CHAPTER 6
Air Emissions

This chapter summarizes federal air emissions regulations for petroleum storage tanks and bulk gasoline terminals. Federal and state permitting requirements are summarized, as well as other general state requirements. Other information within this chapter includes:

- *Sources of emissions from fuel storage tanks and loading racks*
- *Methods of controlling emissions from fuel storage tanks and loading racks*
- *Air quality regulations for fuel storage tanks, loading racks, and internal combustion engines*

6.1 Regulatory Background

Congress first enacted federal clean air legislation in 1955, providing for research and technical and financial assistance to the states. After adopting several additional minor air pollution laws, Congress passed the Air Quality Act of 1967, providing the basic framework of the current statutes. The **Clean Air Act (CAA)** of 1970 and the CAA of 1977 helped shape the control of air pollution. The CAA amendments of 1990 strengthened existing air pollution control programs and added a comprehensive operating permit program (Title V) to consolidate all CAA requirements for major air pollution sources.

Exhibit 6–1 summarizes some of the key federal air quality programs applicable to fuel facilities included in the CAA. A discussion of each of these programs is provided in this section. You'll need to contact your state or regional air quality agency to understand requirements specific to your facility. See *Appendix E* for addresses, phone numbers, and websites for state air quality agencies.

Some of the CAA requirements and U.S. Environmental Protection Agency (EPA) regulations summarized in this chapter address:

- **National Ambient Air Quality Standards (NAAQS)** to protect public health and welfare. EPA has published NAAQS for six criteria pollutants.
- Requirements for new industrial sources to be controlled by standards that, at minimum, meet technology-based **New Source Performance Standards (NSPS)** applicable to classes or categories of industrial facilities.
- Toxic air pollutants, also called **hazardous air pollutants (HAPs)**, which are regulated separately from criteria air pollutants in the CAA. Federal **National Emission Standards for Hazardous Air Pollutants (NESHAP)** have been implemented to reduce HAP emissions from new and existing sources.
- The Montreal Protocol and EPA's Ozone Depleting Substances Management Program to phase out most ozone-depleting substances.
- The prevention, detection, and corrective action for sudden, catastrophic releases of certain **air toxics** and **flammable substances** by requiring that facilities evaluate public risk and develop a risk management program.

The Law Says

- *Most facilities with bulk fuel storage tanks, loading operations, and vapor control need an air permit (40 CFR 70).*
- *The state or regional air quality control agency issues the permit that sets limits on polluting emissions and operations.*
- *Storage tanks subject to NSPS must have one of the following control methods or an equivalent system (40 CFR 60 Subparts K, Ka, and Kb):*
  - *External floating roof*
  - *Fixed-roof with internal floating cover*
  - *Vapor recovery system that reduces VOC emissions*
- *Bulk gasoline terminals subject to NESHAP must have a vapor collection system to collect VOCs during loading operations with emissions to the atmosphere not exceeding 10 mg of VOC per liter of gasoline loaded (40 CFR 63 Subpart BBBBBB).*
- *If stationary internal combustion engines are not able to operated to manufacturer's specification, you must demonstrate compliance, conduct testing, monitor, and keep records (40 CFR 60 Subparts IIII and JJJJ, and 40 CFR 63 Subpart ZZZZ).*

- Permit programs for the operation of major and area sources emitting air pollutants. EPA has delegated air permitting to state, regional, or local air quality agencies.

6.2 Emission Sources

The majority of air emissions at fuel facilities are caused by evaporation from one or more of the following:

- Storage tanks
- Loading and unloading racks
- Equipment leaks
- Accidental releases

EXHIBIT 6–1
Air Compliance Programs Potentially Applicable to DLA Energy Facilities

Air Compliance Program	Summary of Air Program	Applicable Federal Regulatory Reference
New Source Performance Standards	Regulates certain air emission sources, such as petroleum storage tanks, bulk gasoline terminals, and stationary internal combustion engines	40 CFR 60, Subparts A, K, Ka, Kb, XX, IIII, JJJJ
National Emission Standards for Hazardous Air Pollutants	Regulates facilities that emit hazardous air pollutants, such as gasoline distribution facilities and stationary internal combustion engines	40 CFR 63, Subparts A, R, EEEE, ZZZZ, GGGGG, BBBBBB, CCCCCC
National Ambient Air Quality Standards	Established for the following criteria air pollutants: particulate matter, NO_2, SO_2, CO, lead, and ozone	40 CFR 50
Major New Source Review	Has stricter regulation of NAAQS criteria pollutants for new construction or modification to sources and may include registrations or permits	40 CFR 52.21 and various state and local regulations
Title V Permit Program	Establishes uniform permitting requirements to be implemented by states for all major sources	40 CFR 70 and various state and local regulations
Accidental Release Prevention Program	Helps prevent accidental releases of acutely hazardous materials (AHMs) and requires Risk Management Plans for facilities that store AHMs in excess of threshold quantities	40 CFR 68
Ozone-Depleting Substances	Requires the phaseout of certain chemicals often used in air conditioning and fire suppression systems. Requires a trained and certified technician to handle regulated refrigerants, perform leak detection and repairs, and maintain records.	40 CFR 82

6.2.1 Storage Tanks

Storage tanks are a common cause of air emissions at fuel facilities. In a typical tank, the space over the top of the liquid becomes saturated with the vapor of the stored liquid. These saturated vapors can be released from the tank into the atmosphere in a number of different ways, such as:

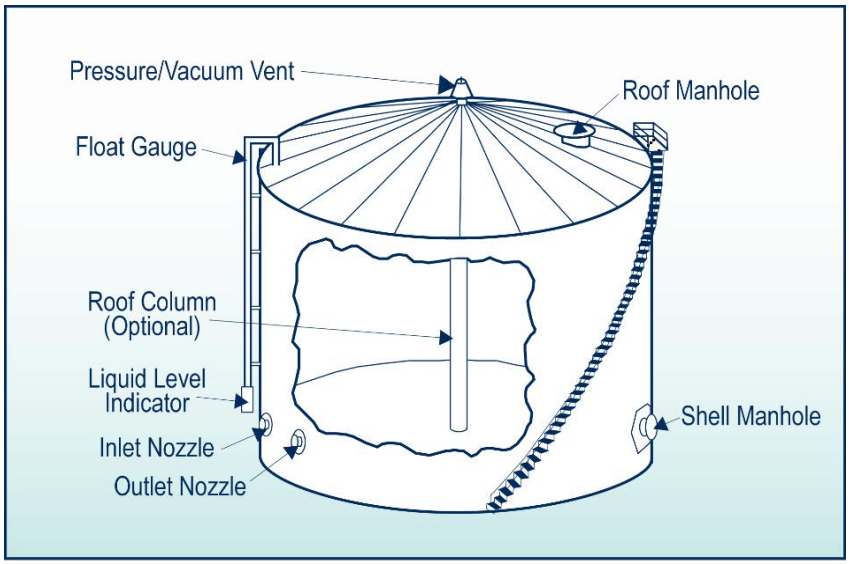
- Expansion and contraction of the vapors because of temperature and barometric pressure changes
- Displacement of the vapors during filling
- Direct evaporation (exposure to the air)

There are two basic storage tank designs used to store petroleum liquids: fixed-roof tanks and floating-roof tanks. Floating-roof tanks can be subdivided into internal floaters and external floaters. Floating-roof tanks have less emissions than fixed-roof tanks because tank roofs float on the stored liquid to essentially eliminate liquid losses due to vapor displacement.

6.2.1.1 Fixed-roof Tanks

A fixed-roof tank consists of a cylindrical steel shell with a permanent roof (cone-shaped, dome-shaped, or flat). Fixed-roof tanks are either freely vented or have a pressure vent. The pressure vent lets the tank operate at either a slight vacuum or a slight positive internal pressure to minimize the release of vapors during operation. Fixed-roof tanks can be installed as either aboveground or underground storage tanks. *Exhibit 6–2* shows a typical aboveground fixed-roof tank.

EXHIBIT 6–2
Typical Aboveground Fixed-roof Tank



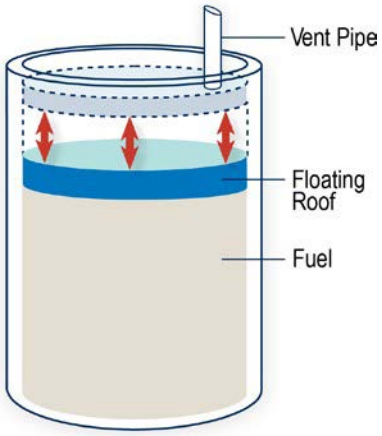
Fixed-roof tanks have two types of emission losses: breathing losses and working losses. **Breathing losses** occur when vapor is released as it expands and contracts because of temperature or pressure changes. **Working losses** occur as a result of liquid level changes in the tank that force fuel-vapor-saturated air out of the tank through a vent. When the tank is emptied, air drawn into the tank becomes saturated with fuel vapor. When the tank is filled, these vapors are expelled from the tank.

Fixed-roof tank emissions can be controlled by installing a **vapor balance system**, a vapor recovery system (discussed later in this chapter), or an internal floating roof (conversion to an internal floating-roof tank).

6.2.1.2 External Floating Roof Tanks

External floating-roof tanks consist of an open-topped cylindrical steel shell with a roof or deck that floats on the surface of the stored liquid. The floating-roof deck rises and falls with the liquid level in the tank (see *Exhibit 6–3*). The floating-roof deck includes a rim seal system to control the release of vapors. The seal system is used to control the evaporative losses from the space between the tank wall and the floating-roof deck. The seal system slides against the tank wall as the roof is raised and lowered.

EXHIBIT 6–3
Schematic of External Floating-roof Tank



External floating-roof tanks have two types of emission losses: standing storage losses and withdrawal losses. **Standing storage losses** are defined as rim seal losses and deck fitting losses. Standing storage losses occur as fuel vapors escape from gaps in the rim seals (the space between the floating-roof seals and the tank wall) and from small openings in the floating roof for deck fittings. The amount of rim seal loss depends on the rim seal system used. Installing two separate seals can reduce standing storage losses. The first seal is called the primary seal, and the other, mounted above the primary seal, is called the secondary seal.

Withdrawal losses occur when an external floating roof is lowered. The liquid that clings to the tank wall is exposed to the atmosphere and evaporates. Installing wiper blade seals around the edge of the roof is one way to reduce withdrawal losses.

6.2.1.3 Internal Floating-roof Tank

The internal floating-roof tank has a permanent fixed roof with a floating roof inside. Internal floating-roof tanks have either a contact roof or deck floating on the liquid surface or a non-contact deck several inches above the liquid surface resting on pontoons. These decks rise and fall with the liquid level within the fixed-roof tank. Circulation vents and an open vent at the top of the fixed roof reduce vapor accumulation in concentrations approaching flammable range. Some internal floating-roof tanks also have internal columns that support the fixed roof.

Most internal floating-roof tanks have the same types of evaporative losses that external floating-roof tanks do—working losses and standing storage losses. Working losses and standing storage losses will increase if the tank has internal column supports. The liquid fuel coats the columns and evaporates. Standing losses from internal floating-roof tanks result from evaporation of liquid fuel from around the rim seals and deck fittings. Other standing losses include breathing losses resulting from ambient temperature and pressure changes.

Internal floating-roof tanks have two types of primary seals: resilient foam-filled and wiper. These seals close the ring of vapor space between the edge of the floating roof and the tank wall. A **resilient foam-filled seal** consists of a foam material surrounded by fabric that expands and contracts to maintain contact with the tank wall. **Wiper seals** are usually flexible perimeter seals or wipers that slide against the tank wall as the tank roof moves up and down.

6.2.2 Loading and Unloading Racks

Another way emissions occur at fuel facilities is due to evaporative losses that occur when petroleum products are loaded and unloaded from storage and transportation vessels. Loading loss is generally the primary source of evaporative emissions from marine vessels, tank cars, and tank truck operations that occur when fuel vapors in the tank truck are vented to the atmosphere during fuel loading. Fugitive equipment leaks can also occur from gasoline cargo trucks. There are certain regulatory requirements for use of vapor-tight cargo trucks to minimize fugitive emissions. As the fuel level in the tank rises during loading, it displaces the vapors in the tank. One way you can control these emissions is to install a **vapor collection system**.

As discussed below, gasoline distribution facilities are required to install and operate vapor collection systems to control vapor emissions during gasoline loading operations. However, aviation gas and diesel fuel loading systems are *not* required to use a vapor collection system.

Loading rack air emissions include emissions from fugitive leaks, spills, and loading operations. Different loading methods have different influences on working loss. Generally, there are two types of fuel loading: submerged loading and splash loading. The type of loading is determined by where the fill pipe terminates in the tank.

6.2.2.1 Submerged Loading

Submerged loading has much lower evaporative loss than splash loading and is preferred for loading fuels (on systems without vapor collection systems). The submerged loading method introduces the fuel into the bottom of the tank below the liquid level. This reduces liquid turbulence and vapor–liquid contact.

There are two types of submerged loading methods: the submerged fill pipe method and the bottom-mounted fill pipe method. The bottom-mounted fill pipe method is the preferred practice at DLA Energy fuel facilities. In the submerged fill pipe method, the fill pipe descends to below the level of the liquid, and the opening is almost at the bottom of the cargo tank. In the bottom-mounted fill pipe method, the fill pipe enters the cargo tank from the bottom.

6.2.2.2 Splash Loading

As noted earlier, splash loading results in higher vapor emissions than submerged loading. In splash loading, fuel enters the tank through a fill pipe at the top and splashes as it hits the liquid surface (or bottom). The splashing generates large amounts of vapors, which are vented from the tank as the fuel level rises in the tank.

6.2.3 Equipment Leaks

Leaks and spills from faulty pumps or compressor seals, loose valve bonnets, fittings, pressure-relief devices, and flanges result in uncontrolled air emissions due to evaporation of the liquid fuel. The best way you can control these emissions is to locate and repair the source of the leak. An inspection and maintenance program will identify and help reduce equipment leaks resulting in air emissions.

Don't Forget...

You can reduce tank emissions by painting storage tanks white to reflect more sunlight. You can also insulate storage tanks to reduce heat gain and losses. Both measures reduce emissions by keeping tanks at a more constant temperature.

6.2.4 Accidental Release

In the event of an accidental release, a fraction of the fuel is lost through evaporation. You cannot prevent these evaporative losses, but you can implement certain procedures to prevent and minimize accidents. See *Chapter 1, Environmental and Emergency Response Planning* for guidelines on Emergency Response Plans and pollution prevention.

6.3 Emission Controls

There are several methods of controlling emissions from fixed-roof tanks. In addition to installing internal floating roofs and seals to minimize evaporative losses, you can use vapor balancing, vapor recovery, and thermal oxidation systems to control emissions.

