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PHASE 2 RFG PERFORMANCE SUBCOMMITTEE

MEETING SUMMARY - AUGUST 16, 1994

Introduction

The second meeting of the Performance Subcommittee was aimed at further defining test fuel specifications, refining the test protocol, selecting test fleets, and procurement of test fuels.

Draft Test Protocol

Jim Guthrie of the Air Resources Board (ARB) discussed the comments received on the test protocol and described the changes that were made since the first meeting. Based on comments received from subcommittee members, staff proposes to test wintertime Phase 2 reformulated gasoline (RFG) against wintertime base fuel and summertime Phase 2 RFG against summertime base fuel. Staff is proposing to extend the summertime test period into July and to reduce the number of smog checks, one at the beginning of the test program, one before the transition to summer fuel, and one before the end of the test. As written in the protocol, the ARB plans to take fuel samples of the test and control fuel throughout the program. If a leak or seep is found, the vehicle is to be repaired immediately. Comments regarding the training of inspectors for consistency were also incorporated. The committee agreed that inspectors, who are ASE certified, will be trained to perform visual inspections only. In the case of multiple drivers per vehicle, each driver will be required to fill out a survey form. Finally, ARB staff requested new comments on the test protocol so that the comments could be incorporated by the next meeting since we are attempting to finalize the protocol at the next subcommittee meeting.

The committee discussed the advantages and disadvantages of reporting performance data daily or weekly. Daily reporting has more detailed driveability information which can be compared to ambient temperature. Some committee members suggested reporting data at each fueling since less frequent data collection would more accurately capture performance characteristics that are important to the driver. Many members agreed that some changes will have to be made; however, what changes should be made have

not been agreed upon.

Tim Sprik of Shell Oil presented a slide showing that a minimum number of observations is necessary to reasonably avoid false conclusions. If the subcommittee tries to test many fuels or divide the test fleet into independent groups, the test program could indicate problems with Phase 2 RFG when no problem actually exists. To obtain statistically significant data with the resources available, the number of test fuels has to be limited.

Fuel Specifications

Fuel properties were, again, discussed in attempt to narrow the type of fuel to be tested. The discussion revolved around the oxygenate selection and the aromatic hydrocarbon level. But, the committee could not agree on the fuel specifications and number of fuels to be used in the test program. The committee expects to resolve these issues at the next meeting.

ARB staff incorporated changes to the fuel specifications based on comments received at the previous meeting and created a new table of the fuel specifications for winter and summer tests. Staff also proposed to use MTBE in Northern California for summer and winter. In Southern California, staff proposed to use MTBE in the summer and ETOH in the winter. However, the committee discussed whether or not ethanol should be tested in this program. From the discussion, it appears that ethanol may be used in the future; however, it will probably not be the primary oxygenate used. Blending ethanol and MTBE is an option for testing the combined effects of both oxygenates. However, including ethanol in the test fuel could present problems due to "house keeping" problems (gum build-up, moisture, and unclean storage or distribution equipment) that could be falsely attributed to Phase 2 RFG and not the ethanol. The committee did not reach a consensus on the type of oxygenate to use; therefore, the ARB staff will contact refiners that will be complying with the federal oxygenate program in the South Coast Air Basin to determine the likely extent that ethanol will be used. The staff will also contact automobile manufacturers for their insights on aromatic hydrocarbon levels and on which oxygenate to test.

When comments on the fuel properties were requested, Mike Kulakowski of Texaco expressed concern that the 19 percent aromatic level proposed for test fuel was not severe enough, he preferred 14 percent to 15 percent. One of Texaco's affiliates produced gasoline at an aromatic hydrocarbon level at less than

10 percent (some of it was below 5 percent aromatics), which caused about 30 failures of O-rings and swivel joints in retail dispensing equipment. Similar problems have not occurred at that refinery after the refinery set a minimum aromatic specification of 10 percent. Texaco is interested in testing the lower limits of the aromatic hydrocarbon levels. The possibility of creating a separate test group in Central California to test low aromatic fuels was discussed, and is being investigated by Texaco and the ARB for the next meeting.

The subcommittee discussed two possible methods of obtaining test fuels. The first approach is to purchase the test fuel and have it shipped. The second is to create the test fuel by obtaining blendstocks from California refineries and blending them in a California facility. These are ideas that will be explored by staff for the next meeting so that a method can be chosen.

Size and Make-up of Fleet

John Courtis discussed the current ARB proposal based on comments from subcommittee members. ARB staff suggests 1,000 test fleet vehicles and 1,000 control vehicles to be tested; 500 vehicles are to be tested in Northern California and 500 in Southern California. In Southern California, staff proposes that all of the test vehicles be from employee fleets. ARB staff has already spoken with several companies in Southern California about an employee fleet. For the fleet In Northern California, staff proposes that 200 vehicles be from centrally operated fleets and the remaining 300 vehicles be from employee fleets.

Resources are the main limitation in creating Northern California employee fleets, but there are other constraints that may limit the size or type of test fleet. The limitations we have encountered are the number of volunteers for an employee fleet, the availability of a central fueling facility, and the ability to manage the logistics of fueling vehicles. Staff is proposing that a majority of the test fleet be privately owned vehicles to avoid a more narrow age range biasing from centrally maintained private fleets. ARB staff is still seeking suggestions from subcommittee members of companies that are willing to be part of the test program and have the available fueling facilities.

Off-Road Vehicles and Equipment

Jack Kitowski made a brief presentation on the status of the off-road test program, which is preceding the on-road program in many aspects. Most of the off-road fleets have been selected, and

some testing has already begun. For the tests that are currently in progress, the equipment manufacturers are using their own data collection forms that have a high level of detail. From these data the subcommittee will be able to choose the data to be analyzed. The Portable Power Equipment Manufacturers Association is doing durability tests on some equipment, and the University of California, Davis will be testing various farm and lawn and garden equipment relatively soon. The ARB and EPA are sponsoring two test programs in which the engines can be taken apart and inspected, if necessary. The test fuel being used is Phase 2 certification gasoline with MTBE as the oxygenate, and the equipment tested is approximately 7 years old before being retired.

Like the on-road vehicle test program, fuel properties are the main concern for the off-road test program. Some ethanol fuels are being tested, but they do not meet the Phase 2 certification fuel specifications. Because off-road vehicles operate on small amounts of fuel, several fuels can be tested.

CBG Program Advisory and Subcommittee Activities