

State of California
AIR RESOURCES BOARD

**Final Statement of Reasons for Rulemaking,
Including Summary of Comments and Agency Response**

PUBLIC HEARING TO CONSIDER TECHNICAL STATUS AND PROPOSED REVISIONS TO MALFUNCTION AND DIAGNOSTIC SYSTEM REQUIREMENTS AND ASSOCIATED ENFORCEMENT PROVISIONS FOR PASSENGER CARS, LIGHT-DUTY TRUCKS, AND MEDIUM-DUTY VEHICLES AND ENGINES (OBD II) AND EMISSION WARRANTY REGULATIONS

Public Hearing Date: September 28, 2006
Agenda Item No.: 06-8-4

I. GENERAL

The Staff Report: Initial Statement of Reasons for Rulemaking (ISOR or "Staff Report"), entitled *Technical Status and Revisions to Malfunction and Diagnostic System Requirements for Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles and Engines (OBD II) and the Emission Warranty Regulations*, released August 11, 2006, is incorporated by reference herein.

Following a public hearing on September 28, 2006, the Air Resources Board (the Board or ARB) by Resolution 06-26 approved, with modifications, the adoption of amendments to section 1968.2, 1968.5, 2035, 2037, and 2038, title 13, California Code of Regulations (CCR). Upon becoming operative, the amendments would update the OBD II requirements and the emission warranty regulations for light-duty and medium-duty vehicles and engines. Resolution 06-26 is incorporated by reference herein.

Within the resolution, the Board directed the Executive Officer to adopt the proposed regulation after making available for public comment all changes specifically directed by the Board and any other necessary changes to the regulatory language as originally proposed in the Staff Report released on August 11, 2006. The changes directed by the Board, in addition to other changes initiated due to comments received during the hearing and the 45-day period prior to it, were made available for public comment in the ARB's Notice of Public Availability of Modified Text (First 15-Day Changes) on May 22, 2007. Descriptions of and rationales for the modifications were provided in the attachment to the First 15-Day Notice. On July 23, 2007, the ARB issued a Second 15-Day Notice to address additional public comments. Both 15-Day Notices are incorporated by reference herein.

In the 45-Day Notice for this rulemaking, the ARB referenced that a few new Society of Automotive Engineers (SAE) documents would be incorporated by reference and International Organization of Standards (ISO) in title 13, CCR section 1968.2. Staff subsequently updated a few SAE documents in the First and Second 15-Day Notices.

The new and updated SAE and ISO documents that are incorporated by reference in the regulation are:

ISO 15765-4:2005 "Road Vehicles-Diagnostics on Controller Area Network (CAN) - Part 4: Requirements for emission-related systems";

SAE J1699-3 - "OBD II Compliance Test Cases", May 2006;

SAE J1939 March 2005-"Recommended Practice for a Serial Control and Communications Vehicle Network" and the associated subparts included in SAE HS-1939, "Truck and Bus Control and Communications Network Standards Manual", 2005 Edition;

SAE J1939-73 - "Application Layers – Diagnostics", September 2006;

SAE J1979 "E/E Diagnostic Test Modes", May 2007;

SAE J2534-1 - "Recommended Practice for Pass-Thru Vehicle Programming," December 2004.

Additionally, the following document has also been incorporated by reference in section 1968.2:

ARB Mail-Out MSC#06-23, "Guidelines for On-Board Diagnostic II (OBD II) Certification Data", December 21, 2006.

Existing administrative practice of the ARB has been to have technical recommended practices, such as the above, incorporated by reference rather than printed in the CCR. These procedures are highly complex technical documents. Because the ARB has never printed these types of documents in the CCR, the affected public is accustomed to the incorporation format utilized in section 1968.2. Moreover, printing portions of the documents in the CCR when the bulk of the procedures are incorporated by reference would be unnecessarily confusing to the affected public. Additionally, the documents from SAE and ISO are copyrighted and are available only for purchase. The full documents are instead available for public inspection from the Clerk of the Board at 1001 "I" Street, 23rd floor, Sacramento, California 95814.

Economic and Fiscal Impacts. The businesses to which the regulation is principally addressed and for which compliance would be required are any business involved in manufacturing, purchasing, or servicing passenger cars, light-duty trucks, and medium-duty vehicles and engines, and businesses that supply parts for these vehicles. Of the 34 domestic and foreign corporations that manufacture California-certified passenger cars, light-duty trucks, and medium-duty vehicles, only one motor vehicle manufacturing plant, the New United Motor Manufacturing, Inc., a joint venture between Toyota Motor Corporation and General Motors Corporation, is located in California.

For manufacturers of light- and medium-duty gasoline vehicles, staff determined that the costs to comply with the proposed regulatory action are expected to be negligible. The proposed revisions consist primarily of modifications to existing computer software, and incorporation and verification of the revised OBD II software would be accomplished during the regular design process at no additional cost.

For manufacturers of light- and medium-duty diesel vehicles, staff determined that the costs to comply with the proposed regulatory action are expected to be around \$140 and \$153, respectively (retail engine price increases to a vehicle purchaser, not the manufacturer itself). Manufacturers would incur these costs in the form of additional hardware and software installed in the engine and the test and development costs to implement the requirements. Further, because the OBD II systems are expected to detect emission system and component malfunctions that would not otherwise be detected, the regulation is expected to result in owners and operators having to make additional emission-related repairs. It is expected that these repairs will result in average costs of approximately \$22 per diesel vehicle, per year over the 20 year life of the vehicle (all vehicles are expected to incur, on average, 0.6 additional repair over the first 20 years of operation at an average repair cost of \$444).

This regulatory action is expected to pose no adverse economic impact on private persons and businesses as consumers. The \$153 cost increase, for example, represents less than a 0.4 percent increase in the retail price of a medium-duty vehicle, and the \$22 per engine per year in increased maintenance costs is negligible.

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.

Alternatives. For the reasons stated in the Staff Report and the agency's response to comments in this Final Statement of Reasons (FSOR), 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. SUMMARY OF COMMENTS AND AGENCY RESPONSE

At the September 28, 2006 hearing, ARB received written comments and/or oral testimony from:

Mr. Steven Douglas and Ms. Julie Becker, Alliance of Automobile Manufacturers (Alliance)

Mr. John Cabaniss, Association of International Auto Manufacturers (AIAM)

Ms. Lisa Stegink, Engine Manufacturer's Association (EMA)

Mr. Mark Stepper, Cummins

Mr. John Trajnowski, Ford Motor Co. (Ford)

Mr. Timothy Gundrum, International Truck and Engine Corp. (International)

Mr. Don Anair, Union of Concerned Scientists
Mr. Luke Tonachel, National Resources Defense Council (NRDC)
Ms. Bonnie Holmes-Gen, American Lung Association (ALA)
Mr. Andy Ginsburg, Oregon Department of Environmental Quality (ODEQ)

Written comments in response to the 45-Day Notice were received during the 45-day comment period prior to the hearing from:

Mr. Jed R. Mandel and Ms. Lisa A. Stegink, EMA
Mr. Don Anair, Union of Concerned Scientists; Ms. Bonnie Holmes-Gen, ALA;
Mr. Luke Tonachel, NRDC (Environmental Group)

Written comments in response to the First 15-Day Changes were received during the First 15-day comment period from:

Mr. Jed R. Mandel and Ms. Lisa A. Stegink, EMA

No written comments were received during the Second 15-day Comment period.

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 wherever possible. Comments not involving objections or recommendations specifically towards the rulemaking or to the procedures followed by the ARB in this rulemaking are not summarized below.

45-DAY COMMENTS

COMMENTS IN SUPPORT

1. Comment: We support the proposal to allow manufacturers of medium-duty engines certified on an engine-dynamometer basis to certify to the OBD II requirements based on engine model year rather than vehicle model year, except in cases where the OBD II requirements is specifically intended for use in California Smog Check program. It properly recognizes that engine manufacturers produce engines, not vehicles, and that forcing engines to be certified on a vehicle model year basis would inappropriately force engines to meet the wrong standards. (EMA)
2. Comment: We have had numerous discussions with ARB staff to address our issues without compromising the needed diagnostic systems for these new emission technologies. The changes included in the 15-day package seem to be workable, though the bar is still set high. We recommend that ARB adopt these 15-day changes. (Cummins)

Agency Response to Comments 1-2: We appreciate the comments. Additionally, ARB adopted the First 15-Day changes with additional changes made after the version the commenter is referring to.

GENERAL COMMENTS ABOUT THE REGULATION

GENERAL COMMENTS

3. Comment: The OBD regulations are by all means and measure the most technologically forcing regulations that ARB adopts and result in extraordinarily complex OBD systems on vehicles. (Alliance)
4. Comment: The OBD II regulations are complex, far-reaching, and highly technical. While ARB can set technology-forcing standards, ARB has an obligation to set standards that reasonably can be projected to be technically feasible. Manufacturers do not know how they will, as a matter of feasibility and as a practical matter, meet many of the extremely technology-forcing threshold requirements proposed. (EMA)
5. Comment: OBD II is not a simple diagnostic add-on. It's a very stringent add-on to the stringent emission standards. The required OBD systems demand much engineering resources and technical ingenuity. (Cummins)
6. Comment: The resources manufacturers spend on OBD are generally near or even more than the resources spent on the emission control system. (Alliance)(Cummins)
7. Comment: The OBD II requirements have become extremely complex and prescriptive. Our goal as we move forward has got to be the simplification of these requirements. (Ford)

Agency Response to Comments 3-7: As required, the Staff Report outlines a technical approach that could be used to meet each of the diagnostic requirements imposed by the regulation. In some cases, such approaches are already being used in production vehicles (e.g., in light- or medium-duty applications with OBD II systems) and the technology is fairly mature. In other cases, similar approaches are being used on the same or similar emission controls and the approaches outlined by staff are able to be adapted. In still others, staff has relied on information from suppliers and/or past experience to identify feasible approaches that could be used by engine manufacturers to meet the requirements. There indeed are technical challenges to implementing many of the diagnostics across a manufacturer's product line but none that cannot be overcome with adequate development and resources between now and the start of implementation. Nonetheless, the Board, cognizant of the manufacturer concerns, directed the staff to continue to watch manufacturer's progress towards meeting the requirements

and to report back to the Board in two years time to address any unforeseen issues that may arise.

8. Comment: It's important for the regulations to contain flexibility to allow staff to adjust requirements as they deem appropriate. (AIAM)
9. Comment: ARB must make the recommended changes and support engine manufacturers in their efforts and take all steps possible to ensure a timely, cost-effective, and feasible rule. (EMA)

Agency Response to Comments 8-9: As noted in the previous response, the Board directed the staff to continue to watch manufacturers' progress towards meeting the requirements and to report back to the Board in two years time to address any unforeseen issues that may arise. This has been the procedure used historically by staff to ensure that the requirements can be satisfied by the manufacturers and where, if necessary, adjustments can be made. Further, in a limited number of areas, the regulation does provide the Executive Officer with the authority to modify the malfunction detection thresholds in cases where technology has not been sufficiently developed to meet the requirements. While this authority has rarely been exercised over the last ten years, staff realizes it is an important backstop and can be used where needed and in the interim until an appropriate change can be brought to the Board for consideration during a biennial review.

10. Comment: While we support OBD II and support many elements of the OBD II regulations, we do not confuse the OBD system's ability to monitor emission components with the emission control system's ability to reduce emissions. ARB routinely adopts emission standards and officially receives credits for these reductions on systems that have no monitors whatsoever. In the past few years, ARB adopted standards for lawn mowers, powerboats, and motorcycles, to name a few. In each case, ARB has requested full credit in the State Implementation Plan for the reductions associated with the new standards, yet none of these sources is equipped with any on-board diagnostic system and certainly none that monitors down to the levels required by today's automobiles. In this spirit, we have worked with ARB to refine the OBD II requirements and have resolved many issues, though there are remaining issues. (Alliance)

Agency Response: ARB has and does adopt emission standards for categories other than on-road motor vehicles and has not typically adopted OBD requirements for many of those other categories. However, ARB does not simply claim full credit in the State Implementation Plan based on the stringency of the emission standards. For most categories, ARB estimates the emission reductions based on actual test data from the sources and includes deterioration factors and, for some sources such as off-road diesel equipment, malfunctions that occur due to tampering or improper repair/maintenance. Further, at this time, these categories typically have very simple non-computerized engine and emission controls and are much smaller categories than on-road motor vehicles— this reduces the need for

comprehensive OBD systems to help identify malfunctions. As these categories expand in technical capability and stringency of standards, OBD will likely be evaluated for its appropriateness and cost-effectiveness to achieve further reductions.