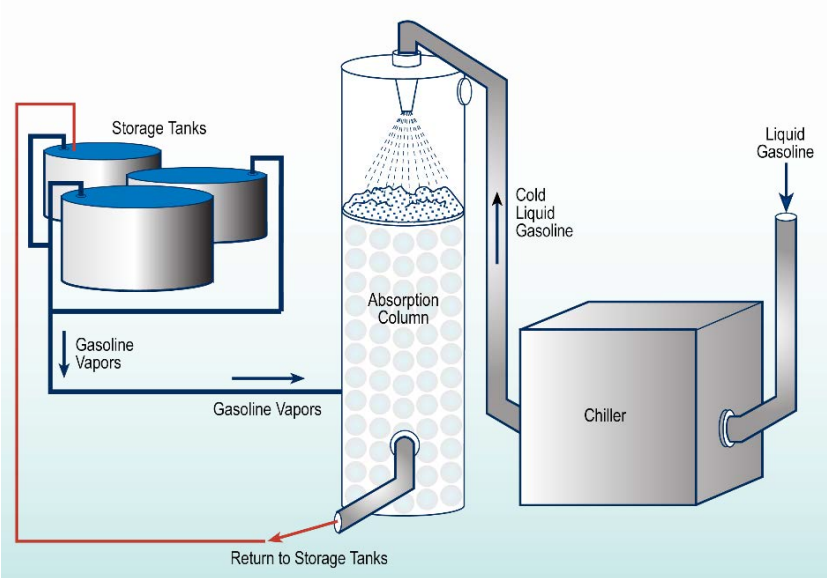
6.3.1 Vapor Balancing

Vapor balancing is a method where the vapors being vented from a storage tank being filled are directed to the storage tank from which the fuel is being pumped. This technique is common at gas stations where the vapors vented from the storage tank are returned to the tank truck. Vapor balancing can recover up to 98% of vapors that would otherwise be vented to the atmosphere.

6.3.2 Vapor Recovery Systems

Vapor recovery systems are used to collect vapor emissions from storage tanks and condense them to a recoverable liquid product using several techniques. Carbon *absorption* systems can include refrigeration and compression cycles where highly concentrated vapors from storage tanks are piped to an absorption tower, where chilled liquid is sprayed into a column filled with an inert packing media. The chilled liquid causes vapors entering the bottom of the column to condense and absorb onto the inert packing media. Droplets of the liquid eventually collect on the packing material and rain out into the bottom of the absorption column. The liquid recovered from the bottom of the absorption tower is then sent back to storage. Vapor recovery system control efficiencies using absorption can be as high as 98%, depending on the design of the absorption unit, the type of equipment used, and the **volatile organic compound (VOC)** concentration of the emission streams. *Exhibit 6–4* illustrates a simple schematic for an absorption tower vapor recovery unit for gasoline vapors.

EXHIBIT 6–4
Vapor Recovery Unit Using Absorption System



Carbon *adsorption* units can also be used for vapor recovery. Carbon adsorption processes typically involve the use of activated carbon, which is suitable for collecting VOCs from high-volume, low-concentration gases by adsorbing or binding the vapors onto the active carbon. Activated carbon is a processed material received from a vendor and is produced by heating coal, coconut shells, or wood in a **pyrolysis** process to drive off the VOCs, making the material "thirsty" for VOCs. VOCs collected in an adsorption unit can be recovered by recycling the activated carbon or other adsorption material in a process designed to capture the adsorption liquid, and the carbon or other adsorption material is regenerated and can be used again.

6.3.3 Thermal Oxidation Systems

In addition to vapor recovery systems, thermal oxidation systems can be used to destroy the vapors. Thermal oxidation systems consist of either flares or incinerators.

Flares are typically used to thermally destroy gaseous emissions from processes like refining, in which waste gas is generated and the emission of the gas without thermal destruction would be harmful. Flares may take different configurations, but they usually have a natural-gas-fired pilot that provides the combustion source. Waste gas is piped to the flare and ignited by the pilot, after which the flame is sustained until the waste gas diminishes. **Destruction efficiency** for most flares is greater than 95%, with the resulting emissions being the by-products of combustion and residual unburned hydrocarbons.

Incinerators are another form of thermal oxidation used for destroying waste gases that otherwise would be harmful. Incinerators come in many different configurations and sizes, but as with flares, their primary purpose is to destroy waste gas emissions. The vapor is injected through a burner manifold into the combustion chamber of an incinerator. Thermal destruction efficiencies for

incinerators can be as high as 99%. Generally, incinerators are a more complex and expensive means of thermal oxidation than flares, but they achieve higher destruction efficiencies.

6.4 National Ambient Air Quality Standards Programs

The NAAQS are limitations on concentrations of criteria air pollutants that should not be exceeded anywhere in the U.S. To date, NAAQS have been established for the following compounds:

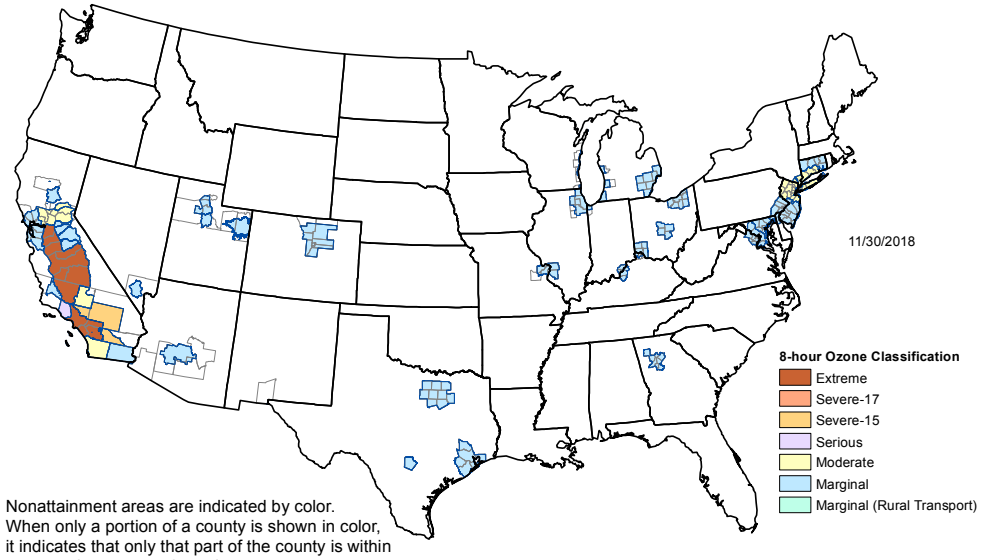
- Ozone (the standard is achieved by regulating hydrocarbons and VOCs)
- Nitrogen dioxide (NO_2)
- Particulate matter (PM–10 means particulates less than 10 micrometers in diameter, and PM–2.5 means fine particulates less than 2.5 micrometers in diameter)
- Carbon monoxide (CO)
- Lead
- Sulfur dioxide (SO_2)

The NAAQS are numerical health-based criteria, so the regulated compounds are commonly referred to as **criteria pollutants**. To determine if the NAAQS are being met, states are divided into air basins or air quality control regions. Ambient monitoring networks sample and analyze air for each of the criteria pollutants. If monitored concentrations are below the corresponding NAAQS, the air basin is designated as an **attainment area**. If monitored concentrations exceed NAAQS, the air basin is designated as a **nonattainment area** for the exceeding pollutant. For CO and ozone, nonattainment areas are assigned a classification depending on the severity of their nonattainment. Ozone nonattainment areas can be classified as marginal, moderate, serious, severe, or extreme. See *Exhibit 6–5* for a map of current ozone nonattainment areas in the U.S as of November 30, 2018.

Areas also can be designated as a maintenance area if that area was designated nonattainment for one of the NAAQS but later met the standards and was redesignated to attainment. To ensure the air quality in this area continues to meet the NAAQS, states are required to develop and implement Maintenance State Implementation Plans.

The air quality designation and classification of an area determines the major source threshold for sources in that area. As discussed previously, this can affect air permitting requirements for existing DLA Energy facilities. In addition, new source review requirements for major new sources and major modifications at existing major sources of air emissions are different in attainment and nonattainment areas. These requirements are discussed later in this chapter under *6.10 , Air Permits*.

EXHIBIT 6–5
8-Hour Ozone Nonattainment Areas



6.5 New Source Performance Standards

Most emissions from fuel facilities are VOCs and toxic air pollutants. No NAAQS exist for VOCs. However, EPA has determined that VOCs contribute to the formation of ground-level ozone, which is a criteria pollutant.

EPA identified a variety of processes and industries as having the potential to emit criteria and certain other regulated air pollutants. For these processes and industrial categories, EPA established technology-based emission control standards called NSPS. These apply to new, modified, or reconstructed stationary sources. NSPS must reflect the "degree of emission limitation achievable through the application of the best system of emissions reductions," taking cost into account. Facilities subject to NSPS must comply with the standards regardless of the ambient air quality of the area.

While NSPS regulate over 90 specific source categories, five different NSPS Subparts in 40 CFR 60 might apply to DLA Energy facilities, as follows:

- Subpart A – General Provisions
- Subpart K – for petroleum storage tanks if construction, reconstruction, or modification began after June 11, 1973, but before May 19, 1978
- Subpart Ka – for petroleum storage tanks if construction, reconstruction, or modification began after May 18, 1978, but before July 23, 1984
- Subpart Kb – for volatile organic liquid (not just petroleum) storage tanks if construction, reconstruction, or modification began after July 23, 1984
- Subpart XX – Standards for Bulk Gasoline Terminals

EPA also established rules in two additional NSPS subparts for certain stationary internal combustion engines. Engines typically emit **nitrogen oxides (NOx)**, particulate matter (PM), SO_2, CO, non-methane hydrocarbons, and VOCs. Internal

combustion engines may be used at fuel facilities to power pumps or generate electricity and are covered by:

- Subpart IIII – for stationary compression ignition internal combustion engines
- Subpart JJJJ – for stationary spark ignition internal combustion engines

Once a permit to operate a fuel facility is issued, applicable NSPS emissions standards and monitoring, recordkeeping, and reporting requirements become part of the permit conditions. The requirements for each of these standards are summarized below. Refer to *Chapter 12, Routine Reporting* for more on NSPS agency notification and reporting requirements.

6.5.1 Subpart A – General Provisions

The General Provisions contain numerous requirements that are generally applicable to any source subject to an NSPS unless otherwise noted within a specific NSPS. Subpart A requires written notification to EPA and the **delegated state agency** of new source construction, reconstruction, or modification within 30 days of commencement of the activity. Written notifications to EPA also are required at least 30 days before the anticipated facility startup (for example, filling of the tank), and again for the actual startup date. Notification is due within 15 days of the actual startup date.

Notification to EPA is required for any physical or operational change to an existing facility that may increase the emission rate of any air pollutant to which the NSPS applies. This notice must be provided 60 days before the change and must include information describing the precise nature of the change, present and proposed emission control systems, productive capacity of the facility before and after the change, and the expected completion date of the change.

Subpart A defines NSPS performance testing, monitoring, reporting, and control device requirements (only if flares are installed). Except for the notification requirements and activities defined that constitute modification or reconstruction, requirements of Subpart A should appear as permit conditions.

6.5.2 Subpart K – Petroleum Storage Tanks

NSPS Subpart K applies to each petroleum liquid storage tank with a capacity of *40,000 gallons or more for which construction or modification started between March 8, 1974, and May 19, 1978. This standard also applies to each petroleum liquid storage tank with a capacity of 65,000 gallons or more for which construction or modification started between June 11, 1973, and May 19, 1978.* Storage tanks covered under Subpart K must be equipped with a floating roof, vapor recovery system, or equivalent method of control if they store petroleum liquids with true vapor pressures between 1.5 and 11.1 **pounds per square inch absolute (psia)**. A vapor recovery system (or equivalent) is required if the tank stores petroleum liquids with true vapor pressures above 11.1 psia. The true vapor pressure is the absolute (partial) pressure of a petroleum liquid at its actual storage temperature measured either in units of psia or millimeters of mercury (mm Hg).

If your storage tanks are subject to NSPS Subpart K, you are required to maintain records of petroleum liquid stored, length of storage, and maximum true vapor

pressure of the liquid during the storage period for at least 2 years (or 5 years if your facility has a Title V operating permit). These monitoring requirements do not apply to tanks that store petroleum liquids with a Reid vapor pressure (RVP) less than 1.0 psia (provided the maximum true vapor pressure does not exceed 1.0 psia) or tanks equipped with a vapor recovery and return disposal system.

6.5.3 Subpart Ka – Petroleum Storage Tanks

Subpart Ka is a more recent and more stringent emissions standard for petroleum liquid storage tanks than Subpart K. Subpart Ka applies to your facility if you have a petroleum storage tank with a storage capacity *over 40,000 gallons for which construction began after May 18, 1978, but before July 23, 1984.* Like Subpart K, Subpart Ka also does not apply to tanks that contain Nos. 2 through 6 fuel oils, Nos. 2-GT through 4-GT gas turbine fuel oils, or Nos. 2-D through 4-D diesel fuel oils.

Storage tanks covered under Subpart Ka must be equipped with one of the following:

- An external floating roof with primary and secondary rim seals
- An internal floating roof with all openings covered and gasketed
- A vapor control system capable of reducing VOC emissions by 95 weight percent
- An equivalent method of VOC emissions control

External floating-roof tanks must be inspected within 60 days of being initially filled (or refilled if the tank was out of service for over 1 year). You are required to measure and record the gap areas and maximum gap widths between the primary seal and the tank wall and between the secondary seal and the tank wall. Inspections must be performed at least every 5 years for the primary seals and at least annually for the secondary seals. Written notification must be provided to EPA and your state agency at least 30 days prior to testing. If any gap measurement test exceeds allowable limits, you must submit a report to EPA and your state within 60 days of the inspection. You are also required to keep all records on-site for 2 years (or 5 years if your facility has a Title V operating permit) from the date the record was created.

Care should be taken to ensure that any **slotted guidepoles** used at external floating roof tanks are installed with controls, such as gaskets, wipers, and pole sleeves.

Slotted guidepoles help guide the motion of the external floating roof and sample the contents of the tank for environmental and quality control purposes. Without emission controls, these guidepoles operate as chimneys, emitting an estimated 20,000 pounds (lb) of VOCs annually per tank—roughly equal to the emissions from 380 cars and trucks. The slots and the space between the guidepoles and the tank's roof are observable emission pathways that violate the "no visible gap" prohibition in NSPS Subparts Ka and Kb.

Subpart Ka does not require any initial testing or monitoring for internal floating-roof tanks. If the tanks are equipped with a **vapor control system**, you must provide emissions data, manufacturer's design specifications, and an Operations and Maintenance (O&M) Plan to EPA.

Did You Know?

Subparts K and Ka do not apply to tanks that contain Nos. 2 through 6 fuel oils, Nos. 2-GT through 4-GT gas turbine fuel oils, or Nos. 2-D through 4-D diesel fuel oils because the rule specifically excludes these materials from the definition of a petroleum liquid.

No actual testing is required, and no periodic inspections are required. Facilities with tanks subject to Subpart Ka are required to perform the same monitoring of operations (petroleum liquid stored, period of storage, maximum true vapor pressure of the liquid during the storage period, and so on) as tanks subject to Subpart K.

6.5.4 Subpart Kb – Volatile Organic Liquid Storage Tanks

Subpart Kb is the most recent emissions standard for petroleum liquid storage tanks. It is stricter than Subparts K and Ka. Subpart Kb applies to any volatile organic liquid storage tank that is *not located at a bulk gasoline plant or service station and that has a capacity of over 75 cubic meters (19,810 gallons) that was constructed after July 23, 1984*. The definition of volatile organic liquids is broader than petroleum liquids, as defined in Subparts K and Ka, so tanks constructed after July 23, 1984, are more likely to be regulated by Subpart Kb. Monitoring, recordkeeping, and reporting requirements are significantly expanded in Subpart Kb.

VOC emissions standards are similar for storage tanks covered under Subparts Ka and Kb for tanks exceeding certain capacity thresholds and storing petroleum compounds exceeding certain thresholds. The key difference between the two regulations is that under Subpart Kb, the internal and external floating-roof alternatives *cannot* be used if the stored liquid has a maximum true vapor pressure of 11.1 psia or higher. Subpart Kb requires tanks that store these more **volatile liquids** to be equipped with a vapor control system capable of reducing VOC emissions by 95 weight percent, or with an equivalent method of VOC emissions control. Diesel and other low volatility petroleum fuels may be stored in fixed roof tanks.

