US: FUELS: COMPLIANCE

Summary

EPA manages a comprehensive fuel compliance program that combines fuel registration, extensive fuel inspections, a fuel quality testing and reporting system, and stiff noncompliance penalties. Most of the US fuel inspection programs are funded by EPA. Industry is, however, required to fund one program to assure that reformulated gasoline compliance for annual average standards is met separately for each of the country's reformulated gasoline control areas. An additional voluntary quality assurance survey program for diesel fuel sulfur compliance is also funded by industry consortium. This serves as an alternative precaution against noncompliance. The Clean Air Act (CAA) gives EPA the authority to prohibit the manufacture or sales of fuel and fuel additives if there is reason to believe they endanger public health, or if they impair emission control devices on vehicles. Amendments to the CAA in 1990 added provisions mandating that fuel combustion result in fewer emissions. The amendments also expanded EPA's authority to include fuels used in non-road vehicles.

EPA's compliance program places the onus of proof largely on refiners, importers, and other fuel handlers to demonstrate compliance through registration, fuel analysis and reporting.

EPA assures the authenticity of industry's proof of compliance by mandating independent lab sampling and testing, third party auditing of industry reports, and by conducting targeted and random audits at refineries, import facilities, truck loading terminals and retail stations. Key elements of the program are discussed in more details in the following sections.

The US fuel compliance program targets all parties in the distribution system, including refiners, importers, distributors, carriers, oxygenate blenders, retailers, and wholesale-purchaser-consumers (fleet operators with their own dispensing pumps).

The program was established to ensure that fuel that is either leaving the refinery gate or being imported meets all requirements on both a per-gallon and an annual average basis.

Program Components

Fuel and Fuel Additive Registration

Under section 211 of the CAA, refiners and importers are required to register any motor vehicle fuel and fuel additive with EPA prior to marketing it. Registration requires submitting the chemical description of the fuel or fuel additive, as well as some technical, marketing and health-related information, such as the in-use purpose of their product.

EPA may also require that a product be tested for possible health effects before registration.

EPA uses registration information to assess likely combustion and evaporative emissions using the Complex Model[1], which identifies products with emissions that might pose unreasonable risks to public health. EPA can deny registration, or repeal existing registration, of any fuel or fuel additive that may endanger public health or impair emission control devices.

Under the CAA, detergent additives are required to be added to gasoline to reduce accumulation of deposits in engines and fuel supply system. These additives must be certified by EPA through the following process:

1. Registration with EPA that includes the additive's composition and the minimum recommended additive concentration. The recommended concentration cannot be lowered without first notifying EPA.
2. Submitting a sample of the detergent additive to EPA.
3. Submitting a certification letter for the detergent additive package. The letter must be signed by a person legally authorized to represent the certifying party.

After receiving the certification letter, EPA may review the certification data, analyze the submitted detergent additive sample, or subject the additive package to confirmatory testing, and may disqualify a certification where appropriate.

Additionally, detergent additive manufacturers are required to communicate their detergent's minimum recommended blending concentration to fuel producers.[2]

Fuel testing and compliance reporting

EPA requires refiners and importers to analyze the properties of every batch of fuel produced or imported.[3] Refiners and importers have to maintain all testing records and retain test samples. Fuel properties are reported to EPA on a quarterly or annual basis depending on the design of the particular compliance program.[4] [5]In addition, annual reports are filed with EPA, summarizing test results and associated properties to show compliance with the per-gallon and annual average standards. EPA selectively audits reports and lab records to check for consistency. Additionally, EPA audits testing labs and test methods.

Additional Components

Industry-paid independent lab testing

In addition to requiring self-testing of every batch of fuel, EPA calls on refiners and importers to hire independent labs to test gasoline. As of 2005, about 150 labs were working with EPA and refiners to test fuel quality.[6]

Lab test reports are submitted to EPA for comparison with reports submitted by industry. All reports are required to be signed by senior lab managers, and EPA can file criminal charges against the signatory if reports are found to be falsified.

Industry-paid independent auditing of refinery reports and lab records

Fuel refiners and importers are required to hire independent certified public accountants or certified internal auditors to audit all fuel test results, volume reports, and other information that is submitted.

Presumptive liability and industry-funded field surveys

EPA rules place liability on refiners, importers, distributors, carriers, resellers, retail and wholesale purchase-consumers to sell or use motor vehicle diesel fuel that meets the sulfur, benzene, volatility, toxics, and lead contamination standards. When a violation is found, not only the party in possession of the non-compliant fuel, but all upstream parties in the fuel distribution system as well, are presumed liable, unless they establish a credible defense. This leads many refiners and importers, whose brands appear at retail outlets, to often implement a downstream quality assurance program to ensure compliance.[7]

As another mechanism to ensure compliance, fuel refiners and importers often fund a fuel survey program.

Under this program, industry hires surveyors to take statistically representative samples from retail stations and test them against set standards.

EPA field audits and inspection

Besides auditing industry's self-reports and requiring industry to arrange for independent lab testing auditing, EPA randomly inspects refineries. EPA also conducts targeted inspections of refineries suspected of producing noncompliant fuels. It also audits a small number of independent labs each year to ensure labs maintain an appropriate independence from fuel producers, and that they correctly report test results.

