined initially and thereafter at least once per year by the methods specified in §61.355(h) of this subpart.

(B) Each opening shall be maintained in a closed, sealed position (e.g., covered by a lid that is gasketed and latched) at all times that waste is in the oil-water separator except when it is necessary to use the opening for waste sampling or removal, or for equipment inspection, maintenance, or repair.

(C) If the cover and closed-vent system operate such that the oil-water separator is maintained at a pressure less than atmospheric pressure, then paragraph (a)(1)(i)(B) of this section does not apply to any opening that meets all of the following conditions:

(*1*) The purpose of the opening is to provide dilution air to reduce the explosion hazard;

(*2*) The opening is designed to operate with no detectable emissions as indicated by an instrument reading of less than ~~500~~ **[50]** ppmv above background, as determined initially and thereafter at least once per year by the methods specified in §61.355(h); and

(*3*) The pressure is monitored continuously to ensure that the pressure in the oil-water separator remains below atmospheric pressure.

(ii) The closed-vent system and control device shall be designed and operated in accordance with the requirements of §61.349 of this subpart.

(b) Each cover seal, access hatch, and all other openings shall be checked by visual inspection initially and quarterly thereafter to ensure that no cracks or gaps occur between the cover and oil-water separator wall and that access hatches and other openings are closed and gasketed properly.

(c) Except as provided in §61.350 of this subpart, when a broken seal or gasket or other problem is identified, or when detectable emissions are measured, first efforts at repair shall be made as soon as practicable, but not later than 15 calendar days after identification.

[55 FR 8346, Mar. 7, 1990, as amended at 58 FR 3098, Jan. 7, 1993]

§61.348 Standards: Treatment processes.

(a) Except as provided in paragraph (a)(5) of this section, the owner or operator shall treat the waste stream in accordance with the following requirements:

(1) The owner or operator shall design, install, operate, and maintain a treatment process that either:

(i) Removes benzene from the waste stream to a level less than 10 parts per million by weight (ppmw) on a flow-weighted annual average basis,

(ii) Removes benzene from the waste stream by 99 percent or more on a mass basis, or

(iii) Destroys benzene in the waste stream by incinerating the waste in a combustion unit that achieves a destruction efficiency of 99 percent or greater for benzene.

(2) Each treatment process complying with paragraphs (a)(1)(i) or (a)(1)(ii) of this section shall be designed and operated in accordance with the appropriate waste management unit standards specified in §§61.343 through 61.347 of this subpart. For example, if a treatment process is a tank, then the owner or operator shall comply with §61.343 of this subpart.

(3) For the purpose of complying with the requirements specified in paragraph (a)(1)(i) of this section, the intentional or unintentional reduction in the benzene concentration of a waste stream by dilution of the waste stream with other wastes or materials is not allowed.

(4) An owner or operator may aggregate or mix together individual waste streams to create a combined waste stream for the purpose of facilitating treatment of waste to comply with the requirements of paragraph (a)(1) of this section except as provided in paragraph (a)(5) of this section.

(5) If an owner or operator aggregates or mixes any combination of process wastewater, product tank drawdown, or landfill leachate subject to §61.342(c)(1) of this subpart together with other waste streams to create a combined waste stream for the purpose of facilitating management or treatment of waste in a wastewater treatment system, then the wastewater treatment system shall be operated in accordance with paragraph (b) of this section. These provisions apply to above-ground wastewater treatment systems as well as those that are at or below ground level.

(b) Except for facilities complying with §61.342(e), the owner or operator that aggregates or mixes individual waste streams as defined in paragraph (a)(5) of this section for management and treatment in a wastewater treatment system shall comply with the following requirements:

(1) The owner or operator shall design and operate each waste management unit that comprises the wastewater treatment system in accordance with the appropriate standards specified in §§61.343 through 61.347 of this subpart.

(2) The provisions of paragraph (b)(1) of this section do not apply to any waste management unit that the owner or operator demonstrates to meet the following conditions initially and, thereafter, at least once per year:

(i) The benzene content of each waste stream entering the waste management unit is less than 10 ppmw on a flow-weighted annual average basis as determined by the procedures specified in §61.355(c) of this subpart; and

(ii) The total annual benzene quantity contained in all waste streams managed or treated in exempt waste management units comprising the facility wastewater treatment systems is less than 1 Mg/yr (1.1 ton/yr). For this determination, total annual benzene quantity shall be calculated as follows:

(A) The total annual benzene quantity shall be calculated as the sum of the individual benzene quantities determined at each location where a waste stream first enters an exempt waste management unit. The benzene quantity discharged from an exempt waste management unit shall not be included in this calculation.

(B) The annual benzene quantity in a waste stream managed or treated in an enhanced biodegradation unit shall not be included in the calculation of the total annual benzene quantity, if the enhanced biodegradation unit is the first exempt unit in which the waste is managed or treated. A unit shall be considered enhanced biodegradation if it is a suspended-growth process that generates biomass, uses recycled biomass, and periodically removes biomass from the process. An enhanced biodegradation unit typically operates at a food-to-microorganism ratio in the range of 0.05 to 1.0 kg of biological oxygen demand per kg of biomass per day, a mixed liquor suspended solids ratio in the range of 1 to 8 grams per liter (0.008 to 0.7 pounds per liter), and a residence time in the range of 3 to 36 hours.

(c) The owner and operator shall demonstrate that each treatment process or wastewater treatment system unit, except as provided in paragraph (d) of this section, achieves the appropriate conditions specified in paragraphs (a) or (b) of this section in accordance with the following requirements:

(1) Engineering calculations in accordance with requirements specified in §61.356(e) of this subpart; or

(2) Performance tests conducted using the test methods and procedures that meet the requirements specified in §61.355 of this subpart.

(d) A treatment process or waste stream is in compliance with the requirements of this subpart and exempt from the requirements of paragraph (c) of this section provided that the owner or operator documents that the treatment process or waste stream is in compliance with other regulatory requirements as follows:

(1) The treatment process is a hazardous waste incinerator for which the owner or operator has been issued a final permit under 40 CFR part 270 and complies with the requirements of 40 CFR part 264, subpart O;

(2) The treatment process is an industrial furnace or boiler burning hazardous waste for energy recovery for which the owner or operator has been issued a final permit under 40 CFR part 270 and complies with the requirements of 40 CFR part 266, subpart D;

(3) The waste stream is treated by a means or to a level that meets benzene-specific treatment standards in accordance with the Land Disposal Restrictions under 40 CFR part 268,

and the treatment process is designed and operated with a closed-vent system and control device meeting the requirements of §61.349 of this subpart;

(4) The waste stream is treated by a means or to a level that meets benzene-specific effluent limitations or performance standards in accordance with the Effluent Guidelines and Standards under 40 CFR parts 401-464, and the treatment process is designed and operated with a closed-vent system and control device meeting the requirements of §61.349 of this subpart; or

(5) The waste stream is discharged to an underground injection well for which the owner or operator has been issued a final permit under 40 CFR part 270 and complies with the requirements of 40 CFR part 122.