Inspection requirements for external floating-roof tanks are similar under Subparts Ka and Kb. One notable difference is that if a Subpart Kb limit is exceeded, you are required to repair the tank or remove it from service within 45 days, instead of reporting the exceedance to EPA, as is the case with Subpart Ka. Inspection requirements for internal floating-roof storage tanks subject to Subpart Kb are similar to the requirements for external floating-roof tanks, with some exceptions. First, internal floating-roof tanks must be visually inspected, and any defects discovered must be corrected prior to filling the tank. Visual inspections of the floating roof and both seals must be performed through manholes and roof hatches at least every 12 months after the first filling if the tanks are equipped with liquid-mounted or mechanical-shoe primary seals. For tanks equipped with double-seal systems, the same inspection frequency can be applied, or complete visual inspections can be performed every 5 years (not through manholes or roof hatches).

As is the case with Subpart Ka tanks, you must repair any defect in the seals or gaskets within 45 days of discovery. A 30-day extension may be allowed by the agency if you are not able to drain the tank for repairs within the 45-day period due to extenuating circumstances. Visual inspection of all sealing systems is required each time the tanks are emptied and degassed, and EPA (and the state agency) must be notified in writing at least 30 days before filling or refilling any storage tank subject to this requirement.

For both external and internal floating-roof tanks, you must provide a description of primary and secondary seal systems and other control equipment installed on the tanks to EPA within 15 days of initially filling the tank. Also, you are required to report the results of any inspections to EPA within 30 days after the inspection and maintain all records on-site for 2 years (or 5 years if your facility has a Title V operating permit) from the date the records were created.

If you have any Subpart Kb petroleum storage tanks that have vapor control systems, you are required to report measured emissions control efficiency to EPA and the state within 6 months of initial startup of the system. Also, semiannual reporting of vapor control system operation to EPA and the state is required. You must maintain on-site records of O&M plans, measured values, and testing performed on the vapor control system for 2 years (or 5 years if your facility has a Title V operating permit) from the date the records were created.

6.5.5 Subpart XX – Standards of Performance for Bulk Gasoline Terminals

This standard applies to your facility if it has *a daily gasoline throughput of 20,000 gallons (75,700 liters per day) or more and was constructed or modified after December 17, 1980*. EPA defines throughput as the maximum calculated design throughput as may be limited by compliance with enforceable conditions under federals, state, or local laws. If this applies to your facility, you must have a **vapor collection and control system** to collect vapors from truck-filling operations. You are required to test the entire loading rack and vapor collection system for leaks at initial startup and monthly thereafter. You must document any leaks discovered, and repair them within 15 days of discovery, plus maintain on-site records of the monthly leak inspections for at least 2 years (or 5 years if your facility has a Title V operating permit).

Tanker trucks filled at these facilities are required to have documentation demonstrating that their cargo tanks are vapor tight. The tanker truck vapor-tightness documentation may either be maintained at the facility and be available for inspection or made available electronically or via FAX. If the electronic or FAX option is used, the electronic copy must be available instantly and the FAX copy must be made available in a relatively short, agreed upon time frame. Also, if the electronic or FAX option is used, the permitting authority (EPA or your state agency) is to be notified. This documentation must be updated annually. This certificate should be provided by the tank truck shipping company. If the tanker truck company cannot or will not provide a recent certificate, you cannot offer gasoline for transfer into their tank truck. Make sure you obtain the certificate *prior* to loading the gasoline into the truck.

6.5.6 Stationary Internal Combustion Engines

There are two NSPS subparts that apply to stationary internal combustion engines (ICE). 40 CFR 60 Subpart IIII is applicable to stationary compression ignition ICE and 40 CFR 60 Subpart JJJJ is applicable to stationary spark ignition ICE. The rules do not apply to motor vehicles or portable non-road engines.

All new ICE owners must maintain documentation from the manufacturer that their engine meets the Subpart IIII- or Subpart JJJJ-tiered engine emission standards for their engine displacement (liters per cylinder), power output (horsepower [hp] or kilowatt [kW]), and duty type (emergency generator, non-road engine, marine engine). This documentation is called an EPA Certificate of Conformity (commonly referred to as a vendor certificate). The engine manufacturer must provide this document, and all new ICE owners must maintain a copy of this document to certify that their engine is compliant with the emissions standards in Subpart IIII or Subpart JJJJ. Ask your engine manufacturer for a copy, or, if you don't know your engine manufacturer, obtain one from your engine supplier. If your engine supplier cannot provide the certificate, you can obtain one from EPA's website listed in *Section 6.13, For More Information*. *Chapter 12, Routine Reporting* provides additional details about the vendor certification requirement.

6.5.6.1 Subpart IIII - Stationary CI ICE

This standard applies to *stationary diesel engines at your site used for tasks such as generating power or electricity for pumps or compressors whose construction, modification, or reconstruction began after July 11, 2005*. This type of engine does not have a spark plug or other sparking device to cause fuel ignition; instead, fuel ignition is driven by compression. For this standard, the date of construction is considered to be the date the engine is ordered by the facility. The standard requires engine manufacturers to produce engines that meet the Subpart IIII emissions standards, and to certify them as such, for engines produced for model year 2007 and after. A majority of engines ordered between July 11, 2005, and model year 2007 were made to meet these standards and may be certified as such. If not, options for alternate methods of compliance demonstration are provided in Subpart IIII. Contact your state agency for information on the full requirements.

These certified **compression ignition internal combustion engines (CI ICE)** are required to be operated and maintained according to the manufacturer's written instructions. You may change only those emission-related settings that are permitted by the manufacturer. A stationary CI ICE equipped with a **diesel particulate filter** to comply with emission standards must be installed with a backpressure monitor that notifies the operator when the high backpressure limit of the engine is approached.

The Subpart IIII emissions standards are primarily met by engine manufacturers. Refer to the regulation for the specific emission limits that vary according to installation date and engine speed. In addition, to lower SO_2 emissions, Subpart IIII requires that diesel fuel with lowered sulfur content be used by owners and operators of CI ICEs that use diesel fuel. If the CI ICE has a displacement size of less than 30 liters (7.9 gallons) per cylinder, beginning October 1, 2010, **ultra-low sulfur diesel (ULSD) fuel** must be used. ULSD fuel, also known as S15, is U.S. diesel fuel with a sulfur content not to exceed 15 parts per million (ppm). If the CI ICE has a displacement size of equal to or greater than 30 liters per cylinder, fuel that meets a maximum per gallon sulfur content of 1,000 ppm must be used. Stationary CI engines used in Guam, American Samoa, remote areas of Alaska, or the Commonwealth of the Northern Mariana Islands do not have to meet these fuel requirements.

Beginning June 1, 2012, CI ICE with a displacement size of greater than or equal to 30 liters (7.9 gallons) per cylinder must use fuel that meets a maximum per-gallon sulfur content of 1,000 ppm.

Existing CI ICE that are modified or reconstructed after July 11, 2005, are also regulated by Subpart IIII. 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. However, when an engine is modified or reconstructed, it keeps the same model year and must meet the standards for that original model year.

Refer to *Chapter 12, Routine Reporting*, for a summary of recordkeeping and reporting requirements.

6.5.6.2 Subpart JJJJ - Stationary SI ICE

This standard applies to any size stationary SI engines at your site used for tasks such as generating power or electricity for pumps or compressors whose construction, modification, or reconstruction began after June 12, 2006. **Spark ignition internal combustion engines (SI ICE)** use a spark (across a spark plug) to ignite a compressed fuel-air mixture. Typical fuels for such engines are gasoline, alcohol-based fuels, natural gas, propane, and liquefied petroleum gas. SI engines are further subdivided by power cycle, that is **two-stroke** versus **four-stroke** and whether they are **rich burn engines** (burning with a higher amount of fuel as compared to air) or **lean burn engines** (less fuel compared to air). As with Subpart IIII, the date of construction for Subpart JJJJ is considered to be the date the engine is ordered by the facility. The standard requires engine manufacturers to produce engines that meet the Subpart JJJJ emissions standards and to certify them as such. These certified SI ICE are required to be operated and maintained according to the manufacturer's written instructions. For instance, gasoline-fired SI engines must use gasoline that meets the per-gallon maximum sulfur limit in 40 CFR 80.195.

The engine size or **horsepower (hp)**, engine type (rich burn engine or lean burn engine), and fuel used dictates the date specific engines manufactured must meet these emission standards. Contact your state agency for information on the specific requirements.

Engines that do not meet the standards applicable to non-emergency engines must install a non-resettable hour meter prior to startup of the engine. Engines equipped with a diesel particulate filter to comply with emission standards must install the diesel particulate filter with a backpressure monitor that notifies the owner or operator when the high backpressure limit of the engine is approached.

Facilities that do not follow the manufacturer's emission-related O&M procedures are considered to be operating a non-certified engine. Facilities that use non-certified engines have several requirements, depending on the engine's horsepower, that may include initial and periodic performance tests, keeping a maintenance plan, records retention, and operating the engine in a manner consistent with good air pollution control practice for minimizing emissions. Existing SI ICE that are modified or reconstructed after June 12, 2006, are regulated by Subpart

JJJJ. However, when an engine is modified or reconstructed, it keeps the same model year and must meet the standards for that original model year. Refer to *Chapter 12, Routine Reporting* for a summary of recordkeeping and reporting requirements.

6.5.6.3 Emergency Use Engines

Subparts IIII and JJJJ have specific requirements for **emergency use engines** and, as a subset of emergency use engines, for fire pumps. Emergency use engines are any stationary ICE that are operated only in emergency situations. Examples of emergency use are operations to provide power when the normal electric power is interrupted or to pump water in the case of fire or flood. Fire pumps are used to pump water for fire protection or suppression.

Subparts IIII and JJJJ establish limitations on the hours that stationary emergency engines may be used for maintenance and readiness testing purposes, for non-emergencies, and for **emergency demand response programs**. There is no time limit on the use during emergency situations. Emergency demand response programs lead by local and regional transmission organizations are important programs that protect the reliability and stability of the national electric service grid in times of eminent blackouts. The hours spent for emergency demand response operations and when there is deviation of voltage or frequency of 5% or greater below standard voltage or frequency are not limited. However, the engine will not be considered an emergency engine and will need to meet all requirements for non-emergency engines in Subparts IIII and JJJJ. Emergency stationary ICE may operate up to 50 hours per year in non-emergency situations under certain conditions, but those 50 hours are counted toward the 100 hours per year provided for maintenance and testing.

Emergency CI ICE that do not meet the standards applicable to nonemergency engines must have a non-resettable hour meter prior to startup of the engine. This requirement to have a non-resettable hour meter also applies to emergency SI ICEs that are less than 130 hp and built on or after July 1, 2008; are 130 hp or greater but less than 500 hp and built on or after January 1, 2011; and are 500 hp or greater and built on or after July 1, 2010. Hours of operation, both during emergencies and for maintenance and testing, must be recorded.

Model year 2007 and beyond fire pumps must meet Subparts IIII and JJJJ emission standards specific to fire pumps, and these standards vary depending on horsepower and model year.

The manufacturer's certifications for ICE and maintenance records must be maintained. Also, to meet the PM standard, some CI engines have a diesel particulate filter. These engines must have a backpressure monitor that indicates when the high backpressure limit is approached, and you must maintain records that show this. Stationary SI natural-gas-fired engines may use propane for a maximum of 100 hours per year solely during emergency operations. Certified engines with control devices must be operated and maintained according to manufacturer's written emission-related instructions.

6.5.6.4 Military Training Engines

EPA understood that some engines used in training and testing of military personnel may have to be configured similarly to engines used by the U.S. or its allies in combat operations. Therefore, EPA has exempted stationary ICE engines used for military purposes that meet the national security exemption. In general, you will know the national security exemption applies to an engine when the engine has a label containing the following information in block letters in English:

- The label heading of "EMISSION CONTROL INFORMATION"
- The engine manufacturer's corporate name and trademark
- Model year and displacement of the engine or whom to contact for further information
- The words "THIS ENGINE HAS AN EXEMPTION FOR NATIONAL SECURITY UNDER 40 CFR 89.908"

Manufacturers may request a national security exemption for any non-road engine that does not meet the otherwise applicable emissions standards. Any manufacturer requesting a national security exemption must state the purpose for which the exemption is required, and the request must be endorsed by an agency of the federal government charged with responsibility for national defense. EPA maintains a list of models of non-road engines that have been granted a national security exemption.

This list is available by writing to the following address:

Group Manager, Engine Compliance Programs Group
Engine Programs and Compliance Division (6403J)
Environmental Protection Agency
1200 Pennsylvania Ave., NW
Washington, DC 20460

Furthermore, engines that receive the national security exemption under the non-road engine provisions when purchased will continue to be exempt if used as stationary ICE, as long as it continues to be used for national security purposes. In addition, engines that receive a national security exemption will also be exempt from the low sulfur and ULSD fuel requirements of the regulation.

6.6 National Emission Standards for Hazardous Air Pollutants

The CAA establishes technology-based emissions standards for HAPs that Congress found, upon exposure, can cause serious adverse health effects. EPA is required to evaluate and control emissions of 187 HAPs, also known as toxic air pollutants or **air toxics**. For example, benzene is a HAP found in gasoline.

There are two types of stationary sources that generate routine emissions of air toxics:

- **Major source** is defined as facilities that emit or have the potential to emit 10 tons per year (tpy) of any of the listed HAPs or 25 tpy of a mixture of HAPs. These sources may release air toxics from equipment leaks when materials

Did You Know?

The federal list of HAPs began with a list of 189 compounds in 1990, two of which have since been deleted. States are free to add additional pollutants to the list as they see fit.

are transferred from one location to another, or during discharge through emission stacks or vents.

- **Area source** consists of a smaller size facility that releases fewer quantities of HAPs into the air. Area sources are defined as stationary sources of HAPs that do not meet the definition of major source. Though emissions from individual area sources are often relatively small, collectively their emissions can be of concern—particularly where large numbers of sources are located in heavily populated areas.

The NESHAP are regulations based on the best demonstrated control technology or practices within the regulated industries and must include control technology requirements, operational controls, and disposal requirements. The standards are based on the emission levels already achieved by the best performing similar facilities and require installation of emission controls known as **Maximum Achievable Control Technology (MACT)** to meet emission limits. NESHAP or MACT standards apply to both new and existing emission sources. The regulatory program intends to reduce potential exposures to the identified HAPs.

Many DLA Energy facilities are potentially covered by one or more of seven NESHAP regulations found in 40 CFR 63, as follows:

- Subpart A – General Provisions
- Subpart R – Gasoline Distribution Facilities
- Subpart EEEE – Organic Liquids Distribution (Non-gasoline)
- Subpart ZZZZ – Stationary Reciprocating Internal Combustion Engines
- Subpart GGGGG – Site Remediation
- Subpart BBBBBB – Gasoline Distribution Bulk Terminals, Bulk Plants, and Pipeline Facilities
- Subpart CCCCCC – Gasoline Dispensing Facilities

Note that there are additional NESHAP that may apply to your facility. See the regulations and *Appendix B* for a listing of other common NESHAP.

Once a permit to operate a fuel facility is issued, applicable NESHAP emissions standards and monitoring, recordkeeping, and reporting requirements become part of the permit conditions. The requirements for each of these standards are summarized in the following sections.