DIESEL-RELATED COMMENTS

11. Comment: When very demanding OBD system requirements coincide with the 2007 stringency change in the emission standards, it is difficult to complete the development of the basic emission control systems in time and to finalize the development of the systems that are required to satisfy these OBD II requirements. (Cummins)

12. Comment: Engine manufacturers are in the midst of a multiple-year effort to meet new stringent federal and California emission standards that begin in 2007 and end in 2010 for on-highway engines used in vehicles over 8,500 lbs. Emission reductions will come primarily from a systems approach of advanced engine technology, aftertreatment systems, and low-sulfur fuel, with diesel technology – long known for being the most durable and energy-efficient – having the right to also be called clean. Though engine manufacturers have essentially completed work on developing and producing 2007 through 2009 engine and aftertreatment technology systems that meet the new stringent 2007 emission standards, significant work remains to meet the more-stringent 2010 standards. Manufacturers will devote thousands of hours of engineering time/expertise and in emissions test cells to achieve these standards. During this time, they must also address the challenges of the new manufacturer-run heavy-duty in-use test program applicable to those engines federally and in California. On top of that, the OBD II rule would further require manufacturers to certify to new, stringent OBD requirements, which adds more complexities and new challenges to produce these engines. (EMA)

13. Comment: While we are neutral on the amendments, we fully agree with ARB that OBD systems are important and necessary tools for ensuring in-use compliance for vehicles throughout their useful lives. We do not object to further developing and implementing more robust systems. However, we believe it is critical that OBD requirements do not become obstacles for the development and deployment of advanced vehicles technologies needed to address overall environmental goals. (AIAM)

14. Comment: The intent of our suggestions for changes to the regulations is to provide a robust OBD system while focusing very scarce engineering resources on those changes which provide the most benefit, reducing the burden on manufacturers implementing the systems. (Alliance)

Agency Response to Comments 11-14: During the 2005 heavy-duty OBD rulemaking, staff carefully considered input received by diesel engine

manufacturers and designed the phase-in schedule for the diesel monitoring requirements to account for the prior commitments on manufacturer's resources. During this period, a substantial number of discussions were held with the manufacturers on this specific topic to find a reasonable schedule that could be managed with their personnel and emission test cell resources. Subsequently, with this rulemaking, the staff proposed medium-duty diesel OBD II monitoring requirements with malfunction thresholds and phase-in plans that were generally consistent with those required for their heavy-duty counterparts in the heavy-duty OBD regulation. Staff believes the proposed schedule for implementation of the various monitoring requirements reflects many changes requested by, granted to, and agreed upon by the engine manufacturers as adequate to address their resource limitations.

Regarding light-duty diesel vehicles, staff met on several occasions with the manufacturers interested in bringing diesel back into the light-duty sector. Based on these discussions, the proposed requirements and implementation schedule were developed with the industry to identify appropriate time frames and malfunction thresholds that could likely be met. In fact, the proposal contains unprecedented changes to allow six years of temporarily higher interim thresholds for diesels to provide for further technology development and lead time to improve the OBD systems to match the recent breakthroughs in diesel emission control technology. This will allow introduction of diesels in the immediate future with less stringent OBD monitoring than equivalent gasoline vehicles, providing diesel vehicle manufacturers valuable time to test consumer reaction and gather real world experience necessary to refine the diagnostic systems.

15. Comment: Though ARB uses the term "medium-duty" to describe engines and vehicles in the 8,500-14,000 pound GVWR range, these engines/vehicles are actually "heavy-duty" under the federal Clean Air Act (CAA). Unlike the light-duty industry, the medium-duty engine and vehicle industry (encompassed within the heavy-duty industry) is a non-vertically integrated industry where manufacturers of engines are not typically the manufacturers of the chassis or vehicles in which those engines are used. Medium-duty manufacturers produce and sell their engines to customers who put them in many different types of chassis or vehicles with many different types of customer specifications and performance requirements. Medium-duty engines and vehicles also play a far more significant role in commerce (construction to goods transport, tow trucks to utility vehicles, waste haulers to delivery trucks) than light-duty vehicles, and are commercial assets of their respective businesses and represent a significant capital investment by their owners. Any regulatory provisions covering medium-duty engines and vehicles must account for the fact that such vehicles engage in a wide range of commercial activities supporting California's economy and the economy nationwide. (EMA)

Agency Response: In developing the changes to the OBD II regulation, the staff limited the scope of the requirements as much as possible to the engine and tried

not to involve items outside of the engine. However, there are interactions between the engine and the vehicle in which it is installed that do have to be taken into account when designing and implementing a robust OBD system that actually works when the engine is being operated in a vehicle on the road. Like other emission and safety requirements, in some cases the engine manufacturer does have to impose limitations on how the vehicle builders integrate the engine into the vehicle to ensure the engine and its emission controls remain in a certified and legal configuration. Given that OBD has been a requirement on medium-duty diesel vehicles since the 1997 model year, OBD will likely continue to be an integral part of the build specifications that engine manufacturers provide to vehicle manufacturers to ensure proper integration of the engine. Concerning the commenter's statement that the OBD II regulations account for medium-duty engines and vehicles' important role in commerce, the medium-duty sector in California is different than the heavy-duty sector and the vast majority of medium-duty engines are indeed partnered and integrated with a specific full size pick-up chassis. Nonetheless, ARB largely proposed changes for the medium-duty engines that are aligned with those previously adopted for heavy-duty engines where there is much more diversity in application and usage. Additionally, the proposed changes, which significantly better address the new emission control technologies that will be used in future diesels, are indeed modifications to the OBD II system requirements that have been successfully implemented for ten years on medium-duty diesels and are not expected to account for any modification to their role in commerce.

16. Comment: Oregon is obliged to adopt regulations that are identical to California's standards under the provisions of Section 177 of the federal CAA. Oregon supports OBD II regulations that will not create an artificial barrier to the certification of light- and medium-duty diesel engines. Without the proposed changes, the availability of these diesel engines could be restricted due to technological limitations of OBD II detection equipment to monitor the functional performance of particulate emissions. The proposal to extend the deadline for the final particulate matter detection limits will provide time for improvements in the equipment while still providing the benefits of the emission standards. Oregonians want not only clean vehicles but also the ability to purchase the full range of vehicle types, including diesels, which are an important means of reducing greenhouse gas emissions. (ODEQ)

Agency Response: As noted in the response to comments 11-14, the proposal includes substantial changes for light-duty diesels to provide an additional six years of lead time and less stringent requirements than currently adopted. While diesels have not been available or had any significant presence in the light-duty market in California for many years, these changes should actually allow for re-introduction of diesels to the market and reduce any barriers to entry. For medium-duty engines, these changes are not expected to reduce the future availability of vehicle models like those that have been sold in California for the last ten years.

17. Comment: We have concerns about the proposal, which would allow light-duty diesel vehicles to be sold in California that meet less stringent OBD requirements than their gasoline counterparts. We have a strong belief that these diesels should be held to the same emission standards and requirements as gasoline vehicles, and are concerned about any proposal to delay or weaken the diagnostic requirements that have been in effect for many years and are currently being met by gasoline vehicles. In 1998, ARB established groundbreaking precedent that diesel passenger vehicles would have to meet the same emission standards, including OBD II requirements, as gasoline vehicles. To propose interim requirements for diesels without sufficient measures to prevent excess emissions and no Smog Check program required for these vehicles will result in emission control malfunctions going undetected or ignored and greater toxic soot and smog-forming tailpipe pollution than gasoline vehicles. ARB must ensure the new emission control technology on light-duty diesel vehicles are performing adequately throughout the useful life of the vehicle and that air quality and public health are not sacrificed. These technologies may malfunction or degrade at a higher rate than mature emission control technologies. (Environmental Group)
18. Comment: We are very concerned about light- and heavy-duty emission levels and impacts on public health. We don't want to see any backsliding that would impact the public health impacts of air pollution, lung illnesses, and deaths that we already have from our extremely high smog levels. (ALA)
19. Comment: ARB's charge is not just criteria pollution but also global warming pollution. While light-duty diesels have the potential to provide us some advantages in terms of reducing global warming pollution, we can't ignore the other pollution as well. During the ZEV symposium, members of the South Coast Air Quality Management District were keen to remind us about how the program is essential for helping them fight the PM and ozone and other problems that they have today. (NRDC)

Agency Response to Comments 17-19: While the proposed changes do temporarily allow light-duty diesels to meet less stringent interim OBD requirements, the changes do not alter the tailpipe emission standards that both gasoline and diesel vehicles must meet to be certified for sale in California. The reduced OBD capability will, however, allow some emission-related malfunctions to occur and go uncorrected on these vehicles. To address the concerns raised by the commenters, two actions were taken by the staff. Firstly, the proposal imposes an additional emission testing burden on light-duty diesels using these higher interim thresholds, requiring manufacturers to procure and emission test in-use vehicles at approximately 35,000 miles and 95,000 miles. This testing, similar to that conducted by ARB for in-use emission standard enforcement testing, should provide additional assurance that the vehicles have successfully been designed and built to meet the tailpipe emission standards without a patent defect. Secondly, as directed by the Board, staff has actively been working with the Bureau of Automotive Repair (BAR) within the Department of Consumer Affairs

towards necessary changes to include light- and medium-duty diesels in the Smog Check program. While these two changes do not directly offset the reduced OBD capability in the interim years, they do represent additional measures taken to minimize the additional emissions that will occur. Further, these interim changes expire with the 2012 model year, at which time the diesel vehicles will need to be monitored with equivalent stringency as gasoline vehicles.

20. Comment: If ARB determines that light-duty diesel vehicles are in non-compliance, manufacturers should be held responsible for the excess pollution from these vehicles. Specific provisions should be included to require auto companies to fully mitigate any pollution increases for all groups of vehicles determined to be non-compliant through in-use enforcement testing. (Environmental Group)

Agency Response: Regulatory language was added and included in the First 15-Day Notice to address identified non-compliances. Specifically, for non-compliances identified on vehicles meeting the less stringent interim OBD requirements, the Executive Officer is directed to calculate the emission losses that occurred and require the vehicle manufacturer to fund a program(s) to offset those losses.

21. Comment: ARB must commit to working with the Bureau of Automotive Repair (BAR), vehicle manufacturers, and public health and environmental community to incorporate light-duty diesels into Smog Check within the next two or three years. Diesel passenger vehicles are projected to increase in number in California, making inspection and maintenance programs critical. Since light-duty diesel passenger vehicles are required to meet the same emission standards as their gasoline counterparts, they should also be subject to an equivalent inspection and maintenance program. (Environmental Group)

22. Comment: We can look for those design defects and systematic failures, but we need to be able to have a system to look at individual vehicles and find those individual vehicles in need of repair. We appreciate that ARB is going to send a letter to address light-duty diesels in Smog Check, but we need to gear up for a sustained program to work with administration, BAR, and public health and environmental groups to really make this happen. (ALA)

Agency Response to Comments 21-22: ARB is committed to incorporating light-duty diesels into Smog Check. ARB has contacted the Department of Consumer Affairs to explain what was decided at the Board Hearing, showed them the Resolution, and has engaged in the technical details of how this would happen. It is unclear how long this will take, because it will ultimately be the decision of Consumer Affairs, not ARB. ARB staff has been involved in ongoing work with BAR staff to develop necessary modifications to the inspection equipment to allow diesel vehicles to be inspected and will continue to do so.

BIENNIAL REVIEW COMMENTS

23. Comment: It's essential that the dialogue between vehicle manufacturers and ARB staff continues, for the biennial process and also in the interim to discuss the progress and any issues that arise. (AIAM)
24. Comment: Because of the complexity of the OBD regulations, ARB long ago implemented a biennial review of the regulations to review manufacturers' progress in meeting the requirements. At no point in the history of OBD have the requirements changed so dramatically so quickly as they do for light-duty diesel vehicles over the next six years. The amendments apply to the 2007 model year even though 2008 model year vehicles will be available long before California finalizes these regulations. Just two model years later in 2010, the standards drop dramatically. And three years after, the standards take another dramatic drop to merge with light-duty gasoline vehicle requirements. Throughout the next six years, manufacturers will devote tremendous resources to developing new and better monitoring strategies and technologies. Some will succeed and some will undoubtedly fail. In the past, the OBD biennial reviews have languished as ARB turned its attention to other matters. (Alliance)
25. Comment: California law requires ARB to conduct biennial rulemaking reviews to evaluate whether technology is progressing as ARB predicted and manufacturers' progress towards meeting ARB's standards. It is crucial that such biennial reviews be conducted in a timely manner, in order to provide manufacturers some degree of certainty with respect to the standards they are being asked to meet, and not take place at the last minute, when manufacturers have already invested their limited resources in meeting the requirements and are under time constraints to certify their products. While ARB has required OBD on medium-duty engines and vehicles for several years, the OBD requirements have evolved into more sophisticated and complex provisions with each new round of OBD amendments. Manufacturers have spent and continue to spend significant resources in meeting the OBD standards. As manufacturers work toward achieving the aggressive OBD threshold standards ARB set, they will learn more and become smarter about what is possible and technologically feasible. Each time changes to the OBD rule are adopted and new technological challenges are added, manufacturers are forced to expend resources to meet those challenges. Yet many times, these challenges have proven to be infeasible, requiring last minute changes, and wasting manufacturers' limited resources. This rulemaking is another example of an infeasible proposal which waste manufacturers' time, resources, and money and will have to be corrected later. Manufacturers need certainty of what standards they must meet and the time frame to meet them so they may use their limited resources most effectively. (EMA)

Agency Response to Comments 23-25: As the Board directed during the hearing and in Resolution 06-26, the staff will come back in two years during its biennial review to modify the OBD II regulation where necessary. The staff understands

the manufacturers' needs to have the requirements defined well in advance and has made every effort to accommodate the manufacturers. This is also one of the reasons for the phase-in of the diesel monitoring regulatory requirements. As discussed in more detail in the agency response to comment 30, the requirements set forth are technically feasible and are not expected to change appreciably in subsequent biennial reviews of the regulation. It should be noted that the OBD regulation has rarely and, arguably, never included a requirement that was proven to be infeasible and was subsequently removed or significantly relaxed. The commenter's statement that "...many times, these challenges have proven to be infeasible...wasting manufacturer's limited resources" is simply not correct. Most often, changes at biennial reviews add clarification or additional requirements where staff has identified emission-related malfunctions that are not adequately covered by the current language. In some cases, phase-ins have been extended (e.g., from three years to four years), but have not been initially delayed, to accommodate manufacturers' requests for more flexibility on the last few vehicle models. In neither case are the changes a result of technical infeasibility nor a case where manufacturers' expended resources have been wasted. In other cases such as full-range misfire monitoring, relief has been provided to assist repair technicians in likely finding and fixing the fault or reducing a manufacturer's calibration burden for particularly troublesome engine operating areas. Again, in either case, it is not an area of technical feasibility (as virtually all cars were able to be built and certified to the requirements before such relief was granted) that dictated or warranted the changes to the regulation.