(e) Except as specified in paragraph (e)(3) of this section, if the treatment process or wastewater treatment system unit has any openings (e.g., access doors, hatches, etc.), all such openings shall be sealed (e.g., gasketed, latched, etc.) and kept closed at all times when waste is being treated, except during inspection and maintenance.

(1) Each seal, access door, and all other openings shall be checked by visual inspections initially and quarterly thereafter to ensure that no cracks or gaps occur and that openings are closed and gasketed properly.

(2) Except as provided in §61.350 of this subpart, when a broken seal or gasket or other problem is identified, first efforts at repair shall be made as soon as practicable, but not later than 15 calendar days after identification.

(3) If the cover and closed-vent system operate such that the treatment process and wastewater treatment system unit are maintained at a pressure less than atmospheric pressure, the owner or operator may operate the system with an opening that is not sealed and kept closed at all times if the following conditions are met:

(i) The purpose of the opening is to provide dilution air to reduce the explosion hazard;

(ii) The opening is designed to operate with no detectable emissions as indicated by an instrument reading of less than ~~**500**~~ **[50]** ppmv above background, as determined initially and thereafter at least once per year by the methods specified in §61.355(h); and

(iii) The pressure is monitored continuously to ensure that the pressure in the treatment process and wastewater treatment system unit remain below atmospheric pressure.

(f) Except for treatment processes complying with paragraph (d) of this section, the Administrator may request at any time an owner or operator demonstrate that a treatment process or wastewater treatment system unit meets the applicable requirements specified in paragraphs (a) or (b) of this section by conducting a performance test using the test methods and procedures as required in §61.355 of this subpart.

(g) The owner or operator of a treatment process or wastewater treatment system unit that is used to comply with the provisions of this section shall monitor the unit in accordance with the applicable requirements in §61.354 of this subpart.

[55 FR 8346, Mar. 7, 1990, as amended at 55 FR 37231, Sept. 10, 1990; 58 FR 3098, Jan. 7, 1993; 65 FR 62160, Oct. 17, 2000]

§61.349 Standards: Closed-vent systems and control devices.

(a) For each closed-vent system and control device used to comply with standards in accordance with §§61.343 through 61.348 of this subpart, the owner or operator shall properly design, install, operate, and maintain the closed-vent system and control device in accordance with the following requirements:

(1) The closed-vent system shall:

(i) Be designed to operate with no detectable emissions as indicated by an instrument reading of less than ~~**500**~~ **[50]** ppmv above background, as determined initially and thereafter at least once per year by the methods specified in §61.355(h) of this subpart.

(ii) Vent systems that contain any bypass line that could divert the vent stream away from a control device used to comply with the provisions of this subpart shall install, maintain, and operate according to the manufacturer's specifications a flow indicator that provides a record of vent stream flow away from the control device at least once every 15 minutes, except as provided in paragraph (a)(1)(ii)(B) of this section.

(A) The flow indicator shall be installed at the entrance to any bypass line that could divert the vent stream away from the control device to the atmosphere.

(B) Where the bypass line valve is secured in the closed position with a car-seal or a lock-and-key type configuration, a flow indicator is not required.

(iii) All gauging and sampling devices shall be gas-tight except when gauging or sampling is taking place.

(iv) For each closed-vent system complying with paragraph (a) of this section, one or more devices which vent directly to the atmosphere may be used on the closed-vent system provided each device remains in a closed, sealed position during normal operations except when the device needs to open to prevent physical damage or permanent deformation of the closed-vent system resulting from malfunction of the unit in accordance with good engineering and safety practices for handling flammable, explosive, or other hazardous materials.

(2) The control device shall be designed and operated in accordance with the following conditions:

(i) An enclosed combustion device (e.g., a vapor incinerator, boiler, or process heater) shall meet one of the following conditions:

(A) Reduce the organic emissions vented to it by 95 weight percent or greater;

(B) Achieve a total organic compound concentration of 20 ppmv (as the sum of the concentrations for individual compounds using Method 18) on a dry basis corrected to 3 percent oxygen; or

(C) Provide a minimum residence time of 0.5 seconds at a minimum temperature of 760 °C (1,400 °F). If a boiler or process heater issued as the control device, then the vent stream shall be introduced into the flame zone of the boiler or process heater.

(ii) A vapor recovery system (e.g., a carbon adsorption system or a condenser) shall recover or control the organic emissions vented to it with an efficiency of 95 weight percent or greater, or shall recover or control the benzene emissions vented to it with an efficiency of 98 weight percent or greater.

(iii) A flare shall comply with the requirements of 40 CFR 60.18.

(iv) A control device other than those described in paragraphs (a)(2) (i) through (iii) of this section may be used provided that the following conditions are met:

(A) The device shall recover or control the organic emissions vented to it with an efficiency of 95 weight percent or greater, or shall recover or control the benzene emissions vented to it with an efficiency of 98 weight percent or greater.

(B) The owner or operator shall develop test data and design information that documents the control device will achieve an emission control efficiency of either 95 percent or greater for organic compounds or 98 percent or greater for benzene.

(C) The owner or operator shall identify:

(*1*) The critical operating parameters that affect the emission control performance of the device;

(*2*) The range of values of these operating parameters that ensure the emission control efficiency specified in paragraph (a)(2)(iv)(A) of this section is maintained during operation of the device; and

(*3*) How these operating parameters will be monitored to ensure the proper operation and maintenance of the device.

(D) The owner or operator shall submit the information and data specified in paragraphs (a)(2)(iv) (B) and (C) of this section to the Administrator prior to operation of the alternative control device.

(E) The Administrator will determine, based on the information submitted under paragraph (a)(2)(iv)(D) of this section, if the control device subiect to paragraph (a)(2)(iv) of this section meets the requirements of §61.349. The control device subject to paragraph (a)(2)(iv) of this section may be operated prior to receiving approval from the Administrator. However, if the Administrator determines that the control device does not meet the requirements of §61.349, the facility may be subject to enforcement action beginning from the time the control device began operation.