6.6.1 Subpart A – General Provisions

Like the NSPS General Provisions, the NESHAP General Provisions contain numerous requirements that are generally applicable to sources subject to a NESHAP unless otherwise noted within a specific NESHAP. The types of requirements specified in NESHAP Subpart A are similar to the types of requirements specified in NSPS Subpart A (notification requirements, performance testing requirements, monitoring requirements, recordkeeping and reporting requirements, control device requirements). In addition, all major sources of HAPs subject to a NESHAP are required to develop a written Startup, Shutdown, and Malfunction (SSM) Plan that describes detailed procedures for operating and maintaining the source during periods of SSM. The purpose of the plan is to help focus on steps needed

to minimize emissions during an SSM *before* such an event occurs. Steps taken to minimize emissions are to be consistent with good air pollution control practices and with good safety practices.

6.6.2 Subpart R – Gasoline Distribution Facilities

NESHAP 40 CFR 63 Subpart R defines a gasoline distribution facility as a facility that receives gasoline by pipeline, ship, or barge and that has a gasoline throughput of 20,000 gallons per day (gpd) (75,700 liters per day) or more. Subpart R applies to **bulk gasoline terminals** and pipeline **breakout stations** that are major sources of HAP emissions by themselves, or are located within or adjoining a larger facility that is a major source of HAP emissions. For instance, *if your terminal does not emit HAPs above the major source thresholds but is part of a military base that is a major source of HAPs, then you need to comply with Subpart R requirements.* If your facility is an area source (not a major source), then it would comply with NESHAP Subpart BBBBBB mentioned later in this chapter.

If your facility is subject to Subpart R, you are required to install emission controls or comply with emission limits on gasoline loading racks, storage tanks, and equipment. You also need continuous monitoring on loading rack operations. These standards mostly mirror the NSPS discussed in Subpart XX, except that certain Subpart R standards are more stringent than NSPS Subpart XX.

In addition, this Subpart R NESHAP requires specific work practice standards related to spills and seals on containers be followed.

6.6.3 Subpart EEEE – Organic Liquids Distribution (Non-gasoline)

NESHAP Subpart EEEE contains standards for reducing HAP emissions at facilities that distribute organic liquids other than gasoline. Subpart EEEE applies to non-gasoline distribution facilities, such as storage terminals, that are major sources of HAP emissions by themselves, or are located within or adjoining a larger facility that is a major source of HAP emissions and that are not regulated by another NESHAP. The definition of organic liquid for this subpart specifically excludes gasoline, aviation gasoline, kerosene (No. 1 distillate oil), diesel (No. 2 distillate oil), asphalt, and heavier distillate oils and fuel oils. 40 CFR 63 Subpart EEEE applies to storage and distribution of chemicals, such as natural gas, **oxygenates** like methyl tert-butyl ether (MTBE), hydrazine, and other missile fuels.

If your facility is subject to Subpart EEEE, you are required to comply with emission limits, operating limits, and work practice standards for storage tanks, transfer racks, equipment leaks, and some **transport vehicles.** If your terminal does not emit HAPs above the major source thresholds but is part of a military base that is a major source of HAPs, then you may need to comply with Subpart EEEE. Contact your state or regional air control agency to understand the full requirements specific to your facility.

6.6.4 Subpart ZZZZ – Stationary Reciprocating Internal Combustion Engines

Subpart ZZZZ applies to existing, new, and reconstructed stationary **reciprocating internal combustion engines (RICE)** that are located at a **major source** or an **area source** of HAP emissions. It applies to both CI and SI RICE. Engines covered by NSPS 40 CFR 60 Subparts IIII (for CI RICE) and JJJJ (for SI RICE) discussed previously are a subset of the engines covered by this regulation (40 CFR 63 Subpart ZZZZ) and meet the requirements of Subpart ZZZZ by complying with Subpart IIII or JJJJ. Stationary RICE use reciprocating motion to convert energy and may be fueled by diesel fuel, gasoline, natural gas, and other types of fuels. Your engine is not considered a stationary RICE if it is mobile. Per EPA, this means the engine is not a stationary RICE if it is used to drive motor vehicles, or it is in or on a piece of equipment that is self-propelled and performs another function (for example, lawnmowers, off-highway mobile cranes, and bulldozers). In addition, engines that are designed to be portable or transportable (that is, have wheels, skids, or carrying handles) and do not stay in one location for more than 12 months (or shorter if a seasonal source) are not considered to be a stationary RICE.

The requirements of Subpart ZZZZ applicable to your specific RICE depends on whether they are considered existing or new. *Exhibit 6–6* defines new and existing RICE under Subpart ZZZZ. **Brake horsepower (bhp)** is a specific measurement of an engine's output before the loss of horsepower caused by any other component; it can be thought of as the capacity of the engine.

EXHIBIT 6–6
Subpart ZZZZ Definition of New and Existing RICE

New or Existing	Facility Category	RICE Size (bhp)	Date Constructed or Reconstructed[1]
New	Major source	>500	On or after December 19, 2002
New	Major source	≤500	On or after June 12, 2006
New	Area source	All	On or after June 12, 2006
Existing	Major source	>500	Before December 19, 2002
Existing	Major source	≤500	Before June 12, 2006
Existing	Area source	All	Before June 12, 2006

[1]Reconstruction, unless otherwise defined in a relevant standard, means the replacement of components of an affected or a previously non-affected source to such an extent that:

1. *The fixed capital cost of the new components exceeds 50 percent of the fixed capital cost that would be required to construct a comparable new source; and*
2. *It is technologically and economically feasible for the reconstructed source to meet the relevant standard(s) established by the Administrator (or a State) pursuant to section 112 of the Act. Upon reconstruction, an affected source, or a stationary source that becomes an affected source, is subject to relevant standards for new sources, including compliance dates, irrespective of any change in emissions of hazardous air pollutants from that source.*

The following RICE do not have to meet the requirements of Subpart ZZZZ:

- Existing SI two-stroke lean burn (2SLB) RICE rated at more than 500 bhp at a major source
- Existing SI four-stroke lean burn (4SLB) RICE rated at more than 500 bhp at a major source
- Existing emergency RICE rated at more than 500 bhp at a major source
- Existing limited use RICE rated at more than 500 bhp at a major source
- Existing RICE rated at more than 500 bhp at a major source that combusts landfill or digester gas equivalent to 10% or more of the gross heat input on an annual basis

The following RICE are subject to Subpart ZZZZ; however, they meet the requirements of this subpart by meeting the requirements of NSPS Subpart IIII or JJJJ, and no further Subpart ZZZZ requirements apply:

- New or reconstructed RICE at an area source
- New or reconstructed 2SLB RICE rated at 500 bhp or less at a major source
- New or reconstructed 4SLB RICE rated at less than 250 bhp at a major source
- New or reconstructed SI four-stroke rich burn (4SRB) RICE rated at 500 bhp or less at a major source
- New or reconstructed RICE rated at 500 bhp or less at a major source that combusts landfill or digester gas equivalent to 10% or more of the gross heat input on an annual basis
- New or reconstructed emergency or limited use stationary RICE rated at 500 bhp or less at a major source
- New or reconstructed CI RICE rated at 500 bhp or less at a major source

The Subpart ZZZZ requirements vary by the type of engine (that is, SI/CI, four-stroke/two-stroke, rich burn/lean burn), engine use (that is, emergency/non-emergency, black start/non-black start), engine horsepower, and fuel type (diesel, gasoline, natural gas, or if landfill or digester gas is used). A black start engine is one whose only purpose is to start up a combustion turbine and could apply to turbines at military terminals. Emission limits for HAPs are imposed by limiting emissions of either formaldehyde or carbon monoxide (for example, by using an oxidation catalyst) and/or by requiring oil and filter changes, air filter changes, and inspection and replacements of hoses and belts at specific time intervals.

Exhibits 6–7 and *6–8* summarize compliance requirements for existing and new engines, respectively. See *Appendix 6–1* and *6–2* for more detailed tables with other requirements such as emission limits, testing, monitoring, and recordkeeping references.

EXHIBIT 6–7
Compliance Requirements for Existing Engines

	Existing Engines	Compliance Requirements
Group One	All engines <100 hp at *major source* Emergency/black start: ≤500 hp at major source and all at *area source* CI ≤300 hp non-emergency at *area source* SI ≤500 hp non-emergency at *area source* SI 2SLB >500 hp non-emergency at *area source* SI LFG/DG >500 hp non-emergency at *area source* SI 4SLB or 4SRB >500 hp non-emergency at *area source* and are used ≤24 hours/year	- Change oil/filter, inspect air cleaner or spark plugs, hoses/belts on prescribed schedule or use oil analysis program instead of prescribed oil change frequency - Operate/maintain engine and control device per manufacturer's instructions or owner-developed maintenance plan - Emergency engines must have a non-resettable hour meter and record hours of operation and document hours spent in emergency or non-emergency operation; if engines used for demand response, keep record of notification of emergency situation and time operated - Keep records of maintenance - *Notifications not required*
Group Two	SI 100–500 hp at *major source* SI >500 hp at *area source* that are 4SLB or 4SRB and are used >24 hours/year CI ≥100 hp at *major source* CI >300 hp at *area source* (additional requirements) SI 4SRB >500 hp at *major source*	- CO and/or formaldehyde limits - Engines >500 hp: initial and subsequent emission performance tests - Engines >500 hp: enhanced monitoring of emissions control devices - Notifications - Semiannual compliance reports - *In addition for CI >300 hp*: ultra-low sulfur diesel (except rural Alaska) and crankcase emission control requirements

Exhibit 6–8
Compliance Requirements for New Engines

New Engines	Compliance Requirements
SI 4SRB >500 hp non-emergency at *major source* SI 2SLB >500 hp non-emergency at *major source* SI 4SLB >250 hp non-emergency at *major source* CI >500 hp non-emergency at *major source*	- CO and/or formaldehyde emission limits - Initial and subsequent emission performance tests - Operating limitations – enhanced monitoring of emissions control devices - Notifications required - Semiannual compliance reports
Emergency/limited use >500 hp new at *major source*	- Initial notification only
Non-emergency landfill or digester gas-fired engine >500 hp new at *major source*	- Initial notification - Monitor/record fuel usage daily - Annual report of fuel usage

The compliance dates are May 3, 2013, for existing CI RICE and October 19, 2013, for existing SI RICE. All new RICE subject to this NESHAP must be in compliance on the day of startup.

Contact your state or regional air quality agency to understand the full requirements specific to your facility.

6.6.4.1 Owners and Operators of CI ICE

New CI engines that are subject to 40 CFR Part 60 Subpart IIII must meet the requirements specified in Subpart IIII to be in compliance with 40 CFR 63 Subpart ZZZZ. There are no additional requirements for these engines under Subpart ZZZZ.

The requirements for existing or reconstructed non-emergency CI ICE vary by engine horsepower and location (area source or major source). The requirements generally include startup requirements, initial performance tests, compliance demonstrations, emission limits, operating limitations, reporting, and recordkeeping. It's best to operate the engine equipment according to the manufacturer's instructions. Existing CI engines with a rating of more than 300 bhp must use ULSD fuel.

Refer to *Appendix 6–1* for a summary of CI ICE requirements based on the type and location of engine.

6.6.4.2 Owners and Operators of SI ICE

New SI engines that are subject to 40 CFR Part 60 Subpart JJJJ must meet the requirements specified in Subpart JJJJ to be in compliance with 40 CFR 63 Subpart ZZZZ. There are no additional requirements for these engines under Subpart ZZZZ.

The requirements for existing or reconstructed nonemergency SI ICE vary by engine horsepower, type (four-stroke/two-stroke, rich burn/lean burn), and location (area source or major source). The requirements generally include startup requirements, initial performance tests, compliance demonstrations, emission limits, operating limitations, reporting, and recordkeeping.

Refer to *Appendix 6–2* for a summary of SI ICE requirements based on based on the type and location of engine.

6.6.4.3 Emergency Stationary RICE

An emergency RICE is one that is used to provide power in an emergency situation, such as when electrical power from local utility (or the normal power source) is interrupted or the emergency engine is used to pump water in case of fire or flood. There are no time limit restrictions on the operating hours during an emergency situation. An emergency RICE may also be used for up to 100 hours per year in specific situations. For instance, an emergency engine may be operated for readiness testing and maintenance checks as recommend by the manufacturer, insurance company, or governmental emergency agencies. In addition, an emergency engine may be used for **emergency demand response programs** when an emergency alert is declared or when there is a deviation of voltage or frequency of more than 5% below standard voltage or frequency (similar to requirements mentioned under NSPS 40 CFR 60 Subparts IIII and JJJJ). There is no limit on the number of hours the engines may operate under these scenarios, however it must be in compliance with the emission standards and other applicable requirements for a nonemergency engine.

Did You Know?

Limited Use versus Emergency Use Engines

Limited use engines are used for less than 100 hours a year and are regulated differently than emergency engines. Emergency use engines are also limited to 100 hours per year, but only 50 of those hours can be used for non-emergency purposes.

New, reconstructed, and existing emergency RICE rated at 500 bhp or less at a *major source* and all emergency RICE at an *area source* are subject to Subpart ZZZZ. A new or reconstructed emergency RICE meeting either description must meet the requirements of Subpart ZZZZ by meeting the requirements of NSPS Subpart IIII, for CI engines or NSPS Subpart JJJJ, for SI engines. Existing emergency RICE have to meet the Subpart ZZZZ work practice standards for emergency RICE as summarized in *Exhibit 6–9*.

EXHIBIT 6–9
Requirements for Emergency Stationary RICE at Major and Area Sources of HAP Emissions

For each…	You must meet the following requirements, except during periods of startup…	During periods of startup you must…
Emergency CI RICE (and black start CI RICE)[1]	Change oil and filter every 500 hours of operation or annually, whichever comes first.[2] Inspect air cleaner every 1,000 hours of operation or annually, whichever comes first, and replace as necessary. Inspect all hoses and belts every 500 hours or annually, whichever comes first, and replace as necessary.[3]	Minimize the time spent at idle and minimize the time at startup not to exceed 30 minutes, after which time the non-startup emission limitations apply.[3]
Emergency SI RICE (and black start SI RICE)	Change oil and filter every 500 hours of operation or annually, whichever comes first.[2] Inspect spark plugs every 1,000 hours of operation or annually whichever comes first, and replace as necessary. Inspect all hoses and belts every 500 hours or annually, whichever comes first, and replace as necessary.[3]	Minimize the time spent at idle and minimize the time at startup not to exceed 30 minutes, after which time the non-startup emission limitations apply.[3]

Notes:

[1]Comply with the scheduled work practice requirements for an emergency engine when it is safe to do so after the engine shuts down if there is an emergency on the scheduled date.

[2]There is an option to use an oil analysis program in 40 CFR 63.6625 to extend the specified oil change requirement.

[3]The EPA and state or regional air quality agency may be petitioned for alternative work practices.

The following types of emergency RICE do not have to meet the requirements of Subpart ZZZZ:

- *Existing* emergency RICE rated at more than 500 bhp at a major source that does not operate more than 15 hours per year
- *Existing* residential, commercial, and institutional emergency RICE at an area source

Any emergency engine operation other than for emergency situations, maintenance and testing, demand response, and operation in non-emergency situations for up to 50 hours per year subjects it to the full regulation of Subpart ZZZZ for non-emergency engines. Emergency engines must be operated and maintained in accordance with the manufacturer's emission-related O&M instructions, or develop and follow your own maintenance plan that must provide to the extent practicable for the maintenance and operation of the engine in a manner consistent with good air pollution control practice for minimizing emissions.

If you own or operate an existing emergency stationary RICE with a site rating of less than or equal to 500 bhp located at a *major source* or an existing emergency stationary RICE located at an *area source*, you must install a non-resettable hour meter if one is not already installed.

