

State of California  
AIR RESOURCES BOARD

Final Statement of Reasons for Rulemaking  
Including Summary of Comments and Agency Responses

**PUBLIC HEARING TO CONSIDER AN AMENDMENT TO THE LIMIT  
ON THE PROPENE CONTENT OF LIQUEFIED PETROLEUM GAS  
INTENDED FOR USE IN MOTOR VEHICLES**

Public Hearing Date: March 27, 1997  
Agenda Item No.: 97-2-2

**I. GENERAL**

This rulemaking was initiated by the publication on January 10, 1997, of a notice of public hearing to consider an amendment to the specifications for liquefied petroleum gas (LPG or “propane”) set forth in section 2292.6, title 13, California Code of Regulations. The proposed amendment is a two-year postponement of the final limit on propene in LPG intended for use in motor vehicles. A Staff Report (Initial Statement of Reasons for Proposed Rulemaking) was made available for public inspection by February 7, 1997. The Staff Report, which is incorporated by reference herein, contained the text of the regulatory amendment as proposed by the staff, along with a description of the rationale for the proposal.

Section 2292.6, title 13, California Code of Regulations, was adopted by the Air Resources Board (ARB or Board) in 1992, to be applicable starting January 1, 1993. In conjunction with section 2291, the regulation controls the properties of LPG that is sold commercially for use in motor vehicles in California. The Board included a maximum limit on the propene content of vehicular LPG. In the initial adoption, the propene limit was ten percent by volume, and the limit was to have declined to five percent on January 1, 1995. However, in 1994, the Board postponed the effective date of the five-percent limit to January 1, 1997; in the interim, the propene limit continued to be ten percent.

When the Board adopted the standards in 1994 for vehicular LPG and other alternative fuels, it set essentially identical standards for (1) the fuel sold commercially in California for motor vehicle use, and (2) the fuel used in certification testing of new motor vehicles to determine whether the vehicles comply with the applicable emission standards. The broad objective of the commercial fuel standards was to assure that motor vehicles designed to use alternative fuels such as LPG will have fuels available that are of consistent quality and produce the expected emission benefits. The limited data on emissions now available indicate that LPG vehicles have greater emissions of ozone precursors and carbon monoxide when using LPG with a propene content at ten percent than when using LPG with the propene at five percent.

In response to a petition from the Western Propane Gas Association (WPGA), in this rulemaking the staff proposed an additional two-year delay of the five percent propene limit, to January 1, 1999. In its petition, WPGA contended that if the limit on the propene content is reduced to five percent on January 1, 1997, there will be insufficient complying LPG to allow the continued supply of LPG to vehicles that now use that fuel. The staff concurred that implementation of the five-percent propene content standard on January 1, 1997 will likely result in a vehicular LPG supply problem in northern California and in the San Joaquin Valley.

On March 27, 1997, the ARB conducted a public hearing at which it received written and oral comments on the regulatory proposal. At the conclusion of the hearing, the Board adopted the regulatory amendment as proposed by adopting Resolution 97-15.

After the hearing, the Executive Officer identified one minor modification that needed to be made to the regulatory text to implement the Board's intent. By far the largest constituent of LPG is propane. In the specifications applicable prior to January 1, 1997, along with the *maximum* propene content limit of 10 percent, there is also a *minimum* propane content limit of 80 percent. When the maximum propene content limit was to decline to 5 percent on January 1, 1997, the minimum propane limit was to rise to 85 percent. The propene and propane requirements were linked because of the difficulty of producing LPG with an 85 percent propane content when the fuel contains close to ten percent propene. When the Board extended the 10 percent maximum propene content limit the first time from January 1995 to January 1997, it also extended the 80 percent minimum propane content limit. Through an oversight, in the present rulemaking staff neglected to include a postponement of the increase in propane content with its proposal to postpone the reduction in propene content. This oversight was identified after the March 27, 1997 hearing. On September 15, 1997, a Notice of Availability of Modified Text was issued, proposing the two-year delay in the rise in minimum propane content, to 85 percent. During the comment period, one letter was received — the WPGA supported the modification. The Executive Officer then issued Executive Order 97-67, which added to the Final Regulation Order a two-year extension of the 80 percent minimum propane limit from January 1, 1997 to January 1, 1999.

**No mandates.** The Board has determined that this regulatory action will not result in a mandate to any local agency or school district, the costs of which are reimbursable pursuant to Part 7 (commencing with section 17500), Division 4, Title 2 of the Government Code.

**Alternatives.** The Board has determined that no alternative considered by the agency would be more effective in carrying out the purpose for which the regulatory action was proposed or would be as effective and less burdensome to affected private persons than the action taken by the Board.