Non-compliance penalty

The CAA sets a maximum civil penalty of US$ 37,500 per day per occurrence plus the amount of economic benefit or savings resulted from such violation.[8] Actual penalties are determined by EPA based on various considerations including economic benefits, business size, and the gravity of violation (whether it results in significant increases in emissions). While maximum fines are seldom assessed, EPA has levied heavy fines for severe violations. For instance, in 1985, EPA imposed fines of US$ 266,000 against Decker Coal Co. for using leaded gasoline in 37 vehicles marked for unleaded fuel only.[9]

In 2008, EPA assessed a penalty of US$ 1.25 million against Biofriendly Corporation for failing to register an additive.[10] In addition, EPA can file criminal charges against refiners, importers and independent labs should they be found to have falsified, or assisted in falsifying, test results.[11]

Enforcement efforts of other government agencies

Motor vehicle fuels are subject to fuel tax, but non-road fuels are exempt. For tax purposes, the Internal Revenue Service (IRS) and some state governments have established their own enforcement programs to ensure non-road fuels are not used to refuel on-road vehicles.

Averaging, banking and trading (ABT) systems

To allow for industry to meet standards in the most cost-effective way, EPA has introduced a number of flexibility measures. One such measure is the Averaging, Banking and Trading (ABT) system.

The (ABT) system add flexibility to standards by allowing compliance to be attained over a specified time period. For example, in EPA's gasoline sulfur reduction programs, a refinery can over-comply with the standard for a period of time and bank any extra credits for later use, or for use at a different refinery. This gives flexibility while ensuring the annual average standard is still met.

It should be noted that per gallon caps cannot be exceeded under the ABT system. Credits can only be applied to meet the average.

Fuel quality labeling

Due to compliance flexibility and multi-tiered fuel quality standards in the US, labels at retail outlets specify the appropriate use for various fuels. [12]

Designate and track

For on-road and non-road diesels subject to differing sulfur content requirements before 2010, EPA allowed distribution and transportation to be tracked through the same system as long as handlers filed quarterly electronic reports listing which fuel they received and to whom they delivered. The Designate and Track program enabled refiners and importers to maximize utilization of the existing fuel distribution system, while still allowing EPA to track fuel distribution and ensure no party illegally represented non-road fuel as on-road. To facilitate enforcement, all non-road diesel was dyed red at the terminal so enforcement officials could distinguish it by observing its color in a white bucket (white bucket test). Retail stations were also required to put labels on the fuel pumps to identify the fuel sulfur level and the intended use of the fuel.

Designate and Track is no longer as important, since on-road and non-road diesel is subject to a 15 ppm maximum sulfur standard.

Controlling evaporative emissions during refueling

Fuel vapors emitted during distribution and storage are a source of VOCs and toxics, such as benzene. Because of this, emission control devices have been developed to contain and recover vapors during fuel delivery and vehicle refueling.

Equipment that recovers evaporative emissions from distribution systems (e.g. storage tanks, bulk plants, bulk terminals, storage tanks at service stations and fuel trucks) are designated as Stage I controls. To meet ambient air quality standards, many states require Stage I controls in their State Implementation Plans (SIP).[13]

Additionally, equipment is often installed at retail outlets. Doing this captures vapors released during vehicle refueling process, and circulates vapors back to underground storage tanks. Such systems are called Stage II controls. Conversely, vapors can also be captured through the use of carbon canisters installed on vehicles. These are called onboard refueling vapor recovery (ORVR) systems.

All passenger cars and light trucks (including SUVs, minivans and pickups) have been required to have ORVRs since 2000 and 2006, respectively. In anticipation of ORVR systems replacing Stage II, in 2006 EPA relieved most of the US from Stage II compliance regulations. Only the worst ozone nonattainment areas, and those in the ozone transport region, were still subject to Stage II control measures.

It is envisioned that all Stage II controls will be phased out in the near future as ORVR vehicles are in widespread use. Currently, ORVR-equipped vehicles comprise approximately 64 percent of the in-service vehicle fleet nationwide, and account for around 74 percent of the vehicle miles traveled (VMT) in the nationwide fleet. It is estimated that by the end of 2012 more than 75% of gasoline will be dispensed into ORVR-equipped vehicles.[14] Therefore EPA published a notice of proposed rulemaking (NPRM) on July 15, 2011 proposing to formally conclude that ORVR will be sufficiently "widespread" as of June 30, 2013.[15] On that date, the federal mandate for use of Stage II systems in the worst nonattainment areas will be dropped.[16]

ORVRs are preferred to Stage II controls because

1. ORVR systems on vehicles are more cost-effective than installing Stage II controls at retail outlets nationwide,
2. the performance of Stage II systems deteriorates over time as components break down from use,
3. the performance of ORVRs shows little deterioration over lifetime,
4. the deterioration of Stage II systems requires strong monitoring and maintenance to ensure effectiveness.

Source: http://transportpolicy.net/index.php?title=US:_Fuels:_Compliance