26. Comment: In the next few years, timely and thorough biennial reviews are absolutely essential to the success of the OBD program. Moreover, the biennial reviews should just be that – an honest assessment and true review of the technology capability of the existing requirements compared against the assumptions previously made in adopting the regulations, with an updated assessment of the expected costs associated with the requirements, and review of manufacturers' progress towards meeting the requirements previously established. These reviews should not be, as they have in each of the past biennial reviews, ARB's opportunity to add additional monitors, new requirements, and more stringent thresholds, making them more difficult to meet. (Alliance)(EMA)
27. Comment: In many cases, as time progresses, the technology development needed to meet the new requirements may not have progressed as expected, resulting in higher costs, increased uncertainty, and potentially less capable systems than ARB assumed during the previous rulemaking. As staff explained in the Staff Report: Initial Statement of Reasons (ISOR), many of the thresholds and requirements that ARB adopted in 2002, despite manufacturers' best efforts, are not feasible and now must be revised. While such relief is absolutely necessary, ARB should not again adopt standards that are beyond technical reach yet cause manufacturers to use limited resources and precious test cell time in attempting to meet them. (EMA)

Agency Response to Comments 26-27: The proposed regulation has set forth technically feasible monitoring requirements, and it is not expected to make significant changes to the regulation in the future. While the biennial review is important to ensure that manufacturers are on track to comply with the OBD requirements and to address any previously unforeseen issues that may have arisen, the review has rarely been used in the context of light-duty OBD to make requirements less stringent and has never been used to drop a monitoring requirement to make the regulation, in manufacturers' eyes, "technically feasible".

Prior to the proposed changes, the OBD regulation did indeed have technically feasible requirements as proven by the certification and availability of vehicles from the 2002 through 2006 model years. As has always been the position of ARB, the requirements are considered technically feasible if they can be met by vehicles that satisfy the marketplace demand. With specific respect to light-duty diesels, no such vehicles have been in the California marketplace for several years and prior to that, the number of light-duty diesels sold in California likely represented less than one percent of the total vehicles sold. Accordingly, the basis for determining if the OBD requirements for light-duty are feasible is relative to a gasoline vehicle's ability to meet the requirements, not a diesel vehicle. With the exception of the PM filter monitor threshold and the diesel catalyst monitor threshold that were adopted in 2002, the proposed changes do not reflect a change from a technically infeasible requirement to a technically feasible requirement. The changes, in fact, represent a significant deviation from past policy by providing special relief to specific vehicle technologies (in this case, light-duty diesels) that are not currently being used to meet the market demand and not requiring them to meet equivalent performance standards to the technologies that are already in the fleet. The commenter's attempt to characterize this relief as proof of technical infeasibility is inappropriate.

The commenter's statement that "many of the thresholds and requirements that ARB adopted in 2002...are not feasible and must be revised" is incorrect. As discussed above, the technical basis for light-duty vehicles is driven by the vehicles in the California fleet which consist virtually entirely of gasoline. Thus, accordingly, the ability of diesel or any other fuel vehicles to meet the requirements is not relevant. Regarding medium-duty vehicles, however, diesel vehicles do fill a unique role in the fleet and must be considered in terms of technical feasibility. Only two monitoring thresholds adopted in 2002 have been modified because of technical feasibility issues and both applied to medium-duty diesels. The first was the PM filter threshold for medium-duty vehicles that was scheduled to begin in the 2007 model year. As was stated in the 2002 rulemaking process, this threshold was adopted at a time when little knowledge was available about the future monitoring capability and was acknowledged that it would be reviewed and refined especially during the development of the heavy-duty OBD regulation. By the time the heavy-duty OBD regulation was developed and adopted, manufacturers, suppliers, and staff did indeed have much more knowledge about the capability of the systems planned for introduction in the 2007 model year and adopted appropriate thresholds for the 2010 and 2013 timeframes. As indicated in 2002,

staff updated the monitoring requirements for medium-duty vehicle PM filter monitoring with this proposal based on the knowledge gained during the heavy-duty rulemaking. Likewise, staff indicated it would use the same process for the diesel catalyst monitoring thresholds adopted in 2002 and thus included appropriate revisions to those requirements in this proposal. ARB staff considers the proposed thresholds and requirements technically feasible and have stated many possible monitoring strategies in the ISOR that manufacturers may use to meet these requirements. See also agency response to comment 30.

Additionally, as ARB staff gains more experience and knowledge in the field, it is entirely appropriate for staff to adopt new monitoring requirements. Through annual certification efforts, staff has often identified areas where current monitoring requirements are insufficient to ensure proper emission control operation for the life of the vehicle and took action to address those areas. Staff has also found cases of high-emitting vehicles without MIL illuminations in the field that have necessitated new monitoring requirements for previously unanticipated failure modes in order to prevent more pollution. Likewise, new emission control technologies emerge and the requirements are updated to provide as detailed requirements as possible to manufacturers regarding the appropriate level of monitoring that is necessary. Given the technical nature of the OBD II system and the ever evolving emission controls used by vehicle manufacturers, it would be completely inappropriate to focus biennial reviews solely on revisiting the past requirements.

28. Comment: ARB must ensure that its actions with respect to the amendments support a meaningful federal preemption waiver process. ARB should not delay in submitting the amendments to EPA for review and must refrain from enforcing any new or more-stringent requirements than those contained in the existing rule until EPA has taken action on the waiver request. Based on the leadtime requirement of the CAA, it's already too late to submit a waiver request and obtain EPA approval for the new requirements that would apply to 2007 to 2009 model year medium-duty diesel engines, and it is too late for the 2010 model year as well. In that regard, ARB must refrain from enforcing the new and more-stringent thresholds and other requirements that are contained in the amendments until the 2013 model year. Any other approach would render the requirements of the federal CAA and California law meaningless. (EMA)

Agency Response: ARB has no intent or plan to unnecessarily delay the waiver process. ARB recognizes that the application for a waiver is a necessary element in the process and works to complete the application as soon as possible. Historically, ARB has submitted applications for waivers for OBD rulemakings in a very timely manner and has not contributed to delays in the waiver process and plans to do so for this OBD rulemaking as well. Staff has, however, received mixed messages regarding the commenter's genuine interest in a quick waiver process as the commenter has also submitted comments to the U.S. EPA directly asking them to delay a decision on ARB's pending heavy-duty OBD waiver

request. If the commenter intends to do the same for the OBD II waiver request, it seems disingenuous that the commenter is requesting quick action on the submittal of the waiver request to the U.S. EPA.

COMMENTS ABOUT LEADTIME, FEASIBILITY, AND COST-EFFECTIVENESS

29. Comment: The medium-duty OBD II requirements constitute new emission standards that engine manufacturers are required to comply with prior to introducing their products for sale into commerce. Thus, the regulation is subject to clear mandates both by the U.S. Congress in the federal CAA and by the California legislature in state law. In recognition of the nature of the medium-duty/heavy-duty industry and its importance in commerce, the U.S. Congress established unique provisions and protections in the federal CAA for engines used in vehicles over 6,000 lbs. GVWR, which encompasses medium-duty engines covered by the OBD II amendments. The OBD requirements constitute emission standards within the meaning of the CAA because they are established and intended by ARB to control engine and vehicle emissions by placing upper limits (thresholds) on the emissions from each engine, above which no OBD system may be certified. Only engines certified to the ARB-promulgated OBD standards may be sold in California. Any mobile source emission standards adopted by ARB for on-highway engines and vehicles from 8,500-14,000 lbs. require a waiver of federal preemption from U.S. EPA, must be technologically feasible and cost-effective, and may be implemented only if the requisite leadtime and period of stability are provided to manufacturers. If ARB is unable to demonstrate all these, California cannot obtain the necessary preemption waiver from U.S. EPA and cannot enforce its own emission standards, as required by section 209(b) of the CAA. (EMA)

Agency Response: In Resolution 06-26, the Board directed staff to request a waiver from U.S. EPA and made all the necessary findings necessary to obtain a waiver. Contrary to the unsupported assertions of the commenter, the Staff Report fully supports the findings of the Board that the requirements of this regulation are technologically feasible and cost-effective. Additionally, the OBD II requirements are not subject to the leadtime and stability requirements specified in the CAA. See agency response to comment 32 for more details.

30. Comment: ARB must adopt OBD requirements that are technologically feasible. However, staff has failed to justify the technological feasibility of many of the proposed requirements. Section 202(a) of the CAA requires that, among other things, "standards must reflect the greatest degree of emission reduction achievable through the application of technology...determine[d to] be available for the model year to which such standards apply, giving appropriate consideration to cost, energy, and safety factors associated with the application of such technology." California law also requires that emission standards be justified and technologically feasible (Health and Safety Code 43013). (EMA)

Agency Response: Contrary to the unsupported assertions of the commenter, the Staff Report fully supports the findings of the Board that the requirements of this regulation are technologically feasible. Further, the proposed regulation has set forth technically feasible monitoring requirements, and it is not expected to make significant changes to the regulation in the future. Though the commenter has stated that it believes the staff has failed to justify the technological feasibility of many of the proposed requirements, the commenter did not give any details as to which specific monitoring requirements are not technically feasible to implement and why the monitoring approaches stated in the ISOR for these specific monitors are not technically feasible. As required, staff has identified methods that are already in-use or could be used to meet each proposed monitoring requirement, determined that such methods will likely succeed in getting there, and addressed all technical issues regarding the monitoring requirements raised by industry.

31. Comment: The OBD II regulation must be cost-effective. Section 202(a) of the CAA requires the Board to consider cost and other related factors in setting new heavy-duty engine and vehicle emission standards. The California Health and Safety Code establishes a similar mandate for ARB, requiring the Board to adopt emission standards which will result in the most cost-effective combination of control measures on motor vehicles and fuel. And California Government Code sections 11346.3 and 11346.5 require the Board to assess the proposal's economic impact. The ARB staff has not met the burden of showing its proposal is cost-effective. Staff has both underestimated the costs to engine manufacturers and vehicle owners and has not fully analyzed the cost-effectiveness (the costs vs. the emission benefits). ARB's cost effectiveness and emissions benefit discussion in the ISOR points to ARB's previous analysis of cost-effectiveness from the 2002 amendments to the OBD II rule. Despite wide-ranging new requirements, ARB relies on past analysis for its current rulemaking. The extent of ARB's analysis is to conclude that, based on the 2002 numbers and ARB's assumptions, a new medium-duty vehicle in 2013 will cost only \$153 additional due to the OBD requirements of this rule. Part of ARB's assumptions is that, while repairs will cost more, engine durability will increase, thereby balancing out the additional repair cost. It is not realistic to assume that medium-duty manufacturers will meet the extremely complex, every-more-stringent OBD II requirements and increase engine durability while holding down the cost of new products as ARB estimates. In fact, the 2002 analysis to which ARB points has very little discussion of the costs vs. benefits of the medium-duty requirements. Further, ARB failed to assess the cost impact and anticipated benefits of significant new requirements including infrequent regeneration adjustment factors, AECD, and NTE tracking. EMA questions whether ARB could justify any of those requirements if it were to properly analyze and assess the OBD II rule and its costs against the anticipated emissions benefits. ARB must conduct a thorough, updated and focused analysis on the amendments to determine their true costs for manufacturers and consumers as well as their true benefits. (EMA)

Agency Response: The staff disagrees. The commenter is mistaken about the calculation of the \$153 cost for a new medium-duty vehicle being based on the 2002 numbers. As specifically stated in the ISOR, the \$153 number was calculated using the same cost analysis (with appropriate modifications) that was utilized for the heavy-duty OBD program in 2005, not the 2002 OBD II cost analysis. This comprehensive cost analysis is detailed in this ISOR and also in the ISOR for the heavy-duty OBD rulemaking. The staff's calculations, developed with input from engine manufacturers, did include all costs to the engine manufacturers for development, calibration, testing, personnel, and hardware costs and sufficiently cover all of the proposed requirements including adjustment for regeneration factors. In specific regard to AECD and NTE activity tracking, this consists solely of software to track actions currently available in or being commanded to happen by the engine computer and are negligible in terms of additional software or computer hardware costs beyond those already included in the analysis. Further, the staff included costs to vehicle owners in the form of additional emission-related repairs that would be incurred outside of the engine warranty period. Though the commenter stated that ARB underestimated the costs to engine manufacturers and customers, the commenter did not provide any details or specifics as to which areas it believes are underestimated in ARB's analysis. Regarding the emission benefit calculations, the staff used ARB's EMFAC emission model to estimate the impact of the OBD system and vehicle owner's response to detected malfunctions to calculate the overall emission benefit. Not one detailed or specific comment was received criticizing any aspect of staff's methodology or identifying any specific flaws or errors in the staff's assumptions. Regarding the cost-effectiveness calculations, as stated in the ISOR, staff believed the numbers calculated during the 2002 OBD II rulemaking are still applicable here because the current light-duty fleet in California consists solely of gasoline vehicles, so the incremental cost of \$140 for light-duty diesels is not assigned to any portion of the light-duty fleet. Manufacturers choosing to introduce light-duty diesels in lieu of gasoline vehicles in the future would be doing so by their own choice and for economic reasons specific to that manufacturer. Thus, the 2002 numbers are still applicable, and the OBD II amendments are shown to be cost-effective.