**Economic Impacts.** In preparing the regulatory proposal, the staff considered the potential economic impacts on California business enterprises and individuals. There are at most 45,000 LPG-fueled motor vehicles currently being operated in California, most of which are

commercial fleet light-duty trucks that have been converted to run solely on LPG. The information available to staff indicates that if the propene limit for vehicular LPG declines to five percent in 1997, a supply problem is likely in Northern California and in the San Joaquin Valley. One of the two northern California LPG producers known to staff does not meet the five percent limit and does not plan to change its operations to enable it to do so. As a result, the documented production of vehicle-grade LPG in northern California would decline by more than 50 percent if the propene limit becomes five percent. A similar situation is expected in the San Joaquin Valley. In southern California, on the other hand, staff is not aware of any LPG now being sold for vehicular use that has a propene content exceeding five percent.

The demand for vehicular LPG constitutes only about twenty percent of the total LPG demand on marketers who provide LPG for vehicles. However, only a few marketers currently have the capability to handle low-propene vehicle-grade LPG as a product separate from commercial-grade LPG. Since there will be insufficient supplies of five-percent propene LPG in northern California to satisfy the total demand for commercial LPG, a substantial portion of northern California marketers would be expected to initially carry only nonvehicular commercial grade LPG if the five-percent propene standard becomes applicable. These marketers would install equipment to separately handle a vehicle-grade LPG only if the equipment is justified economically; apparently few will do so.

The amendment will enable consumers of vehicular LPG to avoid the consequences of a potential supply shortage of vehicular LPG in northern California and the San Joaquin Valley. These consequences would include a likely price increase for vehicular LPG and a need to reduce the use of LPG vehicles (this would be done by either reconverting the vehicles to run on gasoline, or substituting other vehicles). For producers and marketers of vehicular LPG having a propene content between five and ten percent, the amendment will avoid the costs associated with the immediate need to find other markets for this product, install segregated distribution facilities, or reduce the propene content of the LPG. Producers and marketers of LPG having a propene content of five percent or less will have to forego the likely revenue increase associated with higher prices for vehicular LPG. The staff is not aware of any LPG producers or marketers who have altered their facilities or operations to reduce the propene content of their LPG, or to allow segregation of vehicular LPG, in reliance on implementation of the five-percent propene content standard in 1997.

## **II. SUMMARY OF COMMENTS AND AGENCY RESPONSES**

Before or at the hearing, three written comments were received, from the American Automobile Manufacturers Association (AAMA), the Engine Manufacturers Association (EMA), and Shell Martinez Refining Company (SMRC). At the hearing, oral testimony was presented by WPGA, EMA and Adept Group. SMRC, WPGA and Adept Group expressed support for the proposed amendment. One comment was received during the supplemental 15-day comment period, a letter of support from WPGA. Set forth below is a summary of each objection or

recommendation specifically directed at the proposed amendment or the procedures followed in this rulemaking, along with an explanation of why the amendments were not changed to accommodate the objection or recommendation.

1. Comment: It is our fear that the temporary extension of the ten percent propene content limit being considered today may become a permanent one. (EMA)

Response: The extension adopted by the Board is for two years, until January 1, 1999. Any further extension would have to be adopted in a rulemaking that affords an opportunity for interested parties to comment and participate. See also the response to Comments 2 and 3.

2. Comment: Heavy-duty engine manufacturers are concerned about the adverse effects increased propene content is likely to have on engine performance, excess emissions, and especially on endangering engine durability. This is of critical concern especially for the case of lean-burn, heavy-duty engines designed to operate on HD-5 where the fuel metering and ignition timing are set very close to the engine's knock limits. Since increases in propene content lowers the octane number, fuels with more than five percent propene will increase the likelihood of engine knock and the occurrence of engine failure due to the subsequent greater mechanical and thermal stresses. Engine manufacturers have marketing and are designing more advanced low-emission engines for the 1997 model year and beyond based on the reliance that the higher-quality HD-5 grade fuel would be implemented this past January. If HD-5 grade fuel is not going to be available for the new engines that manufacturers are planning to market, those products may not be offered in California, or in the alternative, engine manufacturers may be forced to severely limit warranties in those areas where HD-5 is not made readily available. (EMA)

Propene may have a detrimental effect on vehicle emissions, engine performance, and engine durability. The five percent propene content is a key component in the vehicle manufacturers' design of LPG engines that meet low emission requirements. The AAMA member companies (Chrysler Corporation, Ford Motor Company, and General Motors Corporation) are disappointed ARB has decided that a second waiver extension is necessary. However, we strongly support ARB staff efforts to get this program back on track as soon as possible and certainly without further extensions after this one (1999). (AAMA)

Response: We do not expect a substantial number of LPG lean-burn engines to be on the road before the new delay of the five-percent propene limit ends in January 1999. At that time, the five-percent limit (as in HD-5) will take effect unless the Board decides to take action to adopt an alternative.