Refer to *Appendix 6–1* (CI engines) and *Appendix 6–2* (SI engines) for a summary of monitoring, recordkeeping, and notification requirements for emergency RICE. Consult with your state air quality agency for more details.

6.6.5 Subpart GGGGG Site Remediation

Subpart GGGGG establishes emission limits and work practice standards for HAPs emitted from site remediation activities or cleanups. For 40 CFR 63 Subpart GGGGG to apply, the media (for example, soil or groundwater) being cleaned must be contaminated with organic HAPs. Also, the facility at which the remediation activity is located must be a major source of HAP emissions by themselves, or be located within or adjoining a larger facility that is a major source of HAP emissions and be subject to another MACT standard for other operations at the facility.

Subpart GGGGG includes emission limits and work practice requirements for three types of sources:

- Process vents
- Remediation material management units
- Equipment leaks

In addition, Subpart GGGGG includes requirements for control devices used to comply with the emission standards for **process vents** and remediation material management units. It also requires that remediation material removed from a site subject to the MACT standard be managed per the regulatory requirements at off-site disposal facilities, such as landfills; therefore, coordination with the off-site facilities is required to ensure full compliance.

If the time required for actual remediation is less than 30 days from initiation of cleanup (for example, removal of contaminated soil or groundwater) through final disposal, the standard does not apply to the cleanup. Cleanups seeking exemption per this 30-day clock must maintain written documentation describing the exempted site remediation and listing the initiation and completion dates for the site remediation. No request, report, or notification is required to be submitted to qualify for this exemption; however, EPA has specific definitions of what activities must be conducted within the 30-day period. Contact your state agency or consult 40 CFR 63.7884 for specific information.

In addition, if you ship or otherwise transfer the remediation material off-site, you must include in the applicable shipping documentation a statement that the shipped material was generated by a site remediation activity subject to the conditions of this 30-day exemption. The statement must include the date on which you began the site remediation activity generating the shipped remediation materials and the date 30 calendar days following your initiation date.

Site remediation activities that result in less than 2,200 lb of HAPs per year removed are subject solely to recordkeeping requirements.

The rule does not apply to waste materials generated from routine maintenance activities. Such materials at military fuel facilities might include tank bottoms and sludges removed during tank cleanouts and/or sludges and sediments removed from wastewater treatment tanks, surface impoundments, or lagoons.

Site remediation performed under Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) authority, such as the Superfund program; under Resource Conservation and Recovery Act (RCRA) authority, such as the corrective action process; or under an EPA-authorized state RCRA program are exempted from the regulation. Note that the exemption applies only if the cleanup is performed under the authority of CERCLA or RCRA. Cleanup projects performed under state agency voluntary cleanup programs may be required to comply with this regulation.

6.6.6 Subpart BBBBBB Gasoline Distribution Bulk Terminals, Bulk Plants, and Pipeline Facilities

NESHAP 40 CFR 63 Subpart BBBBBB (sometimes called 6B) establishes emission limitations and management practices for **bulk gasoline terminals**, pipeline **breakout stations**, **pipeline pumping stations**, and **bulk gasoline plants** that are area sources of HAPs. An area source is any source that is not a major source as defined previously.

Facilities regulated under Subpart R (gasoline distribution at major source facilities) or Subpart CCCCCC (gasoline dispensing facilities) are not subject to BBBBBB. Gasoline means any petroleum distillate or blend having an RVP of 27.6 kilopascals or greater, which is used as fuel for internal combustion engines.

This regulation requires:

- All bulk gasoline facilities must check for leaks and use management procedures to prevent evaporation of gasoline.
- Bulk gasoline plants, terminals and breakout stations must use submerged fill (drop tube) or bottom fill pipes for loading gasoline into storage tanks, tank trucks, and railcars.
- Facilities classified as bulk gasoline terminals or breakout stations have additional emission control requirements for storage tanks, and larger facilities have additional control requirements for loading racks.

Under this rule, bulk gasoline plants with a throughput less than 20,000 gpd are subject to less stringent regulatory requirements for storage tanks and loading racks than the larger bulk gasoline terminals (greater than 20,000 gpd). Refer to *Appendix 6–3* for an additional summary of facility requirements.

6.6.7 Subpart CCCCCC Gasoline Dispensing Facilities

NESHAP Subpart CCCCCC defines a **gasoline dispensing facility (GDF)** as any stationary facility that dispenses gasoline into the fuel tank of a motor vehicle, motor vehicle engine, non-road vehicle, or non-road engine. This includes facilities that dispense gasoline into on-road and off-road, street, or highway motor

vehicles, lawn equipment, boats, test engines, landscaping equipment, generators, pumps, and other gasoline-fueled engines and equipment. Subpart CCCCCC applies to GDFs located at area sources of HAPs. The loading of aviation gasoline into storage tanks at airports, and the subsequent transfer of aviation gasoline within an airport, is not subject to this subpart. If you have two or more GDFs at separate locations within your area source, each GDF is treated as a separate affected source.

If you operate a GDF, you should refer to 40 CFR 63 Subpart CCCCCC and/or contact your state or regional air quality agency to understand the full requirements specific to your facility.

6.7 Ozone-depleting Substances

In the early 1970s, scientists first speculated that certain manufactured chemicals, called **ozone-depleting substances (ODSs)**, were destroying the earth's **stratospheric** ozone layer, which protects life and vegetation from damaging ultraviolet light. As a result, more than 125 countries signed a landmark treaty known as the **Montreal Protocol** in 1987 to limit and subsequently phase out the production of all ODSs. In addition, Title VI of the CAA called to limit the emissions of **chlorofluorocarbons (CFCs)**, hydrochlorofluorocarbons (HCFCs), **halons**, and other halogenated chemicals that contribute to the destruction of stratospheric ozone. EPA promulgated the Protection of Stratospheric Ozone regulation (40 CFR 82) as a result. Some of the more common ODSs are:

- Chlorofluorocarbons such as CFC-11, CFC-12, and CFC-113
- Hydrochlorofluorocarbons such as HCFC-22
- Halon such as Halon-1211 and Halon-1301
- Carbon tetrachloride
- Methyl chloroform or 1,1,1–Trichloroethane
- Methyl bromide

When the Montreal Protocol was signed, military organizations around the world were highly dependent on halons for fire protection and CFCs for air conditioning and for manufacturing and maintaining military systems. The U.S. Department of Defense (DoD) has led the way in changing specifications and standards for the use of ODSs as solvents in components and products. DoD has worked with private industry and EPA to identify and verify the acceptability of non-ODS solvents for military uses. DoD established a comprehensive program to reduce and eliminate the use of ODSs in its operations. DoD's experience in reducing the use of ODSs at installations and in new and existing weapon systems is an important model for implementing pollution prevention (P2).

ODSs are being phased out of:

- Refrigerants used in refrigerators and freezers
- Coolants used in air conditioning units, heat pumps, and chillers
- Synthetic foams used in insulation, life vests, and pads
- Propellants used in aerosol spray cans

- Cleaning solvents
- Fire suppressants systems and extinguishers
- DoD weapon systems

The U.S. phased out production of all **Class I ODSs** (such as CFCs) by December 31, 1995. Production and new uses for less harmful **Class II ODSs** (HCFCs) were banned beginning January 1, 2015. HCFCs are to be phased out by 2030. The most widely used HCFC is HCFC–22, also referred to as R–22. It is a popular refrigerant that is commonly used in a variety of refrigeration and air-conditioning equipment. Beginning in 2017, substitute refrigerants, such as HFCs, hydrofluroolefins (HFOs), and perfluorinated compounds (PFCs) became subject to the regulatory standards and requirements due to their high global warming potential.

Service and repair of appliances and equipment containing these ODSs and their substitutes are regulated under federal rules. Technicians performing service must be certified, and the ODS must be captured, recycled, or destroyed. If you are at a small fuel terminal, you may want to consider having these services performed by a certified outside contractor.

If you are at a larger terminal and perform this work in-house, you must provide and document required technician certification. Also required under the ODS regulation are the often overlooked requirements to:

- Document the leak rate and repairs made on equipment containing greater than 50 lb of an ODS or ODS substitute, and
- Document adequate repairs and leak verification tests when servicing leaking equipment, no matter the amount of ODS or ODS substitute.

Equipment such as comfort cooling appliances (for example, heating, ventilation and air conditioning [HVAC]) or industrial refrigeration (industrial freezers, chillers, test chambers) have specific leak rate repair requirements that must be documented, and leaks must be fixed whenever one is discovered. In general, you have 30 days from the discovery of a leak to attempt to fix the leak if the unit has a single circuit of 50 lb or more of refrigerant. However, do not ignore leaking units below 50 lb of refrigerant. Once you have knowledge of a leak, you are required to fix it and perform a follow-up leak verification test to show the leak was properly repaired. Reports must be submitted to EPA for chronically leaking appliances (any appliance leaking ≥125% or more of its full charge in 1 year) describing the efforts to identify leaks and repair the appliance. The reports are due no later than March 1 of the following year. You should maintain records on-site of any ODS training, equipment servicing, leak inspections, verification tests, reclamation, or disposal for at least 3 years.

6.8 Chemical Accident Prevention Program

The chemical accident prevention program requires facilities that manufacture, store, or use certain flammable and toxic substances above threshold quantities to develop a risk management program if an accident occurs. The program is about reducing chemical emergency risks and the potential for serious off-site consequences. It requires conducting hazard assessments evaluating the

worst-case accidental release scenario. Identifying safety precautions, conducting training, performing regular maintenance and monitoring, communicating with emergency responders, and documenting plans are also to be part of the program in accordance with 40 CFR 68.

Refer to *Chapter 1, Environmental and Emergency Response Planning* for more information on Risk Management Plan (RMP) requirements. *Chapter 12, Routine Reporting* summarizes the RMP agency submittal requirements. Also check with your state agency to see if its rules are more stringent than EPA's rules. For example, California's regulations require conducting a seismic study.

Listed flammable substances (such as propane) used as fuel or held for sale as fuel at a retail facility are not covered by these regulations. However, flammable substances used for some other purposes (such as chemical feedstock or when held for sale as fuel at a wholesale facility) are covered by these regulations. For listed flammable substances, the threshold quantity is 10,000 lb. A commonly overlooked chemical that is subject to the chemical accident prevention program is anhydrous ammonia used in refrigeration units. If your facility uses ammonia for refrigeration, you need to perform an RMP applicability review and may be required to develop an RMP.

6.9 Air Emissions from Hazardous Wastes

Air emissions from hazardous waste containers, tanks, and process vents are regulated under 40 CFR 265 Subparts AA, BB, and CC (40 CFR 265.1030–1091). These regulations apply to hazardous wastes with a volatile organic (VO) concentration of 500 parts per million by weight (ppmw) at the point of generation. Gasoline and many solvents exceed this VO threshold. The concentration of the VOs in the waste does not need to be determined analytically; the facility can assume that the concentration exceeds the 500 ppmw and implement the requirements. Hazardous waste containers (such as drums) with a capacity over 26 gallons must:

- Be a U.S. Department of Transportation (DOT)-approved container
- Operate with no detectable organic emissions or be vapor tight
- Have covers, lids, and closure devices for each opening that are in place at all times (except when adding or removing waste)

Open-top containers can be used if they have an organic vapor-suppressing barrier or foam over the VO material. In addition, containers could be vented to a control device (such as a combustion unit or flare) or in a building with a closed-vent system to a control device. You must maintain records of the inspections and the VO concentrations at your facility.

These regulations do *not* apply to containers used for satellite accumulation or to facilities that are **small quantity generators** of hazardous waste.

Information on classification, storage, tracking and transport of hazardous waste may be found in *Chapter 7, Hazardous and Recycled Waste*.

6.10 Air Permits

All DLA Energy facilities are likely to require air permits from their respective state agency or from EPA for sources that emit air contaminants (such as storage tanks and vapor recovery systems) and that are not otherwise exempted under state or local agency regulations. Generally, there are two types of air permits: construction permits and operating permits. Operating permits can be further classified as major source operating permits (sometimes called Title V permits) or **minor source** operating permits. The process of obtaining an air permit for a new source of air pollution (such as a storage tank or a new vapor control system) or modifying an existing source of air pollution (reconstructing or installing a floating roof on an existing tank) starts with the construction permit. The permit application review process is called **new source review** or preconstruction review. In simplified terms, an operating permit is typically issued after the construction permit has been issued, the source has been constructed, and conditions of the construction permit have been satisfied.

The purpose of the permitting process is to ensure that sources comply with all state and federal air quality regulations. The following subsections discuss requirements for Title V operating permits, state minor operating permits, new source review, and emissions inventory reporting as they apply to DLA Energy facilities.

6.10.1 Title V Permitting Programs

Title V of the CAA amendments of 1990 required EPA to develop an operating permit program for major sources that would be implemented by the state air quality agencies. EPA promulgated the Title V regulations under 40 CFR 70. Significant incentives were included in the CAA for the states to develop Title V programs, so almost all states have. Most states had permitting programs in place before Title V, and these programs have been modified and retained for minor sources.

The purpose of Title V is to identify and improve compliance with all applicable requirements of the CAA and to enhance EPA's ability to enforce those regulations. It's also a way to ensure accountability through public review and certification of compliance. Permit holders file periodic reports certifying the extent of compliance. Title V provides that permits for most sources be issued for a term not less than 3 years and not more than 5 years. Under Title V, sources are required to pay annual fees proportional to their amount of air emissions.

Title V applies to major stationary sources of air pollution. Under the Title V program, a major source is defined as a facility with the potential to emit:

- Over 100 tpy of any criteria pollutant (CO, NOx, SOx, PM, or VOCs)
- Over 10 tpy of any HAP
- Over 25 tpy of total HAPs

For sources located in nonattainment areas, major source thresholds can be lower than listed above and depend on the level of nonattainment (see *Exhibit 6–10*). State agencies and local air quality offices may establish more stringent thresholds than those shown in *Exhibit 6–10*. State and local air regulations need to be checked to ensure the proper threshold is used to determine Title V applicability.

Potential to emit (PTE) is a legally complicated definition of the maximum capacity of the facility to emit air pollutants. Calculating a facility's PTE is usually based on 24-hour/day, 365-day/year operation of a source at its maximum operational capacity in the absence of air emission controls, if any. The PTE of a source can be limited by obtaining federally enforceable limitations on the operation of the source, as discussed in the next section, Synthetic Minor Permits.

EXHIBIT 6–10
Major Source Pollutant Thresholds for Title V Permit Applicability Based on Severity of Nonattainment Designation (All values shown in tpy)

Nonattainment Area	NOx[a,b]	CO	SO_2	PM10	VOC[b,d]
Extreme	10	NA	100[c]	NA	10
Severe	25	NA	100[c]	NA	25
Serious	50	50	100[c]	70	50
Moderate	100	100[c]	100[c]	100[c]	100
Marginal	100	100[c]	100[c]	100[c]	100

[a]Does not apply for any source for which the EPA has made a finding, under Section 182(f)(1) or (2) of the CAA, that requirements under Section 182(f) of the act do not apply.

[b]Thresholds for NOx and VOC apply to ozone nonattainment area designations.

[c]Federal regulations (40 CFR 70) do not specify a more stringent threshold, so the 100 tpy would apply by default.

[d]Ozone transport regions have thresholds of 50 tpy or less depending on category.

NA=not applicable

When defining the PTE for a facility, you also need to consider **fugitive emissions**. Fugitive emissions are pollutants released to the atmosphere through leaks or other unintended or irregular releases and not those emissions that could not reasonably pass through a chimney, stack, vent, or other functionally equivalent opening. The general rule is to include fugitive emissions if they are regulated by a federal regulation (NSPS or NESHAP), or are occurring at a listed facility under the **Prevention of Significant Deterioration (PSD)** rules discussed in *Section 6.10.5*. Otherwise, fugitive emissions are typically not counted toward a facility's PTE.

