FINAL STATEMENT OF REASONS

AMENDMENTS TO THE CERTIFICATION REQUIREMENTS
AND PROCEDURES FOR LOW-EMISSION PASSENGER CARS,
LIGHT-DUTY TRUCKS AND MEDIUM-DUTY VEHICLES

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ATTACHMENT 1: Description of Nonsubstantive Changes Made After the 15-Day Comment Periods

State of California
AIR RESOURCES BOARD

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

PUBLIC HEARING TO CONSIDER AMENDMENTS TO THE CERTIFICATION REQUIREMENTS AND PROCEDURES FOR LOW-EMISSION PASSENGER CARS, LIGHT-DUTY TRUCKS, AND MEDIUM-DUTY VEHICLES

I. INTRODUCTION AND BACKGROUND

The California Low-Emission Vehicle (LEV) program, approved by the Air Resources Board (ARB/Board) in 1990, represents one of the primary elements of the State's long-term plan to further reduce air pollution from light- and medium-duty vehicles by 2010. The program introduces four new sets of increasingly tighter emission standards -- Transitional Low-Emission Vehicles (TLEVs), Low-Emission Vehicles (LEVs), Ultra-Low-Emission Vehicles (ULEVs) and Zero-Emission Vehicles (ZEVs). It also incorporates a market-based approach to implementation through the use of a sales-weighted fleet averaging system with credit trading provisions for light-duty vehicles and an additional credit trading system for medium-duty vehicles (MDVs). These trading provisions afford manufacturers considerable flexibility in complying with the program because manufacturers that sell more low-emission vehicles than required can generate credits which can be banked, traded or sold to other manufacturers.

Another element of the LEV Program is the consideration of the vehicle and the fuel it uses as a system. Vehicle exhaust contains many different hydrocarbon species, each with a different reactivity or potential to form ozone in the atmosphere. To account for the varying reactivity of the exhaust from different vehicle emission control technologies and fuels, a mechanism was established by which the mass of non-methane organic gas (NMOG) emissions from low-emission vehicles operating on clean and other nonconventional fuels is adjusted by a reactivity adjustment factor, or "RAF," according to the specific reactivity[1] of the exhaust. The specific reactivity of a given vehicle/fuel combination is based on the application of a maximum incremental reactivity (MIR) scale developed by Dr. W.P. Carter at the Statewide Air Pollution Research Center at the University of California at Riverside. The MIR scale is a measure of the reactivity, or propensity to form ozone, of each of the hydrocarbon compounds in vehicle exhaust. It is based on the atmospheric conditions where the maximum increase in ozone results from any additional hydrocarbon, and thus where hydrocarbon controls have the greatest impact in

[1] Specific reactivity is the ozone forming potential of a given vehicle/fuel system and is measured in grams of ozone formed per gram of NMOG emitted.

reducing ozone formation. RAFs are established based on a comparison of the specific reactivity of a clean fuel/low-emission vehicle technology to the specific reactivity of a conventional gasoline low-emission vehicle. This reactivity adjustment mechanism credits clean fuels and low-emission vehicle technologies that contribute to lower ozone.

Since the inception of the LEV program, the Board has conducted several technical and regulatory reviews of the program in order to assess the progress made in implementation and to make any necessary regulatory modifications to facilitate implementation. In 1991, the Board approved the first reactivity adjustment factors. In 1992, staff provided an update to the Board on the technological progress of low-emission vehicles. At that time the Board determined that the LEV program continued to be technologically feasible within the program time frame. In 1993, the Board adopted additional RAFs and numerous amendments which further clarified existing provisions and added new requirements to facilitate implementation of the program. In 1994, the Board conducted a public meeting to discuss the status of technological development of low-emission and zero-emission vehicles. Again the Board concluded that no major changes to the program were necessary at that time and that the program requirements continued to be technologically feasible.

On September 28, 1995, the Board held the third regulatory review of the LEV program. There were four major topics considered in this rulemaking: 1) the adoption of baseline specific reactivities for medium-duty LEVs and ULEVs and the adoption of interim RAFs for light- and medium-duty LEVs and ULEVs operating on Phase 2 reformulated gasoline, methanol, compressed natural gas and liquefied petroleum gas; 2) a proposal for the accelerated introduction of medium-duty ULEVs pursuant to the State Implementation Plan (SIP) adopted by the Board in 1994; 3) a new requirement that a smog index be included on the window label on new vehicles; and 4) amendments to the general certification requirements and procedures for low-emission light- and medium-duty vehicles. This last category of amendments covers a wide variety of topics and include very detailed aspects of the regulations ranging from removal of the methanol (M100) luminosity requirement, revisions to the assembly-line test requirements and updates to the laboratory methods to reflect new and improved measurement techniques.

The regulatory provisions affected by the final amendments are sections 1956.8, 1960.1, 1965, 2061, 2062, 2101, and 2292.1 of Title 13, California Code of Regulations (CCR) and seven test procedures and other documents that are incorporated by reference in those sections: the "California Exhaust Emission Standards and Test Procedures for 1988 and Subsequent Model Passenger Cars, Light-Duty Trucks and Medium-Duty Vehicles" (hereafter the LDV/MDV Test Procedures), the "California Exhaust Emission Standards and Test Procedures for 1987 and Subsequent Model Heavy-Duty Otto-Cycle Engines and Vehicles" (hereafter the HDO Test Procedures), the "California Non-Methane Organic Gas (NMOG) Test Procedures (hereafter the NMOG Test Procedures), **the "California Assembly-Line Test Procedures for 1983 Through 1997 Model-Year Model Passenger Cars, Light-Duty Trucks and Medium-Duty Vehicles" (hereafter the old Assembly-Line Test Procedures),** the "California Assembly-Line Test Procedures for 1998 and Subsequent Model-Year Passenger Cars, Light-Duty Trucks and

Medium-Duty Vehicles" (hereafter the new Assembly-Line Test Procedures), the "California New Vehicle Compliance Test Procedures" (hereafter the NVC Test Procedures), and the "California Motor Vehicle Emission Control and Smog Index Label Specifications" (hereafter the Label Specifications).

At the conclusion of the September 28, 1995 hearing, the Board approved the amendments by adopting Resolution 95-40. As approved, the regulations included a number of modifications to the originally proposed text. Most of the modifications reflected suggestions made by the staff at the hearing, which were in turn based on informal comments from vehicle and engine manufacturers. The Board directed the Executive Officer to incorporate the approved modifications into the originally proposed regulatory text with such other conforming changes as were appropriate. In accordance with section 11346.8 of the Government Code, the Board directed the Executive Officer to adopt the approved regulatory language after making the modified regulatory text available to the public for comment for a period of at least 15 days, provided that the Executive Officer consider the written comments submitted during the supplemental comment period, to make such additional modifications as may be appropriate in light of the comments received, and to present the regulatory action to the board for further consideration if he determines that this is warranted.

The modified regulatory text was made available on October 20, 1995, for a 15-day period for supplemental public comment; this comment period was announced by the issuance of a Notice of Public Availability. At the same time, additional documents and information were made available for public inspection pursuant to title 1 CCR section 45. Additional modified regulatory text was made available on February 13, 1996 and on April 5, 1996 for 15-day periods for supplemental public comment. Each of these comment periods was also announced by the issuance of a Notice of Public Availability. Written comments were received during the first and second 15-day comment periods; no written comments were received during the third 15-day comment period. After considering all of the comments submitted, the Executive Officer issued Executive Order G-96-032 adopting the final amendments.

A complete description of the proposed regulatory action and its rationale is contained in the Staff Report and the information made available in the three supplemental 15-day Notices. These documents are incorporated by reference herein. This Final Statement of Reasons updates the Staff Report by identifying and explaining the modifications made to the originally proposed texts. The Final Statement of Reasons also contains a summary of the comments the Board received on the proposed regulatory amendments during the formal rulemaking process and the ARB's responses to those comments.

Incorporation of Test Procedures and Federal Regulations. The amended test procedures are incorporated by reference in Title 13, CCR, sections 1956.8, 1960.1, 1965, 2061, 2062 and 2101. The test procedures in turn incorporate certification test procedures adopted by the U.S. Environmental Protection Agency (U.S. EPA) and contained in 40 Code of Federal Regulations (C.F.R.) Parts 86 and 600.

Title 13, CCR sections 1956.8, 1960.1, 1965, 2062, 2101, and 2292.1 identify the incorporated ARB documents by title and date. The ARB documents are readily available from the ARB upon request and were made available during the subject rulemaking in the manner specified in Government Code section 11346.7(a). The C.F.R. is published by the Office of the Federal Register, National Archives and Records Administration, and is therefore reasonably available to the affected public from a commonly known source.

The test procedures are incorporated by reference because it would be impractical to print them in the CCR. Existing ARB administrative practice has been to have the test procedures incorporated by reference rather than printed in the CCR because these procedures are highly technical and complex. They include the "nuts and bolts" engineering protocols required for certification of motor vehicles and have a very limited audience. Because the ARB has never printed complete test procedures in the CCR, the affected public is accustomed to the incorporation format utilized therein. The ARB's test procedures as a whole are extensive and it would be both cumbersome and expensive to print these lengthy, technically complex procedures with a limited audience in the CCR. Printing portions of the ARB's test procedures that are incorporated by reference would be unnecessarily confusing to the affected public.

The test procedures incorporate portions of the C.F.R. because the ARB requirements are substantially based on the federal regulations. Manufacturers typically certify vehicles and engines to a version of the federal emission standards and test procedures which have been modified by state requirements. Incorporation of the federal regulations by reference makes it easier for manufacturers to know when the two sets of requirements are identical and when they differ.

Economic and Fiscal Impacts. In developing the regulatory proposal, the ARB staff evaluated the potential economic impacts on private persons and businesses. Most of the amendments are intended to facilitate implementation of the regulations and are not expected to add costs to businesses. However, one of the amendment areas -- acceleration of the introduction of ULEVs in the medium-duty fleet by the year 2003 -- could affect some California businesses which purchase these vehicles. In general the MDV amendments are not expected to significantly affect California businesses because the expected cost increases would be well under one percent of the cost of the vehicle (less than $500 for vehicles which have retail prices between $25,000 and $50,000). Given that consumers generally expect that new vehicle prices will routinely increase three to four percent each year, we do not expect that these amendments will have a noticeable impact on California businesses that purchase these kinds of vehicles. The combined cost to Ford, Chrysler, and General Motors for the medium-duty amendments is estimated to be about $1.5 million annually. This cost is not expected to noticeably impact the profitability of these U.S. auto manufacturers because in 1994, these manufacturers collectively reported approximately $13.5 billion in net profit. This amounts to a minor reduction in the profitability of auto manufacturers -- approximately 0.01 percent.

Since the amendments impose no noticeable impact on the profitability of U.S. vehicle manufacturers, no significant change in consumer price, employment, business competitiveness, or

the status of businesses in California is expected. By simplifying the certification process, vehicle manufacturers will receive some resource reduction benefits from the modifications to the proposed regulations. The Executive Officer has therefore determined that adoption of the proposed regulatory action will not have a significant adverse economic impact on the ability of California businesses to compete with businesses in other states, or on directly affected private persons. In accordance with Government Code section 11346.3, the Executive Officer has also determined that this regulatory action will not affect the creation or elimination of jobs within California, the creation of new businesses and the elimination of existing businesses within California, or the expansion of businesses and the elimination of existing businesses within California, or the expansion of businesses currently doing business within the State of California. It is possible, however, that some individual businesses may be adversely affected by this regulatory action, even though overall there should be no significant adverse economic impact on businesses as a whole. For example, it is possible that some individual businesses which either purchase or sell medium-duty vehicles might be adversely impacted due to some unusual circumstances pertaining to that particular business. Therefore, the Executive Officer finds that the adoption of this regulatory action may have an adverse impact on some businesses. The Board's Executive Officer has also determined, pursuant to Government Code section 11346.5(a)(3)(B), that the regulation will affect small business.

