

Updated Informative Digest

Adoption of Proposed Amendments to the California Phase 2 Reformulated Gasoline Regulations, Including Amendments Providing for the Use of a Predictive Model

Sections Affected: Amendments to sections 2260, 2261, 2262.2, 2262.3, 2262.4, 2262.5, 2262.6, 2262.7, 2264, and 2270, and adoption of sections 2264.2, 2264.4, and 2265, in Title 13, California Code of Regulations. Adoption of the "California Procedures for Evaluating Alternative Specifications for Phase 2 Reformulated Gasoline Using the California Predictive Model," incorporated by reference in section 2265, Title 13, California Code of Regulations.

Background

The California Phase 2 reformulated gasoline (Phase 2 RFG) regulations were adopted by the Air Resources Board (ARB) following a public hearing in November 1991. These regulations establish a comprehensive set of specifications for gasoline designed to achieve the maximum reductions in emissions of criteria pollutants and toxic air contaminants from gasoline-powered motor vehicles. California gasoline will in most cases have to meet the Phase 2 RFG specifications beginning March 1, 1996. The specifications apply to the sulfur, benzene, olefin, oxygen, and aromatic hydrocarbon contents, the 50 percent (T50) and 90 percent (T90) distillation temperatures, and the Reid vapor pressure (RVP).

The Phase 2 RFG standards include "cap" limits that apply to finished gasoline throughout the distribution system in California. The Phase 2 RFG standards also include generally more stringent limits that apply to gasoline when it is first supplied from a production facility (typically a refinery) or an import facility. Except in the case of RVP and oxygen content, the regulations provide two compliance options for meeting the limits applicable to gasoline being supplied from a production or import facility. One option is to elect to have the gasoline subject to a "flat limit," which must be met by every gallon of gasoline leaving the production or import facility. The other option is to elect an "averaging limit." The averaging limits are established in the regulations for six properties and are more stringent than the comparable flat limits. Under the averaging option, the producer may assign differing "designated alternative limits" (DALs) to different batches of gasoline being supplied from the production or import facility. Each batch of gasoline must meet the DAL for the batch. In addition, a producer or importer supplying a batch of gasoline with a DAL less stringent than the averaging limit must within 90 days before or after supply from the same facility sufficient quantities of gasoline subject to more stringent DALs to fully offset the exceedances of the averaging limit.

The Phase 2 RFG regulations also provide another approach producers can use to comply with the requirements applicable to gasoline being supplied from production facilities. Producers are allowed to seek certification of

alternative gasoline formulations found to result in equivalent emissions reductions based on a motor vehicle emission testing program. A producer may elect to have gasoline sold from the production facility subject to the specifications of a certified alternative gasoline formulation instead of the flat or averaging limits in the regulations. These provisions apply to importers as well.

When it adopted the Phase 2 RFG regulations, the Board expressed its intent to provide a second way that a producer could demonstrate that a set of alternative specifications would reduce emissions at least as much as Phase 2 RFG. This approach involves the use of a "predictive model," based on the analysis of a large number of vehicle emission test studies. The Board directed the staff to develop such a predictive model and to propose regulatory amendments providing for its use.

Following a June 9, 1994 hearing, the Board adopted amendments to incorporate the predictive model into the Phase 2 RFG regulations. The Board also adopted various other amendments intended to facilitate implementation of the Phase 2 RFG program.

The amendments were developed with considerable public participation. Since the November 1991 public hearing, the staff conducted four public workshops to discuss possible amendments to the Phase 2 RFG regulations. The staff worked closely with representatives of the Western States Petroleum Association (WSPA), particularly two WSPA subcommittees addressing the predictive model and implementation issues, respectively. In addition, numerous individual meetings and telephone conversations were conducted with industry representatives to discuss revisions to the regulations.

The amendments were designed to provide additional flexibility to gasoline producers and importers without compromising either the emission benefits or the enforceability of the Phase 2 RFG regulations. This additional flexibility is expected to allow producers to make more gasoline at a lower cost, thereby lowering the expected cost to the consumers and minimizing the potential for disruptions in the supply of gasoline.

These amendments are an important part of the ARB's ongoing comprehensive efforts to ensure that there is a smooth transition from current conventional gasoline to Phase 2 RFG beginning in March 1996. These efforts include working with refiners to assure that they are ready to produce the new fuel on time and in sufficient quantities. The staff will continue to investigate ways to provide additional flexibility to the regulated public and will return to the Board if necessary to propose additional amendments.

Amendments Relating to the California Predictive Model

The amendments allow gasoline producers the option to use the California predictive model to assign specifications to an alternative gasoline formulation. This alternative gasoline formulation may then be used in lieu of meeting either the flat or averaging limits applicable to gasoline being supplied from production and import facilities.

The Board adopted the "California Procedures for Evaluating Alternative Specifications for Phase 2 Reformulated Gasoline Using the California Predictive Model," which is incorporated by reference in section 2265, Title 13, California Code of Regulations. These procedures define the California predictive model and specify how producers may use the model to evaluate alternative gasoline specifications.