(b) Each closed-vent system and control device used to comply with this subpart shall be operated at all times when waste is placed in the waste management unit vented to the control device except when maintenance or repair of the waste management unit cannot be completed without a shutdown of the control device.

(c) An owner and operator shall demonstrate that each control device, except for a flare, achieves the appropriate conditions specified in paragraph (a)(2) of this section by using one of the following methods:

(1) Engineering calculations in accordance with requirements specified in §61.356(f) of this subpart; or

(2) Performance tests conducted using the test methods and procedures that meet the requirements specified in §61.355 of this subpart.

(d) An owner or operator shall demonstrate compliance of each flare in accordance with paragraph (a)(2)(iii) of this section.

(e) The Administrator may request at any time an owner or operator demonstrate that a control device meets the applicable conditions specified in paragraph (a)(2) of this section by conducting a performance test using the test methods and procedures as required in §61.355, and for control devices subject to paragraph (a)(2)(iv) of this section, the Administrator may specify alternative test methods and procedures, as appropriate.

(f) Each closed-vent system and control device shall be visually inspected initially and quarterly thereafter. The visual inspection shall include inspection of ductwork and piping and connections to covers and control devices for evidence of visable defects such as holes in ductwork or piping and loose connections.

(g) Except as provided in §61.350 of this subpart, if visible defects are observed during an inspection, or if other problems are identified, or if detectable emissions are measured, a first effort to repair the closed-vent system and control device shall be made as soon as practicable but no later than 5 calendar days after detection. Repair shall be completed no later than 15 calendar days after the emissions are detected or the visible defect is observed.

(h) The owner or operator of a control device that is used to comply with the provisions of this section shall monitor the control device in accordance with §61.354(c) of this subpart.

[55 FR 8346, Mar. 7, 1990; 55 FR 12444, Apr. 3, 1990, as amended at 55 FR 37231, Sept. 10, 1990; 58 FR 3098, Jan. 7, 1993; 65 FR 62160, Oct. 17, 2000]

§61.350 Standards: Delay of repair.

(a) Delay of repair of facilities or units that are subject to the provisions of this subpart will be allowed if the repair is technically impossible without a complete or partial facility or unit shutdown.

(b) Repair of such equipment shall occur before the end of the next facility or unit shutdown.

§61.351 Alternative standards for tanks.

(a) As an alternative to the standards for tanks specified in §61.343 of this subpart, an owner or operator may elect to comply with one of the following:

(1) A fixed roof and internal floating roof meeting the requirements in 40 CFR 60.112b(a)(1);

(2) An external floating roof meeting the requirements of 40 CFR 60.112b (a)(2); or

(3) An alternative means of emission limitation as described in 40 CFR 60.114b.

(b) If an owner or operator elects to comply with the provisions of this section, then the owner or operator is exempt from the provisions of §61.343 of this subpart applicable to the same facilities.

[55 FR 8346, Mar. 7, 1990, as amended at 55 FR 37231, Sept. 10, 1990]

§61.352 Alternative standards for oil-water separators.

(a) As an alternative to the standards for oil-water separators specified in §61.347 of this subpart, an owner or operator may elect to comply with one of the following:

(1) A floating roof meeting the requirements in 40 CFR 60.693-2(a); or

(2) An alternative means of emission limitation as described in 40 CFR 60.694.

(b) For portions of the oil-water separator where it is infeasible to construct and operate a floating roof, such as over the weir mechanism, a fixed roof vented to a vapor control device that meets the requirements in §§61.347 and 61.349 of this subpart shall be installed and operated.

(c) Except as provided in paragraph (b) of this section, if an owner or operator elects to comply with the provisions of this section, then the owner or operator is exempt from the provisions in §61.347 of this subpart applicable to the same facilities.

§61.353 Alternative means of emission limitation.

(a) If, in the Administrator's judgment, an alternative means of emission limitation will achieve a reduction in benzene emissions at least equivalent to the reduction in benzene emissions from the source achieved by the applicable design, equipment, work practice, or operational requirements in §§61.342 through 61.349, the Administrator will publish in the FEDERAL REGISTER a notice permitting the use of the alternative means for purposes of compliance with that requirement. The notice may condition the permission on requirements related to the operation and maintenance of the alternative means.

(b) Any notice under paragraph (a) of this section shall be published only after public notice and an opportunity for a hearing.

(c) Any person seeking permission under this section shall collect, verify, and submit to the Administrator information showing that the alternative means achieves equivalent emission reductions.

[55 FR 8346, Mar. 7, 1990, as amended at 58 FR 3099, Jan. 7, 1993]

§61.354 Monitoring of operations.

(a) Except for a treatment process or waste stream complying with §61.348(d), the owner or operator shall monitor each treatment process or wastewater treatment system unit to ensure the unit is properly operated and maintained by one of the following monitoring procedures:

(1) Measure the benzene concentration of the waste stream exiting the treatment process complying with §61.348(a)(1)(i) at least once per month by collecting and analyzing one or more samples using the procedures specified in §61.355(c)(3).

(2) Install, calibrate, operate, and maintain according to manufacturer's specifications equipment to continuously monitor and record a process parameter (or parameters) for the treatment process or wastewater treatment system unit that indicates proper system operation. The owner or operator shall inspect at least once each operating day the data recorded by the monitoring equipment (e.g., temperature monitor or flow indicator) to ensure that the unit is operating properly.

(b) If an owner or operator complies with the requirements of §61.348(b), then the owner or operator shall monitor each wastewater treatment system to ensure the unit is properly operated and maintained by the appropriate monitoring procedure as follows:

(1) For the first exempt waste management unit in each waste treatment train, other than an enhanced biodegradation unit, measure the flow rate, using the procedures of §61.355(b), and the benzene concentration of each waste stream entering the unit at least once per month by collecting and analyzing one or more samples using the procedures specified in §61.355(c)(3).

(2) For each enhanced biodegradation unit that is the first exempt waste management unit in a treatment train, measure the benzene concentration of each waste stream entering the unit at least once per month by collecting and analyzing one or more samples using the procedures specified in §61.355(c)(3).

(c) An owner or operator subject to the requirements in §61.349 of this subpart shall install, calibrate, maintain, and operate according to the manufacturer's specifications a device to continuously monitor the control device operation as specified in the following paragraphs, unless alternative monitoring procedures or requirements are approved for that facility by the Administrator. The owner or operator shall inspect at least once each operating day the data recorded by the monitoring equipment (e.g., temperature monitor or flow indicator) to ensure that the control device is operating properly.