Finally, 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 by the state pursuant to Part 7 (commencing with section 17500), Division 4, Title 2 of the Government Code.

Consideration of Alternatives. The amendments proposed in this rulemaking were the result of extensive discussions and meetings involving staff and the affected parties (e.g., automobile manufacturers and oil refiners). Staff considered all of the alternatives proposed by industry and was able to incorporate a majority of industry's proposed amendments into the regulation presented to the Board. As discussed below, a number of additional modifications proposed by affected parties during the comment periods were incorporated into the final amendments. 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.

II. MODIFICATIONS TO THE ORIGINAL PROPOSAL

The adopted amendments reflect a number of modifications to the original proposal. The modifications are described in the September 28, 1995 document titled Staff's Suggested Changes to the Original Proposal (attached to the Resolution), and in the three 15-day notices, all of which are incorporated herein by reference. Many of the modifications were made to clarify provisions or to correct inadvertent errors or omissions. The substantive modifications are

described below.[2]

A. Medium-Duty Revised SIP Proposal

2004 and Subsequent Model-Year NOx Standard. The Staff Report indicated that U.S. EPA, along with engine manufacturers and the ARB, issued a Statement of Principles in July 1995 that outlined new more stringent oxides of nitrogen (NOx) standards proposed for 2004 and subsequent model-year heavy-duty engines. There would be two options: (a) a combined 2.4 grams per brake horsepower-hour (g/bhp-hr) non-methane hydrocarbon (NMHC) plus NOx standard, or (b) a combined 2.5 g/bhp-hr NMHC plus NOx standard with a 0.5 g/bhp-hr cap on NMHC. Noting that these standards are expected to result in emissions comparable to a 2.0 g/bhp-hr NOx standard and that the final federal rule would not be available before next year, the staff initially recommended a 0.5 g/bhp-hr NMHC standard and a 2.0 g/bhp-hr NOx standard for the 2004 and subsequent model years. This would apply both to medium-duty engine-dynamometer-certified vehicles and to all heavy-duty Otto-cycle engines.

On August 31, 1996, U.S. EPA published an Advance Notice of Public Rulemaking (ANPRM) for the 2004 and subsequent model-year standards (60 F.R. 45579). At the request of manufacturers and to help assure that manufacturers will have a uniform nationwide standard towards which they can target their development work, the Board modified the California NMHC and NOx standards for the 2004 and subsequent model years to reflect the U.S. EPA proposal.

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[2] As adopted, the amended regulations and test procedures contained various nonsubstantial modifications to the last texts made available in the supplemental comment periods. These additional modifications are identified in Attachment 1 to this Final Statement of Reasons. One of the modifications was to include amendments to section 2061 of Title 13, CCR and the document incorporated by reference. Prior to this rulemaking, section 2061 incorporated by reference the California Assembly-Line Test Procedures for 1983 and Subsequent Model-Year Model Passenger Cars, Light-Duty Trucks and Medium-Duty Vehicles. One of the elements of the original proposal in this rulemaking was the adoption of new section 2062, which establishes updated assembly-line test procedures applicable to 1998 and subsequent model-year vehicles. The amendments added for section 2061 conformed that regulation to new section 2062 by confirming that the assembly-line test procedures incorporated by reference in section 2061 apply only through the 1997 model year.

(§ 1956.8(c)(3) and (h); HDO Test Procedures § 86.098-10(f)(1).) In response to comments during the first 15-day comment period, the carbon monoxide (CO) standard for 2004 and subsequent model-year heavy-duty Otto-cycle engines was modified from 14.4 g/bhp-hr to 37.1 g/bhp-hr to conform with standard in U.S. EPA's ANPRM.

The originally proposed text pertaining to low-emission medium-duty vehicles referred to the federal rulemaking initiated by U.S. EPA's ANPRM, and stated that, upon U.S. EPA's promulgation, the ARB will within a year conduct a noticed hearing to consider similar or identical California standards. (§1956.8(h) note G.) The second 15-day notice included a modification adding similar language to the 2004 and subsequent model year standards for heavy-duty Otto-cycle engines. (§1956.8(c)(3) note A.)

Intermediate In-Use Standards. As discussed on pages 20-21 of the Staff Report, the original proposal included extensions of the intermediate in-use NMOG and NOx standards for medium-duty *chassis-certified* LEVs and ULEVs. In the final amendments, the Board modified the optional combined NMOG and NOx standards for *incomplete* medium-duty LEVs and ULEVs to similarly provide an intermediate in-use compliance standard for the first two model years, in order to provide manufacturers with a compliance cushion during the introductory years. (§1956.8(h) note H.) Modifications were also made to establish intermediate in-use standards for both chassis-certified and incomplete medium-duty SULEVs. (§1960.1(h)(2) note (9); §1956.8(h) note H.) In addition, a modification was made to reflect the intent that the intermediate in-use formaldehyde standards for medium-duty SULEVs are subject to the same time limits that apply to LEVs and ULEVs. (§1960.1(e)(3) note 5.) Finally, the originally proposed amendments to the formaldehyde in-use exhaust emission standards for light- and medium-duty vehicles in note 4, section 3.d of the LDV/MDV Test Procedures were in error; a modification returned the provisions to their original form except for the addition of references to SULEVs.

The medium-duty vehicle 120,000 mile exhaust standards and the intermediate in-use standards prior to the 1998 model year have also been clarified. Prior to this rulemaking, the intermediate in-use standards where identified in parentheses in the main table in section 1960.1(h)(2) and in section 3.j of the LDV/MDV Test Procedures. Through an oversight, these standards were not carried over to the expanded text of note 9 to the main table. Accordingly, modifications have been made to specifically identify those standards, as well as the pre-1998 model year 120,000 mile NOx standards. (§1960.1(h)(2), notes (3) and (9), and LDV/MDV Test Procedures § 3.j notes (3) and (9).)

Durability data for 1998-2000 model-year medium-duty LEVs. Among the changes made by this rulemaking are substantially more stringent NOx standards -- identical to ULEV levels -- for chassis-certified medium-duty LEVs in all but the lightest weight classification. With the new phase-in schedules, this means that 25%, 50% and 75% respectively of 1998, 1999, and 2000 model-year chassis-certified MDVs will have to meet the more stringent NOx standards, compared to the 2% ULEVs subject to the same stringent NOx standards through the 2000 model year under the preexisting regulations. Because of the limited lead-time for 1998-2000 chassis-certified medium-duty LEVs to meet the more stringent NOx standard, the Board made a

modification for these vehicles to allow the use of durability data from California only, federal, or 50-state vehicles that line-cross the LEV NOx standard. (LDV/MDV Test Procedures §§ 4.c.5. and 6.b.5.) This will minimize the need for additional durability test vehicles during the early years. No modification was made for engine-dynamometer-certified vehicles because LEVs in this category are not required until the 2002 model-year and the NMOG + NOx standard has not been changed prior to that model year.

Formaldehyde Standard. In the original proposal, the formaldehyde standard for medium-duty ULEVs would be increased from 0.025 to 0.050 g/bhp-hr for the 2004 and subsequent model years. The preexisting ULEV formaldehyde standard for 1992 through 2003 ULEVs remained unchanged at 0.025 g/bhp-hr. In light of the modification to the formaldehyde standard for 2004 and subsequent model incomplete MDVs, it was not appropriate for the ULEV formaldehyde standard for 1992 through 2003 model MDVs to be more stringent. accordingly, the 1992 through 2003 ULEV formaldehyde was modified from 0.025 to 0.50 g/bhp-hr so that it was aligned with the 2004 and subsequent model year standards. (§1956.8(h).)

SULEVs. The name of the emission category "Super-Low-Emission Vehicle" (SLEV) was changed to "Super-Ultra-Low-Emission Vehicle" (SULEV), to make clearer that it is more stringent than the preexisting "Ultra-Low-Emission Vehicle" category.

B. Smog Index Window Label

At the hearing, the Board approved a modification requiring that a smog index be included on the window label on new passenger cars and light-duty trucks (0-5750 lbs. loaded vehicle weight (LVW)) beginning with the 1998 model year. The original proposal contained two conditions that had to be met before the label requirements would apply: (a) the Department of Consumer Affairs determines that a system for the electronic filing of certificates of compliance or noncompliance is operational and so notifies the Secretary of State, and (b) both the San Diego County and Ventura County Air Pollution Control Districts notify the Secretary of State that they have sufficient funds to implement a pilot study for identifying high-pollution high-mileage vehicles and requiring annual smog checks for those vehicles. The modifications eliminate these two conditions, and make the requirements applicable beginning with the 1998 model year. The Board concluded that the conditions were not legally required, and that it is appropriate to make the smog index label information available to potential purchasers of light-duty vehicles by the first model year for which implementation of the requirements is feasible.

The original proposal mandated that the smog index label be in a form set forth in the Label Specifications. In order to provide manufacturers with greater flexibility, the requirement was modified to allow the use of an alternative form if it is shown to be at least as clear as the specified form and is approved in advance by the Executive Officer. The specified form was also modified slightly to shade the portion of the smog index display that is to the left of the value for the vehicle on which the label is affixed, in order to make this value more prominent. In addition, the Board deleted an originally proposed requirement that the label be placed either on a side

window to the rear of the driver or, if that is not possible, on the vehicle's windshield. This provision was not necessary in light of the remaining requirement that the label be affixed in a readily visible location. Finally, language was added to sections 7. and 8. of the Label Specifications to make clear that the requirements in those sections apply to emission control labels only, and not to smog index labels.

An explanation of the methodology for calculating the index was included as Attachment V to the first Notice of Availability of Modified Text, and was added to the rulemaking record by that notice. The methodology is as follows.

The purpose of a smog index on the window label is to provide an indication to the consumer when purchasing a vehicle of the relative contribution of that vehicle to ozone formation compared to other vehicles within the same vehicle class. A smog index of 1.00 is assigned to new passenger cars and light-duty trucks which certify to the Tier 1 standards for exhaust emissions and to the evaporative standards in effect in the 1995 model year.[3] These vehicles are treated as the baseline vehicles. New vehicles which certify to more stringent emission standards are assigned smog indices of less than 1.00. Older used vehicles will be assigned smog indices which are greater than 1.00.[4]

The smog index is based on the ratio of exhaust NMOG, exhaust NOx, and evaporative HC emissions from any given vehicle to those of the baseline vehicle. Both hydrocarbons and NOx emissions are included because the ARB has historically considered both to be important factors in the formation of ozone. In addition, since there is no clear way to determine the relative impact on ozone formation of each of these pollutants, the formula gives equal weight to exhaust NMOG, exhaust NOx, and evaporative HC when estimating their impact on ozone formation. The formula for calculating the smog index, using values expressed in gram per mile (g/mi), is:

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3 The smog indices account for the fact that there are two evaporative emission standards -- the current standards which are being phased out and do not include running loss emissions ("the old standards") and the new standards which do include running loss emissions.

4 This rulemaking establishes smog indices for new vehicles only; the indices for older vehicles will be considered at a later rulemaking.

$$\text{SMOG INDEX} = \frac{\text{exhaust NMOG(g/mi) + exhaust NOx (g/mi) + evaporative HC(g/mi) (new vehicle)}}{\text{exhaust NMOG(g/mi) + exhaust NOx (g/mi) + evaporative HC(g/mi) (baseline vehicle)}}$$

For example, the smog index for a 1998 LEV passenger car would be 0.075 g/mi NMOG + 0.2 g/mi NOx + 0.14 g/mi evaporative emissions, or 0.415. Compared to the baseline vehicle whose smog index is 0.25 g/mi NMOG + 0.4 g/mi NOx + 0.48 g/mi evaporative emissions, or 1.00, the smog index of the 1998 LEV passenger car would be 0.37.