The California predictive model is comprised of three equations. In each equation, the vehicular emissions that will result from the use of alternative gasoline formulations are compared to emissions resulting from the use of Phase 2 RFG. One equation determines the percent change in exhaust emissions of hydrocarbons; the second determines the percent change in exhaust emissions of oxides of nitrogen; and the third determines the percent change in the combined exhaust emissions of four toxic air contaminants. The four toxic air contaminants included are benzene, 1,3-butadiene, acetaldehyde, and formaldehyde. An alternative gasoline formulation is acceptable if the percent change in emissions is less than or equal to 0.04 percent for hydrocarbons, oxides of nitrogen, and the potency-weighted toxic air contaminants.

The staff developed the California predictive model based on an analysis of vehicle emissions tests for two different classes of motor vehicles. The first class represents model year 1981 through 1985 motor vehicles and the second class represents model year 1986 through 1995 motor vehicles. Each class is comprised of vehicles with similar exhaust emission control technologies. These data generally represent the best data available for predicting the emissions impact that an alternative gasoline formulation will have when used in gasoline-powered low-emission vehicles and future motor vehicle fleets in California.

Each of the three equations in the California predictive model considers the effects from the two motor vehicle classes. The effects are combined using a technique to "weight" the impact that changes in fuel properties may have on each vehicle class. For hydrocarbons and oxides of nitrogen, the predicted emissions for the two vehicle classes are weighted by the average contribution each vehicle class is expected to make to the total on-road emissions for light-duty vehicles in the years 1996, 2000, and 2005. For the toxic air contaminants equation, the predicted emissions are weighted by the average contribution each vehicle class is expected to make to the total on-road vehicle miles traveled for light-duty vehicles in the years 1996, 2000 and 2005. The predicted emissions for each toxic air contaminant are further weighted by the potential of the toxic air contaminant to cause cancer relative to 1,3-butadiene.

In order to evaluate an alternative gasoline formulation using the California predictive model, a producer will identify specifications for seven of the eight properties subject to the Phase 2 RFG regulations. The specification for RVP need not be entered since it is kept constant at 7.00 psi. Each of the remaining seven specifications must not exceed the cap limit applicable to the property. For each fuel property other than RVP and oxygen content, a producer may choose between a specification to be applied as a flat limit, and a specification to be applied as an averaging limit.

A producer wishing to produce an alternative gasoline formulation would notify the Executive Officer of the alternative specifications and of the percent change in emissions under the model for emissions of hydrocarbons, oxides of nitrogen, and potency-weighted toxic air contaminants. The producer would also provide the identity, location, and estimated volume of the batch. The notification would be subject to the same time requirements as apply to notification of DALs.

Under the amended regulations, a producer is required to offset any outstanding designated alternative limit debits before using the California predictive model to approve an alternative gasoline formulation. Once a producer starts supplying an alternative gasoline formulation certified using the California predictive model and using the averaging limits, the producer is required to offset any averaging debits before switching to another compliance option.

The provisions regarding the California predictive model apply to importers of gasoline as well as to producers.

Other Amendments

Implementation dates. Prior to the adoption of the amendments, the Phase 2 RFG regulations required all producers and importers (other than qualifying small refiners) to meet the standards applicable to gasoline supplied from a production or import facility starting March 1, 1996. Furthermore, gasoline anywhere in the distribution system was subject to the cap limits as of April 1, 1996. To minimize potential disruptions in fuel supplies, the regulations now require that the cap limits apply starting April 15, 1996 everywhere in the distribution system except to the fueling of motor vehicles at service stations and other fueling facilities, and apply to all fueling facilities as of June 1, 1996. There is an exception from the April 15, 1996 compliance date for deliveries of gasoline from bulk plants to service stations and bulk purchaser-consumers. In addition, it will now be legal to dispense noncomplying gasoline into a motor vehicle after June 1, 1996 if it is shown that the noncompliance was due to gasoline delivered prior to April 15, 1996 (or from a bulk plant prior to June 1, 1996). The amendments do not change the March 1, 1996 implementation date for production and import facilities.

Election of Compliance Option; Reporting Requirements. Prior to the adoption of the amendments, the Phase 2 RFG regulations required producers and importers to elect whether they will be using the flat limit or averaging limit compliance option on an annual basis. The elections applied for a minimum of one calendar year. Producers were required to make an initial election by November 1, 1995 for calendar year 1996. Each subsequent annual election was to be made by October 1 of the preceding year. These requirements have been deleted from the regulations. Instead, a producer or importer changing the applicable compliance option for a property only has to meet the notice requirements that apply to the assignment of a DAL, described in the following paragraph. A producer is not permitted to switch from the compliance option for a property if there are any outstanding debits for that property. In addition, a producer

switching from an averaging limit for a property to another compliance option is not be permitted to carry over any credits for that property.

For each final blend of fuel receiving a DAL, the Phase 2 RFG regulations required the producer to notify the Executive Officer of the volume, the DAL, the blend identity, and the location of each final blend. This notification was to be received by the Executive Officer before the physical transfer of the gasoline from the production facility, and in no case less than 12 hours before the producer either completes physical transfer or commingles the final blend. These requirements have been amended to allow the producer to initially report an estimated volume, with notification of the revised volume within 48 hours after transfer of the gasoline is completed.