(1) For a thermal vapor incinerator, a temperature monitoring device equipped with a continuous recorder. The device shall have an accuracy of ±1 percent of the temperature being monitored in °C or ±0.5 °C, whichever is greater. The temperature sensor shall be installed at a representative location in the combustion chamber.

(2) For a catalytic vapor incinerator, a temperature monitoring device equipped with a continuous recorder. The device shall be capable of monitoring temperature at two locations, and have an accuracy of ±1 percent of the temperature being monitored in °C or ±0.5 °C, whichever is greater. One temperature sensor shall be installed in the vent stream at the nearest feasible point to the catalyst bed inlet and a second temperature sensor shall be installed in the vent stream at the nearest feasible point to the catalyst bed outlet.

(3) For a flare, a monitoring device in accordance with 40 CFR 60.18(f)(2) equipped with a continuous recorder.

(4) For a boiler or process heater ~~having a design heat input capacity less than 44 MW (150 × 10^6 BTU/hr)~~, a temperature monitoring device equipped with a continuous recorder. The device shall have an accuracy of ±1 percent of the temperature being monitored in °C or ±0.5 °C, whichever is greater. The temperature sensor shall be installed at a representative location in the combustion chamber.

(5) For a boiler or process heater ~~having a design heat input capacity greater than or equal to 44 MW (150 × 10^6 BTU/hr)~~, a monitoring device equipped with a continuous recorder to measure a parameter(s) that indicates good combustion operating practices are being used.

(6) For a condenser, either:

(i) A monitoring device equipped with a continuous recorder to measure either the concentration level of the organic compounds or the concentration level of benzene in the exhaust vent stream from the condenser; or

(ii) A temperature monitoring device equipped with a continuous recorder. The device shall be capable of monitoring temperature at two locations, and have an accuracy of ±1 percent of the temperature being monitored in °C or ±0.5 °C, whichever is greater. One temperature sensor shall be installed at a location in the exhaust stream from the condenser, and a second temperature sensor shall be installed at a location in the coolant fluid exiting the condenser.

(7) For a carbon adsorption system that regenerates the carbon bed directly in the control device such as a fixed-bed carbon adsorber, either:

(i) A monitoring device equipped with a continuous recorder to measure either the concentration level of the organic compounds or the benzene concentration level in the exhaust vent stream from the carbon bed; or

(ii) A monitoring device equipped with a continuous recorder to measure a parameter that indicates the carbon bed is regenerated on a regular, predetermined time cycle.

(8) For a vapor recovery system other than a condenser or carbon adsorption system, a monitoring device equipped with a continuous recorder to measure either the concentration level of the organic compounds or the benzene concentration level in the exhaust vent stream from the control device.

(9) For a control device subject to the requirements of §61.349(a)(2)(iv), devices to monitor the parameters as specified in §61.349(a)(2)(iv)(C).

(d) For a carbon adsorption system that does not regenerate the carbon bed directly on site in the control device (e.g., a carbon canister), either the concentration level of the organic compounds or the concentration level of benzene in the exhaust vent stream from the carbon adsorption system shall be monitored on a regular schedule, and the existing carbon shall be replaced with fresh carbon immediately when carbon breakthrough is indicated. The device shall be monitored on a daily basis or at intervals no greater than 20 percent of the design carbon replacement interval, whichever is greater. As an alternative to conducting this monitoring, an owner or operator may replace the carbon in the carbon adsorption system with fresh carbon at a regular predetermined time interval that is less than the carbon replacement interval that is determined by the maximum design flow rate and either the organic concentration or the benzene concentration in the gas stream vented to the carbon adsorption system.

(e) An alternative operation or process parameter may be monitored if it can be demonstrated that another parameter will ensure that the control device is operated in conformance with these standards and the control device's design specifications.

(f) Owners or operators using a closed-vent system that contains any bypass line that could divert a vent stream from a control device used to comply with the provisions of this subpart shall do the following:

(1) Visually inspect the bypass line valve at least once every month, checking the position of the valve and the condition of the car-seal or closure mechanism required under §61.349(a)(1)(ii) to ensure that the valve is maintained in the closed position and the vent stream is not diverted through the bypass line.

(2) Visually inspect the readings from each flow monitoring device required by §61.349(a)(1)(ii) at least once each operating day to check that vapors are being routed to the control device as required.

(g) Each owner or operator who uses a system for emission control that is maintained at a pressure less than atmospheric pressure with openings to provide dilution air shall install, calibrate, maintain, and operate according to the manufacturer's specifications a device equipped with a continuous recorder to monitor the pressure in the unit to ensure that it is less than atmospheric pressure.

[55 FR 8346, Mar. 7, 1990, as amended at 58 FR 3099, Jan. 7, 1993; 65 FR 62160, Oct. 17, 2000]

§61.356 Recordkeeping requirements.

(a) Each owner or operator of a facility subject to the provisions of this subpart shall comply with the recordkeeping requirements of this section. Each record shall be maintained in a readily accessible location at the facility site for a period not less than two years from the date the information is recorded unless otherwise specified.

(b) Each owner or operator shall maintain records that identify each waste stream at the facility subject to this subpart, and indicate whether or not the waste stream is controlled for benzene emissions in accordance with this subpart. In addition the owner or operator shall maintain the following records:

(1) For each waste stream not controlled for benzene emissions in accordance with this subpart, the records shall include all test results, measurements, calculations, and other documentation used to determine the following information for the waste stream: waste stream identification, water content, whether or not the waste stream is a process wastewater stream,

annual waste quantity, range of benzene concentrations, annual average flow-weighted benzene concentration, and annual benzene quantity.

(2) For each waste stream exempt from §61.342(c)(1) in accordance with §61.342(c)(3), the records shall include:

(i) All measurements, calculations, and other documentation used to determine that the continuous flow of process wastewater is less than 0.02 liters (0.005 gallons) per minute or the annual waste quantity of process wastewater is less than 10 Mg/yr (11 ton/yr) in accordance with §61.342(c)(3)(i), or

(ii) All measurements, calculations, and other documentation used to determine that the sum of the total annual benzene quantity in all exempt waste streams does not exceed 2.0 Mg/yr (2.2 ton/yr) in accordance with §61.342(c)(3)(ii).

(3) For each facility where process wastewater streams are controlled for benzene emissions in accordance with §61.342(d) of this subpart, the records shall include for each treated process wastewater stream all measurements, calculations, and other documentation used to determine the annual benzene quantity in the process wastewater stream exiting the treatment process.