The values used to calculate the smog index are the 50,000 mile NMOG and NOx emission standards to which the vehicle is certified. The evaporative HC emissions are 0.48 g/mi for vehicles which certify to the old evaporative emission standards and 0.14 g/mi for vehicles certifying to the new evaporative emission standards. The evaporative HC emission values are calculated using the U.S. EPA's MOBILE 5 emission model[5] with the following assumptions: the currently required cleaner burning gasoline with a reduced vapor pressure is used; daily temperatures range from 72?F to 96?F; a fully operational inspection and maintenance program is in place; and the on-board computer system is fully capable of detecting failures of the evaporative control system.[6]

C. Other Provisions

Most of the remaining modifications to the originally proposed text pertained to various specific requirements associated with the certification of new motor vehicles and engines.

50º F Test Requirements. Manufacturers are required to demonstrate that light- and medium-duty vehicles meet NMOG, CO, NOx and formaldehyde emission standards when tested at 50º F. Prior to this rulemaking, TLEVs were required to meet the 50,000 mile NMOG and formaldehyde standards after multiplying those standards by 2.0, and the NMOG and formaldehyde standards for LEVs had a multiplicative factor of 1.75. There were no other multipliers. The final amendments in this rulemaking include two modifications to the 50º F test requirements. First, the text of the LDV/MDV Test Procedures did not reflect the proposal described on p. A-6 of the Staff Report to change the NMOG and formaldehyde multipliers for

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5 The reason a model estimate of the evaporative emissions is used rather than the actual evaporative standards is because the actual standards that are currently being phased in are based on extreme conditions (the vehicle is tested at 105?F for three days). Since the smog index is intended to be an educational tool which would provide the public with an estimate of the relative impact of a particular vehicle on ozone formation compared to other vehicles, staff used evaporative emission estimates that are more representative of average summer days in the South Coast Air Basin (72?F to 96?F) rather than the higher temperature conditions which only occur on a few days in the summer.

6 By 1998, all vehicles will be equipped with the second generation on-board diagnostic (OBD II) systems and will be capable of detecting failures of the evaporative emission control system.

ULEVs from 1.0 to 2.0 in light of ARB testing demonstrating that 50º F emissions from a ULEV-capable vehicle were approximately double the value at higher temperatures. The final amendments correctly reflect the change to the ULEV multiplier from 1.0 to 2.0. Second, the NMOG and formaldehyde multiplier for LEVs was changed from 1.75 to 2.0 to be consistent with the other emission categories and to better reflect emission test data. (LDV/MDV Test Procedures §11.k.)

Intermediate In-Use Standards. The original proposal included a 50,000 mile intermediate in-use NMOG standard for passenger cars and light-duty trucks 0-3750 LVW of 0.100 g/mi through the 1998 model year and 0.090 g/mi for the 1999 model year. The 1999 model-year intermediate in-use NMOG standard for these vehicles was modified to 0.100 g/mi to avoid potential calibration revisions for just one year of production. (§1960.1(g)(1) note (6); LDV/MDV Test Procedures §3.g. note 6.)

"Unleaded Fuel Only" Label. On February 2, 1996, U.S. EPA announced a Direct Final Rule (61 F.R. 3832) making regulatory changes to reflect section 211(n) of the federal Clean Air Act, which prohibits the sale or distribution of leaded gasoline for highway use after December 31, 1995. (42 U.S.C. § 7545(n).) Because leaded gasoline will no longer be available, the Direct Final Rule includes the deletion of the requirement in 40 C.F.R. section 80.24(a) that vehicle manufacturers place "Unleaded Fuel Only" labels on the vehicle instrument panel and fuel filler inlet. Repeal of the requirement was effective March 4, 1996. California has a similar requirement in section 3.(d) of the Label Specifications, and manufacturers requested that the Board remove this requirement in California as well. Since leaded gasoline is now prohibited nationwide, the Board eliminated the "unleaded gasoline only" labeling requirements for 1997 and subsequent model year vehicles. (Label Specifications § 2.(a).)

NMOG Test Procedures. In order to provide labs with additional flexibility, the NMOG Test Procedures were modified to allow the stock solution used in the measurement of alcohols in automotive exhaust to be prepared volumetrically as well as gravimetrically. (NMOG Test Procedures §5.4.) In addition, the identification of the amount of alcohol contained in the stock solution for the determination of alcohols in automotive source samples was corrected from one microgram per milliliter to 10 milligrams per milliliter. (NMOG Test Procedures §5.4.) A typographical error was also corrected at the very end of Part G, Determination of NMOG Mass Emissions, section 5, "Carbonyl Mass Emission Calculation," so that RHO_{wm} is expressed in milligrams per mile rather than in grams.

New Assembly-Line Test Procedures. The originally proposed deletion of a clause authorizing the Executive Officer to reject nonrepresentative data based on information submitted by the manufacturer was not implemented, resulting in no change on this point.

Old Assembly-Line Test Procedures. In order to reflect the fact that the New Assembly-Line Test Procedures will apply to 1998 and subsequent model-year vehicles, the Old

Assembly-Line Test Procedures were modified to expressly provide that they only apply through the 1997 model year.

III. SUMMARY OF PUBLIC COMMENTS AND AGENCY RESPONSES -- COMMENTS PRIOR TO OR AT THE HEARING

At the September 28, 1995 hearing, oral testimony was received from the American Automobile Manufacturers Association (AAMA), the Engine Manufacturers Association (EMA), the Manufacturers of Emission Controls Association (MECA), the Western States Petroleum Association (WSPA), General Motors (GM), Ford Motor Company (Ford), Chrysler Corporation (Chrysler), 76 Products Company (Unocal), California Natural Gas Vehicle Coalition (NGVC), South Coast Air Quality Management District (SCAQMD), Coalition for Clean Air, and CalStart. All of these entities except Ford submitted written comments as well. Additional written comments were received by the hearing date from Southern California Gas Company (The Gas Company) and Nissan.

Set forth below is a summary of each objection or recommendation made regarding the specific regulatory actions proposed, together with an explanation of how the proposed action was changed to accommodate each objection or recommendation, or the reasons for making no change. The comments have been grouped by topic whenever possible. Comments not involving objections or recommendations specifically directed towards the rulemaking or to the procedures followed by the ARB in this rulemaking are not summarized below.

A number of commenters generally supported adoption of the proposed amendments pertaining to MDVs and RAFs. These commenters included AAMA, EMA, MECA, GM, Ford, and Chrysler. Comments in support of the amendments are not summarized below.

A. Medium-Duty SIP Proposal

1. **Comment:** The Coalition for Clean Air does NOT support the proposed changes to the Medium-Duty Vehicle Regulations. There are three major problems with the proposed changes: First, CARB staff identifies a shortfall in NOx emissions reductions in excess of EIGHT tons per day relative to the reductions included in the State Implementation Plan. While a shortfall has been identified, the proposed changes before you contain no indication of how California will recoup this loss of emissions reductions. Unfortunately, the infamous “black box” is growing just when it should be shrinking.

At a minimum, the ARB should delay action on this item until staff has identified specific replacement measures to address the shortfall in NOx emission reductions. Because mobile sources now account for a majority of California’s air pollution emissions, it is essential that these replacement measures be applied to mobile rather than stationary sources. (Coalition for Clean

Air)

Comment: While the proposed acceleration of NOx reductions compared with the original 1990 medium-duty LEV timetable is laudable, it nevertheless falls far short of commitments made in the 1994 SIP for the medium-duty class, with no net benefit to the SIP NOx reduction effort. (NGVC)

Comment: That the ARB is, in effect, removing NOx reductions from a specific SIP control measure and placing them in the so-called black box of unspecified future reductions -- without mitigation -- is disturbing to us, and should be to the Board as well. (NGVC)

Comment: Today we have added another ten tons per day to the black box. Where will the emission reductions come from down the road? I think we can do better and I would encourage you to find a way to take the ten tons and still keep it within the medium-duty vehicle area and try to find a way to encourage other cleaner fuels to make up the difference. (CalStart)

Agency Response: The relationship of the staff's revised MDV proposal to the MDV element in the 1994 SIP revision is discussed in detail on pages 18-27 of the Staff Report. The MDV emission standards and phase-in schedule adopted in this rulemaking will achieve greater NOx emission reductions in the South Coast Air Basin than would be the case under the standards and phase-in schedule in the SIP: 23.9 tons per day (tpd) compared to 23.5 tpd.

When it was submitted to U.S. EPA, the 1994 SIP was projected to achieve NOx emission reductions in the South Coast Air Basin of 32 tpd. However, this figure was based on an emission inventory that characterized the medium-duty fleet in very general terms. When staff was developing its medium-duty proposal for this rulemaking, it became apparent that the inventory needed to be adjusted to reflect the unique contribution of MDVs to the emission inventory. Based on these adjustments, and further analysis of the impact of MDV control strategies, the staff found that the NOx emission reduction in the South Coast Air Basin that would be achieved from the MDV element in the SIP category is 23.5 tpd rather than the 32 tpd originally set forth in the SIP. Using the same inventory and analysis, the MDV amendments adopted in this rulemaking will result in a NOx emission reduction of 23.9 tpd.

The staff has not identified any technologically feasible additional strategies that could be adopted at this time to further reduce NOx emissions from MDVs. It is clearly preferable to adopt the MDV amendments now rather than later, because a delay would reduce the lead-time available to manufacturers to meet the MDV NOx standards on schedule.

2. **Comment:** Our second -- and perhaps greater -- concern relates to the proposed relaxation of the particulate standard for medium-duty engines. This change would *double* the particulate matter standard. In light of several recent health studies that show particulate matter to be deadly, we find it unconscionable that California would even consider relaxing the particulate standard in any air quality regulation. The growing number of health studies which

condemn particulate air pollution make it clear that if the ARB is to make any change to the particulate emission standard, that change should be to strengthen it rather than weaken it. (Coalition for Clean Air)

Comment: The proposed standards also allow a doubling of the allowed particulate emissions for ULEVs. There is no termination date for this relaxation, and the SCAQMD would recommend that the 0.05 grams per mile standard be reimposed for at least model years beyond the year 2002. As you know, a recent study sponsored by Cal/EPA has rigorously documented serious health effects associated with particulate air pollution. This study found that 275 deaths per year can be associated with particulate exposure in just two counties in the South Coast district -- namely, San Bernardino and Riverside. By permanently relaxing the ULEV particulate standard, the Board may be foregoing a major opportunity to improve public health in the early twenty-first century. There are impressive advancements underway on alternative fuel engine technologies which can easily comply with a 0.02 particulate standard. The SCAQMD therefore suggests that the Board request the staff to revisit this issue over the next twelve months and that a stricter particulate standard be considered at that time. (SCAQMD)

Comment: The MDV proposal will result in an incremental degradation of our attainment status for toxic PM_{10} and CO emissions. (NGVC)

Comment: Particulate matter standards should not be relaxed until the results of numerous ongoing studies are reviewed and the 1997 PM Attainment Plan is completed. (The Gas Company)

Agency Response: The commenters are referring to an increase in the particulate standard from 0.05 grams per brake horsepower-hour (g/bhp-hr) to 0.10 g/bhp-hr for medium-duty ULEVs certified to the optional heavy-duty engine standards (§1956.8(h)(2)), and an increase in the ULEV CO standards to LEV levels for both engine-certified vehicles and chassis-certified MDVs (§§ 1956.8(h)(2) and 1960.1(g)(2)). Because NOx controls on diesel engines tend to increase PM emissions, the limited relaxation of the ULEV PM standards has been included to give manufacturers a greater chance of success in developing low NOx strategies to meet the substantially more stringent NOx requirements the Board is adopting. The rationale for the modifications to the ULEV CO standard similarly stems from the fact that NOx controls tend to increase CO emissions.

California has six areas of non-attainment for the federal ambient air quality standard for ozone, and NOx control is a critical element in California's plan to meet the federal and state ozone standards. Under the preexisting regulations, 15% of the combined chassis-certified and engine-dynamometer-certified MDVs would have to be ULEVs in the 2004 and subsequent model years, with the remaining 85% having to meet the LEV standard. (§1960.1 note (1).) The amendments require that for the 2004 and subsequent model years, *100%* of engine-dynamometer-certified MDVs be ULEVs, as well as *40%* of the chassis-certified MDVs. For engine-dynamometer-certified MDVs, the ULEV NMHC + NOx standard is more stringent than

the preexisting LEV standard; this is also the case for all weight classifications of chassis-certified MDVs. In addition, the NOx standards for LEVs have been made more stringent. The staff has identified the total baseline NOx emissions from MDVs prior to implementation of the amendments as about 89 tons per day (tpd) in 2010 in the South Coast Air Basin. The amendments are projected to reduce these NOx emissions by 23.9 tpd--a reduction of about 27%.