32. Comment: Sufficient leadtime and a period of stability between changes in standards are needed and essential to the way manufacturers do business. The amendments to the OBD II regulation do not provide sufficient leadtime or stability for medium-duty engines and vehicles, as ARB is obligated to do under the CAA (Section 202(a)) and California law (Health and Safety Code section 43013). The federal CAA provisions include a requirement that any new emission standard may go into effect only four or more full model years after the year in which they were promulgated, and those new standards must stay in effect for at least three full model years before ARB may establish another standard (i.e., three years between each new change or step-down in standards). Unless California meets these requirements, it has no authority to adopt emissions standards for on-highway heavy-duty engines (which include medium-duty engines under the definition of the

CAA). ARB is refusing to set standards and then stick with those standards for the necessary period of stability. This causes an undue burden and unjustified expenses for manufacturers. (EMA)

Agency Response: The commenter submitted the exact same comments during the engine manufacturer diagnostic (EMD) rulemaking in 2004 and the heavy-duty OBD rulemaking in 2005. In each of these rulemakings, ARB had provided a detailed response indicating why the federal leadtime and stability provisions did not apply to the OBD regulations (see the Final Statement of Reasons for Rulemaking for the EMD and heavy-duty OBD regulations). Yet, the commenter has given the same comments again for this rulemaking. Thus, the following response is essentially the same as those given in the previous rulemakings.

ARB does not believe that conformance with the federal four-year lead-time requirement is required for California to qualify for a waiver of preemption. Since 1970, U.S. EPA has typically applied a “two-pronged” test of whether California standards are consistent with CAA section 202(a) as required by section 209(b)(1)(C). The standards first must be technologically feasible in the lead-time provided considering the cost of compliance, and second must be compatible with the federal test procedures so that a single vehicle could be subjected to both tests. No more should be required.

This is in accord with the legislative history of section 209. When the California waiver provisions and the “consistent with section 202(a)” language were first placed in the CAA in 1965, section 202(a) consisted of just one sentence requiring adequate lead time in consideration of technological feasibility and economic costs. In the 1977 CAA amendments, Congress amended section 209 “to afford California the broadest possible discretion in selecting the best means to protect the health of its citizens and the public welfare.” (H. R. Rep. No. 294, 95th Cong., 1st Sess. 301 (1977), reprinted in 4 Leg.Hist., at 2768.) At the same time, Congress expanded section 202(a) to add several directives to U.S. EPA regarding its adoption of emission standards, including the four-year lead time requirement for heavy-duty/medium-duty vehicles. (Emphasis added.) Given Congress’s expressed intent to strengthen the waiver provisions, it is unlikely Congress intended to apply the specific four-year requirement to California, which would effectively narrow the deference provided to the state.

This is especially true in the case of OBD requirements. Congress clearly did not intend the OBD requirements to be subject to the lead-time and stability provisions of CAA section 202(a)(3)(C). First, as indicated above, those requirements were first enacted in 1977 and specifically applied to heavy-duty vehicle emission reductions, which at that time solely consisted of tailpipe and evaporative emission standards that Congress directed U.S. EPA to implement for new heavy-duty vehicles. (1977 CAA, section 202(3)(B).)

It was not until the 1990 CAA amendments, that Congress enacted an entirely new provision, section 202(m), which directed the Administrator to adopt regulations to implement OBD requirements. Under the new provision, Congress directed the Administrator to promulgate regulations for new light-duty vehicles and light duty trucks within 18 months of enactment. (CAA section 202(m)(1).) Additionally, at the Administrator's discretion, Congress provided U.S. EPA with equivalent authority to adopt OBD requirements for new heavy-duty vehicles. (*Id.*) The federal CAA further provided that the effective date for those regulations initially adopted under section 202(m) shall be the model year 1994, unless the Administrator postpones application for certain classes and categories of vehicles until the 1996 model year. The Administrator could decide to delay implementation for reasons that the OBD requirements were infeasible or to be consistent with the policies adopted by the ARB. (CAA section 202(m)(2).) Thus, theoretically, under the provisions of CAA section 202(m), the Administrator had effective authority to promulgate and implement OBD requirements for heavy-duty vehicles as early as the 1994 model year. Assuming that such requirements were adopted in June 1992 (18 months after the enactment of the CAA), Congress would have provided less than the requisite time allowed for implementation under CAA section 202(a)(3)(C). Accordingly, it would be appropriate to infer that Congress never intended that the OBD requirements be subject to the lead-time provisions of section 202(a)(3)(C).

This is confirmed by the administrative actions of U.S. EPA. Although the Administrator chose initially not to adopt OBD requirements for heavy-duty vehicles (58 Fed.Reg.9485 (February 19,1993)), OBD requirements were subsequently adopted and applied to medium-duty passenger vehicles (a subclass of heavy-duty vehicles). (64 Fed.Reg.23925 (May 4, 1999).) Adopted federal regulations provide, "Except as otherwise indicated, the provisions of this subpart apply to new 2001 and later model year Otto-cycle and diesel cycle light-duty vehicles, light-duty trucks, medium-duty passenger vehicles ["MDPVs"] . . ." (40 Code of Federal Regulations ("CFR"), subpart, S §86.1801-01. Emphasis added.) Under the Administrator's adopted definition, a heavy-duty vehicle is defined as "any motor vehicle rated at more than 8,500 pounds GVWR [gross vehicle weight rating] or that has a vehicle curb weight of more than 6,000 pounds or that has a basic vehicle frontal area in excess of 45 square feet. (40 CFR 1803-01.) MDPV is defined as "any heavy-duty vehicle . . . with a [GVWR] of less than 10,000 pounds that is designed primarily for the transportation of persons." (*Id.*) The specific OBD requirements were set forth in section 86.1806-01 of the same regulation and provide that certain MDPVs, as well as light-duty vehicles and trucks, are required to meet the OBD standards set forth therein. An exception applied to diesel-fueled, chassis-certified MDPVs and engine-certified diesel engines used in MDPVs, but no exception exists for Otto-cycle MDPVs, which are subject to the requirements of section 1806-01. (40 CFR 1806-01(a)(2). These vehicles were only subject to the requirements if the exhaust emission certification of the applicable test group is being carried across from a California configuration to which California OBD II requirements are applicable.) The OBD provision does not

provide for a separate and distinct implementation date for MDPVs to meet the OBD requirement. Accordingly, under the terms of section 1806-01, the 2001 and later model year implementation requirements would deem to be applicable to the OBD requirement. In such a case, the lead-time provided under the regulations would be less than two years from the May 4, 1999 initial promulgation date of the regulation.

Section 1806-05, which establishes OBD requirements for heavy-duty vehicles weighing 14,000 pounds GVWR or less, including diesel-powered MDPVs, provides a similarly abbreviated lead-time period. (68 Fed.Reg. 35800, June 17, 2003, 40 CFR section 1806.05.) The regulations were adopted in June 2003 and apply to 2005 and later model year vehicles. The lead-time again is well below the minimum four years of lead-time required under section 202(a)(3)(C). For the foregoing reasons, the only reasonable inference is that Congress did not intend that the provisions of CAA section 202(a)(3)(C) apply to OBD requirements and specifically not to California adopted OBD requirements.

33. Comment: There is an issue with timing of the proposed changes. September 28th, 2006 is a late time to make changes for the 2007 model year products, which already have been or are getting ready to be delivered. (Cummins)
34. Comment: Manufacturers need sufficient time to research, develop, and produce emission control technology, OBD technology, and engines for commercial use, which is not an easy task and cannot be done “on the fly.” Manufacturers first have to research possible technology options, develop those that look promising, and spend countless hours in the test cell to achieve products that can meet the standards. It is not necessarily a linear process, as technologies are tried, tested, adjusted or abandoned, and developed and tested some more. After years of development, manufacturers begin the production and certification process, which requires testing to regulatory procedures and measuring the compliance of the technology (both emission control and OBD monitoring technology) to the required standards and obtaining approval from the regulatory agencies. Because of how a model year is defined, engine manufacturers may certify (emissions and OBD) their 2007 products as early as January 1, 2006. Once the certification process begins, it is generally too late to make changes. Stability is needed to provide manufacturers time in which they may, in theory, begin to recoup some of the significant investments they have made in new technology to meet the standards. They need time to develop OBD technology that is feasible and practical. ARB’s rulemaking process, and this rule in particular, disregards those real notice and time issues that manufacturers face in many ways, the three most significant ways being: (1) proposing new, last-minute requirements with less than four months (let alone four years) of leadtime and in some cases even after the model year has started, (2) failing to specify the actual standards or any defined methods to meet the requirements, and (3) attempting to codify a practice that allows ARB to change the standards from year to year. In other words, ARB is making these changes too late – manufacturers’ product designs are already settled. (EMA)

35. Comment: Some of the 2007 changes are needed and we couldn't live without some of the changes folded into the rule, so we want these changes. But this topic should have been addressed at a hearing months or a year ago. Some manufacturers have EO approvals that have provisions contingent on the outcome of this hearing. We think this is an unreasonable jeopardy. Additionally, we held off on submitting other applications pending the outcome of this hearing, which is an unreasonable position to be put in. These issues are complex and take a lot of time to address. We just encourage the process to get started earlier. This hearing has been delayed not once but twice. And even the original hearing was late in the development cycle for the 2007 model year. The changes for the 2007 model year are really to adjust the threshold for the monitors that are required for the 2007 model year products. So, moving the start date to 2008 probably wouldn't make too much difference because those products are pretty well developed as well. The Board and staff should commit themselves to addressing OBD biennial review changes in an earlier development cycle. (Cummins)

Agency Response to Comments 33-35: Staff acknowledges that the Board Hearing of September 2006 took place later than desired for proposing the changes and indeed took place later than planned. The reason for the delays primarily involved light-duty diesels and late appeals by industry and other interested parties to reconsider the changes to be proposed regarding less stringent interim light-duty diesel requirements. As acknowledged by the Executive Officer during the hearing, ARB considered separating out the light-duty diesel items that were cause for the delay but decided against it in balancing the staff resources and the length of the delay. Nevertheless, medium-duty vehicles, including diesels, have had to meet the OBD II requirements since the 1996 and 1997 model years. So even in 2002, when amendments were last proposed for the OBD II requirements, there were requirements in place on the books for 2007 and subsequent model year diesels. The elements of the proposal that affect the 2007 model year represent relaxations to the requirements adopted in 2002 or earlier and do not represent new requirements first being introduced with this proposal. Regarding the comments about the failure to specify actual standards and codifying a practice that allows the standards to change each year, see agency response to comments 44 and 82.