Limited Extensions of the 90-Day Offset Period Under the Averaging Compliance Option. Prior to the adoption of the amendments, a producer or importer supplying a batch of gasoline with a DAL less stringent than the averaging limit would have to fully offset the exceedances of the averaging limit using sufficient quantities of gasoline subject to more stringent DALs. This would have to be done within 90 days before or after supply of gasoline from the same facility.

The amended regulations allow producers to extend the 90-day DAL offset period in limited circumstances. Producers are allowed up to three extensions in 1996, and up to three extensions in 1997. The maximum duration of each extension is 10 days and the extensions can be taken consecutively. The extension provision ends on December 31, 1997. Therefore, no extensions can start on or after January 1, 1998.

Each extension applies to the required time in which a batch or batches of gasoline with DALs generating "debits" for a particular parameter would have to be fully offset by a subsequent batch or batches of gasoline with a more stringent DAL generating "credits" for that parameter. Each extension allows debits for a parameter to be offset up to 100 days after shipment of the debit batch, rather than in no more than 90 days. The extension also applies to other debit batches for that parameter whose 90-day offset period expires during the extension period, although the extension length for these batches diminish as the fixed ending date is approached. For example, a producer may on January 1 refine a batch of gasoline with a sulfur deficit, and on January 6 produce another batch with a sulfur deficit. The 90-day period for offsetting the January 1 batch will end March 31. If a producer extends the March 31 offset deadline 10 days to April 10, April 10 would also become the new offset deadline for the January 6 batch.

In order to extend an offset period beyond 90 days, a producer would have to notify the ARB before 5:00 pm on the 90th day. The producer would be required to identify an unforeseen event necessitating the extension. In the notification, the producer would have to specify the DAL parameter(s) and the date the extension would go into effect.

A single extension could apply to more than one DAL parameter if (a) the additional fuel parameters are identified in the original notification, (b) the need for an extension for the additional parameters is shown to be attributable to the unforeseen event identified in the notification, and (c) the additional parameters have a "debit" balance at the time of the extension notification and would reach 90-day offset deadlines during the requested extension period.

This amendment also applies to importers operating under the averaging compliance plan.

Use of an Enforcement Protocol with the California Predictive Model Option. An amendment was added to allow the use of enforcement protocols to vary the notification requirements pertaining to gasoline batches to be sold subject to alternative specifications based on application of the California predictive model. The regulatory language is identical to a preexisting provision allowing protocols regarding designated alternative notifications.

Treatment of Importers. Amendments were also adopted regarding gasoline imports. Where gasoline is produced in California and the producer reasonably should know that the gasoline will be offered for sale at an out-of-state facility as gasoline produced in California and suitable for sale as a motor vehicle fuel in California, the gasoline is not treated as imported gasoline. Instead, the California refiner is responsible for complying with the producer limits when the gasoline is initially shipped from the California production facility.

Minor Amendments. Other additional minor amendments include refinements to the requirements for sampling and testing of gasoline subject to one or more DALs, and the addition of significant digit (to a tenth of a percent) to all references to aromatic hydrocarbon content standards.

Comparable Federal Regulations

The 1990 amendments to the federal Clean Air Act (FCAA) require the United States Environmental Protection Agency (U.S. EPA) to adopt regulations regarding reformulated gasoline [FCAA section 211(k)]. These regulations have been adopted as 40 CFR sections 80.40 to 80.82. In California, the regulations apply in Los Angeles, Orange, Ventura and San Diego counties, and in parts of Riverside and San Bernardino counties, starting on December 1, 1994 at all locations other than retail outlets and wholesale purchaser-consumer facilities, and on and after January 1, 1995 at all locations.

The FCAA provides that the federal regulations must require no increase in oxides of nitrogen emissions, a minimum 2.0 percent by weight oxygen content (with certain exceptions), a maximum 1.0 percent by volume benzene content, and limits on heavy metals. The federal regulations must also specify performance standards for hydrocarbons in the high ozone period and toxic compounds year-round in two phases--the first starting in 1995 and the second starting in 2000.

The U.S. EPA regulations identify "per-gallon" and optional averaged standards that may be met under a "simple model" through 1997. The regulations also identify a "complex model" which is optional until January 1, 1998, and is mandatory thereafter. The U.S. EPA complex model differs from the proposed California predictive model in several respects, including its use of emissions data only representative of 1990 model year vehicle technology, simpler statistical approach, and pre-exclusion of terms.

While the federal substantive requirements will apply in the covered areas of southern California, the ARB has worked with U.S. EPA and gasoline producers to avoid unnecessary duplication of the enforcement requirements. In 40 CFR section 80.81, the U.S. EPA has exempted California producers from many of the federal enforcement requirements from March 1, 1996 to January 1, 2000, as long as certain criteria are met. In the case of two parts of the federal program, California producers are exempt before March 1996 as well. While in some instances the federal test procedures differ from the ARB's, 40 CFR section 80.81(h) allows producers of California gasoline to use the California sampling and test methodologies in lieu of the applicable federal methodology.