In addition to being suitable in quality, vehicular LPG must be *available* to the consumer. For the foreseeable future, the availability of the HD-5-quality LPG that the commenters desire is not likely to depend on the ARB's propene limit. The portion of total commercial grade LPG that is directed to vehicles is so small that refiners are unlikely to adjust the propene content of their

LPG to meet any vehicle fuel specification, and many distributors are unlikely to carry a separate vehicle fuel. Therefore, rather than forcing the LPG that is made available for vehicles to be HD-5 quality, the five-percent limit is likely to restrict the supply of such fuel to the amount that happens to comply with HD-5.

Given the current distribution situation, it makes sense for the Executive Officer to convene a working group of interested parties to discuss the technical issues of emissions, fuel requirements of future LPG vehicles and engines, and the economics of LPG production and marketing, in order to see if a consensus standard for the propene content of vehicular LPG can be developed. In adopting the current amendment in Resolution 97-15, the Board directed the Executive Officer to take this action.

3. Comment: In the event ARB approves the additional two-year delay of the imposition of the five percent propene limit, it should be resolved at the hearing that at the end of this period there will be no further delays granted. That is, by January 1, 1999, LPG for use in a motor vehicle must meet either the HD-5 specification or an alternative specification that has been shown to meet or exceed the performance of HD-5. This alternative LPG specification may be determined in the course of a two-year LPG fuels testing program run by the producers and suppliers with the consultation of the engine manufacturers. The objective of this test program will be to identify alternative blends of LPG fuels that would provide equivalent or better performance than HD-5 in terms of emissions control, engine performance and required durability. (EMA)

Agency Response: In response to the concerns of the commenter and others, the Board stated in Resolution 97-15 that,

[I]t is the intent of the Board that it will not adopt a further postponement of the five percent propene content standard for vehicular LPG, and that by the end of 1998 the Board either will adopt an appropriate consensus standard for the vehicular LPG propene content of vehicular LPG if one is developed, or will have the five percent propene content standard become applicable.

The Board further found in the Resolution that,

It is appropriate to investigate a revision of the specification of LPG for motor vehicles to help assure that LPG used in vehicles will not cause excessive emissions, will preserve engine performance and durability, and will be commercially viable to produce and distribute.

We agree that the effect of potential alternative specifications on engine durability is an important factor to be considered.

4. Comment: To avoid further extensions, we request that the Board direct the staff to work with the LPG industry so that the statewide HD-5 refueling infrastructure is in place when the proposed extension expires, and provide semi-annual reports to the Board on progress towards an acceptable infrastructure. (AAMA)

Agency Response: As discussed in the response to Comment 2, in the Resolution the Board directed the Executive Officer to convene a working group of interested parties to discuss various issues, including the economics of LPG production and marketing. One of the aspects this group can look at is the refueling infrastructure. The primary problem posed by that infrastructure is that only a small percentage of all the LPG marketed is sold for use in motor vehicles, and there are no HD-5 requirements for LPG used in nonvehicular sources; the market for motor vehicle LPG is not large enough to support a dual distribution system. Because of this, Resolution 97-15 also directed the Executive Officer to investigate the potential for air pollution control and management districts to control the propene content of nonvehicular LPG, in order to reduce the reactivity and mass of emissions, and to have a single, market-wide standard.

5. Comment: Because LPG engines are designed and specified to operate on HD-5, and higher propene content is likely to cause engine problems, customers have to have a reliable means of identifying the proper LPG fuel for their engines. For this reason, California must address the need for labeling LPG dispensers immediately. Whether or not the Board approves the delay in the implementation of the HD-5 standard, California should enforce the fuel pump labeling requirements currently adopted in state regulations, and should ensure that those labels provide a meaningful method of discriminating commercial grade from HD-5 grade propane. (EMA)

We strongly endorse staff efforts to require fuel labels on LPG dispensers indicating fuel composition (i.e., HD-5 or HD-10) and octane rating. Labeling will allow customers the opportunity to purchase HD-5 as specified by LPG vehicle manufacturers. (AAMA)

Response: Labeling requirements for LPG being marketed as a motor vehicle fuel are generally administered by the Division of Measurement Standards in the Department of Food and Agriculture. (Business and Professions Code §§12103.5, 13401(c), 13480.) ARB staff has been meeting with all the parties to discuss the vehicular LPG labeling issues, with the objective of development of an appropriate labeling mechanism.