36. Comment: It should be noted that ARB adopted a comprehensive new OBD program for heavy-duty on-highway engines and vehicles over 14,000 pounds GVWR over a year ago. Much of what ARB has included in the OBD II amendments mirrors provisions in the heavy-duty OBD rule, which will go into effect with the 2010 model year. Throughout the course of the heavy-duty OBD rulemaking, staff acknowledged many of the concerns raised by manufacturers and, in fact, delayed the initial implementation of the heavy-duty OBD rule until 2010 to address, in part, some of those concerns. (EMA)

Agency Response: While the staff acknowledges that concerns about the limited use of new diesel emission control technologies did result in delays or longer phase-in for several requirements, the main reason the heavy-duty rule was set to start with the 2010 model year is the fact that heavy-duty engines were not required to have any OBD systems prior to this rulemaking. Thus, aside from heavy-duty engine manufacturers that also produce medium-duty engines, heavy-duty manufacturers have had virtually no experience with developing OBD systems, as engine manufacturers themselves have indicated to ARB many times during the heavy-duty OBD rulemaking. Light-duty and medium-duty vehicles, however, have had OBD systems since the 1996 and 1997 model years. Where appropriate and necessary for new technologies, staff has provided similar lead-time as that provided for heavy-duty engines.

COMMENTS ABOUT GASOLINE MONITORING REQUIREMENTS

37. Comment: The ISOR indicates that the OBD regulation has been revised to allow the higher interim threshold of 3.5 times the NOx standard for gasoline catalyst monitoring (section 1968.2(e)(1)) for 2007 and 2008 model year vehicles and allow “*carry-over of those calibrations until the 2010 model year. This additional phase-in time should allow all manufacturers to make any further changes needed to comply with the final threshold of 1.75 times the NOx standard in the 2009 and 2010 model years.*” Allowing manufacturers to carry over their NOx catalyst monitoring strategies to the 2009 and 2010 model years provides for time to develop more robust monitoring strategies without the need to waste resources redesigning an existing monitor during the middle of a product cycle. We appreciate ARB’s recognition of the need for the additional time and the need to stagger introduction of new monitors. However, there seems to be a typographical error in section 1968.2(e)(1.2.5), which states carryover is only allowed through the 2009 model year. This should be changed to carry over through the 2010 model year. (Alliance)

Agency Response: The commenter seems to have misinterpreted the sentence in the ISOR. The language in the ISOR does state carry-over is allowed “until the 2010 model year”, but, consistent with how this language has been used in OBD rulemakings, this means that the carry-over provision would be allowed up to but not including the 2010 model year. As is also done consistently in OBD rulemakings, if the carry-over provision was intended to include the 2010 model year, the language “through the 2010 model year” would have been used. The subsequent part of the sentence indicating that the additional phase-in time allows “manufacturers to make any further changes needed to comply with the final threshold of 1.75 times the NOx standard in the 2009 and 2010 model years” was meant to illustrate the two possible required start dates for the final NOx threshold of 1.75 times the applicable NOx standard – vehicles not carried over from the 2005 through 2008 model year would start using 1.75 times the standard in the 2009 model year, and vehicles carried over from the 2005 through 2008 model year would first start using the 1.75 times the standard in the 2010 model year. If

there was any confusion in the first part of the sentence, the OBD II regulatory language provided as part of the ISOR details the applicable model years with very clear language. Therefore, staff did not make any changes to the regulation in response to this comment.

38. Comment: The malfunction thresholds for air-fuel ratio cylinder imbalance monitoring (section 1968.2(e)(6.2.1)(C)), which are currently set at 3.0 times the applicable standards for 2011 through 2013 model year vehicles and 1.5 times the applicable standards for 2014 and later model year vehicles, should be set higher for SULEVs, since these vehicles are certified to much lower emission standards than LEVs and ULEVs and are allowed to be certified to 2.5 times the standards under the OBD II regulation to prevent false MILs. The thresholds should be set to 5.0 times the applicable standards for the 2011 through 2013 model year SULEVs and 2.5 times the applicable standards for 2014 and later model year SULEVs. (Alliance)

Agency Response: While staff agrees that a higher threshold should be applied to SULEVs for this requirement, it believes that 5.0 times the applicable standard is too high and not technically justified. Instead, staff modified the regulation and set the threshold at 4.0 times the applicable standards for 2011 through 2013 model year vehicles to provide a similar amount of interim flexibility as non-SULEVs in meeting the requirements for the first three years. This change was made available with the First 15-Day Notice. No change is needed for 2014 and subsequent model year SULEVs since, as the commenter mentioned, there already exists a provision in the regulation (section 1968.2(e)(17.1.1)) that allow SULEVs to use 2.5 times the standards in lieu of 1.5 times the standards.

39. Comment: Manufacturers are concerned about the primary oxygen sensor monitoring requirement to detect symmetric and asymmetric delayed response faults (section 1968.2(e)(7.2.1)(A)), with phase-in starting with the 2009 model year. While ARB staff believes that current algorithms employed by manufacturers will detect delayed failure modes, manufacturers must still prove this is the case. This proof requires development of test equipment and procedures. Moreover, if manufacturers determine they cannot detect a delayed response, appropriate changes must be made and additional testing and validation performed to demonstrate the effectiveness of the changes. All of this additional testing and validation is only justified if the delay is a real world problem; otherwise, the work solved an academic problem with no air quality benefit. ARB should demonstrate that this fault is a real world problem. If ARB demonstrates this or goes ahead before demonstrating the need for the requirement, this requirement should be phased in with 25 percent of 2011, 50 percent of 2012, and 100 percent of 2013 model year vehicles meeting this in order to allow for sufficient time for manufacturers to develop the necessary test equipment and procedures. (Alliance)

Agency Response: Monitoring of oxygen sensor response failures (and all other characteristics that can cause an emission increase) has been required since the

introduction of OBD in the 1994 through 1996 model years. Both the regulation and past guidance issued by ARB has consistently defined response to cover all areas including delayed response as well as asymmetric versus symmetric faults. Further, staff has consistently maintained that diagnostics should be designed to catch all failures and not focus only on specific failure modes or patterns that the manufacturer thinks are most likely or more common. In order to maximize the emission reductions from in-use motor vehicles, ARB is relying on OBD to identify virtually every individual vehicle in need of repair and cannot afford to have OBD systems that only detect what the manufacturer believes are the most common failure modes. In the past, staff was provided with data from a vehicle manufacturer showing analysis of deteriorated oxygen sensors recovered from the field. That analysis did include sensors that had symmetric response faults, asymmetric response faults, and delayed response faults. While staff is not aware of any particular manufacturer's response monitor that is not capable of detecting all required failure modes, staff has recently become aware that not all manufacturers are evaluating each possible failure mode when developing their calibration to ensure that it will detect all failures prior to exceeding the prescribed malfunction thresholds. Accordingly, staff included a phase-in by which a manufacturer will need to demonstrate to ARB that its calibration method evaluates all failure modes. Additionally, given industry's concerns about the workload associated with that, staff modified the proposed phase-in to start one model year later, with 25 percent of 2010, 50 percent of 2011, and 100 percent of 2012 model year vehicles. This change was made available in the First 15-Day Notice.

COMMENTS ABOUT DIESEL MONITORING REQUIREMENTS

GENERAL COMMENTS

40. Comment: The OBD thresholds and standards being proposed are truly technology-forcing. Technical challenges remain. This is especially true of diesels, where OBD technology is in its infancy compared to gasoline monitoring. (AIAM)
41. Comment: All of the medium-duty aspects of the rule will be difficult and challenging for engine manufacturers to meet. (EMA)
42. Comment: Manufacturers developed today's very sophisticated gasoline OBD systems during nearly two decades of research, development, validation, testing, and certification. In contrast, diesel vehicles emission control technology is still evolving and the monitoring strategies for some of these technologies are still in their infancy. Before this 2006 rulemaking, the OBD II regulations did not fully consider the differing emission control technologies and monitoring strategies of diesel-powered vehicles. In fact, ARB just adopted OBD regulations for heavy-duty diesel vehicles last year. After much engineering analysis and investigation, we proposed light- and medium-duty diesel OBD thresholds that we believe are

technically feasible, which are generally less stringent and provides for more leadtime than what was adopted by ARB. We appreciate ARB's recognition of the early stages of diesel OBD and we are committed to working toward the standards ARB adopted. However, a great deal of uncertainty remains as to whether these standards can be met across many manufacturers, product lines, and different engine sizes now and in the coming years. (Alliance)

Agency Response to Comments 40-42: During the heavy-duty OBD rulemaking, which started in 2004 year, ARB staff researched and discussed diesel technologies with industry. As required, the Staff Report outlines an approach that could be used to meet each of the diagnostic requirements imposed by the regulation. Staff believes the proposed thresholds are achievable. See agency response to comment 43 for more details. Nonetheless, the Board, cognizant of the manufacturer concerns, directed the staff to continue to watch manufacturer's progress towards meeting the requirements and to report back to the Board in two years time to address any unforeseen issues that may arise.

MALFUNCTION EMISSION THRESHOLDS

43. Comment: ARB must revise the 2007 and 2010 medium-duty OBD II thresholds. Manufacturers support many of the changes that ARB has proposed to make to the 2007 and 2010 monitoring requirements. While the ISOR correctly notes that many of the emission malfunction thresholds have been relaxed from those currently in the regulation, the current threshold requirements that ARB adopted in 2002 were not technologically feasible. Thus, changes to the existing thresholds are absolutely necessary. But ARB has not gone far enough to adopt technologically feasible thresholds in the amendments and further changes are needed.

EMA supports aligning the medium-duty diesel OBD requirements (emission thresholds and implementation dates) with the heavy-duty OBD requirements, since many of the engines complying with both the medium-duty and heavy-duty requirements are the same engines. However, meeting the aggressive OBD thresholds ARB set for heavy-duty engines is not certain. The more manufacturers develop OBD technologies, the more they question the technical feasibility of the threshold standards that were adopted for heavy-duty OBD. So the OBD requirements for medium-duty engines and vehicles are questionable as well. EMA has recommended numerous changes to the 2007 medium-duty threshold requirements in many cases. In some cases, ARB has added new requirements, referred to as "substantially more detailed and rigorous monitoring requirements" in the ISOR, for which there is insufficient leadtime. ARB must provide sufficient leadtime for these requirements, including new requirements applied to diesel engines. Additionally, some of these thresholds are not technically feasible. EMA recommends ARB modify the 2007 thresholds to those EMA suggested, including changing most of the diesel monitor thresholds to "functional" monitors and increasing other thresholds.

The 2010 requirements should also be changed, which we will discuss further with staff as the biennial review of the heavy-duty OBD program begins next year. Where ARB has adopted 2.5 times the NO_x standards as a threshold, EMA recommends now for medium-duty vehicles (and next year for heavy-duty engines) that the threshold be 3.5 times the NO_x standards. Engine manufacturers seriously question whether they will reach the 2010 thresholds in time. (EMA)

Agency Response: ARB staff disagrees and thus did not make these changes to the OBD II regulation. As required, the ISOR outlines an approach that could be used to meet each of the diagnostic requirements imposed by the regulation. In some cases, such approaches are already being used in production vehicles (e.g., in light- or medium-duty applications with OBD II systems) and the technology is fairly mature. In other cases, similar approaches are being used on the same or similar emission controls and the approaches outlined by staff are able to be adapted. In still others, staff has relied on information from suppliers and/or past experience to identify feasible approaches that could be used by engine manufacturers to meet the requirements. The commenter did not provide specifics on why the 2007 and 2010 thresholds were not technically feasible and why the approaches outlined in the ISOR were not sufficient in meeting these thresholds. There indeed are technical challenges to implementing many of the diagnostics across a manufacturer's product line but none that cannot be overcome with adequate development and resources between now and the start of implementation. Nonetheless, the Board, cognizant of the manufacturer concerns, directed the staff to continue to watch manufacturer's progress towards meeting the requirements and to report back to the Board in two years time to address any unforeseen issues that may arise.

44. Comment: ARB should not adopt the proposed language for medium-duty chassis-dyno thresholds, which include no standards at all, unless it includes a clear method for determining those thresholds as it is obligated to under federal and California law. ARB proposed medium-duty chassis-dyno engines be required to meet the engine-dyno thresholds only if manufacturers can demonstrate "equivalency" of those thresholds to the engine-dyno thresholds. In other words, ARB is proposing a "standard" without establishing what the standard or what the method is to meet the standard. Standards do not exist in a vacuum but must be based on a clear method of measurement. Yet, ARB's proposal would prevent medium-duty chassis-dyno engines from being sold in California unless they can meet this "standard-not-a-standard." Engine manufacturers proposed a method to ARB staff, which involves using ratios based on the standards and thresholds developed for engine-dyno engines and which is workable and provides clear and technically reasonable standards for engine manufacturers. This "ratioing" method is based on the assumption that EPA and ARB applied an equal stringency logic to the development of the emission standards for chassis-dyno engines, and EMA proposed that ARB adopt chassis-dyno thresholds which reflect the same ratios of the OBD II engine dyno thresholds to the engine-dyno emission standards in order

to treat engine-dyno and medium-duty chassis-dyno engines on an appropriately equivalent basis. To clarify, EMA is not proposing that the same numerical threshold limits should apply. ARB staff has suggested additional language that it believes may define such a method, which engine manufacturers have not sufficiently reviewed and thus cannot comment with any specificity. EMA does note that the additional language relies on consideration of “best available monitoring technology,” which fails to provide a clear and constant standard. To the extent that ARB fails to include clear standards or a clear method for meeting this requirement or does not adopt the ratio method, ARB must clarify in the regulation that any method used to meet the requirements is not intended to, and will not, require manufacturers to conduct additional testing beyond that necessary for calibrating the OBD system on a single test cycle. ARB staff confirmed that intent in discussions with manufacturers, and ARB must include such a clarification in the regulation. (EMA)

Agency Response: Up to the time of the Board Hearing, no diesel engine manufacturer had ever chosen to utilize the optional certification procedures to certify using a chassis dynamometer procedure in lieu of the engine dynamometer procedure. Accordingly, neither ARB staff nor industry had any experience with the relative stringency of the chassis standards relative to the engine dynamometer standards. Further, since no manufacturer had ever utilized the optional procedures, there was no justification for expending large amounts of resources to try and develop equivalently stringent thresholds for an option that might never be utilized nor were there any reference engines or vehicles to even base such a development on. The proposal included language recognizing that the chassis option existed and that no specific numeric values had been established for OBD thresholds if the option was utilized. The language was clear, however, that the applicable monitoring requirements (e.g., the components and types of malfunctions that had to be monitored) were identical regardless of certification type. Further, the language required a plan to be submitted to the Executive Officer for review and approval of how the manufacturer would be establishing the numeric malfunction thresholds (e.g., similar to “2.5 times the standards”) to assure an equivalent level of monitoring stringency. A similar provision exists in the OBD regulation for new emission controls that may emerge and have not previously been addressed with specific requirements.