(4) For each facility where waste streams are controlled for benzene emissions in accordance with §61.342(e), the records shall include for each waste stream all measurements, including the locations of the measurements, calculations, and other documentation used to determine that the total benzene quantity does not exceed 6.0 Mg/yr (6.6 ton/yr).

(5) For each facility where the annual waste quantity for process unit turnaround waste is determined in accordance with §61.355(b)(5), the records shall include all test results, measurements, calculations, and other documentation used to determine the following information: identification of each process unit at the facility that undergoes turnarounds, the date of the most recent turnaround for each process unit, identification of each process unit turnaround waste, the water content of each process unit turnaround waste, the annual waste quantity determined in accordance with §61.355(b)(5), the range of benzene concentrations in the waste, the annual average flow-weighted benzene concentration of the waste, and the annual benzene quantity calculated in accordance with §61.355(a)(1)(iii) of this section.

(6) For each facility where wastewater streams are controlled for benzene emissions in accordance with §61.348(b)(2), the records shall include all measurements, calculations, and other documentation used to determine the annual benzene content of the waste streams and the total annual benzene quantity contained in all waste streams managed or treated in exempt waste management units.

(c) An owner or operator transferring waste off-site to another facility for treatment in accordance with §61.342(f) shall maintain documentation for each offsite waste shipment that includes the following information: Date waste is shipped offsite, quantity of waste shipped offsite, name and address of the facility receiving the waste, and a copy of the notice sent with the waste shipment.

(d) An owner or operator using control equipment in accordance with §§61.343 through 61.347 shall maintain engineering design documentation for all control equipment that is installed on the waste management unit. The documentation shall be retained for the life of the control equipment. If a control device is used, then the owner or operator shall maintain the control device records required by paragraph (f) of this section.

(e) An owner or operator using a treatment process or wastewater treatment system unit in accordance with §61.348 of this subpart shall maintain the following records. The documentation shall be retained for the life of the unit.

(1) A statement signed and dated by the owner or operator certifying that the unit is designed to operate at the documented performance level when the waste stream entering the unit is at the highest waste stream flow rate and benzene content expected to occur.

(2) If engineering calculations are used to determine treatment process or wastewater treatment system unit performance, then the owner or operator shall maintain the complete design analysis for the unit. The design analysis shall include for example the following information: Design specifications, drawings, schematics, piping and instrumentation diagrams, and other documentation necessary to demonstrate the unit performance.

(3) If performance tests are used to determine treatment process or wastewater treatment system unit performance, then the owner or operator shall maintain all test information necessary to demonstrate the unit performance.

(i) A description of the unit including the following information: type of treatment process; manufacturer name and model number; and for each waste stream entering and exiting the unit, the waste stream type (e.g., process wastewater, sludge, slurry, etc.), and the design flow rate and benzene content.

(ii) Documentation describing the test protocol and the means by which sampling variability and analytical variability were accounted for in the determination of the unit performance. The description of the test protocol shall include the following information: sampling locations, sampling method, sampling frequency, and analytical procedures used for sample analysis.

(iii) Records of unit operating conditions during each test run including all key process parameters.

(iv) All test results.

(4) If a control device is used, then the owner or operator shall maintain the control device records required by paragraph (f) of this section.

(f) An owner or operator using a closed-vent system and control device in accordance with §61.349 of this subpart shall maintain the following records. The documentation shall be retained for the life of the control device.

(1) A statement signed and dated by the owner or operator certifying that the closed-vent system and control device is designed to operate at the documented performance level when the waste management unit vented to the control device is or would be operating at the highest load or capacity expected to occur.

(2) If engineering calculations are used to determine control device performance in accordance with §61.349(c), then a design analysis for the control device that includes for example:

(i) Specifications, drawings, schematics, and piping and instrumentation diagrams prepared by the owner or operator, or the control device manufacturer or vendor that describe the control device design based on acceptable engineering texts. The design analysis shall address the following vent stream characteristics and control device operating parameters:

(A) For a thermal vapor incinerator, the design analysis shall consider the vent stream composition, constituent concentrations, and flow rate. The design analysis shall also establish the design minimum and average temperature in the combustion zone and the combustion zone residence time.

(B) For a catalytic vapor incinerator, the design analysis shall consider the vent stream composition, constituent concentrations, and flow rate. The design analysis shall also establish the design minimum and average temperatures across the catalyst bed inlet and outlet.

(C) For a boiler or process heater, the design analysis shall consider the vent stream composition, constituent concentrations, and flow rate. The design analysis shall also establish the design minimum and average flame zone temperatures, combustion zone residence time, and description of method and location where the vent stream is introduced into the flame zone.

(D) For a flare, the design analysis shall consider the vent stream composition, constituent concentrations, and flow rate. The design analysis shall also consider the requirements specified in 40 CFR 60.18.

(E) For a condenser, the design analysis shall consider the vent stream composition, constituent concentration, flow rate, relative humidity, and temperature. The design analysis shall also establish the design outlet organic compound concentration level or the design outlet benzene concentration level, design average temperature of the condenser exhaust vent stream, and the design average temperatures of the coolant fluid at the condenser inlet and outlet.

(F) For a carbon adsorption system that regenerates the carbon bed directly on-site in the control device such as a fixed-bed adsorber, the design analysis shall consider the vent stream composition, constituent concentration, flow rate, relative humidity, and temperature. The design analysis shall also establish the design exhaust vent stream organic compound concentration level or the design exhaust vent stream benzene concentration level, number and capacity of carbon beds, type and working capacity of activated carbon used for carbon beds, design total steam flow over the period of each complete carbon bed regeneration cycle, duration of the carbon bed steaming and cooling/drying cycles, design carbon bed temperature after regeneration, design carbon bed regeneration time, and design service life of carbon.

(G) For a carbon adsorption system that does not regenerate the carbon bed directly on-site in the control device, such as a carbon canister, the design analysis shall consider the vent stream composition, constituent concentration, flow rate, relative humidity, and temperature. The design analysis shall also establish the design exhaust vent stream organic compound concentration level or the design exhaust vent stream benzene concentration level, capacity of carbon bed, type and working capacity of activated carbon used for carbon bed, and design carbon replacement interval based on the total carbon working capacity of the control device and source operating schedule.

(H) For a control device subject to the requirements of §61.349(a)(2)(iv), the design analysis shall consider the vent stream composition, constituent concentration, and flow rate. The design analysis shall also include all of the information submitted under §61.349 (a)(2)(iv).