The substantial NOx reductions from this rulemaking far outweigh the much less significant PM and CO emission increases. We have identified no feasible mitigation measures or alternatives that would reduce CO and/or particulate emissions from MDVs while at the same time providing the substantial overall health benefits realized by the significant NOx emission reductions.

With regard to particulate matter effects, based on staff's most recent technology assessment there is no alternative to allowing a higher ULEV particulate standard in order to ensure achieving the desired NOx levels. However, even though the amendments will allow slightly more particulate to be emitted directly from MDVs (0.8 tpd) than the preexisting regulations, the lower NOx emissions will mitigate this increase by reducing the formation of secondary particulate matter in the atmosphere by approximately 12 tpd.[7]

The contribution of MDVs to the total CO inventory is relatively minor. For example, under the current proposal, the MDV CO inventory for the South Coast Air Basin would be increased to 322 tpd from 298 tpd relative to the original SIP proposal. Given that the total CO inventory is 6600 tpd for the South Coast Air Basin, it is not anticipated that this slight increase would significantly affect the CO attainment status of the basin or other areas.

3. **Comment:** With specific regard to PM_{10} attainment, we are concerned about the combined indirect effect of this rulemaking with that embodied in the "Statement of Principles" agreement with EPA and original equipment manufacturers (OEMs) for heavy-duty LEVs. The agreement for NOx reductions to accrue from the Statement of Principles is predicated on the abeyance of stricter PM_{10} and CO standards by ARB and EPA. With this rulemaking, the Board appears prepared to forego any definitive further progress in reducing PM_{10} and CO emissions from either medium- or heavy-duty vehicle classes for many years to come. We hope this does not prove to be the case, especially in view of the mounting evidence of carcinogenicity related to diesel particulate and pending plans for a new state PM_{10} attainment strategy. (NGVC)

Agency Response: The Statement of Principles does not preclude future adoption of more stringent particulate or CO emission standards for MDVs or heavy-duty engines. One element of the Statement of Principles is the commitment to development of a research agreement

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[7] One of the constituents of secondary particulate is ammonium nitrate which is formed from NOx in the atmosphere.

that aims to develop technologies that can reduce particulate emissions to 0.05 g/bhp-hr or lower. The ARB has committed to consider adoption of any new more stringent particulate standards that may be adopted in the national program. Further, it should be emphasized that with the implementation of this and earlier rulemakings, the particulate emissions from new MDVs will decline through the 2002 model year.

4. **Comment:** Our third major concern relates to what appears to be a change in the philosophy behind California's air quality regulations. The Coalition for Clean Air believes that the ARB must maintain its reputation and continue to implement the kind of technology-forcing regulations necessary to restore clean air to California. We support incentives for industry to use cleaner alternative fuels as called for in California's SIP which was submitted to the U.S. EPA last November. Unfortunately, the delays incorporated in the proposed changes before you today, coupled with a relaxation of the standards for carbon monoxide and particulates, are designed to accommodate the prolonged use of gasoline and diesel.

While we are aware that the proposed changes suggest adding a SLEV category for medium-duty vehicles, it is unlikely that auto and engine manufacturers will pursue this level if a weakened regulation allows them to achieve medium-duty ultra-low emissions levels with gasoline or diesel. The proposed changes are effectively taking away the carrot which has driven technology advancement for the first half of this decade. (Coalition for Clean Air)

Comment: As a partial remedy to the shortage of SIP NOx emission reductions in the medium-duty class, and to the incremental loss of particulate and CO reductions from both medium- and heavy-duty vehicles, we support a SIP strategy that contains a phase-in of the proposed medium-duty SLEV tier as an OEM tailpipe standard beginning in 2002. In addition, the natural gas industry will also be urging ARB and EPA to adopt a straight 2.0 gram NOx standard and not to forego future particulate and CO reductions in regulatory proceedings for heavy-duty vehicles. To keep momentum forward and to effectuate real alternative fuel development, staff should reassess the medium-duty vehicle proposal. (NGVC)

Comment: The proposed amendments to both the ULEV standards and the modified phase-in schedule virtually ensure that no manufacturer will certify to the optional SLEV level, since the proposed LEV/ULEV standards and revised phase-in schedule are achievable with gasoline and diesel technology. (The Gas Company)

Agency Response: Traditionally, the ARB has been fuel neutral in its promulgation of emission standards. However, in response to a request from the natural gas industry, the Board approved the addition of a new SULEV emission category for MDVs. Because the technological feasibility and cost-effectiveness of this category has not yet been determined, the current amendments do not require manufacturers to introduce specified percentages of these vehicles but provide a mechanism whereby they can earn additional credits if the vehicles are produced. Staff will continue to monitor the progress of manufacturers in meeting the MDVs standards. If it can

be determined that the SULEV category is technologically feasible and cost-effective, a proposal to stimulate the increased production of SULEVs will be brought to the Board for consideration.

With respect to the comment regarding the shortage of NOx emission reductions, see the Agency Response to Comment No. 1 above.

5. **Comment:** Perhaps the ARB should consider a market-based approach in order to achieve both the NOx reductions in addition to CO and PM standards. We ought not to adjust the LEV, ULEV and SULEV standards. Rather we should allow a market-based approach to give manufacturers flexibility in achieving those standards. We should encourage trading between the manufacturers and not penalize those manufacturers who could meet the accelerated NOx schedule and not require the relaxation of the other standards, but in fact could meet all the ULEV standards without any relaxation at all. (NGVC)

Agency Response: During the course of this rulemaking, manufacturers proposed the reduction of the LEV NOx standard to ULEV levels. With this approach, staff was able to present a proposal to the Board that not only achieved 100% of the NOx emission reduction goals of the SIP, but was achievable by manufacturers as well. Additionally, for the reasons stated in the Agency Response to Comment No. 2 above, the impact of the increased CO and PM standards will be more than offset by the greater NOx emission reductions that will be achieved by this proposal. Therefore, we believe that the adopted amendments are appropriate. In addition, there are sufficient incentives in the regulations allowing manufacturers that produce more medium-duty low-emission vehicles than required to earn credits which would gain even more emission reductions. Staff will, however, continue to monitor the progress of manufacturers in developing medium-duty emission control strategies in order to determine the feasibility of more stringent standards.

6. **Comment:** We still don't endorse the cost estimates that the staff is doing. We believe they are too optimistic. (AAMA)

Agency Response: The cost estimates proposed in this rulemaking were given to the auto manufacturers for their review and comment prior to the release of the Staff Report. All comments that staff received were reflected in the final estimate. Staff believes that the cost estimates are as accurate and reasonable as possible.

7. **Comment:** For incomplete medium-duty vehicles, will the SULEV standard remain 2.0 gm/bhp-hr for combined NMHC and NOx or is the staff proposing a modification to a 2.4 g/bhp-hr? (NGVC)

Agency Response: The SULEV standard for incomplete medium-duty vehicles is being

adopted as originally proposed, 2.0 gm/bhp-hr for combined NMHC and NOx.

B. Smog Index Window Label

8. **Comment:** In stark contrast to the systematic and cooperative dialogue which led to reasonable resolution of most of the issues involved in today's rulemaking, CARB staff, in proposing the smog index rule, did so without workshops and without adequate discussion. (AAMA, Chrysler)

Comment: Nissan believes that additional workshops and discussions will be required to resolve issues regarding the smog index pilot program prior to implementation. (Nissan)

Agency Response: The ARB endeavors to resolve issues as early as possible in the rulemaking process. Staff resources are limited, however, and not every issue can be discussed before the Board hearing as extensively as one might prefer. For the smog index labeling program, all applicable legal requirements were followed and commenters were given the opportunity to suggest modifications during three separate 15-day public comment periods. Several changes to the program were made in response to comments that were received; these changes are discussed below in this Final Statement of Reasons. Although the ARB did not make all of the modifications suggested by the commenters, each comment was thoroughly considered and the requirements were modified where it was appropriate to do so.

9. **Comment:** We strongly object to the late change proposed by staff which would remove the statutory triggers, particularly the one requiring two districts to allocate funds to conduct pilot programs utilizing the smog indices in a market-based incentive program. A labeling program alone, for only the newest and cleanest vehicles, without any assurance that it will lead to the piloting of tangible market-based programs, is vastly different and less beneficial than the program outlined in Senate Bill 2050. We object to implementing a smog index label that applies to new vehicles only, rather than to all vehicles as was intended by Senate Bill 2050. We also do not agree that the Board has the general legal authority to adopt a smog index program without the conditions imposed by SB 2050. (AAMA, Chrysler)

Agency Response: Senate Bill 2050 establishes several different programs: (1) a statewide smog index program for new light-duty motor vehicles sold by motor vehicle dealers (see Health and Safety Code §§ 43200.5, 44251, and 44254), (2) a statewide smog index program for used motor vehicles (see Health and Safety Code §§ 43706 and 44254), and (3) a five-year pilot study -- in San Diego and Ventura Counties only -- to test a pollution-miles-per-vehicle proposal to reduce pollution from existing motor vehicles by identifying high-pollution high-mileage vehicles and requiring annual smog checks for those vehicles (see Health and Safety Code §§ 40927, 43705, 44251, and 44255).

SB 2050 *requires* that these programs be implemented only if two conditions occur.

These two conditions are set forth in Section 32 of the bill. The first condition is that the Bureau of Automotive Repair (BAR) must complete the computer system for the electronic filing of smog check certificates. The second condition is that both the San Diego and Ventura County Air Pollution Control Districts must have sufficient funds to implement the five-year pilot study mentioned above. These conditions have not yet been met, and the ARB is therefore not *required* to implement the smog index programs envisioned by SB 2050. However, the ARB believes that implementation of a smog index label requirement has merit, regardless of the ultimate fate of SB 2050, since the label would provide consumers with a means of identifying and purchasing the cleanest vehicles. Accordingly, the Board has adopted a smog index labeling requirement for new vehicles. The ARB staff agrees that a program for used motor vehicles would also beneficial, and has petitioned the Federal Trade Commission to allow a smog index chart to be included in the Federal Trade Commission's Buyer's Guide for used vehicles (see **Health and Safety Code** § 43706). Since it may take some time for a used vehicle program to be approved and implemented, we believe it is good public policy to proceed in the meantime with implementing the program for new motor vehicles. The comments regarding the ARB's legal authority to adopt the program are addressed in the response to Comment No. 24.

C. Reactivity Adjustment Factors

10. **Comment:** The Western States Petroleum Association has long maintained that the ARB's approach for calculating and applying RAFs, as set forth in their LEV regulation, is fundamentally flawed, and could be detrimental to air quality. The principal flaw is not only in the choice of a particular reactivity scale, but also in the notion that there can be a single reactivity scale that would be applicable to all urban atmospheric conditions. Applying a single, fixed reactivity scale -- such as the MIR scale -- neglects important influences of atmospheric conditions in determining the actual reactivity of a particular species in a real urban situation. Stated simply, the reactivity of any NMOG species is not a constant, but is a complex variable which depends upon many other factors. It is scientifically possible to calculate a reactivity scale for a given set of environmental conditions; however, different environmental situations will yield different reactivity scales. Thus, the choice of a single scale could be detrimental to air quality compared to requiring the same mass emissions from all vehicles. (WSPA, Unocal)

Agency Response: The approach of a RAF-adjusted NMOG standard provides an effective and appropriate way of evaluating conventional and nonconventional vehicle/fuel combinations on an equal ozone-forming-potential basis. Measuring the emissions of "NMOG" means that a significantly broader range of hydrocarbons -- of widely differing reactivities -- are counted than had been the case with previous hydrocarbon standards. The RAF mechanism then adjusts the measured emissions based on a maximum incremental reactivity (MIR) scale that can be applied for all vehicle/fuel combinations. The measurement of mass NMOG emissions was fundamentally designed to be used in conjunction with an adjustment for the relative reactivities of the different hydrocarbon species in a vehicle's exhaust. It would be clearly inappropriate to base an emission standard on the full mass of NMOG emissions without consideration of relative

reactivity. The question is not *whether* reactivity should accounted for, but rather *how* reactivity should be taken into account.