Since emissions from tanks are affected by throughput and the term maximum capacity does not lend itself to throughput, the method used to calculate PTE should be confirmed with the state agency. The preferred method of estimating potential emissions would be based on the highest throughput of fuel possible for the facility, taking into account maximum anticipated fuel demand (such as maximum aircraft operations or maximum vehicular activity).

In 1998, EPA issued further PTE guidance for specific source categories, including gasoline bulk plants. Bulk plants are small, bulk gasoline distribution facilities that distribute less than 20,000 gallons of gasoline per day, and that receive gasoline by truck rather than by rail or barge. The EPA guidance is given in the form of operational cutoffs. The minor source guideline for a bulk plant is 20,000 gpd, which is the basic definition of a bulk plant. That is, if a source owner agrees to limit the amount of gasoline loaded to no more than 20,000 gpd (the operational cutoff), then a source that has 90% or more of VOC emissions coming from bulk loading and unloading of gasoline is a minor source. EPA intends for the states to incorporate this guidance into their rules and general permits. Contact your state or regional air quality agency to understand its specific PTE requirements.

One of the objectives of the Title V program is to maintain assurance that major sources comply with all applicable air quality regulations at all times. Periodic compliance reporting and certification requirements are included in Title V permits for this reason. Reporting frequencies for various parts of the facility's operation can be found in your Title V operating permit. Compliance certification is the responsibility of the facility commander. Significant civil and criminal penalties are defined in Title VII of the CAA for non-compliance, and enforcement can be initiated by EPA or any citizen. One important concept to understand about Title V is that it does not add any new emissions standards or limitations—it only captures major sources (large emitters) into the program.

Did You Know?

Often, the start of construction is defined as the date that a contract is executed for the construction of the facility, not the date of the ground-breaking ceremony. Because the definition of commencement of construction may vary from state to state, make sure you understand this definition before executing a contract so that timely permit applications can be submitted.

6.10.2 Synthetic Minor Permits

A synthetic minor source is one that has federally enforceable limitations on its PTE so that it does not exceed any major source threshold. Federally enforceable limitations are usually permit conditions or control requirements that effectively limit some operational aspect, such as hours of operation or throughput, or mandate the use of emission control equipment. Synthetic minor permits allow such sources to stay out of the Title V program. For DLA Energy facilities, a synthetic minor operating permit may include federally enforceable limitations, such as limitations on fuel type and throughput volume so that VOC emissions will remain below Title V major source thresholds. *The burdens associated with compliance with a synthetic minor permit may outweigh the advantages associated with avoiding Title V permitting* recordkeeping needed to demonstrate compliance with synthetic minor permit conditions may actually be greater than that needed for a Title V permit. In addition, the restrictions needed to reduce PTE to less than major source levels may constrain facility operations to the point that the facility mission is compromised. The advantage of synthetic minor permitting must be evaluated on a facility-by-facility basis.

6.10.3 Minor Source Construction and Operation Permits

Generally, the state or regional agency must be notified prior to construction of any new stationary sources of air pollution or modification of any existing sources of air pollution (modification means something that will increase emissions or cause the emission of new pollutants). Often, the start of construction is defined as the date that a contract is executed for the construction of the facility, *not* the date of the ground-breaking ceremony. Because the definition of commencement of construction may vary from state to state, make sure you understand this definition before

executing a contract so that timely permit applications can be submitted. Penalties can be imposed for construction of a source without a permit.

The requirements for obtaining a minor source construction and/or operating permit vary considerably between agencies. In general, the "construction" permit allows actual construction of the source, and may allow initial startup. Some agencies require separate startup authorizations following a compliance test. At some point, the facility may need to apply for a minor source operating permit. The operating permit application may consist of a simple form accompanied by a source test verifying that the conditions of the construction permit have been satisfied. If a separate operating permit for minor sources is required, the need for an associated application will usually be specified in a construction permit.

Contact your state or regional agency to determine the appropriate permitting procedures. In general, you will need to:

- Define the proposed scope of the project or modification.
- Estimate the quantity of emissions created by the modification (new emissions or an increase in emissions).
- Review the state regulations for construction permits and associated permit exemptions.
- Review the state operating permit requirements.
- Determine if construction and/or operating permits are required (new permits or modifications to existing permits).
- Complete and submit the appropriate permit applications to the state agency.

Many agencies will conduct a completeness review of your application to notify you if further information is needed for their evaluation of the permit request. If your application is complete, most agencies will provide the permit to you within 60 to 90 days. The exact state review period should be factored into your planned construction schedule.

6.10.4 Major Modification and New Sources in Nonattainment Areas

Installation of new major stationary sources or major modifications to existing **major sources** in areas designated as nonattainment requires special approval by your applicable state or regional agency. These projects require strict emissions controls and corresponding emissions reductions, or offsets, from other facilities located in the region.

For purposes of this program, major source thresholds depend on the severity level of the nonattainment designation and are the same as those for Title V permitting as shown in *Exhibit 6–10*. A **major modification** is either a modification at an existing minor source with emissions greater than major source thresholds or a modification at an existing major source that would result in a significant net emission increase. Significant emission rates are defined as follows for each individual pollutant:

- Particulate matter=15 tpy
- Nitrogen oxides=40 tpy
- Sulfur dioxide=40 tpy
- Carbon monoxide=100 tpy
- VOCs (ozone)=40 tpy
- Lead=0.6 tpy

Lower thresholds may apply based on the severity of nonattainment within the area in which the project occurs.

The construction of a new source or modification of an existing source, as described, will trigger the requirement for controls that limit emissions to the **Lowest Achievable Emission Rate (LAER)**. LAER is the strictest method of emissions control technically achievable, and must be at least as strict as any NSPS standard. LAER does *not* take into account economic considerations. For DLA Energy facilities, LAER may consist of thermal oxidation of fuel vapors.

6.10.5 Prevention of Significant Deterioration Program

Installation of new major stationary sources or major modifications to existing major sources in areas designated as attainment for any of the criteria pollutants also requires special approval by your applicable state or regional agency. In attainment areas, the potential to emit very high rates of criteria and several other air pollutants (over 250 tpy for non-listed sources and over 100 tpy for listed sources) triggers the PSD permitting program. Greenhouse gas (GHG) regulations can be triggered for projects if GHG emissions increase by 75,000 tpy as CO2e if the project is also triggering PSD for another PSD-regulated pollutant. However, the same major modification thresholds listed previously in Section 6.10 for nonattainment new source review also apply to new sources proposed at existing PSD major sources in attainment areas. If your facility is included in the PSD program, you are required to install **Best Available Control Technology (BACT)** and perform an air quality impact analysis to demonstrate that the source will not adversely impact air quality. BACT is similar but less strict than LAER, since cost is considered in determination of BACT. Unless your facility is part of a larger installation that supports many other missions, this program would probably not apply to DLA Energy facilities, and thus is beyond the scope of this guide.

6.10.6 Conformity

The federal government is not allowed to support, permit, or provide financial assistance for any action that would jeopardize the ability of a state to *conform* to the requirements of its **state implementation plan (SIP)**. Each state's SIP incorporates the federal CAA requirements into state programs, specifies state rules, and gives the states authority to issue air permits. The analysis of federal actions to determine conformity with a SIP is required by the **National Environmental Policy Act (NEPA)**. In compliance with NEPA requirements, EPA promulgated 40 CFR 93, "Determining Conformity of Federal Actions to State or Federal Implementation Plans." This requirement for review of federal actions applies only to areas in nonattainment or maintenance status for compliance with NAAQS, and applies only to the pollutants for which the area is not in attainment. Actions

must be evaluated in a conformity determination that addresses both direct and indirect emissions resulting from the project. **Direct emissions** are caused by the action and occur at the same time and place as the action. **Indirect emissions** are caused by the action later in time and/or are removed from the action but are still reasonably foreseeable.

The addition of new fuel storage facilities or the expansion of existing fuel storage facilities are examples of federal actions that must be evaluated in this regard. For example, if your facility is located in an area classified as nonattainment for ozone, any significant changes to facility operations must be evaluated to determine if emissions of VOCs would increase beyond certain defined thresholds. If so, the increase must be consistent with the most recent ozone SIP approved by EPA.

Your state agency can help determine the conformity applicability thresholds and requirements for federal projects in specific areas. If your facility is located in a nonattainment or maintenance area, estimates of direct and indirect emissions increases (or decreases) should be prepared early in the planning process. A document called a Record of Non-Applicability (RONA) is also to be prepared as part of the conformity applicability evaluation to indicate that a proposed action is below the *de minimis* level (the minimum thresholds for which a conformity determination must be performed for criteria pollutants) or otherwise qualifies for an exemption in the rule. RONA documentation is most helpful when the annual emissions are close to the *de minimis* level or for controversial actions that may be challenged.

6.11 Annual Air Emission Inventories

Most state and regional agencies require regular inventories of emissions from sources of air pollution. If your facility requires a construction permit, minor source operating permit (including synthetic minor permit), and/or Title V permit, you will almost always be required to submit an **emissions inventory** annually to your applicable agency. Emissions and license fees associated with the emissions inventory submittals are the primary means by which air pollution control agencies collect revenue to support their staff.

Many agencies even require reporting of emissions from unpermitted sources. Unpermitted sources are usually small sources that the state agency has decided do not emit enough pollution to justify the expense of including them in the permitting program. There are usually types of sources that are exempt from permitting but *not* exempt from annual emissions inventory requirements. As a safeguard, you should expect to report emissions from *all* fuel storage tanks and vapor control systems. Refer to *Chapter 12, Routine Reporting* for more information on air reporting requirements.

Typical emissions estimating tools used to prepare inventories are discussed in *Appendix 6–4*. Consult the regulations of your specific agency to determine acceptable inventory reporting requirements and methodology.

Emissions testing (measuring the actual concentration of chemicals in emissions) is typically required for sources subject to numerical emissions limitations. The

Did You Know?

500 parts per million by weight (ppmw) is equivalent to 0.05 percent.

purpose of emissions testing is to verify compliance with those limitations. Measurements can be obtained by continuous emission monitors or by performing actual stack tests. For example, you are required to conduct annual emissions testing if your facility has **air pollution control devices**, such as flares, condensers, or adsorber systems. Emissions tests are not used for license fee (emissions inventory) determination.

State Requirements

6.12 State Requirements

Contact your state and local air pollution control agency to determine if they have air quality programs and permitting requirements that differ from the federal program.

- Some states (for example, Oregon) have their own state PSD programs. Similar to the federal PSD program, these programs are designed to prevent degradation of air quality in attainment or unclassifiable areas where existing air quality is better than NAAQS. Each state may have different thresholds for determining whether a new source or modification triggers the state PSD program.
- California has some of the most stringent air regulations in the nation. For instance, the California Environmental Protection Agency, California Air Resources Board (CARB) established enhanced vapor recovery requirements and specifications for standing loss controls for aboveground storage tanks (for example, certified tanks and paints, pressure/vacuum vent valves). Additionally, CARB has a useful database where you can search and obtain engine vendor certificates: *www.arb.ca.gov/msprog/offroad/cert/cert.php*.
- In some states, such as California portable engines greater than 50 hp are required to have permits to operate. In New Jersey, portable engines (used on-site for less than 90 days a year) may be subject to permitting under a general permit (GP–019) depending on the use and size of the engine even though they are not federally regulated.

6.13 For More Information

For More Information

For Information On…	See…
Air Related Agencies	
EPA's Office of Air Quality Planning and Standards	https://www3.epa.gov/airquality/
EPA's Office of Air and Radiation	www.epa.gov/aboutepa/about-office-air-and-radiation-oar
EPA's Climate Change website	https://www.epa.gov/arc-x
EPA's Technology Transfer Network Related to Air Pollution Topics	www.epa.gov/technical-air-pollution-resources
NSPS Compression Ignition Engines and Spark Ignition Engines	www.epa.gov/stationary-engines
NESHAP for Reciprocating Internal Combustion Engines	www.epa.gov/stationary-engines
EPA's Certificate of Conformity website for engines	www.epa.gov/importing-vehicles-and-engines
EPA's website for NESHAPs 40 CFR 63, Subpart R, BBBBBB, and CCCCCC	www.epa.gov/stationary-sources-air-pollution/gasoline-distribution-mact-and-gact-national-emission-standards
EPA's website with guidance for area sources	www.epa.gov/ttn/atw/area/arearules.html
Documents and References	
RICE NESHAP Subpart ZZZZ Regulation Navigation Tool for applicability	www.epa.gov/ttn/atw/rice/output/quiz.html
EPA's Combustion Portal for combustion-related air quality regulations	www.combustionportal.org
8-hour Ozone Nonattainment Designations by State and County, Interactive Map	www.epa.gov/ozone-pollution

6.14 Action Items

Action Items

Item	Date Started	Date Completed	NA	Comment(s)
Identify air emission sources from your storage tanks (the vents), loading and unloading racks, and vapor control equipment.			☐	
Get assistance if you are unsure which air quality regulations apply to your terminal.			☐	
Prepare and submit emissions inventory reports and license fees to your state or regional air quality agency.			☐	
Visually inspect the primary and secondary seals and take gap measurements as appropriate on your tanks storing petroleum or volatile organic liquids.			☐	
Maintain records on the type of fuel stored, the period of storage, throughput, and maximum true vapor pressure of the liquid stored. Keep records of fuel burning engines, pumps, and generators with installation dates, manufacturer model numbers, conformity determinations, operational/run time data, and O&M manuals. Keep these records for a minimum of 5 years.			☐	
Determine whether your facility is in an attainment or nonattainment area for ozone or VOCs prior to construction of a new source or modification of existing sources resulting in increased emissions.			☐	
Contact your state or regional agency for help in evaluating whether the addition of new fuel storage tanks or the expansion of existing facilities will conform with the state's SIP.			☐	
Notify the air quality agency and obtain a construction permit before adding or modifying additional tanks, loading racks, and other sources that would increase emissions. (Some construction activities may be exempt from permitting.)			☐	
Obtain operating permits (or modify your Title V permit if you are a major source) for construction or modification of existing sources that will increase emissions.			☐	
Review the specific monitoring, record-keeping, and reporting requirements in your facility's air permit.			☐	

CHAPTER 6
Appendices

THIS PAGE LEFT
INTENTIONALLY BLANK

Appendix 6-1: Summary of Compression Ignition Stationary Reciprocating Internal Combustion Engine Requirements (40 CFR 63 Subpart ZZZZ)