(ii) [Reserved]

(3) If performance tests are used to determine control device performance in accordance with §61.349(c) of this subpart:

(i) A description of how it is determined that the test is conducted when the waste management unit or treatment process is operating at the highest load or capacity level. This description shall include the estimated or design flow rate and organic content of each vent stream and definition of the acceptable operating ranges of key process and control parameters during the test program.

(ii) A description of the control device including the type of control device, control device manufacturer's name and model number, control device dimensions, capacity, and construction materials.

(iii) A detailed description of sampling and monitoring procedures, including sampling and monitoring locations in the system, the equipment to be used, sampling and monitoring frequency, and planned analytical procedures for sample analysis.

(iv) All test results.

(g) An owner or operator shall maintain a record for each visual inspection required by §§61.343 through 61.347 of this subpart that identifies a problem (such as a broken seal, gap or other problem) which could result in benzene emissions. The record shall include the date of the inspection, waste management unit and control equipment location where the problem is identified, a description of the problem, a description of the corrective action taken, and the date the corrective action was completed.

(h) An owner or operator shall maintain a record for each test of no detectable emissions required by §§61.343 through 61.347 and §61.349 of this subpart. The record shall include the following information: date the test is performed, background level measured during test, and maximum concentration indicated by the instrument reading measured for each potential leak interface. If detectable emissions are measured at a leak interface, then the record shall also include the waste management unit, control equipment, and leak interface location where detectable emissions were measured, a description of the problem, a description of the corrective action taken, and the date the corrective action was completed.

(i) For each treatment process and wastewater treatment system unit operated to comply with §61.348, the owner or operator shall maintain documentation that includes the following information regarding the unit operation:

(1) Dates of startup and shutdown of the unit.

(2) If measurements of waste stream benzene concentration are performed in accordance with §61.354(a)(1) of this subpart, the owner or operator shall maintain records that include date each test is performed and all test results.

(3) If a process parameter is continuously monitored in accordance with §61.354(a)(2) of this subpart, the owner or operator shall maintain records that include a description of the operating parameter (or parameters) to be monitored to ensure that the unit will be operated in conformance with these standards and the unit's design specifications, and an explanation of the criteria used for selection of that parameter (or parameters). This documentation shall be kept for the life of the unit.

(4) If measurements of waste stream benzene concentration are performed in accordance with §61.354(b), the owner or operator shall maintain records that include the date each test is performed and all test results.

(5) Periods when the unit is not operated as designed.

(j) For each control device, the owner or operator shall maintain documentation that includes the following information regarding the control device operation:

(1) Dates of startup and shutdown of the closed-vent system and control device.

(2) A description of the operating parameter (or parameters) to be monitored to ensure that the control device will be operated in conformance with these standards and the control device's design specifications and an explanation of the criteria used for selection of that parameter (or parameters). This documentation shall be kept for the life of the control device.

(3) Periods when the closed-vent system and control device are not operated as designed including all periods and the duration when:

(i) Any valve car-seal or closure mechanism required under §61.349(a)(1)(ii) is broken or the by-pass line valve position has changed.

(ii) The flow monitoring devices required under §61.349(a)(1)(ii) indicate that vapors are not routed to the control device as required.

(4) If a thermal vapor incinerator is used, then the owner or operator shall maintain continuous records of the temperature of the gas stream in the combustion zone of the incinerator and records of all 3-hour periods of operation during which the average temperature of the gas stream in the combustion zone is more than 28 °C (50 °F) below the design combustion zone temperature.

(5) If a catalytic vapor incinerator is used, then the owner or operator shall maintain continuous records of the temperature of the gas stream both upstream and downstream of the catalyst bed of the incinerator, records of all 3-hour periods of operation during which the average temperature measured before the catalyst bed is more than 28 °C (50 °F) below the design gas stream temperature, and records of all 3-hour periods of operation during which the average temperature difference across the catalyst bed is less than 80 percent of the design temperature difference.

(6) If a boiler or process heater is used, then the owner or operator shall maintain records of each occurrence when there is a change in the location at which the vent stream is introduced into the flame zone as required by §61.349(a)(2)(i)(C). For a boiler or process heater ~~having a design heat input capacity less than 44 MW (150 × 106 BTU/hr)~~, the owner or operator shall maintain continuous records of the temperature of the gas stream in the combustion zone of the boiler or process heater and records of all 3-hour periods of operation during which the average temperature of the gas stream in the combustion zone is more than 28 °C (50 °F) below the design combustion zone temperature. For a boiler or process heater ~~having a design heat input capacity greater than or equal to 44 MW (150 × 106 BTU/hr)~~, the owner or operator shall maintain continuous records of the parameter(s) monitored in accordance with the requirements of §61.354(c)(5).

(7) If a flare is used, then the owner or operator shall maintain continuous records of the flare pilot flame monitoring and records of all periods during which the pilot flame is absent.

(8) If a condenser is used, then the owner or operator shall maintain records from the monitoring device of the parameters selected to be monitored in accordance with §61.354(c)(6). If concentration of organics or concentration of benzene in the control device outlet gas stream is monitored, then the owner or operator shall record all 3-hour periods of operation during which the concentration of organics or the concentration of benzene in the exhaust stream is more than 20 percent greater than the design value. If the temperature of the condenser exhaust stream and coolant fluid is monitored, then the owner or operator shall record all 3-hour periods of operation during which the temperature of the condenser exhaust

vent stream is more than 6 °C (11 °F) above the design average exhaust vent stream temperature, or the temperature of the coolant fluid exiting the condenser is more than 6 °C (11 °F) above the design average coolant fluid temperature at the condenser outlet.

(9) If a carbon adsorber is used, then the owner or operator shall maintain records from the monitoring device of the concentration of organics or the concentration of benzene in the control device outlet gas stream. If the concentration of organics or the concentration of benzene in the control device outlet gas stream is monitored, then the owner or operator shall record all 3-hour periods of operation during which the concentration of organics or the concentration of benzene in the exhaust stream is more than 20 percent greater than the design value. If the carbon bed regeneration interval is monitored, then the owner or operator shall record each occurrence when the vent stream continues to flow through the control device beyond the predetermined carbon bed regeneration time.

(10) If a carbon adsorber that is not regenerated directly on site in the control device is used, then the owner or operator shall maintain records of dates and times when the control device is monitored, when breakthrough is measured, and shall record the date and time then the existing carbon in the control device is replaced with fresh carbon.

(11) If an alternative operational or process parameter is monitored for a control device, as allowed in §61.354(e) of this subpart, then the owner or operator shall maintain records of the continuously monitored parameter, including periods when the device is not operated as designed.