We believe that accounting for reactivity through application of the MIR scale is the most effective approach developed to date. The ARB has never claimed that there can be a single reactivity scale that accurately reflects all urban atmospheric situations. As explained on page 6 of the Staff Report,

> The MIR scale is designed to reflect the relative reactivities of the various [hydrocarbon] species under one particulate set of atmospheric conditions -- the conditions in which the maximum change in ozone results from any additional hydrocarbon. It is under these conditions that hydrocarbons (and consequently hydrocarbon controls) have the most impact on ozone formation.

It is clearly appropriate in administering a hydrocarbon control program to compare the reactivity of the tailpipe emissions of different vehicle/fuel combinations under the conditions where reductions in hydrocarbon emissions will have the greatest impact on reducing ozone.

In its 1991 report *Rethinking the Ozone Problem in Urban and Regional Air Pollution*, the National Research Council endorsed the ARB's RAF approach as a valid way to treat fuels equally. Research on RAFs sponsored by ARB, the Auto/Oil Air Quality Improvement Program, and the Department of Energy has passed several tests of scientific peer review. Seven articles favoring ARB's approach on the development, application, evaluation, and uncertainty analysis of the RAF concept have been published to date. (see the references identified in Appendix D to the Staff Report.)

11. **Comment:** The use of a single reactivity scale can produce RAFs which exacerbate urban ozone under certain atmospheric conditions. This possibility was demonstrated by CARB's air modeling work conducted in support of the proposed RAFs for CNG and LPG fueled low-emission vehicles. In this work, exhaust emissions from the alternative-fuel vehicles were adjusted upward, in accordance with the proposed RAFs, and the resulting ozone impacts were assessed. If these RAFs were correct, the increased emissions from the alternative-fuel vehicles should lead to the same ozone impacts as lower emissions from the conventional-fuel vehicles. If the RAF-adjusted alternative-fuel case and the conventional gasoline case produced equivalent ozone impacts, the null test result would be 1.00. Various ozone metrics can be used when computing null test results. Since both federal and California ozone standards are based on peak ozone, WSPA maintains that the most appropriate metric is basin-wide peak ozone. The CARB Technical Support Document for Reactivity Regulations (dated September 27, 1991) also states that a peak ozone metric must be considered when assessing air modeling results. However, ARB relies on model results for geographic ozone extent and population ozone exposure to determine RAF correction factors and ignores results for peak zone. Consequently, adoption of the currently proposed RAFs for CNG and LPG will make it difficult to meet the

federal and state ozone standards for the reasons noted above. (WSPA, Unocal)

The peak ozone null test results from modeling CNG, LPG and Phase 2 gasoline vehicles were greater than 1.00 for CNG and LPG and equal to 1.0 for Phase 2 gasoline, indicating that application of the proposed RAFs for both CNG- and LPG-fueled LEVs would be expected to increase peak ozone in the South Coast Air Basin when compared with either Phase 2 or conventional gasoline LEVs. To achieve equivalent ozone impact, these modeling results indicate that both CNG and LPG RAFs need to be adjusted upward by 10% for CNG and 23% for LPG. The modeling work in support of the LEV RAFs strongly suggests that peak ozone will increase if the proposed RAFs for CNG- and LPG-fueled LEVs are implemented, thereby making attainment of the federal and state ozone standards more difficult. To avoid this problem, WSPA urges ARB to increase the proposed RAFs for these alternative-fueled vehicles, and then repeat the air modeling work to determine if further adjustments are necessary. (WSPA, Unocal)

Agency Response: The confirmatory airshed modeling questioned by WSPA is consistent with a protocol recommended by the Reactivity Advisory Panel -- an *ad hoc* group of the public, auto manufacturers, and fuel suppliers, including WSPA members. This protocol was applied in the development of the RAF for M85 TLEVs established following the November 1991 public hearing, and was applied again in the establishment of additional RAFs following the January 1993 Board hearing. This approach involves the examination of results for peak ozone, as well as a measure that takes into account all hours that people are exposed to ozone levels above the state standard. Both of these measures of ozone are important. While an air basin's attainment status is based on peak ozone levels, the LEV regulations are designed to reduce exposure to unhealthy levels of ozone everywhere. As is the case with every other ozone control program we have, ozone will go down in some areas more than others, dependent on where the emission reductions occur and on which direction the wind is blowing on a particular day. Because of this fact, and based on the recommendations of in-house health effect experts and the Reactivity Advisory Panel, the airshed modeling includes a measure that takes into account the effect on all instances of ozone levels above the standard that impact where people live.

For CNG- and LPG-fueled vehicles, the airshed modeling peak ozone results are different (*e.g.*, higher null test result) than the ozone exposure results. The ozone peaks (located over Mt. Baldy in the modeling domain) for the June and August 1987 episodes are less sensitive to hydrocarbon emissions than much of the urban area, so the null test results are the ratios of two small numbers. These results are less reliable due to statistical noise. The peak ozone results for the September 1982 episode are more statistically robust because of a greater response to changes in hydrocarbon emissions, and they fall more in line with the ozone exposure results. By placing less weight on the peak ozone results for the two ozone episodes with greater statistical noise, the staff recommended no increase in the RAF for CNG-fueled vehicles rather than the 2% increase that results if all the data are weighted equally. Applying the same logic to the RAF for LPG-fueled vehicles results in a 10% increase, as compared to 13% for equal weighting. These interpretations of the null test results are consistent with those employed at the 1991 and 1993 ARB hearings for vehicles fueled with Phase 2 reformulated gasoline and M85, and are protective

of air quality over the entire South Coast Air Basin.

11. **Comment:** We further note that ignoring RAF impacts on peak ozone is inconsistent with guidance provided earlier by CARB health experts. The initial Technical Support Document for the reactivity regulations, dated September 27, 1991, states that CARB health experts had evaluated the issue of ozone metrics (measures) for use in reactivity regulations and had concluded that "reactivity regulations will be derived based on ozone peaks" because the federal and state standards were protective of cumulative exposures (pages V-1 and V-2). The current rulemaking ignores this advice. (WSPA, Unocal)

Agency Response: This is an inaccurate quote, as the statement refers to reactivity *scales*, not reactivity regulations. The next sentence in the referenced document reads "The airshed model evaluation will demonstrate a successful reactivity scale if two fuel/vehicle combinations result in equal one-hour based peak concentrations *and equal ozone exposure* (in units of ppm-hours for all hours in all grid cells with ozone concentrations above 0.09 ppm)." (emphasis added) The 15-day notice in that rulemaking, dated April 21, 1992, further clarified that the result should be population-weighted (Attachment III, page 17). These criteria were recommended by in-house health effect experts and the Reactivity Advisory Panel, and were reflected in the 1991, 1993, and 1995 rulemakings.

12. **Comment:** AAMA is concerned about the Staff Report's inference that it may be appropriate in the future to increase RAFs if the actual emission control systems do not reduce reactivity to the extent forecast by the staff. Such a RAF change would improperly increase the stringency of the LEV standards, potentially requiring unique vehicle hardware, requiring a careful reevaluation of lead-time, feasibility, and cost-effectiveness. (AAMA, Ford)

Comment: Chrysler *does not* support the Staff Report's statement that future RAFs should be increased to a value greater than 1.0 if early LEVs cannot achieve the staff's projection of best case specific reactivity. Such a change would be equivalent to increasing the stringency of all LEV standards and would likely require new vehicle hardware. What we are objecting to is expanding the use of RAFs to push new vehicle hardware. Pushing the frontier means trying new approaches and accepting new risks, as Chrysler is doing with the LEV Program -- piling-on more risks by changing RAFs may have the effect of stalling new technologies since there is a limit to the risks that can be taken by a manufacturer. It is our position that any increase in the stringency of the LEV Program requires significant study of lead time, technical feasibility, and cost-effectiveness. In addition, we feel that such an increase in stringency would be premature until experience is gained with the current LEV Program and with RAFs. (Chrysler)

Comment: GM is troubled with several statements in the Staff Report that infer that RAFs may be used in the future to increase the stringency of the LEV Program. This undermines the certainty that manufacturers need. Any changes that impact the stringency of the LEV program must go through a full rulemaking process to provide the proper consideration of the feasibility, cost and benefits of such changes. (GM)

Agency Response: The RAF mechanism is designed to account for the fact that the relative reactivity of the hydrocarbon species in the exhaust of different vehicle/fuel systems can vary considerably. As set forth in the LEV regulations, RAFs are based on a comparison of the relative reactivity of NMOG emissions from a vehicle operating on a clean fuel to those of a comparable vehicle operating on conventional gasoline. In order to establish a reactivity factor, the baseline "specific reactivity" for each emission category (TLEV, LEV, ULEV) is obtained based on test results from circa 1990 vehicles using conventional gasoline and prototype electrically-heated catalyst systems. The specific reactivity of low-emission vehicles operating on clean and nonconventional fuels (e.g., Phase 2 reformulated gasoline (CaRFG), compressed natural gas, or liquefied petroleum gas) is then obtained for each vehicle/fuel category (e.g., an LEV operating on CaRFG). A RAF reflects the ratio of these two values as follows:

$$\text{RAF} = \frac{\text{Specific reactivity of nonconventional fuel low-emission vehicle}}{\text{Specific reactivity of conventional gasoline low-emission vehicle}}$$

The underlying basis for the RAF mechanism was described on page 18 of the August 13, 1990 Staff Report for the Proposed Regulations for LEVs and Clean Fuels:

> For the first time, reactivity adjusted emission standards are proposed. Reactivity adjustment is necessary to properly recognize the inherently lower ozone-forming potential of emissions from vehicles powered by fuels cleaner than conventional gasoline. Alternate fueled vehicles may emit similar amounts of hydrocarbons as gasoline-fueled vehicles, but the capacity of the emissions to form ozone can differ significantly. To allow all fuels to be evaluated on the *same air quality basis*, the so-called "level playing field," it is necessary to establish hydrocarbon standards in terms of ozone-forming potential rather than actual mass of emissions.
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> Emissions of ozone precursors and toxic air contaminants result from the interaction of the vehicle and its fuel. Whereas previous regulations have established standards for vehicles and fuels separately, this proposal considers the two components as parts of a single system -- a vehicle/fuel system. Although the technological feasibility of the emission standards being proposed is based on the performance of very advanced vehicles operating on gasoline, to accommodate the diversity of technologies that may be developed to meet the proposed standards, emission standards need to be set in a way that will be *equally stringent* for all vehicle/fuel systems. Of the pollutants currently regulated, the greatest differences between vehicle/fuel systems occur in emissions of hydrocarbons. Both the mass and ozone-forming potential of hydrocarbon emissions can differ significantly among the various vehicle/fuel systems, and both need to be considered in order to *equalize their effects* on an air quality basis. (emphasis added)

In 1992, WSPA challenged the basis for the RAF mechanism and the RAF of 0.41 for M85 TLEVs. At the heart of WSPA's argument was the claim that because the 0.41 RAF for M85 TLEVs would allow these alternative fuel vehicles to emit more than twice the mass NMOG allowed for a conventional gasoline TLEV, the RAF for M85 TLEVs and the whole RAF mechanism will lead to significant adverse air quality impacts not adequately considered by the ARB. AAMA intervened in support of the ARB's regulations on RAFs, noting that although a M85 TLEV is allowed to emit more mass NMOG than a conventional gasoline TLEV, both vehicles will have an equal impact on ozone formation because the greater mass NMOG emissions from the M85 vehicle will be offset by the lower specific reactivity of those emissions.