Source Type [§63.6585; 63.6590]		Engine Type		Emission Standards (Limits)[1] [§63.6602; Subpart ZZZZ Table 2c]		Work Practice Standards[1]			Tests [§63.6610, 63.6612, 63.6615, 63.6620] (Initial Performance Test within 180 Days After Compliance Date)	Monitor [§63.6625, 63.6635, 63.6640]	Records [§63.6655; 63.6660] (Copies of Notifications If Required)	Notifications [§63.6645]
		Site Rating	Specific Engine	Carbon Monoxide (CO) @ 15% O_2	Sulfur	Oil and Filter	Air Cleaner	Hoses and Belts				
Major	Existing	>500 hp	Non-emergency, Non-black start	23 ppmvd or reduce CO by 70%	15 ppm				Initial Performance and Retest (See Subpart ZZZZ Table 3, 4, and 5)	Temperature and Pressure	Malfunctions, performance tests/evaluations, maintenance on OC/CC/CMS, notifications, and continuous monitoring	Yes
Major	Existing	>300 hp and <500 hp	Non-emergency, Non-black start	49 ppmvd or reduce CO by 70%	15 ppm				Initial Performance (See Subpart ZZZZ Table 4 and 5)		Malfunctions, performance tests/evaluations, maintenance on OC/CC/CMS, notifications, and continuous monitoring	Yes
Major	Existing	>100 hp and ≤300 hp	Non-emergency, Non-black start	230 ppmvd					Initial Performance (See Subpart ZZZZ Table 4 and 5)		Malfunctions, performance tests/evaluations, maintenance on OC/CC/CMS, notifications, and continuous monitoring	Yes
Major	Existing	<100 hp	Non-emergency or Non-black start			Change every 1,000 hrs or annually, whichever occurs first[2] (See Subpart ZZZZ Table 2c)	Inspect every 1,000 hrs or annually, whichever occurs first (See Subpart ZZZZ Table 2c)	Inspect every 500 hrs or annually, whichever occurs first (See Subpart ZZZZ Table 2c)	Maintenance Plan (See §63.6640 and Subpart ZZZZ Table 6)		Maintenance and malfunction records	No
Major	Existing	>500 hp	Limited use	No Requirements								
Major	Existing	>500 hp	Emergency, black start[3]	No other requirements except §63.6640(f)(2)(ii)–(iii)								
Major	Existing	≤500 hp	Emergency, black start[3]			Change every 500 hrs or annually, whichever occurs first[2] (See Subpart ZZZZ Table 2c)	Inspect every 1,000 hrs or annually, whichever occurs first (See Subpart ZZZZ Table 2c)	Inspect every 500 hrs or annually, whichever occurs first (See Subpart ZZZZ Table 2c)	Maintenance Plan (See §63.6640 and Subpart ZZZZ Table 6)	Non-resettable hour meter	Hours of operation, reason for operation, maintenance, and malfunctions	No
Major	New or Reconstructed	>500 hp	Non-emergency, Non-black start	Reduce CO by 70% (See Subpart ZZZZ Table 2a) or limit formaldehyde conc. to 580 ppbvd					Initial Performance and Retest (See Subpart ZZZZ Table 3, 4, and 5)	Temperature and pressure	Malfunctions, performance tests/evaluations, maintenance on OC/CC/CMS, notifications, and continuous monitoring	Yes
Major	New or Reconstructed	>500 hp	Emergency[3]	No other requirements except §63.6640(f)(2)(ii)–(iii)								Yes
Major	New or Reconstructed	>500 hp	Limited use	No other requirements except Initial Notification								Yes
Major	New or Reconstructed	<500 hp		Must comply with NSPS 40 CFR 60 Subpart IIII[4]								
Area	Existing	>500 hp	Non-emergency, Non-black start	23 ppmvd or reduce CO by 70% (See Subpart ZZZZ Table 2d)					Initial Performance (See Subpart ZZZZ Table 4 and 5)	Temperature and Pressure; must install closed ccvs or ocfecs	Malfunctions, performance tests/evaluations, maintenance on OC/CC/CMS, notifications, and continuous monitoring	Yes

Source Type [§63.6585; 63.6590]		Engine Type		Emission Standards (Limits)[1] [§63.6602; Subpart ZZZZ Table 2c]		Work Practice Standards[1]			Tests [§63.6610, 63.6612, 63.6615, 63.6620] (Initial Performance Test within 180 Days After Compliance Date)	Monitor [§63.6625, 63.6635, 63.6640]	Records [§63.6655; 63.6660] (Copies of Notifications If Required)	Notifications [§63.6645]
		Site Rating	Specific Engine	Carbon Monoxide (CO) @ 15% O_2	Sulfur	Oil and Filter	Air Cleaner	Hoses and Belts				
Area	Existing	>300 hp and ≤500 hp	Non-emergency, Non-black start	49 ppmvd or reduce CO by 70% (See Subpart ZZZZ, Table 2d)					Initial Performance (See Subpart ZZZZ Table 4 and 5)	Must install closed ccvs or ocfecs	Malfunctions, performance tests/evaluations, maintenance on OC/CC/CMS, notifications, and continuous monitoring	Yes
Area	Existing	≤300 hp	Non-emergency, Non-black start			Change every 1,000 hrs or annually, whichever occurs first[2] (See Subpart ZZZZ Table 2d)	Inspect every 1,000 hrs or annually, whichever occurs first (See Subpart ZZZZ Table 2d)	Inspect every 500 hrs or annually, whichever occurs first (See Subpart ZZZZ Table 2d)	Maintenance Plan (See §63.6640 and Subpart ZZZZ Table 6)		Maintenance and malfunction records	No
Area	Existing		Emergency, black start[3]			500 hrs or annually, whichever occurs first[2] (See Subpart ZZZZ Table 2d)	Inspect every 1,000 hrs or annually, whichever occurs first (See Subpart ZZZZ Table 2d)	Inspect every 500 hrs or annually, whichever occurs first (See Subpart ZZZZ Table 2d)	Maintenance Plan (See §63.6640 and Subpart ZZZZ Table 6)	Non-resettable hour meter	Hours of operation, reason for operation, maintenance, and malfunctions	No
Area	Existing		Emergency – residential, commercial, or institutional[3]	No other requirements except §63.6640(f)(2)(ii)–(iii)								
Area	New or Reconstructed		Must comply with NSPS 40 CFR 60 Subpart IIII[4]									

Notes:

*See NESHAP Subpart ZZZZ for additional provisions. Appendix 6–1 does not include requirements for engines located on the Outer Continental Shelf (OCS), engines located in remote areas, and engines located in states where periodic engine replacement is required.

[1]For all engines, the time spent at idle and time for startup must be minimized to not more than 30 minutes. For non–emergency, non–black start engines with a site rating of more than 300 hp and with a displacement of less than 30 liters per cylinder, you must use diesel fuel that meets the specific requirements in 40 CFR 80.510(b). [§63.6604].

[2]Option to use an oil analysis program to extend the specified oil change requirement. The oil analysis must be performed at the same frequency as oil changes are required, and the program must analyze the parameters and keep records as required in §63.6625(i).

[3]Emergency engines may not be operated for non-emergency purposes for more than 100 hours per year. Additional restrictions on non-emergency use of emergency engines applies, see Section 63.6640(f) of NESHAP Subpart ZZZZ for specifics. No limit on hours of operations during an emergency. New and existing emergency engines located at major sources of HAPs and greater than 500 hp may not operate for more than 15 hrs/yr for non-emergency purposes as identified in § 63.6640(f)(2)(ii) and (iii).

[4]As a major or area source considered new/reconstructed, your requirements under the Subpart ZZZZ are to comply with the NSPS IIII. However, the owners and operators subject to the NSPS IIII are only CI engines constructed after July 11, 2005, and the engine was manufactured on or after April 1, 2006.

CC=catalytic controls

CMS=continuous monitoring system

ccvs=crankcase ventilation system

hrs=hours

OC=oxidation catalyst

ocfecs=open crankcase filtration emission control system

ppbvd= parts per billion of volume dry

ppmvd=parts per million of volume dry

Work Practice Standards – refers to best management practices required

Tests – various tests required depending on your engine

Monitor – requirements regarding monitoring of engine

Records – all records that you are required to maintain

Notifications – provided to EPA and/or your state regulatory agency

Appendix 6-2: Summary of Spark Ignition Stationary Reciprocating Internal Combustion Engine Requirements (40 CFR 63 Subpart ZZZZ)

Source Type[1] [§63.6585; 63.6590]		Engine Type		Emission Standards (Limits) [§63.6602; Subpart ZZZZ Table 2c]		Work Practice Standards			Tests [§63.6610, 63.6612, 63.6615, 63.6620]	Monitor [§63.6625, 63.6635, 63.6640]	Records [§63.6655; 63.6660]	Notifications [§63.6645]
		Site Rating	Specific Engine	Carbon monoxide (CO) @ 15% O_2	Sulfur	Oil and Filter	Spark Plugs	Hoses and Belts	(Initial Performance Test within 180 Days After Compliance Date)		(Copies of Notifications If Required)	
Major	Existing	>500 hp	4–stroke rich burn Nonemergency, Non–black start	Reduce formaldehyde by 76% or limit formaldehyde conc. to 350 ppbvd or less (See 63.6600, Subpart ZZZZ Table 1a)					Initial Performance and Retest (See Subpart ZZZZ Table 3, 4, 5)	Temperature and Pressure	Malfunctions, performance tests/ evaluations, maintenance on OC/CC/CMS, notifications, and continuous monitoring	Yes
Major	Existing	>500 hp	2– and 4–stroke lean burn	No Requirements								
Major	Existing	<100 hp	Nonemergency, Non–black start, and not 2–stroke lean burn			Change every 1,440 hrs or annually, whichever occurs first[2] (See Subpart ZZZZ Table 2c)	Inspect every 1,440 hrs or annually, whichever occurs first (See Subpart ZZZZ Table 2c)	Inspect every 1,440 hrs or annually, whichever occurs first (See Subpart ZZZZ Table 2c)	Maintenance Plan (See §63.6640 and Subpart ZZZZ Table 6)		Maintenance and Malfunction Records	No
Major	Existing	<100 hp	2–stroke lean burn Nonemergency, Non–black start			Change every 4,320 hrs or annually, whichever occurs first[2] (See Subpart ZZZZ Table 2c)	Inspect every 4,320 hrs or annually, whichever occurs first (See Subpart ZZZZ Table 2c)	Inspect every 4,320 hrs or annually, whichever occurs first (See Subpart ZZZZ Table 2c)	Maintenance Plan (See §63.6640 and Subpart ZZZZ Table 6)		Maintenance and Malfunction Records	No
Major	Existing	≥100 hp and ≤500 hp	2–stroke lean burn, Nonemergency, non–black start	225 ppmvd					Initial Performance (See Subpart ZZZZ Table 4 and 5)		Malfunctions, performance tests/ evaluations, maintenance on OC/CC/CMS, notifications, and continuous monitoring	Yes
Major	Existing	≥100 hp and ≤500 hp	4–stroke lean burn, Nonemergency, non–black start	47 ppmvd					Initial Performance (See Subpart ZZZZ Table 4 and 5)		Malfunctions, performance tests/ evaluations, maintenance on OC/CC/CMS, notifications, and continuous monitoring	Yes
Major	Existing	≥100 hp and ≤500 hp	4–stroke rich burn, Nonemergency, non–black start	10.3 ppmvd Formaldehyde[3]					Initial Performance (See Subpart ZZZZ Table 4 and 5)		Malfunctions, performance tests/ evaluations, maintenance on OC/CC/CMS, notifications, and continuous monitoring	Yes
Major	Existing	>500 hp	Limited use	No Requirements								
Major	Existing	>500 hp	Emergency, black start[4]	No other requirements except §63.6640(f)(2)(ii)–(iii)								
Major	Existing	≤500 hp	Emergency, black start[4]			Change every 500 hrs or annually, whichever occurs first[3] (See Subpart ZZZZ Table 2c)	Inspect every 1,000 hrs or annually, whichever occurs first (See Subpart ZZZZ Table 2c)	Inspect every 500 hrs or annually, whichever occurs first (See Subpart ZZZZ Table 2c)	Maintenance Plan (See §63.6640 and Subpart ZZZZ Table 6)	Non–resettable hourmeter	Hours of operation, reason for operation, maintenance, and malfunctions	No
Major	New or Reconstructed	>500 hp	Nonemergency, Non–black start 4–stroke rich burn	Reduce formaldehyde by 76% or limit formaldehyde conc. to 350 ppbvd[3] (See §63.600(b), Subpart ZZZZ Table 1a)					Initial Performance and Retest (See Subpart ZZZZ Table 3, 4, and 5)	Temperature and Pressure	Malfunctions, performance tests/ evaluations, maintenance on OC/CC/CMS, notifications, and continuous monitoring	Yes

Source Type[1] [§63.6585; 63.6590]		Engine Type		Emission Standards (Limits) [§63.6602; Subpart ZZZZ Table 2c]		Work Practice Standards			Tests [§63.6610, 63.6612, 63.6615, 63.6620]	Monitor [§63.6625, 63.6635, 63.6640]	Records [§63.6655; 63.6660]	Notifications [§63.6645]
		Site Rating	Specific Engine	Carbon monoxide (CO) @ 15% O_2	Sulfur	Oil and Filter	Spark Plugs	Hoses and Belts	(Initial Performance Test within 180 Days After Compliance Date)		(Copies of Notifications If Required)	
Major	New or Reconstructed	>500 hp	Non-emergency, Non-black start 2-stroke lean burn	12 ppmvd formaldehyde or reduce CO by 58% (See §63.600, Subpart ZZZZ Table 2a)					Initial Performance and Retest (See Subpart ZZZZ Table 3, 4, and 5)	Temperature and Pressure	Malfunctions, performance tests/ evaluations, maintenance on OC/CC/CMS, notifications, and continuous monitoring	
Major	New or Reconstructed	≥250 hp	Non-emergency, Non-black start 4-stroke lean burn	14 ppmvd formaldehyde or reduce CO by 93% (See §63.600, Subpart ZZZZ Table 2a)					Initial Performance and Retest (See Subpart ZZZZ Table 3, 4, and 5)	Temperature and Pressure	Malfunctions, performance tests/ evaluations, maintenance on OC/CC/CMS, notifications, and continuous monitoring	
Major	New or Reconstructed	>500 hp	Emergency[4]	See §63.6640(f)(2)(ii)–(iii)								Yes
Major	New or Reconstructed	>500 hp	Limited use	No requirements other than Initial Notification								Yes
Major	New or Reconstructed	≤500 hp	Emergency or limited use	Must comply with NSPS 40 CFR 60 Subpart JJJJ[5]								
Major	New or Reconstructed	≤500 hp	2-stroke lean burn	Must comply with NSPS 40 CFR 60 Subpart JJJJ[5]								
Major	New or Reconstructed	<250 hp	4-stroke lean burn	Must comply with NSPS 40 CFR 60 Subpart JJJJ[5]								
Major	New or Reconstructed	≤500 hp	4-stroke rich burn	Must comply with NSPS 40 CFR 60 Subpart JJJJ[5]								
Area	Existing	>500 hp	4-stroke lean burn Non-emergency, Non-black start (operates less than 24 hrs/year)			Change every 500 hrs or annually, whichever occurs first[2] (See Subpart ZZZZ Table 2d)	Inspect every 1,000 hrs or annually, whichever occurs first (See Subpart ZZZZ Table 2d)	Inspect every 500 hrs or annually, whichever occurs first (See Subpart ZZZZ Table 2d)	Maintenance Plan (See §63.6640 and Subpart ZZZZ Table 6)		Maintenance and malfunction records	No
Area	Existing	>500 hp	4-stroke rich burn Non-emergency, Non-black start (operates less than 24 hrs/year)			Change every 500 hrs or annually, whichever occurs first[3] (See Subpart ZZZZ Table 2d)	Inspect every 1,000 hrs or annually, whichever occurs first (See Subpart ZZZZ Table 2d)	Inspect every 500 hrs or annually, whichever occurs first (See Subpart ZZZZ Table 2d)	Maintenance Plan (See §63.6640 and Subpart ZZZZ Table 6)		Maintenance and malfunction records	No
Area	Existing	>500 hp	4-stroke rich burn not remote, non-emergency, non-black start (operates more than 24 hrs/ year)	Install NSCR to reduce HAP emissions (See §63.6603 and Subpart ZZZZ Table 2d)					Initial Performance and Retest (See Subpart ZZZZ Table 3, 4, 5)	Temperature and Pressure	Malfunctions, performance tests/ evaluations, maintenance on OC/CC/CMS, notifications, and continuous monitoring	Yes
Area	Existing	>500 hp	4-stroke rich burn remote, non-emergency, non-black start			Change every 2,160 hrs or annually, whichever occurs first[2] (See Subpart ZZZZ Table 2d)	Inspect every 2,160 hrs or annually, whichever occurs first (See Subpart ZZZZ Table 2d)	Inspect every 2,160 hrs or annually, whichever occurs first (See Subpart ZZZZ Table 2d)	Maintenance Plan (See §63.6640 and Subpart ZZZZ Table 6)		Maintenance and malfunction records	No
Area	Existing	>500 hp	4-stroke lean burn not remote, non-emergency, non-black start (operates more than 24 hrs/ year)	Install an oxidation catalyst to reduce HAP emissions (See §63.6603 and Subpart ZZZZ Table 2d)					Initial Performance and Retest (See Subpart ZZZZ Table 3, 4, 5)	Temperature and Pressure	Malfunctions, performance tests/ evaluations, maintenance on OC/CC/CMS, notifications, and continuous monitoring	Yes