The engine manufacturers, who had no previous experience in chassis certification, proposed actual numeric limits based on formulas that varied by monitor and by pollutant with no valid rationale for why they represented an equivalent level of stringency in either component malfunction levels or tailpipe emission levels. Staff was concerned that such a technically unsupported approach would likely lead to inappropriate or even infeasible levels for specific monitored components. The proposed language, on the other hand, would ensure that individual components were monitored to an equivalent level of stringency (e.g., a similar amount of deterioration such as valve plugging, slow sensor response, deviation error from command) and that the emission levels of such a

failure would be determined during development and certification and would not factor into the determination of equivalency. At the commenter's request, staff added more clarifying language with the suggested changes presented at the Hearing and included in the First 15-Day Notice. Staff has not received any further comments from the commenter or others on the provision since the First 15-Day Notice was published. Additionally, the first manufacturer to ever use the option has indeed certified a 2007 model year package to the OBD II requirements using the procedure required by this proposed language. With that, no further changes were included. Regarding the comment about the "best available monitoring technology," see agency response to comment 82.

INFREQUENT REGENERATION ADJUSTMENT FACTORS

45. Comment: The requirement for infrequent regeneration adjustment factors (section 1968.2(d)(6.2)) is a big issue for the automobile manufacturers. This requirement should be deleted for the 2007 through 2009 model years. (Alliance)(EMA)
46. Comment: The 2007 model year products will come out with a new diesel particulate filter to be able to comply with the new emission standards, and this requires regeneration, which is a new requirement. The adjustment factors is something that came along new when that type of emission device was required to be able to satisfy emission standards. So dealing with adjustment factors are something both EPA and ARB are even having difficulty finalizing as to how they should be treated just for emission standards certification, let alone the add-on work for the OBD monitoring. Another year or two later, it won't be nearly as problematic because we'll all be more familiar with them. (Cummins)

Agency Response to Comments 45-46: The tailpipe emission testing procedures (the Federal Test Procedure or "FTP") appropriately require manufacturers to measure and account for emissions due to emission control strategies that 'infrequently' operate at much higher levels. PM filters typically use a regeneration strategy that fits in this definition and at various intervals of vehicle operation, emits at substantially higher emission levels than normal. Manufacturers are required to measure these emissions and the frequency with which they occur so they can factor this in with other emissions to calculate a true average emission level that must meet the certification standards. While devices such as PM filters utilizing such infrequent events are newly implemented for the 2007 model year, the requirements to account for such events has been part of the FTP procedure for quite some time. No alternative FTP test procedure exists—if infrequent regeneration strategies are used, the emissions must be accounted for. The OBD II regulation also, in some instances, requires emission testing using FTP procedures. There are no alternate FTP procedures within U.S. EPA or ARB regulations that allow manufacturers to ignore infrequent regeneration events and it is unclear what test procedure the commenters had been planning to use if they had not intended to follow official FTP test procedures. Further, the previously

adopted heavy-duty OBD regulation, like the OBD II regulation, includes specific language regarding infrequent testing that reminds manufacturers that, when they calibrate a malfunction threshold, they must take into account the impact the malfunction has on infrequent events and ensure they detect faults before the required adjusted levels.

There is also a defined provision for determining the factors for frequency and measuring the emissions of such events (e.g., by running successive FTP cycles until it occurs). If a manufacturer implements strategy changes that alter the frequency of such events or the emission levels during an event, the manufacturer must develop new appropriate factors by redoing some or all of this demonstration so that ARB can be assured that the new average emission level of the vehicle is indeed compliant with the standards. Similarly, in OBD there are several malfunction thresholds that must be calibrated to specific emission levels to ensure malfunctions are detected before they exceed the prescribed limits. In virtually all cases, these malfunctions affect engine-out emission levels which, in turn, can alter the regeneration frequency or emission levels during a regeneration event. Without re-determining the frequency or measuring the new emission levels, a manufacturer cannot verify that the total emissions from the vehicle, on average, will be at or below the required tailpipe levels when a fault is detected. In some cases, the re-determination may be as simple as an engineering evaluation to verify that the OBD malfunction being tested will not impact the frequency nor emission levels. In other cases, a manufacturer may determine that only the emission level during an event is altered and will have to run an emission test to determine that new level. In still other cases, a manufacturer may determine that the frequency will be impacted (e.g., increased because the engine-out PM levels will be much higher) and will have to make a new assessment of the frequency (likely relative to the previously determined frequency to ratio it up or down). In no case should it result in the manufacturer having to throw out the previously used methodology or likely larger dataset used to generate the certification factors. Nonetheless, given the manufacturer's constrained resources, the proposal includes changes to allow manufacturers additional leadtime to develop the appropriate adjustments. Specifically, it allows manufacturers to directly use the exact same factors they used for certification for all monitors in 2007 and all but one monitor in 2008 and 2009. Starting with 2010, manufacturers are required to adjust the factors for all monitors. The one monitor of exception for 2008 and 2009 model years is the oxidation catalyst in the exhaust. Medium-duty manufacturers have indicated that the primary (and very much the dominant) reason they have such a catalyst is to achieve infrequent regeneration events when they command them to happen. Accordingly, if this component is malfunctioning, the emission levels during a regeneration event are directly affected and can increase quite dramatically. To prevent manufacturers from calibrating this component while completely ignoring regeneration emissions even though that is virtually the sole reason the component is there, the proposal requires manufacturers to develop appropriate adjustment factors for this one component monitor in 2008 and 2009 model years. This will allow manufacturers time to refine the process for adjusting

most of the factors by 2010 while not allowing regeneration emissions that result due to a catalyst malfunction to go unchecked.

The commenter's statement that the U.S. EPA and ARB are having trouble finalizing how the infrequent events should be measured is misleading. There is no difficulty in interpreting the method stated in the regulations (i.e., consecutive emission tests). Where the difficulty has arisen is with manufacturers that have elected to try and use an alternate procedure based on real world driving in lieu of the emission test cycle. As can be expected, attempts to quantify real world driving can be difficult and predicting how never-before-utilized emission control components and strategies will react is even harder. Manufacturers generally have had minimal data to represent "real world driving" and have asked for great latitude to include large portions of data favorable to their strategy for lengthening the interval between regeneration events, making the certification decisions very time-consuming and difficult. Despite this, the requirement to adjust the numbers to account for OBD malfunctions does not require a manufacturer to re-validate or re-prove his methodology to ARB or the U.S. EPA—it simply requires analysis and/or data to make relative comparisons and determine the appropriate adjustments in increased/decreased frequency and increased/decreased emission levels during the event.

47. Comment: ARB calls these provisions "noteworthy" in the ISOR, and EMA agrees – ARB is proposing to make significant changes to an already complex and highly technical OBD II rule that ARB has not established any need for. (EMA)
48. Comment: ARB has not established a benefit for this proposal. In light of the substantial increase in development, testing, calibration, and certification resources to meet the requirement, it would seem appropriate for ARB to determine the benefit associated with this new requirement. However, the ISOR is completely silent on the benefit or even the potential benefit of this provision. A simple review of possible failures would reveal the benefit of this provision is limited to situations where a failed component causes substantial emission increases only during regeneration but does not cause emissions to exceed the malfunction threshold when regeneration is not occurring. Given that most component failures cause emission increases regardless of regeneration activity and the LEV II emission standards are extraordinarily low, a reasonable review would suggest that the benefits of this provision are very low and probably entirely insignificant. (Alliance)
49. Comment: The workload and costs of adding adjustment factors far outweigh the benefits. (Alliance)(EMA)
50. Comment: The sections in the ISOR describing the overall emission benefits and cost-effectiveness of the OBD II rule completely fail to provide any analysis of the costs vs. benefits of adding adjustment factors. In fact, when discussing the benefits of requiring adjustment factors, staff admits that their value is low and in many cases, engineering analysis will be sufficient to determine whether

regeneration events change incremental emissions or frequency of regeneration. Typically, engineering analysis is considered sufficient when the impacts of a given event or characteristic are anticipated to have little or no impact. Thus, by their own arguments, staff is admitting that there will be little or no incremental emissions benefit from adding adjustment factors to the OBD requirements, so adjustment factors are not needed at all. Balancing the enormous workload and costs against the anticipated emissions benefit, there is simply no comparison – adding adjustment factors is not cost-effective. (EMA)

Agency Response to Comments 47-50: Staff's cost analysis apportions a small amount of resources to the specific task of adjustments to the infrequent factors because it should only require a small amount of analysis and, in some cases, emission testing to complete. There is nothing to support the commenters' statements that it will require enormous workload and costs. As discussed to some extent in the response to the previous comments, the costs and resources necessary should be very limited and nowhere near the level of effort required to generate the factors for certification. Manufacturers are expected to make relative quantifications to determine the appropriate adjustments using experience and data gathered during calibration of each OBD II monitor. As an example, if a manufacturer is calibrating a malfunction, he will be measuring emissions during non-regeneration events and will be able to compare those emission levels to the baseline levels. The manufacturer will also have access during those tests to regeneration triggers/counters and will be able to assess if the malfunction it is testing is significantly altering those counters. Armed with these data, manufacturers would likely be able to infer, relative to the baseline, whether the system is working towards a regeneration event at a slower pace or faster pace and by how much and apply a similar correction to the certification derived factors. Further, engineers with understanding of the aftertreatment, control system, and implanted malfunction should also be able to accurately identify those malfunctions likely to alter emission levels during regeneration events. Those that are identified would require an additional emission test during a regeneration event to then compare that with the baseline measured values and scale the factors accordingly. As the manufacturer applies similar control strategies and controls across its product line, this process would likely be refined even further to make capturing the necessary data an automatic step during the calibration process and thus virtually eliminating the need for any additional testing.

Regarding the cost-effectiveness of requiring this one element of the proposal, staff's analysis did assume that vehicles would be emitting at the prescribed emission levels when a fault is detected. To redo the analysis assuming the manufacturers did not account for regeneration factors would result in higher emission levels before a fault is detected, and thus, less emission benefit and a worse cost-effectiveness. Further, if staff's analysis is correct and the additional resources consist primarily of engineering analysis of data captured during the calibration process, the additional cost is essentially negligible for additional

engineering hours of crunching data relative to the resources for developing and calibrating monitors and the test cell resources and costs.