It is essential, however, for the specific reactivity of the emissions from each nonconventional fuel to be characterized correctly in order to avoid adverse air quality impacts. If the ARB were to "cap" the RAF for vehicles certified using CaRFG at 1.00, despite data indicating a real-world value of more than 1.00, then the fundamental theoretical underpinning of the RAF mechanism would disappear because the ARB would be allowing CaRFG-fueled LEVs to cause more ozone than vehicles in the same emission category certified on other fuels. To maintain the integrity of the RAF mechanism, the ARB must be willing to set RAFs above 1.00, as well as below 1.00, if indicated by the data. This is particularly important in the case of a fuel

such as CaRFG which is attractive to vehicle manufacturers because of its low mass NMOG emissions.

In this rulemaking, as in previous rulemakings, the *numerator* of the RAF equation has been based on the speciated exhaust of prototype LEVs operating on clean fuels because actual production LEVs have not yet been available. This was done in order to provide manufacturers with a clear target for the development of future LEV emission control strategies. However, throughout the development of the LEV program we have indicated that if subsequent tests of actual production low-emission vehicles demonstrate that the adopted specific reactivity of low-emission vehicles operating on clean fuels has been either underestimated or overestimated, the staff intends to propose future changes to the specific reactivities to more accurately characterize the reactivity of the technology used on the production vehicles. For instance, the September 27, 1991 Staff Report for the November 14, 1991 hearing on amendments to the RAF provisions and adoption of the initial RAF for M85 TLEVs stated on page 22:

> In addition to testing new vehicle/fuel systems for reactivity, the ARB staff will continue testing to verify the applicability of existing reactivity adjustment factors. As additional preproduction or production clean fuel vehicles become available, the reactivity of their emissions will evaluated. *If, based on the data accumulated, the Executive Officer finds that an established reactivity adjustment factor is no longer representative of actual production vehicles, the reactivity adjustment factor will be revised.* An amendment to the regulations is proposed to ensure that the affected industries and public will be notified at least three years before the new adjustment factor becomes effective, although vehicle manufacturers would have the option of using the revised reactivity adjustment factor immediately after its establishment for certifying any new engine families. Furthermore, to mitigate the time and expense of recertifying the engine family, the proposed regulations allow manufacturers to continue using the original reactivity adjustment factor until new durability data are generated. (emphasis added)

This passage makes it clear that vehicle manufacturers have been on notice for at least four and one half years of the ARB's intent to reevaluate the initially-adopted RAFs once data from production nonconventional fuel TLEVs and LEVs become available.

The *denominator* of the RAF equation represents the baseline specific reactivity values for conventional gasoline low-emission vehicles. The ARB has consistently made clear that the denominator of the RAF equation is to be based on the specific reactivity of the sorts of prototype conventional gasoline low-emission vehicles equipped with the advanced emission control technologies used in the ARB's 1990 technological feasibility demonstrations. Because the baseline specific reactivity is intended to reflect what was considered technologically feasible in 1990, it is not subject to periodic reviews as production low-emission vehicles become available. Thus Resolution 93-3, adopted by the Board at its January 14, 1993 hearing, expressed the Board's intent that any proposed revisions to the baseline reactivity values for LEVs and ULEVs

must not reduce the stringency of the adopted emission standards, except as may result from improved test methods and data analysis. (See p. 29 of the September 1993 Final Statement of Reasons.)

13. **Comment:** We would also point out that one fuel which may be employed in the near future in California (i.e., E85) is missing from the RAF table, because staff lacked sufficient data. AAMA has now provided the staff with data to fill this void. These Auto/Oil data suggest an E85 RAF of 0.69. We ask the Board to add this fuel to the RAF Table. (AAMA, GM)

Agency Response: The data provided to staff were very limited (two tests on two vehicles that were not low-emission vehicles) and did not meet the criteria applied to other vehicles and fuels when establishing the reactivity factors. For these reasons, it would be premature to adopt a factor based on the current limited and questionable test data. Staff will propose a reactivity factor for E85 vehicles once data from qualifying vehicles become available.

14. **Comment:** We believe that extending the interim RAFs through the 2003 model year as proposed by AAMA is a constructive step in helping foster regulatory, as well as fuel, flexibility. Thus we recommend that the RAFs proposed by the staff through the 2000 model year be extended through the 2003 model year, and that any changes to RAFs be considered as part of the post-2003 LEV program rulemaking. (GM, SCAQMD)

Agency Response: We believe that five years is sufficient lead time for manufacturers to design and develop low specific reactivity technologies for low-emission vehicles. However, staff will be continually monitoring progress in this area and will evaluate the need for an extension of the RAFs at the next biennial review.

15. **Comment:** It is also helpful that the staff has identified the possibility that the baseline specific reactivity used to specify the ozone per gram potential of vehicles operating on Phase II gasoline may be higher than currently assumed. Given the importance of achieving the baseline specific reactivity assumed in the ARB's LEV program, it would be wise to obtain more data on in-use vehicles as new technology vehicles are introduced. The Board may also want to consider providing manufacturers limited flexibility in substituting their own baseline reactivity factors for thoroughly tested engine families if such testing shows a significant difference compared to the assumed generic factor. As noted in the Staff Report, six of the eight light-duty vehicles which were tested for their baseline specific reactivity (shown in Table III-9 of the ARB Staff Report) have ozone per gram values above the assumed generic baseline level of 3.13 grams ozone per gram of exhaust. (SCAQMD)

Agency Response: We agree that more data on in-use vehicles would be appropriate and informative as the LEV program progresses. Staff intends to continually monitor the progress of

the LEV program and to update the RAFs if necessary as production low-emission vehicles become available for testing. However, for the reasons stated above in the Agency Response to Comment No. 13, the baseline is a fixed value and represents a benchmark that all future low-emission vehicles must meet or exceed. This baseline is fixed in order to protect the public health of the citizens of California and to prevent a *de facto* relaxation of the ozone standard. Furthermore, the data that this commenter is referring to were not used for the development of the 3.13 baseline value. These vehicles were chosen to demonstrate that the amendments to the NMOG Test Procedures proposed in the 1993 rulemaking did not affect the RAFs that had already been adopted by the Board in the 1991 rulemaking. In fact, most of these vehicles were used to establish the 3.42 baseline for TLEVs and not the 3.13 baseline for LEVs.

D. Miscellaneous

16. **Comment:** We do not support the ARB's proposal to remove the requirement for a luminosity additive in the specification for M100 fuel methanol. Although we agree with staff's conclusion, based on the study conducted by the U.S. EPA, that the risk of an M100 fire is low, the risk has not been eliminated, and will increase with the growing acceptance of M100 fueled vehicles. In addition, the serious consequences of an M100 fire have not diminished. The fact is, if M100 does catch fire, the flame will be virtually invisible, and could lead to serious injury to unsuspecting accident victims and firefighters.

Staff also asserts that the risk of a M100 fire is further mitigated by the fact that M100 vehicles are fleet vehicles which are fueled at a central location by trained personnel. In the Staff Report, staff states that "the risk would be very low that an untrained person would come in contact with an M100 fuel spill or fire." We disagree with this logic. First, the fact that trained personnel are used to refuel M100 vehicles will not reduce the exposure of unsuspecting accident victims and firefighters if an M100 fire were to occur as a result of M100 vehicle accident on a public highway. Second, as M100 vehicles grow in acceptance and the fuel becomes more widely available, it is likely that their use will grow beyond fleet applications, thereby increasing the exposure to M100 fires by the untrained or unsuspecting public.

We do not agree that the reduced risk of M100 fires should be used as basis to remove the luminosity requirement for M100 fuel methanol. We recommend that the luminosity additive requirement for M100 fuel methanol remain intact and that the requirement for fire suppression systems be used as a substitute until a suitable luminosity additive is identified. (Unocal)

Agency Response: Even though the risk of an M100 fire has not been completely eliminated, there are no motor vehicle fuels which are completely without risk. It is clear, based on the risk assessment conducted by staff, that the risk of an M100 fire is less than that of a gasoline fire and essentially the same as the risk of a fire for diesel fuel vehicles. For this reason, we believe it is reasonable to remove the luminosity additive and fire suppression equipment requirement.

17. **Comment:** Nissan proposes that the interim in-use standard period be extended to the 2001 model year for LEVs and to the 2004 model year for ULEVs and that the existing standards not change during these periods. Under the current proposal there is not adequate time to receive and utilize feedback which will confirm the effectiveness of the new emissions control system in customer use. Nissan proposes that the current interim in-use standard for LEVs of 0.100 g/mi be extended through the model year 2001 and similarly the ULEV standard of 0.058 g/mi be extended through the model year 2004. These should both be 50,000 mile standards, and 100,000 mile standards should not apply. (Nissan)

Agency Response: We believe that allowing an intermediate in-use compliance standard for the first two model years of introduction is reasonable and gives manufacturers adequate time to evaluate new technologies in-use. However, we do concur that adding an in-use standard for LEVs for 1999 which is different than the 1998 standard and is effective for only one year adds an unnecessary complication to the regulations. Therefore, we have modified the 1999 LEV interim in-use standard for NMOG to make it 0.100 g/mi instead of 0.090 g/mi.

18. **Comment:** Nissan proposes a 2.5 or higher value for the 50°F multiplier for ULEVs rather than the 2.0 proposed in this rulemaking. (Nissan)

Agency Response: Based on test data, we believe that 2.0 multiplier for LEVs and ULEVs is a reasonable value. However, staff will continue to monitor this requirement as more production LEVs and ULEVs become available.

IV. SUMMARY OF PUBLIC COMMENTS AND AGENCY RESPONSES -- FIRST NOTICE OF PUBLIC AVAILABILITY OF MODIFIED TEXT

During the first 15-day comment period, which ended November 3, 1995, written comments were received from AAMA, EMA, the California Motor Car Dealers Association (CMCDA), and The Gas Company.

A. Medium-Duty SIP Proposal

19. **Comment:** As a result of the cooperative efforts between representatives of EMA and ARB, EMA has just one remaining concern regarding the pending amendments as they relate to heavy-duty Otto-cycle engines. More specifically, the proposed amendments to Title 13, California Code of regulations, section 1956.8(c)(3) -- "Exhaust Emission Standards and Test Procedures - 1985 and Subsequent Model Heavy-Duty Engines and Vehicles" -- would set a CO standard of 14.4 g/bhp-hr for new 2004 and subsequent model heavy-duty Otto-cycle engines. This standard is markedly different from the applicable federal CO standard for 2004 and subsequent model engines, which is 37.1 g/bhp-hr. This creates a clear conflict between the proposed ARB standard and the federal EPA standard.

This clear conflict between the ARB and U.S. EPA standards is violative of the letter and spirit of the comprehensive SOP recently entered into among U.S. EPA, ARB and the engine industry regarding future emission regulations for heavy-duty on-highway vehicles. A fundamental tenet of the SOP is a harmonization of ARB and federal requirements. To that end, U.S. EPA and ARB specifically agreed in the SOP not to increase the stringency of the CO standard (or the diesel PM standard) beyond the current levels for the 2004 model year. This agreement was an essential component of the engine manufacturers' commitment to attempt to meet the stringent NMHC + NOx standard set forth in the SOP. In addition, the conflict between the ARB and CO standards is at odds with the separate discussions and agreement between the engine industry and ARB to pursue harmonization through a negotiated implementation of the MDV rule. The proposed 14.1 g/bhp-hr standard obviously is not harmonized with U.S. EPA's 37.1 g/bhp-hr standard, and therefore is contrary to the SOP and to the discussions that EMA representatives had with Tom Cackette and members of the ARB staff.

Accordingly, to correct this discrepancy, and to harmonize the ARB and EPA standards as the Board and all other parties have intended and agreed, EMA urges ARB to change the 2004 model year heavy-duty Otto-cycle CO standard to 37.1 g/bhp-hr. (EMA)

Comment: The 2004 and later model year Otto-cycle HDE CO standard proposed is not consistent with the provisions in the SOP agreement. In the SOP, U.S. EPA and ARB agreed not to increase the stringency of the CO and diesel PM standards beyond current levels for the 2004 model year standards. This trade off was essential for HDE manufacturers as they attempt to meet the stringent NMHC + NOx standard in the SOP.