(12) If a control device subject to the requirements of §61.349(a)(2)(iv) is used, then the owner or operator shall maintain records of the parameters that are monitored and each occurrence when the parameters monitored are outside the range of values specified in §61.349(a)(2)(iv)(C), or other records as specified by the Administrator.

(k) An owner or operator who elects to install and operate the control equipment in §61.351 of this subpart shall comply with the recordkeeping requirements in 40 CFR 60.115b.

(l) An owner or operator who elects to install and operate the control equipment in §61.352 of this subpart shall maintain records of the following:

(1) The date, location, and corrective action for each visual inspection required by 40 CFR 60.693-2(a)(5), during which a broken seal, gap, or other problem is identified that could result in benzene emissions.

(2) Results of the seal gap measurements required by 40 CFR 60.693-2(a).

(m) If a system is used for emission control that is maintained at a pressure less than atmospheric pressure with openings to provide dilution air, then the owner or operator shall maintain records of the monitoring device and records of all periods during which the pressure in the unit is operated at a pressure that is equal to or greater than atmospheric pressure.

(n) Each owner or operator using a total enclosure to comply with control requirements for tanks in §61.343 or the control requirements for containers in §61.345 must keep the records required in paragraphs (n)(1) and (2) of this section. Owners or operators may use records as required in 40 CFR 264.1089(b)(2)(iv) or 40 CFR 265.1090(b)(2)(iv) for a tank or as required in 40 CFR 264.1089(d)(1) or 40 CFR 265.1090(d)(1) for a container to meet the recordkeeping requirement in paragraph (n)(1) of this section. The owner or operator must make the records of each verification of a total enclosure available for inspection upon request.

(1) Records of the most recent set of calculations and measurements performed to verify that the enclosure meets the criteria of a permanent total enclosure as specified in "Procedure T—Criteria for and Verification of a Permanent or Temporary Total Enclosure" in 40 CFR 52.741, appendix B;

(2) Records required for a closed-vent system and control device according to the requirements in paragraphs (d) (f), and (j) of this section.

[55 FR 8346, Mar. 7, 1990; 55 FR 12444, Apr. 3, 1990; 55 FR 18331, May 2, 1990, as amended at 58 FR 3103, Jan. 7, 1993; 65 FR 62161, Oct. 17, 2000; 67 FR 68533, Nov. 12, 2002]

§61.357 Reporting requirements.

(a) Each owner or operator of a chemical plant, petroleum refinery, coke by-product recovery plant, and any facility managing wastes from these industries shall submit to the Administrator within 90 days after January 7, 1993, or by the initial startup for a new source with an initial startup after the effective date, a report that summarizes the regulatory status of each waste stream subject to §61.342 and is determined by the procedures specified in §61.355(c) to contain benzene. Each owner or operator subject to this subpart who has no benzene onsite in wastes, products, by-products, or intermediates shall submit an initial report that is a statement to this effect. For all other owners or operators subject to this subpart, the report shall include the following information:

(1) Total annual benzene quantity from facility waste determined in accordance with §61.355(a) of this subpart.

(2) A table identifying each waste stream and whether or not the waste stream will be controlled for benzene emissions in accordance with the requirements of this subpart.

(3) For each waste stream identified as not being controlled for benzene emissions in accordance with the requirements of this subpart the following information shall be added to the table:

(i) Whether or not the water content of the waste stream is greater than 10 percent;

(ii) Whether or not the waste stream is a process wastewater stream, product tank drawdown, or landfill leachate;

(iii) Annual waste quantity for the waste stream;

(iv) Range of benzene concentrations for the waste stream;

(v) Annual average flow-weighted benzene concentration for the waste stream; and

(vi) Annual benzene quantity for the waste stream.

(4) The information required in paragraphs (a) (1), (2), and (3) of this section should represent the waste stream characteristics based on current configuration and operating conditions. An owner or operator only needs to list in the report those waste streams that contact materials containing benzene. The report does not need to include a description of the controls to be installed to comply with the standard or other information required in §61.10(a).

(b) If the total annual benzene quantity from facility waste is less than 1 Mg/yr (1.1 ton/yr), then the owner or operator shall submit to the Administrator a report that updates the information listed in paragraphs (a)(1) through (a)(3) of this section whenever there is a change in the process generating the waste stream that could cause the total annual benzene quantity from facility waste to increase to 1 Mg/yr (1.1 ton/yr) or more.

(c) If the total annual benzene quantity from facility waste is less than 10 Mg/yr (11 ton/yr) but is equal to or greater than 1 Mg/yr (1.1 ton/yr), then the owner or operator shall submit to the Administrator a report that updates the information listed in paragraphs (a)(1) through (a)(3) of this section. The report shall be submitted annually and whenever there is a change in the process generating the waste stream that could cause the total annual benzene quantity from facility waste to increase to 10 Mg/yr (11 ton/yr) or more. If the information in the annual report required by paragraphs (a)(1) through (a)(3) of this section is not changed in the following year, the owner or operator may submit a statement to that effect.

(d) If the total annual benzene quantity from facility waste is equal to or greater than 10 Mg/yr (11 ton/yr), then the owner or operator shall submit to the Administrator the following reports:

(1) Within 90 days after January 7, 1993, unless a waiver of compliance under §61.11 of this part is granted, or by the date of initial startup for a new source with an initial startup after the effective date, a certification that the equipment necessary to comply with these standards has been installed and that the required initial inspections or tests have been carried out in accordance with this subpart. If a waiver of compliance is granted under §61.11, the certification of equipment necessary to comply with these standards shall be submitted by the date the waiver of compliance expires.

(2) Beginning on the date that the equipment necessary to comply with these standards has been certified in accordance with paragraph (d)(1) of this section, the owner or operator

shall submit annually to the Administrator a report that updates the information listed in paragraphs (a)(1) through (a)(3) of this section. If the information in the annual report required by paragraphs (a)(1) through (a)(3) of this section is not changed in the following year, the owner or operator may submit a statement to that effect.

(3) If an owner or operator elects to comply with the requirements of §61.342(c)(3)(ii), then the report required by paragraph (d)(2) of this section shall include a table identifying each waste stream chosen for exemption and the total annual benzene quantity in these exempted streams.