Source Type[1] [§63.6585; 63.6590]		Engine Type		Emission Standards (Limits) [§63.6602; Subpart ZZZZ Table 2c]		Work Practice Standards			Tests [§63.6610, 63.6612, 63.6615, 63.6620]	Monitor [§63.6625, 63.6635, 63.6640]	Records [§63.6655; 63.6660]	Notifications [§63.6645]
		Site Rating	Specific Engine	Carbon monoxide (CO) @ 15% O_2	Sulfur	Oil and Filter	Spark Plugs	Hoses and Belts	(Initial Performance Test within 180 Days After Compliance Date)		(Copies of Notifications If Required)	
Area	Existing	>500 hp	4-stroke lean burn remote non-emergency, non-black start			Change every 2,160 hrs or annually, whichever occurs first[2] (See Subpart ZZZZ Table 2d)	Inspect every 2,160 hrs or annually, whichever occurs first (See Subpart ZZZZ Table 2d)	Inspect every 2,160 hrs or annually, whichever occurs first (See Subpart ZZZZ Table 2d)	Maintenance Plan (See §63.6640 and Subpart ZZZZ Table 6)		Maintenance and malfunction records	No
Area	Existing	≤500 hp	4-stroke rich burn Non-emergency Non-black start			Change every 1,440 hrs or annually, whichever occurs first[3] (See Subpart ZZZZ Table 2d)	Inspect every 1,440 hrs or annually, whichever occurs first (See Subpart ZZZZ Table 2d)	Inspect every 1,440 hrs or annually, whichever occurs first (See Subpart ZZZZ Table 2d)	Maintenance Plan (See §63.6640 and Subpart ZZZZ Table 6)		Maintenance and malfunction records	No
Area	Existing	Any size engine	2-stroke lean burn Non-emergency, Non-black start			Change every 4,320 hrs or annually, whichever occurs first[2] (See Subpart ZZZZ Table 2d)	Inspect every 4,320 hrs or annually, whichever occurs first (See Subpart ZZZZ Table 2d)	Inspect every 4,320 hrs or annually, whichever occurs first (See Subpart ZZZZ Table 2d)	Maintenance Plan (See §63.6640 and Subpart ZZZZ Table 6)		Maintenance and malfunction records	No
Area	Existing	Any size engine	Emergency, black start[4]			Change every 500 hrs or annually, whichever occurs first[2] (See Subpart ZZZZ Table 2d)	Inspect every 1,000 hrs or annually, whichever occurs first (See Subpart ZZZZ Table 2d)	Inspect every 500 hrs or annually, whichever occurs first (See Subpart ZZZZ Table 2d)	Maintenance Plan (See §63.6640 and Subpart ZZZZ Table 6)	Non–resettable hourmeter	Hours of operation, reason for operation, maintenance, and malfunctions	No
Area	Existing		Emergency – residential, commercial, or institutional[4]	No other requirements except §63.6640(f)(2)(ii)–(iii)								
Area	New or Reconstructed (§63.6603)		Must comply with NSPS 40 CFR 60 Subpart JJJJ[5]									

Notes:

*For all engines, the time spent at idle and time for startup must be minimized to not more than 30 minutes. See NESHAP Subpart ZZZZ for additional provisions. This Appendix 6–2 does not include requirements for engines located on the Outer Continental Shelf (OCS), engines located in remote areas, and engines located in states where periodic engine replacement is required.

[1]Engines powered by landfill or digester gas are not included in Appendix 6–2; see NESHAP Subpart ZZZZ for applicable requirements for engines using these fuels.

[2]Option to use an oil analysis program to extend the specified oil change requirement. The oil analysis must be performed at the same frequency as oil changes are required, and the program must analyze the parameters and keep records as required in §63.6625(i).

[3]Engine type does not have an option to control carbon monoxide.

[4]Emergency engines may not be operated for non-emergency purposes for more than 100 hours per year. Additional restrictions on nonemergency use of emergency engines applies, see Section 63.6640(f) of NESHAP Subpart ZZZZ for specifics. No limit on hours of operations during an emergency. New and existing emergency engines located at major sources of HAPs and greater than 500 hp may not operate for more than 15 hrs/yr for non-emergency purposes as identified in § 63.6640(f)(2)(ii) and (iii).

[5]As a major or area source considered new/reconstructed, your requirements under the Subpart ZZZZ are to comply with the NSPS JJJJ; see NSPS Subpart JJJJ to determine applicability.

ppbvd=parts per billion of volume dry

ppmvd=parts per million of volume dry

OC=oxidation catalyst

CC= catalytic controls

CMS=continuous monitoring system.

Work Practice Standards – refers to best management practices required

Tests – various tests required depending on your engine

Monitor – requirements regarding monitoring of engine *Records* – all records that you are required to maintain

Notifications – provided to US EPA and/or your state regulatory agency

THIS PAGE LEFT
INTENTIONALLY BLANK

Appendix 6-3: National Air Toxic Standards for Gasoline Distribution Bulk Terminals, Bulk Plants, and Pipeline Facilities (40 CFR 63 Subpart BBBBBB)[1]

Facility Type	Storage Tanks	Cargo Tank Loading Racks	Equipment Leaks
Bulk Gasoline Plant (less than 20,000 gallons per day)	For storage tanks ≥250 gallons capacity, load storage tank using submerged fill with discharge that is no more than the following from the bottom of tank: a) 12 inches for pipes installed on or before 11/9/2006 b) 6 inches for pipes installed after 11/9/2006 OR keep documentation that the liquid level never falls below the pipe discharge.	Use submerged fill	Same for all facilities: Implement monthly equipment leak inspection; standards allow a sight, sound, and smell inspection of all equipment components in gasoline liquid or vapor service.
Bulk Gasoline Terminal (greater than or equal to 20,000 gallons per day)	**≥75 cubic meters (m^3) capacity:** Use specified floating roofs and seals or a closed vent system and control device to reduce emissions by 95%.	**Gasoline throughput <250,000 gallons per day:** use submerged fill for the loading of cargo tanks.	
	<75 m^3 capacity OR <151 m^3 capacity and throughput <480 gallons/day: Cover tank with a fixed roof mounted in a stationary manner and maintain all openings in a closed position at all times when not in use.	**Gasoline throughput ≥250,000 gallons per day:** (1) reduce HAP emissions to 80 milligrams (mg) or less, per liter of gasoline loaded into cargo tanks and (2) limit the loading of gasoline into cargo tanks demonstrated to be vapor tight[2] using Reference Method 27 or equivalent.	
	Surge control tank: Cover tank with a fixed roof mounted in a stationary manner and with a p/v vent with a positive cracking pressure of no less than 0.50 inches of water. Maintain all openings in a closed position at all times when not in use.		
Pipeline Breakout Station	Same as bulk gasoline terminals	Not Applicable	
Pipeline Pumping Station	Not Applicable	Not Applicable	

[1]This is a summary table; compliance will only be determined by compliance with actual rule text in 40 CFR 63 Subpart BBBBBB.

[2]Must be tested annually and meet a maximum allowable pressure/vacuum change of 3 inches of water in 5 minutes.

Source: U.S. EPA Office of Air Quality Planning and Standards (EI: 43–02), January 2011. www.epa.gov/ttn/atw/area/arearules.html

THIS PAGE LEFT
INTENTIONALLY BLANK

Appendix 6-4: Tools for Estimating Emissions

Air emission reports, sometimes called emissions inventories, for sources of air pollution are required by most state and regional air programs. Construction permits, minor source operating permits (including synthetic minor permits), and Title V permits almost always have requirements for annual submittal of emissions inventories to the state agencies. This appendix describes some of the data needed to prepare emissions inventories. In addition, a brief overview of emissions estimating techniques is presented.

Data Needed to Estimate Emissions

The following paragraphs provide a quick reference to the types of data that should be collected for estimating emissions from tanks, loading racks, and combustion sources to prepare emissions inventories. It is not intended as a complete reference. You will need to understand the emissions estimating techniques to be used to ensure that all required data are collected.

Tank Emissions

The method of operation and the physical characteristics of the tank will influence volatile organic compound (VOC) emissions from it. The most important operating parameters are the tank throughput and the volatility of the liquid stored. Tank throughput can be measured either by the total fuel pumped into or out of a tank. With a large tank, and where the tank level is significantly higher or lower at the end of the time period versus the beginning, these two values may be different. In this case, the total fuel pumped into the tank is the preferred data point. Volatility of the liquid stored is a function of storage temperature, as indicated by its true vapor pressure. Petroleum liquid Reid vapor pressures can be converted to true vapor pressures over a range of storage temperatures. Actual data from the fuel supplier or Safety Data Sheet (SDS) is useful, although there are average values available in various references.

Important physical tank characteristics include the type of roof (fixed or floating), the type of primary and secondary seals, the numbers and types of roof fittings, the number of vents, the color and age of the tank, and the condition of the paint. Other information such as the condition of floating-roof seals, influent nozzle arrangement (splash or submerged fill pipe), and dimensions of the tank are also used to calculate emissions.

Loading Rack Throughput

The primary data needed to estimate emissions are the amount of fuel loaded onto trucks. Also, data on the trucks themselves, such as splash or submerged filling, dimensions, vent relief settings, and type of vapor collection and control system installed, are important. Bulk gasoline terminals are required to comply with emissions limitations. The volume of vapors discharged through a vapor control device can be multiplied by the emissions limitation or by the device control efficiency to obtain an estimate of emissions.

Combustion Sources

For boilers, heaters, and engines, the most important data are the total quantity and type of fuel consumed. For liquid fuels, sulfur content is also important. Data on the combustion unit itself includes the heat input rating (British thermal unit per hour [Btu/hour] of the burners, manufacturer-provided emissions data, age of the boiler engine, and emission control technology installed, if any).

Estimating Methods and Tools

There are several methods available for estimating emissions from pollutant sources: direct measurement, engineering calculations with knowledge of the process generating the pollutant, and **emission factors**.

Direct Measurement

Direct measurement or source testing is the most reliable and the most expensive method of determining emissions from a source. Direct measurement is based on actual monitoring of the concentration of a chemical in the exhaust

stream. Measurements can be obtained by using continuous emission monitors or by performing actual stack tests. Obtaining test data is not always feasible and may not reflect the variability of actual emissions over time.

Engineering Calculations

Knowledge of the process generating the pollutant can be used to estimate emissions, and in many cases, this method is as reliable as direct measurement. Typically, these methods are based on standard engineering principals using properties of the chemicals involved, process data, or process knowledge. For example, VOC emissions from a paint booth can accurately be assumed to be equivalent to the VOC content of the paint. Obtaining process information necessary to use this approach may require some effort, but it is relatively inexpensive in comparison to direct measurement.

Mass balancing is a common engineering method of estimating emissions that is widely accepted by state agencies. Chemical engineers have long used mass balances in working with chemical processes. The concept is simple in theory: for a continuous flow, batch, or semi-batch process, the total inputs to the process must equal the total outputs plus any accumulation. The primary limitation of mass balances is the accuracy with which the inputs and outputs can be measured.

For example, SO_x emissions from a boiler can be calculated by mass balance. Since no sulfur accumulates inside a boiler, the total sulfur flowing into the boiler must equal the total sulfur exiting the boiler. By estimating the rate of sulfur entering with the fuel and by multiplying by the ratio of molecular weight of SO_2 to molecular weight of elemental sulfur, the total SO_2 per time exiting the boiler can be calculated (this assumes sulfur oxides mostly consist of SO_2).

Another example is solvent degreasers. If the quantities of solvent added to and removed from a degreaser can be measured accurately, the air emissions must equal the difference between the two. However, caution must be used to account for the extra volume of effluent associated with the sludge that is removed.

Emission Factors

The most widely accepted method for estimating air emissions from common sources is through the use of emission factors published in reference documents. An emission factor is derived from facilities or processes similar to yours. In most cases, these factors are simply averages of all available data of acceptable quality. These factors are expressed in terms of pollutant generated per unit of process operation (for example, pounds of VOC per million-gallon fuel throughput). Emission factors may be the least reliable, but are the least costly method of estimating emissions.

EPA's Office of Air Quality Planning and Standards (OAQPS) is responsible for air quality regulation, guidance documents, and other activities required by the CAA. The OAQPS established the Technical Transfer Network (TTN), which is a collection of web pages on air pollution topics. TTN maintains a web page called the Clearinghouse for Inventories and Emission Factors (CHIEF) for downloading the latest information and tools for estimating emissions of air pollutants and performing air emissions inventories. The CHIEF information desk can be reached at (919) 541–1000, or at *info.chief@epa.gov*

Guidance Document AP-42

The most important source for emission factors is EPA's guidance document, *Compilation of Air Pollutant Emission Factors,* referred to as AP–42. These emission factors are based on empirical data collected through various research programs, and are generally written in terms of pounds of pollutants per unit quantity of process throughput.

For example, emission factors for emissions from boilers are published in the form of pounds of pollutants per million cubic feet of natural gas burned or pounds of pollutants per thousand gallons of fuel oil burned. The factors are easy to use and are widely accepted by the state agencies as a method of estimating emissions.

Each emission factor is given a quality rating of A through E. Emission factors with a rating of A are based on larger data populations and are the most reliable. Emission factors with a rating of E should be considered of questionable reliability.

AP–42 sections and other related estimation techniques can be downloaded from EPA's website at *www.epa.gov/chief.*

Air Pollution Engineering Manual

Another excellent document for understanding the mechanisms of air pollution, techniques for estimating the rate of emissions, and techniques for controlling air pollution is the *Air Pollution Engineering Manual,* edited by Wayne T. Davis, 2000. This document is prepared by the Air and Waste Management Association and is commonly referred to as AP–40.

TANKS Computer Program

TANKS is a user-friendly computer software program developed by EPA that computes VOC emissions from storage tanks. It is a widely accepted method of estimating the air emissions from:

- Vertical and horizontal fixed-roof tanks
- Internal and external floating-roof tanks
- Domed external floating-roof tanks
- Underground storage tanks

The mechanism of emissions from storage tanks is very complicated and is not easily estimated without computer tools. The TANKS program relies on a database of chemical properties for over 100 organic compounds and mixtures (such as gasoline and diesel), as well as a meteorological database of over 250 cities in the U.S.

The latest version of TANKS, Version 4.09D, requires an IBM-compatible PC with at least 8 MB of RAM and 15 MB of available hard disk space. The TANKS program and manual can be downloaded from EPA's website at *www.epa.gov/ttn/chief/software/tanks/index.html*.

THIS PAGE LEFT
INTENTIONALLY BLANK