51. Comment: The adjustment factors increase the stringency of the OBD thresholds, which manufacturers and ARB staff agree on. The OBD thresholds were developed without consideration of adjustment factors. The feasibility of the OBD thresholds is already questionable and increasing the stringency using adjustment factors could tip the scale of feasibility for diesel vehicles and engines. (Alliance)
52. Comment: Adding adjustment factors make the OBD thresholds tougher to meet. The stringency of the OBD thresholds would be increased by at least 10% or more, leading to even greater stringency in the OBD standards over a short period of time. These thresholds have been set at the very limits of what ARB thinks – optimistically - manufacturers can achieve. Only in the last few months, when the staff and the industry raised the question for the first time, did anyone consider the impact of infrequent regeneration adjustment factors on the stringency of the OBD thresholds. Through discussions in the last several years on heavy-duty OBD as well as medium-duty OBD, manufacturers focused on the “baseline” case of how to meet OBD thresholds during non-regeneration events. The underlying emission standards already require the application of adjustment factors before an engine may be certified and sold, with the factors require to be included to average weighted emissions over a test cycle (including not-to-exceed emissions and supplemental test requirements) and compared to the emission standards. EMA commented in great detail during the heavy-duty rulemaking that the heavy-duty OBD thresholds adopted, which are for the most part being proposed for medium-duty engines, are by no means assured. Adding adjustment factors to these highly questionable thresholds simply assures that adjustment factors are technically infeasible. When designing engine-aftertreatment systems to meet emission standards and designing OBD systems to meet OBD standards, manufacturers must leave “headroom”/margin to account for variability and other factors that may increase engine or OBD emissions in a given situation. In other words, if the standard is 2.5 g/bhp-hr or .01 g/bhp-hr, manufacturers must design to some level below that number. Adding adjustment factors eliminates this margin. (EMA)

Agency Response to Comments 51-52: The previously adopted heavy-duty OBD regulation includes the very same requirements as the amendments to the OBD II regulation - manufacturers must take into account the impact the malfunction has on the infrequent regeneration events when calibrating. To do so otherwise is illogical and would result in inequity among manufacturers as well as uncertainty as to the actual emission levels at which a fault would assuredly be detected. In regards to malfunctions of components that play an active role during regeneration or otherwise significantly alter regenerative frequency or emissions (such as the oxidation catalyst), ignoring the impacts would largely defeat the purpose of OBD—to assure vehicles with virtually any emission-related malfunction can be identified as needing repair. In general, OBD malfunction thresholds are in the range of 1.5 to 3.0 times the applicable standards. The commenter indicated that

regeneration factors are nearly 10% of the standard, making a 2.5 times the standard monitor effectively a 2.4 times the standard monitor and, therefore, infeasible. While the adopted thresholds are indeed technology forcing, staff does not believe a difference of 10% of the standard is the dividing line between a requirement being technically feasible or not. It is not reasonable to believe that regeneration emissions should be ignored for OBD, thus gaining an additional 10% of margin that they do not get for certification. Furthermore, while the 10% number may be a reasonable approximation for baseline certification adjustments, the case of the oxidation catalyst offers a striking comparison. Most medium-duty manufacturers have indicated that a completely missing oxidation catalyst would still result in emissions being less than 1.0 times the standard during non-regeneration events. If the OBD threshold did not require malfunction-specific adjustment, the manufacturer could calibrate the system to only detect a fault when the catalyst was completely missing. However, during a regeneration event, where emission levels can be 10 or more times above the emission standard, a missing catalyst resulted in emissions so high that one manufacturer was unable to quantify the results because the analyzers were not expecting such high levels. If, as proposed for 2008 and subsequent model years, the manufacturer has to adjust for such results, a malfunction of the oxidation catalyst will have to be detected at some intermediate level of deterioration in lieu of a completely-missing catalyst. As a result, a malfunction will be detected when the actual average emissions of the vehicle reach the threshold (e.g., 2.0 times the standards) instead of much higher (and unknown) emission levels.

53. Comment: The adjustment factor provisions would require manufacturers to develop a threshold component (current practice for OBD development), determine emissions with and without a regeneration event with the threshold component, determine if the frequency of regeneration is affected and if so, by how much, calculating the upward and downward adjustment factors, using these factors to develop a new “threshold” component (one that caused emissions to exceed the threshold using the nearly established factors), and calibrate the OBD system to detect the new “threshold” component. Additionally, determining emissions during a regeneration event will require several tests, since by definition an “infrequent” regeneration does not occur during every test cycle, and the entire process must be repeated for each regeneration component (e.g. the PM filter and again for the NOx adsorber). Further, the entire process (including both tests for both regeneration components) must be repeated for each of the 13+ threshold monitors required. Even if manufacturers use engineering analysis to eliminate some of this testing, the significant increase in workload is indisputable. (Alliance)
54. Comment: Calculating adjustment factors for every monitor creates an unreasonable and extremely high workload for manufacturers. To do this, manufacturers would have to test for and calculate upward and downward adjustment factors on each relevant component fully deteriorated to malfunction levels (threshold parts). The section in the Federal Register addresses the adjustment factor requirements for normally operating systems but does not define

a process that should be used for developing adjustment factors that are unique to each OBD emission threshold monitor. As an example, assume a manufacturer has 13 OBD threshold monitors and the engine has two regeneration devices (e.g., a PM filter and NOx adsorber). In this case, a manufacturer would have to determine 26 unique upward and downward adjustment factors. Step 1 would be to determine the baseline adjustment factor for the end of useful life engine. For the example above, as many as 20-30 FTP tests could be required for PM filter infrequent regeneration and 20-30 FTP tests for the NOx adsorber. This would require running the normal emissions test cycle (e.g., FTP) and collecting the NOx, PM, NHMC, and CO emissions, presuming the transient FTP (versus the steady-state cycle) has been determined to be the worse case for adjustment factor values. Step 2 would be to determine the OBD emission threshold part for the first monitor (PM filter efficiency monitor). The emissions test cycle would need to be run repeatedly and emissions collected until a regeneration cycle has completed. At this point, the adjustment factor information can be calculated and emissions impact of the first attempt of the threshold part determined. The probability that emissions would occur at just the right margin under the OBD threshold in this case is unlikely. Therefore, most, if not all, threshold parts require step 2 to be repeated multiple times to obtain the “perfect threshold part”. Throughout this process, the engine test cycle time or vehicle time could be lengthy and may be difficult to repeat – there is no means to accelerate the aging process to create additional copies of this perfect threshold part – and the original perfect threshold may become further deteriorated through repeated testing – since the perfect threshold part has a finite life, the same time-consuming and costly process must take place again to achieve another part. Step 3 would be to determine the OBD emission threshold part for the second monitor (NOx adsorber efficiency monitor). The process is the same as Step 2. Step 4 would be to determine the OBD emission threshold part for the third threshold monitor considering the impact on the first infrequent regeneration device (PM filter), with the process being the same as Step 2. Step 5 would be to determine the OBD emission threshold parts for the rest of the 13 threshold monitors considering the impact on the first infrequent regeneration device (PM filter). Step 6 and 7 would be to determine the OBD emission threshold parts for the third through thirteenth threshold monitors considering the impact of the second regeneration device (NOx adsorber). The information from Steps 4 and 5 would be compared to that from steps 6 through 7 to determine which creates the correct “perfect threshold part,” which, according to the regulation, would be the worst case adjustment factors. In every step, the amendments would require the test configuration use the end-of-useful life engine and aftertreatment system. As illustrated above, all this testing translates to an enormous amount of engineering resources, expense, test cell time, and leadtime required to obtain the necessary data. Engine manufacturers estimate their OBD threshold development work would at least double that manufacturers currently predict for achieving threshold compliance without adjustment factors. ARB simply should not impose such unreasonable, unjustified and costly requirements.

ARB attempts to justify the adjustment factors requirement in the ISOR by stating, among other things, that manufacturers will be able to use engineering evaluation and analysis to determine the impact of regeneration events on OBD emissions. Engine manufacturers do not believe, and at best have no knowledge of whether, engineering evaluation is sufficient, since they have no experience with determining the impacts of regeneration events on OBD emissions and developing appropriate adjustment factors. Either way, even in the limited circumstances (as the ISOR points out) in which engine manufacturers could rely on engineering analysis to develop appropriate adjustment factors, manufacturers still would need to conduct some level of testing and obtain some data to use as a basis for the judgments. Staff is well aware that engineering analysis cannot be pulled out of thin air, but must be based on real data and knowledge gained from testing. (EMA)

Agency Response to Comments 53-54: Manufacturers are required to determine the appropriate factors to account for regeneration as a part of normal tailpipe certification—the amount of workload or resources to do so has nothing to do with OBD or the proposed amendments. Starting with that as a baseline, manufacturers are required to determine appropriate adjustments to those factors—a relative comparison that should in no way entail the level of resources used to generate the original factors. To imply that a manufacturer has to replicate the entire process for every OBD malfunction is incorrect.

OBD calibration work is, by definition, an iterative process. No manufacturer ever “guesses” right on the very first try as to the degree of component deterioration for that will cause emissions to be exactly at the OBD malfunction threshold. A manufacturer partially deteriorates or simulates a malfunction and conducts emission tests to see if it is above or below the limits and to take steps accordingly for the next test to pinpoint the actual levels. Requiring manufacturers to account for impacts to regeneration doesn’t happen independent of this process or after it is completely done—it happens simultaneously. Manufacturers, who themselves design the regeneration strategies and calibrate the triggers to begin them, have access during this iterative process to the strategies and accumulation of data towards those triggers. A manufacturer is expected to (and would be foolish not to) gather data during emission testing regarding the progress towards regeneration triggers and should be able to compare it directly to previously acquired data on the speed with which the baseline system accumulates over the exact same cycle. There would be no need to actually ignore these data and operate the truck unnecessarily all the way to the trigger point just to quantify the relative increase or decrease in accumulation. Furthermore, just as the manufacturer must assess the first test results and see if it is above or below the requirements to determine whether to simulate a less or more deteriorated component, the manufacturer would make assessments about the magnitude of the impact on frequency of regeneration in making that determination. For those malfunctions where it is expected to have an impact on the actual emissions during regeneration, an additional data point would need to be measured. However, staff’s recent discussions with manufacturers have revealed that they often

encounter regeneration events during testing and attempt to work around them by triggering them before scheduled emission tests or interrupting testing to operate the truck on the road to allow the regeneration cycle to occur. There would be opportunities for manufacturers to measure emissions during one of those regeneration events in lieu of aborting or delaying emission tests to get around them and, again, make a relative comparison to the baseline system to determine the appropriate adjustments.

55. Comment: ARB's "compromise" proposal to use emission certification adjustment factors in lieu of developing unique adjustment factors beginning in 2007 is technically incorrect, does not provide sufficient leadtime, and should not be adopted. ARB proposed this "interim relief" to address manufacturers' concerns about significant workload issues. Manufacturers would be expected to "transfer" emission certification adjustment factors to use as OBD certification adjustment factors. The manufacturers develop the 2007 model year engine emission certification adjustment factors based on baseline engine emissions, not on OBD threshold emissions. There is no technical justification for simply carrying over the adjustment factors for one purpose and declaring them appropriate for another purpose, and in discussions with manufacturers, ARB staff admitted that it did not have technical justification or data for this. Rather, ARB is proposing their use simply as a "placeholder" for specific OBD threshold component adjustment factors yet to come. It should be noted that the development and application of emissions certification adjustment factors were first discussed three years ago and are still being discussed among industry and the regulatory agencies (EPA and ARB). During that time, EPA had numerous drafts of a guidance document for this purpose, with a "final" version issued less than four months ago that includes provisions which manufacturers strongly object to and are seeking further revisions. To assume that something that is still unclear and in flux for the purposes for which it was designed (emission certification) is now "ready" to be used for a different purpose (OBD) is not logical. Engine manufacturers appreciate ARB's attempt at a "compromise", but do not support a "compromise" that has no technical basis and may lead to the wrong result. This is bad regulatory policy and wrong from an engineering perspective, and would not in any way advance air quality in California. Even if this were technically correct, this new requirement starts in 2007, while manufacturers currently are certifying their 2007 model year engines, so it fails to provide the necessary leadtime and stability since manufacturers do not have enough time to incorporate the necessary technology changes. Applying emission certification adjustment factors automatically makes the OBD thresholds some percentage more stringent. Manufacturers have provided data to ARB staff demonstrating that using these factors would increase the OBD threshold standards by about 10%. ARB must provide at least four model years' leadtime before making any changes that would increase the stringency of the OBD standards. Any changes, including OBD threshold requirements that might undermine the success of meeting the new heavy-duty emissions standards in 2007, should not be considered. It is simply too late to make a change for 2007-2009. (EMA)

Agency Response: Staff agrees with the commenter that the interim requirement is not the technically correct thing to do for malfunctions that affect the regeneration factors, which is why it is proposed only as an interim policy until the technically correct solution begins in 2010. However, completely ignoring the regeneration factors is even more technically incorrect than the interim solution. The interim solution requires no additional resources by the manufacturer—the factors developed and required as a necessary element of tailpipe certification are also directly used for OBD with zero adjustment. For monitors and/or regeneration strategies where the implanted malfunction will not materially affect the factors, the interim proposal actually results in the technically correct adjustments being applied. On monitors that do significantly alter regenerations, the application of the certification factors could over-estimate or under-estimate the amount of emissions due to regeneration. On the other hand, ignoring the factors never results in a technically correct consideration of regeneration emissions. Regarding the increased stringency of OBD monitors based on the use of the factors, see agency response to comments 51-54. Regarding the four-year leadtime comment, see agency response to comment 32.