Shortly before the September 28 ARB hearing, staff informed AAMA that they planned to incorporate standards consistent with the SOP for the diesel/incomplete medium-duty vehicle and Otto-cycle HDE categories in their proposal. However, in staff's suggested changes to the original proposal distributed at the hearing, staff proposed a 2004 model year CO standard of 14.4 g/bhp-hr for over 14,000 pound Otto-cycle HDEs. This standard is much more stringent than the current CO standard of 37.1 g/bhp-hr for this category. AAMA recommends correcting the apparent error by changing the 2004 model year Otto-cycle HDE CO standard to 37.1 g/bhp-hr. (AAMA)

Agency Response: Based on these comments and material in the record, we have modified the CO standard for 2004 and subsequent model-year Otto-cycle HDEs over 14,000 pounds from 14.4 g/bhp-hr to 37.1 g/bhp-hr. (§ 1956.8(c)(3).) This is identical to the preexisting CO standard for this weight class in the 2004 and subsequent model years.

20. **Comment:** Generally, the Gas Company believes that relaxation of California's engine-certified MDV emission standards in order to "align" with the U.S. EPA's proposed standards provided in the SOP is inappropriate and counter to the intent of the congressionally

approved provisions of the Clean Air Act. The SOP is in a very early stage of the rule development process and it is hoped that significant modifications will be incorporated prior to final rulemaking that ensure maximum emission reductions are achieved from mobile sources. (the Gas Company)

Agency Response: The relaxation the commenter is referring to is the increase in the particulate and CO standards from 0.05 and 7.2 g/bhp-hr to 0.10 and 14.4 g/bhp-hr respectively for medium-duty ULEVs certified to the optional heavy-duty engine standards. (§1956.8(h)(2).) The revised particulate and CO standards for ULEVs in this class are identical to the standards for LEVs in this category. As explained in the response to comment 2, NOx controls generally increase emissions of particulate and CO, and the relaxation of the ULEV particulate and CO standards has been included to give manufacturers a greater chance of success in developing low NOx strategies to meet the substantially more stringent NOx requirements the Board is adopting. The benefits from the substantial NOx emission reductions achieved by this rulemaking clearly outweigh the much smaller increases in CO and PM standards.

21. **Comment:** Furthermore, it should be noted that ARB's commitment to the SOP was not publicly noticed and approved and emission standard amendments based on this document seem to circumvent the public notice process. (the Gas Company)

Agency Response: The SOP was a statement of intent to propose nationwide emission standards; it was not part of a rulemaking. The basis for the various amendments the ARB is making to the medium- and heavy-duty standards in this rulemaking has been set forth in the Staff Report, the staff's presentation at the hearing, and this Final Statement of Reasons. The proposed amendments were properly noticed and interested parties have had a full opportunity to comment on the originally proposed amendments and all subsequent modifications. Thus the ARB has in all respects complied with the California Administrative Procedure Act.

22. **Comment:** The Gas Company submitted strong objection to the SOP to U.S. EPA during the Advanced Notice of Proposed Rule-Making public comment period. The Gas Company is strongly opposed to the SOP because it significantly reduces required reductions from heavy-duty mobile sources. Reductions from heavy-duty mobile sources are a critical component to California's attainment strategy and as the primary supplier of fuel for stationary sources in the South Coast Air Basin, we are extremely concerned that industry will be unfairly burdened with this responsibility. The Gas Company's submission to U.S. EPA is attached and incorporated by reference. (The Gas Company)

In conclusion, the Gas Company urges delay of any regulatory amendments based on the SOP until: 1) EPA has concluded its publicly reviewed rule-making process and the final form of the EPA program is fully developed; and 2) the lost reductions are fully and enforceably restored to the mobile sources from which they were removed. (the Gas Company)

Agency Response: We do not agree that the adopted amendments significantly reduce the emission reductions required from heavy-duty mobile sources. As discussed in the response to Comment 1, the NOx emissions reductions that will result from the amended requirements for chassis-certified and engine-dynamometer-certified MDVs be slightly greater than the reductions that would have occurred from the MDV NOx emission controls in the SIP -- 23.9 tpd vs. 23.5 tpd in the South Coast Air Basin, using the preexisting MDV NOx requirements as the baseline. As discussed in the response to Comment 2, the limited relaxation of the ULEV standards for particulate and CO are justified by the needed and substantial NOx emission reductions.

Postponing the rulemaking would be unwise because it would reduce the leadtime available to manufacturers to meet the standards. The adopted amendments include provisions stating that within one year of U.S. EPA's promulgation of amendments to the standards for heavy-duty engines, the ARB will conduct a noticed hearing to consider similar or identical California standards.

B. Smog Index Label

23. **Comment:** The ARB does not have the statutory authority to unconditionally require inclusion of a smog index on the window label of 1998 and subsequent model year light-duty vehicles. As originally proposed by ARB staff, the smog index requirements were to apply *only* after two conditions occurred. These two conditions tracked precisely the conditions specified by the Legislature in Section 32 of Senate Bill 2050 (Stats. 1994, ch. 1192). However, the regulations ultimately adopted by the Board made the smog index labeling requirements effective starting with the 1998 model year, regardless of whether these conditions have been fulfilled. The regulations adopted by the Board also provide for a permanent smog index program, even though SB 2050 only authorizes a temporary 5-year program.

The ARB does not have the legal authority to do this. The conditions specified in SB 2050 have not been met, and the provisions of the bill remain inoperative. The sections cited by the ARB -- Health and Safety Code sections 39600, 39601 and 43200 -- do not authorize the ARB to bypass the specific limitations contained in SB 2050. Even if the ARB had the authority to implement a smog index label requirement prior to the enactment of SB 2050, this authority has been preempted by the bill. The ARB's disregard of the subsequent legislative direction is arbitrary and capricious, and violates the basic constitutional principle of separation of powers. The Legislature has spoken directly to the issue of the applicability of the smog index labeling requirements. The ARB's proposed adoption of the requirements outside of these statutory limitations is illegal, and the proposed changes should not be adopted. (AAMA, CMCDA)

Agency Response: The ARB is authorized to adopt a smog index label program by Health and Safety Code sections 39600, 39601, and 43200. Sections 39600 and 39601 give the Board broad authority to adopt regulations and to ". . . do such acts as may be necessary for the

proper execution of the powers and duties granted to, and imposed upon the state board . . . ." Section 43200 more specifically authorizes the Board to adopt regulations requiring window labels to be affixed to new motor vehicles:

> "43200. The state board may adopt a regulation to prohibit the sale and registration in this state of any new motor vehicle . . . to which there has not been securely affixed on a side window .. by the manufacturer a decal on which the manufacturer shall endorse . . . true and correct entries disclosing the following information concerning such motor vehicle: . . . the exhaust emissions . . . based on certification fleet data . . . ."

The smog index labeling regulation accomplishes this statutory objective. The regulation requires that window labels be attached to new motor vehicles disclosing the smog-forming potential of emissions produced by the vehicle, relative to other vehicles. The smog index numbers are based on motor vehicle certification data. The information is presented in a graphical form so that it can be readily understood by consumers and can be used by them to help make purchasing decisions. Section 43200(b) further provides that such a regulation may be adopted only if the Board finds that the regulation is either: ". . . (1) necessary to enforce or assure compliance with applicable statutes, standards, or procedures relating to vehicle emissions, *or* (2) necessary for the protection and information of consumers." (emphasis added) To fulfill this statutory requirement, finding (2) was made by the Board (see page 5 of Resolution 95-40).

The preceding discussion shows that the ARB has the authority to adopt a smog index labeling regulation. The ARB has had this authority since at least 1975, when the basic provisions of sections 39600, 39601, and 43200 were recodified by the Legislature (Stats. 1975, ch. 957). The central legal issue raised by the commenters is whether it can reasonably be concluded that SB 2050 was intended by the Legislature to preempt, impose new limits upon (i.e., amend by implication), or partially repeal by implication, the ARB's preexisting authority.

The commenters are not entirely clear in explaining their conclusion that SB 2050 was intended to preempt or limit the ARB's longstanding authority. The commenters appear, however, to be relying on general principles of statutory construction that, "a special statute dealing expressly with a particular subject takes precedence over a conflicting general statute on the same subject" (ALRB v. Superior Court, 16 Cal.3d 392, 420 (1976) and "the latest legislative expression prevails, and the prior law yields to the extent of the conflict." (Governing Board v. Mann, 18 Cal.3d 819, 828 (1977). However, the principles of statutory construction also state that these maxims have no application unless the two statutes are fundamentally inconsistent and cannot be harmonized. These principles also state that a legislative scheme must be construed whenever possible to harmonize its various parts, and that whenever possible seemingly conflicting provisions should be reconciled to give effect to both. (Natural Resources Defense Council v. Arcat Nat. Corp., 59 CA3d 959, 965 (1976).

There is an obvious way to harmonize these two statutory provisions and give effect to

both SB 2050 and Health and Safety Code section 43200. SB 2050 states that the ARB *shall* adopt regulations establishing a smog index program if certain conditions are met (see Health and Safety Code section 44254 and Section 32 of SB 2050). By contrast, Health and Safety Code section 43200 states that the Board *may* adopt a regulation establishing such a program. SB 2050 imposes a mandatory duty on the Board (if certain conditions are met), while section 43200 gives the Board the discretionary authority to establish a program. This is such a straightforward way to harmonize these two statutes that there is absolutely no reason to interpret them as being in conflict. Therefore, the principles of statutory construction require that both statutes must be given effect.

Another way of framing the issue is to ask whether in enacting SB 2050 the Legislature intended to amend by implication (i.e., impose new implied limitations on) or partially repeal by implication the ARB's preexisting authority to adopt a smog index labeling program. There is no language in SB 2050 expressly limiting or repealing the ARB's authority. By merely requiring the ARB to adopt a smog index label program if certain conditions are met, the bill simply does not address the issue of whether the ARB's longstanding discretionary authority to adopt such a program is to be limited or repealed. Any such amendment or repeal must therefore be assumed by implication from the statute.

The case law is well settled regarding the circumstances in which a statute operates to repeal an agency's authority by implication. In Western Oil and Gas Association v. Monterey Bay Unified Air Pollution Control 49 Cal.3d 408, 261 Cal.Rptr. 384, 77 P.2d 157 (1989) the California Supreme Court stated:

> ". . . All presumptions are against repeal by implication . . . The presumption against implied repeal is so strong that 'To overcome the presumption the two acts must be irreconcilable, clearly repugnant, and so inconsistent that the two cannot have concurrent operations' . . . There must be no possibility of concurrent operation . . . implied repeal should not be found unless . . . the later provision gives undebatable evidence of an intent to supersede the earlier . . . ." 49 Cal.3d 408, 419-420.

No language in SB 2050 comes even close to overcoming the very strong presumption stated by the California Supreme Court in the WOGA case. Nor is there any legislative history that would support a conclusion that the Legislature intended to limit the ARB's authority -- certainly not the "undebatable evidence" of this intent that the WOGA court requires. It must therefore be concluded that SB 2050 does not by implication limit or partially repeal the ARB's existing authority to adopt a smog index labeling program.

24. **Comment:** AAMA understands that the Smog Index Label requirement should allow manufacturers to label vehicles during the production process. In other words, no labeling is required after production. Labeling during production ensures accuracy of the labels and avoids

costly and burdensome post-production labeling by the manufacturers or dealers. The following example illustrates this important point for a dealer trade.

> Assume, for a 50-state certified engine family, a manufacturer places smog index labels on vehicles ordered by California dealers and does not place smog index labels on vehicles ordered by non-California dealers. If a Nevada dealer then trades a vehicle from this family to a California dealer, the vehicle from the Nevada dealer should not have to be labeled even though it will be sold by a California dealer.