(4) If an owner or operator elects to comply with the alternative requirements of §61.342(d) of this subpart, then he shall include in the report required by paragraph (d)(2) of this section a table presenting the following information for each process wastewater stream:

(i) Whether or not the process wastewater stream is being controlled for benzene emissions in accordance with the requirements of this subpart;

(ii) For each process wastewater stream identified as not being controlled for benzene emissions in accordance with the requirements of this subpart, the table shall report the following information for the process wastewater stream as determined at the point of waste generation: annual waste quantity, range of benzene concentrations, annual average flow-weighted benzene concentration, and annual benzene quantity;

(iii) For each process wastewater stream identified as being controlled for benzene emissions in accordance with the requirements of this subpart, the table shall report the following information for the process wastewater stream as determined at the exit to the treatment process: Annual waste quantity, range of benzene concentrations, annual average flow-weighted benzene concentration, and annual benzene quantity.

(5) If an owner or operator elects to comply with the alternative requirements of §61.342(e), then the report required by paragraph (d)(2) of this section shall include a table presenting the following information for each waste stream:

(i) For each waste stream identified as not being controlled for benzene emissions in accordance with the requirements of this subpart; the table shall report the following information for the waste stream as determined at the point of waste generation: annual waste quantity, range of benzene concentrations, annual average flow-weighted benzene concentration, and annual benzene quantity;

(ii) For each waste stream identified as being controlled for benzene emissions in accordance with the requirements of this subpart; the table shall report the following information for the waste stream as determined at the applicable location described in §61.355(k)(2): Annual waste quantity, range of benzene concentrations, annual average flow-weighted benzene concentration, and annual benzene quantity.

(6) Beginning 3 months after the date that the equipment necessary to comply with these standards has been certified in accordance with paragraph (d)(1) of this section, the owner or operator shall submit quarterly to the Administrator a certification that all of the required inspections have been carried out in accordance with the requirements of this subpart.

(7) Beginning 3 months after the date that the equipment necessary to comply with these standards has been certified in accordance with paragraph (d)(1) of this section, the owner or operator shall submit a report quarterly to the Administrator that includes:

(i) If a treatment process or wastewater treatment system unit is monitored in accordance with §61.354(a)(1) of this subpart, then each period of operation during which the concentration of benzene in the monitored waste stream exiting the unit is equal to or greater than 10 ppmw.

(ii) If a treatment process or wastewater treatment system unit is monitored in accordance with §61.354(a)(2) of this subpart, then each 3-hour period of operation during which the average value of the monitored parameter is outside the range of acceptable values or during which the unit is not operating as designed.

(iii) If a treatment process or wastewater treatment system unit is monitored in accordance with §61.354(b), then each period of operation during which the flow-weighted annual average concentration of benzene in the monitored waste stream entering the unit is equal to or greater than 10 ppmw and/or the total annual benzene quantity is equal to or greater than 1.0 mg/yr.

(iv) For a control device monitored in accordance with §61.354(c) of this subpart, each period of operation monitored during which any of the following conditions occur, as applicable to the control device:

(A) Each 3-hour period of operation during which the average temperature of the gas stream in the combustion zone of a thermal vapor incinerator, as measured by the temperature monitoring device, is more than 28 °C (50 °F) below the design combustion zone temperature.

(B) Each 3-hour period of operation during which the average temperature of the gas stream immediately before the catalyst bed of a catalytic vapor incinerator, as measured by the temperature monitoring device, is more than 28 °C (50 °F) below the design gas stream temperature, and any 3-hour period during which the average temperature difference across the catalyst bed (i.e., the difference between the temperatures of the gas stream immediately before and after the catalyst bed), as measured by the temperature monitoring device, is less than 80 percent of the design temperature difference.

(C) Each 3-hour period of operation during which the average temperature of the gas stream in the combustion zone of a boiler or process heater ~~having a design heat input capacity less than 44 MW (150 × 106 BTU/hr)~~, as mesured by the temperature monitoring device, is more than 28 °C (50 °F) below the design combustion zone temperature.

(D) Each 3-hour period of operation during which the average concentration of organics or the average concentration of benzene in the exhaust gases from a carbon adsorber, condenser, or other vapor recovery system is more than 20 percent greater than the design concentration level of organics or benzene in the exhaust gas.

(E) Each 3-hour period of operation during which the temperature of the condenser exhaust vent stream is more than 6 °C (11 °F) above the design average exhaust vent stream temperature, or the temperature of the coolant fluid exiting the condenser is more than 6 °C (11 °F) above the design average coolant fluid temperature at the condenser outlet.

(F) Each period in which the pilot flame of a flare is absent.

(G) Each occurrence when there is a change in the location at which the vent stream is introduced into the flame zone of a boiler or process heater as required by §61.349(a)(2)(i)(C) of this subpart.

(H) Each occurrence when the carbon in a carbon adsorber system that is regenerated directly on site in the control device is not regenerated at the predetermined carbon bed regeneration time.

(I) Each occurrence when the carbon in a carbon adsorber system that is not regenerated directly on site in the control device is not replaced at the predetermined interval specified in §61.354(c) of this subpart.

(J) Each 3-hour period of operation during which the parameters monitored are outside the range of values specified in §61.349(a)(2)(iv)(C), or any other periods specified by the Administrator for a control device subject to the requirements of §61.349(a)(2)(iv).

(v) For a cover and closed-vent system monitored in accordance with §61.354(g), the owner or operator shall submit a report quarterly to the Administrator that identifies any period in which the pressure in the waste management unit is equal to or greater than atmospheric pressure.

(8) Beginning one year after the date that the equipment necessary to comply with these standards has been certified in accordance with paragraph (d)(1) of this section, the owner or operator shall submit annually to the Administrator a report that summarizes all inspections required by §§61.342 through 61.354 during which detectable emissions are measured or a problem (such as a broken seal, gap or other problem) that could result in benzone emissions is identified, including information about the repairs or corrective action taken.

(e) An owner or operator electing to comply with the provisions of §§61.351 or 61.352 of this subpart shall notify the Administrator of the alternative standard selected in the report required under §61.07 or §61.10 of this part.

(f) An owner or operator who elects to install and operate the control equipment in §61.351 of this subpart shall comply with the reporting requirements in 40 CFR 60.115b.

(g) An owner or operator who elects to install and operate the control equipment in §61.352 of this subpart shall submit initial and quarterly reports that identify all seal gap measurements, as required in 40 CFR 60.693-2(a), that are outside the prescribed limits.

[55 FR 8346, Mar. 7, 1990; 55 FR 12444, Apr. 3, 1990, as amended at 55 FR 37231, Sept. 10, 1990; 58 FR 3105, Jan. 7, 1993; 65 FR 62161, Oct. 17, 2000]