To make this explicitly clear, we recommend that the Label Specifications be clarified to state that: "The specifications for smog index labels shall apply to all new passenger cars and light-duty trucks *produced for sale in California*." (AAMA)

Agency Response: We do not agree that the commenter's suggested revision is appropriate. The purpose of the smog index label is to provide consumers with a mechanism for determining the relative contribution of a vehicle to ozone formation, as compared to other vehicles offered for sale on a dealer's lot. This information allows consumers to make an informed choice when they buy a vehicle. For this reason, all new vehicles sold in California should display a smog index label. As long as the label appears on each new vehicle offered for sale on a dealer's lot, it is up to the manufacturer and the dealer to work out the point in the production process when this labeling occurs.

25. **Comment:** The curved line between the 0 to 10 scale and the 0 to 1 scale seems to be unnecessary, is undefined, and would be very difficult to program for the wide range of engine families. Additionally, based on label size and space constraints, it may be desirable to place both scales side-by-side rather than on top of one another. The following wording should adequately explain the two scales and eliminate the need for the curved line: "The Smog Index for all vehicles ranges from 0 (lowest polluting) to 10 (highest polluting), with new vehicles ranging from 0 to 1." (AAMA)

Comment: We are also very concerned about the amount of space the label will take, and expect that ARB will be open to alternatives that take up less space, including the use of one visual scale, if such alternatives effectively communicate the desired information. (AAMA)

Agency Response: The original proposal required that the smog index label must take the form set forth in the Label Specifications. In order to provide manufacturers with greater flexibility, this requirement has been modified to allow an alternative label to be used if it is shown to be at least as clear as the specified form and is approved in advance by the Executive Officer. This modification should address manufacturers' concerns, in that they will not be required to use an exact replica of the label as it appears in the Label Specifications. To further address the commenter's concerns, the appearance of the label has modified to be less complex than the version mentioned by the commenter (which is the version that was proposed in connection with

the first 15-day Notice of Public of Availability of Modified Text.) The finally adopted version of the label is very similar to the simpler version that was originally proposed; the difference is that the revised label has shading in the portion of the smog index display that is to the left of the value for the vehicle on which the label is affixed, in order to make this value more prominent.

26. **Comment:** Sections 5, 6, and 7 of the Label Specifications were originally meant to apply to vehicle emissions control labels and do not appear necessary for Smog Index Labels. However, the way in which the Smog Index Label requirements were added to these specifications implies that these sections should apply to Smog Index Labels as well. In particular, it does not appear necessary for manufacturers to submit actual production labels to the Executive Officer for all possible combinations, when the only change will be the Smog Index number. AAMA recommends ARB clarify that these sections apply to vehicle emission control labels only. (AAMA)

Agency Response: For the reasons stated by the commenter, Section 7 has been modified to clarify that it applies only to emission control labels and not smog index labels. For identical reasons, the same modification has also been made to Section 8 (although the commenter did not specifically request that Paragraph 8 be modified). However, it is not appropriate to modify Sections 5 and 6. Section 5 contains a definition for the term "readily visible". Since the Label Specifications require that smog index labels be affixed in a "readily visible" location (see Section 3.5 of the Label Specifications), it is useful to have a definition of this term that applies to both emission control and smog index labels. Section 6 specifically provides that it applies only to "the tune-up label and vacuum hose routing diagram label." This explicit language makes further clarification unnecessary.

V. SUMMARY OF PUBLIC COMMENTS AND AGENCY RESPONSES -- SECOND NOTICE OF PUBLIC AVAILABILITY OF MODIFIED TEXT

During the second 15-day comment period, which ended February 29, 1996, written comments were received from AAMA, CMCDA, and Chrysler.

A. Medium-Duty SIP Proposal

27. **Comment:** The changes made to Section 3.j. of the LDV/MDV Test Procedures could lead to significant confusion. Specifically, the changes to Section 3.j. Footnote (9) state that the intermediate in-use standards for medium-duty vehicles begin in 1998 model year whereas they began in 1992 model year under the original regulation. The new wording pertaining to 1998 model year raises the question of what the intermediate in-use standards are in the 1996 and 1997 model years. While Chrysler would interpret the new wording to mean that there is no in-use requirement prior to the 1998 model year for LEVs or ULEVs, we request the actual regulatory text be modified to clarify the Air Resources Board's intention. (Chrysler)

Agency Response: We agree that the language should be clarified, and have done so in modifications to section 1960.1(h)(2) notes (3) and (9), and to the LDV/MDV Test Procedures, section 3.j. notes (3) and (9). In the example given by the commenter, the 50,000 mile intermediate NMOG standards for LEVs and ULEVs apply to all model years through 1999; the 50,000 mile intermediate NOx standards for LEVs and ULEVs apply to all model years through 2000.

B. Smog Index Label

28. **Comment:** After reviewing the modifications proposed in connection with the Second Notice of Public Availability of Modified Text, we would like to reiterate our objections regarding the Smog Index Label Specifications. We continue to believe that the conditions contained in the Smog Index Label Bill (SB 2050), passed on September 30, 1994, limit ARB's authority to require a Smog Index Label until certain conditions are met. We repeat the legal analysis and conclusions set forth in our earlier comments. (AAMA, CMCDA)

Agency Response: See Agency Response to Comment No. 24, above.

ATTACHMENT 1

Description of Nonsubstantive Changes Made After the 15-Day Comment Periods

Set forth below are descriptions of the nonsubstantive changes made to the regulations and incorporated documents after the third 15-day comment period.

I. **Title 13, California Code of Regulations**

A. Section 1960.1

1. Throughout: Underline the "." at the end of headings in the footnotes to tables; italicize headings of tables contained in the footnotes to tables.

2. § 1960.1(e)(3): In second line, replace "super-low-emission vehicles" with "super-ultra-low-emission vehicles".

3. § 1960.1(g)(1): In introductory paragraph, change "vehicles shall not exceed:" to "vehicles in the passenger car and light-duty truck classes shall not exceed:", to make text parallel to the standards table.

4. § 1960.1(g)(1) Table: eliminate underlining of footnote numbers accompanying headings (compared to text available with second 15-day notice).

5. § 1960.1(g)(1), notes (4)(b) and (6)(b): Underline contents of table (compared to text available with second 15-day notice).

6. § 1960.1(g)(1), note (6): change "for 50,000 miles and 100,000" to "for 50,000 and 100,000 miles".

7. § 1960.1(g)(2), note (6): change "*Requirement*." to "*Requirements.*"

8. § 1960.1(g)(2), note (6)e.: change "MDVs" to "~~MDWs~~ MDVs" to indicate the correction of an error in Barclays.

9. § 1960.1(h)(2) Table: In caption of table, change periods between footnote numbers to commas. In captions of columns, delete underlining of footnote numbers.

10. § 1960.1(h)(2) note (3): Insert comma after "last amended" to reflect preexisting language.

11. § 1960.1(h)(2) note (9)b.: Underline colon in third line; change "ULEVs through the" to "ULEVs and through the".

12. § 1960.1(h)(2) note (10)b.: The contents of the table have been underlined.

13. § 1960.1(h)(2) note (12): Underline comma in fourth line.

14. § 1960.1(h)(2) note (15): Underline heading.

15. § 1960.1(k): Update reference to date of most recent amendments.

B. Section 1956.8

1. Throughout, change "otto-cycle" to "~~o~~Otto-cycle".

2. § 1956.8(c)(1): In introductory paragraph, change "new 1987 and subsequent model" to "new 1987 ~~and subsequent~~ through 2003 model", to reflect the contents of the table.

3. §§ 1956.8(c)(3) Note A, and (h), Note G: Revise text to reflect the fact that U.S. EPA has preexisting heavy-duty Otto-cycle engine emission standards and is considering amendments to those standards, and to add "]" at end.

4. § 1956.8(d) Insert date the Test Procedures were last amended.

5. § 1956.8(h) Italicize headings in table.

6. § 1956.8(h), note A: change "pounds," to "pound~~s~~ to improve syntax.

C. Section 1965

1. Delete "required by Health and Safety Code Section 43200.5."

D. Section 2061

1. Update the reference to the incorporated old Assembly-Line Test Procedures to reflect the fact that, starting with the 1998 model year, they are superseded by the new Assembly-Line Test Procedures incorporated by reference in new section 2062.

II. California Exhaust Emission Standards and Test Procedures For 1988 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles

1. Throughout: change "otto-cycle" to "Otto-cycle".

2. Page 6-1, § 6.a.2., line 9: change "LEVs ~~and~~ ULEVs, and SULEVs" to "LEVs, ~~and~~ ULEVs, and SULEVs".

3. Page 10-1, § 10, Introductory paragraph: change “section (3)” to “section 3”.

4. Page 10-3, § 10(b), first paragraph: change “100,100,000” to “100,000” to correct typographical error.

5. Appendix VIII(a), last line: change “section 9.a.(1)” to “section 9.a.~~(~~1~~)~~.”

III. **California Exhaust Emission Standards and Test Procedures For 1987 and Subsequent Model Heavy-Duty Otto-Cycle Engines and Vehicles**

1. Face sheet: insert “ Amended: September 22, 1994".

2. Facesheet and §§ 86.098-02 and 86.098-10: Revise Note and text to reflect change in the convention used to show the amendments adopted June 29, 1995.

3. Page 4, at end of § 86.091-2, and page 8, at end of § 86.098-10: delete “# # # # #”.

4. Pages 6-7: In § 86.098-10, use italics where italics appear in the federal regulation.

5. Page 6, § 86.091-10 (a)(4): delete subsection (a)(4), which was originally proposed to be added. This change reflects and is consistent with the deletion of originally proposed note G in the table in § 1956.8(c)(1).

6. Page 7, underline “ADD SUBPARAGRAPH (f) WHICH READS:”

7. Page 7, subsection (f)(2), line 8, change “emission” to “emissions”.

8. Page 16, in § 86.1313-90, change “SUBPARAGRAPH (A)(1)” TO SUBPARAGRAPH (a)(1)”, to correct typographical error.

9. Pages 19-21: In §§ 86.1313-90(a)(3)(ii)(B), (e)(1)(ii), and (e)(2)(i), change “**Emission-test**” to “**Emission-testing**”.

IV. **California Motor Vehicle Emission Control and Smog Index Label Specifications**

1. Page 1, §1., lines 7-8: change “and (2) to require that smog index labels be affixed to motor vehicle windows as provided in Health and Safety Code section 43200.5" to “and (2) to require that smog index labels be affixed to motor vehicle windows.”

2. Page 8, § 3.5: In the sentence following the label form, change “1995" to “1998" to reflect the change in the model year when the smog index label requirements become applicable per §2.(b).

V. **California Assembly Line-Test Procedures For 1983 Through 1997 Model-Year Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles**

1. Add a new amended date, and change the title and first paragraph to provide that the document applies to “1983 through 1997" rather than “1983 and subsequent” model-year passenger cars, light-duty trucks and medium-duty vehicles. Make similar conforming changes on pages 6 and 14.

2. Page 4, § 1.(g): change “California Administrative Code (C.A.C.)” to “California ~~Administrative~~ Code of Regulations (~~C.A.C.~~CCR).”

3. Page 8, fourth paragraph, last two lines: change “Section 2110, Chapter 3, Title 13 of the C.A.C.” to “CCR, Title 13, Section 2110 ~~Chapter 3, Title 13 of the C.A.C~~.”

4. Page 8, § 2.(c)(1), second line: change “California Code of Regulations” to “~~California Code of Regulations~~ CCR”.

5. Page 12, third full paragraph: change “Section 2109, Chapter 3, Title 13 of the CCR,” to “Section 2109, ~~Chapter 3,~~ Title 13 of the CCR,”

6. Page 19, third line: change “C.C.R,” to “~~C.C.R~~ CCR,”.

IV. **California Assembly Line-Test Procedures For 1998 and Subsequent Model-Year Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles**

Page 16, § C.5.(e), third to last line: change “SLEV” to SULEV” to reflect the change in nomenclature.