56. Comment: Despite numerous meetings and the November 2005 workshop, the topic of adjusting OBD thresholds based on infrequent regeneration events was not highlighted or discussed. Until recently, manufacturers assumed that the OBD thresholds were baseline thresholds unadjusted for regeneration events. (Alliance)
57. Comment: Discussions on the proposed amendments began well over a year ago. Staff held a workshop in November, 2005, where it shared draft regulatory language changes, and engaged in numerous meeting with manufacturers over the last year. Early this year, ARB provided another draft of the regulatory changes, with new language covering the adjustment factors. Yet, despite periodic, regular exchanges of information, ARB did not highlight to manufacturers this significant provision and did not attempt to engage the industry in any discussions on this issue. So manufacturers certainly had no expectation that they would be asked to account for infrequent regeneration events in the course of certifying OBD systems and meeting established OBD thresholds. Not until one or two individual manufacturers began discussing with ARB their plans for 2007 OBD certification did staff make clear its intent to add adjustment factors. Regulators and industry did not analyze and account for the feasibility and cost impacts of having to apply adjustment factors to OBD emission threshold testing results to determine appropriate thresholds, even during discussions about the technological feasibility issues with the OBD thresholds. This is also true for the heavy-duty OBD rulemaking. Manufacturers believe that process was not provided in a way to allow meaningful comment and interaction on the adjustment factor issue. Any steps that ARB takes to address infrequent regeneration issues should be taken with care and deliberation, not as a last-minute measure. (EMA)

Agency Response to Comments 56-57: The requirements to account for infrequent regeneration adjustment factors during OBD calibration were first introduced by staff as part of the heavy-duty OBD regulation, which was adopted in 2005. During the heavy-duty OBD rulemaking process, industry did not indicate any concerns regarding these factors. This requirement was in the exact same section as the requirement to determine the appropriate test cycle for malfunction threshold determination, an area of regulatory language that industry had specifically pointed out to ARB as a concern and discussed with ARB staff at length. Blaming industry's overlooking of the adjustment factor requirement on ARB's failure to "highlight" this requirement is not warranted. The process included draft regulatory language available from very early on and open discussions with the affected parties as to any sections that it had concerns with or wanted clarification or changes to. It is not ARB's job to highlight "every" single proposed requirement it thinks may be important to and overlooked by the manufacturers – all the proposed requirements are in the regulatory language, which is made available to manufacturers, and it is a manufacturer's responsibility to review the entire regulatory language and express to ARB its concerns regarding any of the proposed requirements. Additionally, during the heavy-duty OBD rulemaking, ARB indicated that it planned to adopt the same OBD diesel requirements for medium-duty diesel engines as it adopted for heavy-duty diesels, basing the language on that previously adopted for heavy-duty and including the requirements considering adjustment factors. Lastly, it is still unclear to staff exactly what emission test procedures the commenters were planning on using to demonstrate compliance if they believed they could ignore accounting for regeneration factors altogether. Official FTP emission tests require such compensation and by the commenters' own admission, extensive talks over the last three years have been going on with the U.S. EPA and ARB regarding proper calculation and application of such factors. To indicate that despite all these discussions, they had an expectation that a completely different and undefined test procedure that excludes the use of these factors for emission testing in the OBD regulation is not realistic.

58. Comment: There are several reasons why the 2008 adjustment factor requirement for NMHC catalyst monitors should not be adopted, one of which is that it is unnecessary. (EMA)(International)
59. Comment: Manufacturers have other systems in place to help control emissions and turn on the MIL if a partially failed oxidation catalyst does not properly regenerate, making sure the engines get repaired. (EMA)
60. Comment: The requirement would provide little or no incremental benefit over containment measures that manufacturers already have in their control strategies. There are many reasons manufacturers place boundaries on the control of infrequent regeneration: fuel economy, performance, reliability, and durability. These affect the manufacturers' bottom line through customer dissatisfaction and warranty costs. During regeneration of the PM filter, the oxidation catalyst is used to raise the exhaust temperature by burning fuel introduced into the exhaust. If the

oxidation catalyst is deteriorated, not as much heat is generated, and some hydrocarbons will pass through the catalyst unburned, increasing emissions, but there will be the parallel effect of reducing fuel economy because the regeneration of the PM filter is less effective. Some of the limitations placed on the regeneration process include determining whether the amount of heat at the outlet of the catalyst is comparable to what is expected, placing a time limit on the length of regeneration attempts, and monitoring regeneration for minimum effectiveness. Regenerations are aborted or avoided and errors flagged when it becomes obvious there is a problem, so the emissions impact of an oxidation catalyst malfunction will be limited. Regeneration of the PM filter is complex, and entry conditions are selected to ensure that regeneration is effective. The heat-up of the fragile catalyst and filters is carefully controlled so that thermal stress does not fracture the components. The regeneration phase is carefully monitored to prevent overheating that would result in catastrophic damage to the PM filter or oxidation catalyst. Engine manufacturers do not indiscriminately increase fuel levels in order to achieve regeneration when an oxidation catalyst has deteriorated. Upper boundaries are placed on these levels and they are based on extensive laboratory and field test data. These measures should ensure that ARB's concerns will not be realized. By delaying until 2010, in the interim we can work together to determine the most effective way to eliminate ARB's concerns. (International)

Agency Response to Comments 58-60: Based on industry's representations that they had other controls in place that would sufficiently bound emissions in the event of a malfunctioning oxidation catalyst, staff discussed the controls and looked at what emission data manufacturers had available. While manufacturers indicated that there are other safety and performance factors involved that factor into these safeguards, limited data from the manufacturers showed emission levels ranging from 10 to over 60 times the emission standard when these limitations were invoked. These discussions revealed that manufacturers were not taking into account the emission levels when calibrating these safeguards. Requiring them to account for regeneration emissions starting in 2008 model year will ensure that they will. In addition, language was added in the First 15-Day Notice to allow manufacturers to be exempt from a unique catalyst adjustment factor for the 2008 and 2009 model year if they can show that the safeguards they put in place do account for emission levels and ensure a fault will be detected prior to exceeding the OBD II malfunction threshold for the catalyst. The proposal, while allowing emission levels to go virtually unchecked in 2007, will ensure that equitable safeguards for malfunction detection at reasonable emission levels are in place for the 2008 model year.

61. Comment: There is virtually no time to meet a 2008 adjustment factor requirement for the oxidation catalyst. (Alliance)
62. Comment: Timing and workload are two reasons to delay this 2008 model year requirement. Manufacturers have finished their 2007 model year engine and OBD system designs, and these will be carried over into the 2008 and 2009 model years

until the next change of emission standards in 2010. Manufacturers are already deeply engaged in developing engine and OBD technology to meet the 2010 standards and in-use program requirements. Requiring unique adjustment factors would further strain manufacturers' already limited resources. Even without any other work to do, 2008 is right around the corner in design terms. So though we agree that it is appropriate to look at and consider applying adjustment factors to account for potential emission effects of infrequent regeneration events, there's not enough time to develop and validate new monitoring strategies for 2008. This 2008 requirement fails to provide the necessary four years' leadtime and three years' stability period required by the CAA or the "reasonable time" required by California law. With the new OBD thresholds becoming effective in 2007, the first time any new standards could be implemented (assuming sufficient leadtime was provided) is 2010. As an example, a manufacturer that relied on a functional check to meet the OBD threshold standard for the NMHC catalyst during the 2007-2009 timeframe could be forced to change monitoring strategies and hardware in order to meet the 2008 adjustment factor requirement, which is not enough time to make changes and properly validate the monitor. (EMA)

63. Comment: Requiring an adjustment factor for 2008 would require us to develop an entirely new monitoring strategy on our medium-duty diesels in 2008. This simply does not provide us with enough leadtime to fully develop and validate an entirely new monitoring strategy and implement it into production in just a little over a year's time. If we are forced to do this, we have to cut our validation process short and, in turn, run a much higher risk of false malfunction indicator light illuminations in the field. This could result in the replacement of a perfectly good catalyst at a very large expense to industry and vehicle owners with no air quality benefit. This requirement should be implemented in a timeframe that is consistent with other changes that will be required for the OBD II system. (Ford)
64. Comment: The language in section 1968.2(d)(6.2.4) should be changed to require unique adjustment factors for oxidation catalyst starting in 2010, not 2008. (Alliance)(EMA)(Ford)

Agency Response to Comments 61-64: On the one hand, industry has argued in previous comments that the incremental difference due to regeneration emissions are not significant enough to warrant specific adjustments while in this comment, one manufacturer indicates it will have to completely change its monitoring strategy because the impact of regeneration emissions is so large. For the oxidation catalyst, the potential for a large unchecked emission increase is the exact reason the proposal requires adjustment in the 2008 model year. If the manufacturers' safeguards (mentioned in comments 59 and 60) are not sufficient to keep emissions at reasonable levels up to the point a malfunction is detected, the monitoring strategy may indeed need to be changed. However, as long as the monitoring strategy and safeguards are somewhat reasonable, it is expected that a recalibration of the existing monitor would be sufficient to ensure a fault is detected at a slightly earlier level. Further, if the manufacturer cannot or chooses not to

tighten the safeguards to reduce emissions and has pursued a crude catalyst monitoring strategy that cannot be recalibrated, the deficiency provisions are available for those manufacturers who have made a good faith effort to comply but have fallen short in one or more elements of it. Thus, a manufacturer who planned to certify in 2007 by completely ignoring regeneration emissions (on a component primarily there to control regeneration emissions) and utilize an overly simplified diagnostic for the catalyst as a result can certify in 2007 without a problem. For 2008, if the manufacturer cannot alter the safeguards and/or the monitoring strategy to comply in time, a free deficiency could be granted as long as the manufacturer was making progress towards a compliant system. It should also be noted that as of the day this response was written, one medium-duty manufacturer has successfully certified a 2008 model year diesel catalyst monitor using adjusted thresholds and a similar monitoring strategy as that used for virtually every 2007 medium-duty diesel. At this point, no other medium-duty manufacturers have been certified for the 2008 model year to determine their certification status. Regarding the four-year leadtime and three-year stability issue, see agency response to comment 32.

65. Comment: We appreciate the fact that we can use deficiencies, because we need them. But my only caution is to be sure to be aware of not using deficiencies as a replacement for doing a thorough upfront technological feasibility analysis. (EMA)

Agency Response: Deficiencies cannot and have not been used to address technically infeasible monitoring requirements. The biennial review process is set up to address any changes that arise regarding technical feasibility of future requirements, as noted in agency response to comments 26 and 27. Further, a rarely used yet nonetheless important provision also exists to allow the Executive Officer to revise malfunction thresholds if the best available technology cannot satisfy the requirements and relief is needed prior to a biennial review. Deficiencies are only awarded when specific factors identified in the regulation are satisfied, including consideration of the manufacturer's attempts to satisfy the requirements in full and to come into full compliance as expeditiously as possible. As a reminder to manufacturers, the availability of deficiencies is not a replacement for manufacturers putting forth a good faith effort and expending the necessary resources to fully meet the OBD II requirements.

66. Comment: Between now and the biennial review, ARB should work with industry and EPA to quantify the benefits and, if justified based on the benefits, develop regulations that can provide those benefits in a manner that minimizes the burden on industry and provides more certainty in the testing. (Alliance)(EMA)
67. Comment: Manufacturers recognize that there are many issues related to adjustment factors that must be evaluated and we are willing to work through those issues with the regulatory agencies. This effort should include assessing the need for adjustment factors in determining compliance with OBD thresholds, assessing the feasibility issues and cost-effectiveness associated with adding these factors to

OBD thresholds, determining how to apply adjustment factors (including developing specific measures equivalent to those required for medium-duty for defining and calculating how light- and medium-duty chassis-certified vehicles meet the requirement), if found necessary and appropriate, for 2010 and later years, and any other analyses the industry group believes necessary to fully evaluate the issue. EMA envisions this industry effort will begin now, as EPA is set to propose its federal heavy-duty OBD program soon, and will continue with the biennial review set to start in 2007 to review the heavy-duty OBD program adopted in 2005. This adjustment factor issue applies equally in the heavy-duty context, and EMA recommends that they be considered together. The joint agency-industry effort would continue into 2008, when the OBD II rule and proposed amendments currently being considered are subject to another biennial review. In that regard, we ask the Board to direct staff to eliminate the adjustment factors from the amendments and engage in this joint effort. (EMA)

Agency Response to Comments 66-67: As discussed in agency response to comments 47-50, the analysis done by staff does take into account the issues related to adjustment factors by assuming vehicles will, on average, be at or below the required emission levels when a fault is detected and included costs for sufficient engineering analysis and test cell time to cover any additional workload. Just as there is no question that regeneration emissions must be included when doing emission testing for tailpipe certification, there should be no question that they are needed and relevant when doing emission testing for OBD certification and calibration. The proposal includes a delay until 2010 for the start of developing actual adjustments to the factors for all except the oxidation catalyst monitor and thus, should provide the leadtime the commenter wants for most of the monitors. For the catalyst, as discussed in agency response to comments 58-64, staff believes it is appropriate and necessary to ensure emission levels do not go unchecked in the 2008 and 2009 model years and further delays in introduction of such a requirement will only perpetuate inequities between manufacturers as to how high emissions can get without a malfunction being detected. Further, by requiring manufacturers to undertake such an effort in 2008 on a single monitor, manufacturers will have direct experience on the process without undue risk or use of resources and a better assessment can be made if any changes are necessary before wide-scale implementation in 2010.

ADDITIONAL LIGHT-DUTY DIESEL EMISSION TESTING REQUIREMENTS

68. Comment: The proposed requirement for additional emission testing of light-duty diesels (section 1968.2(d)(6.3)) is difficult. Vehicles sold in California willfully comply with the emission requirements, the durability requirements, and the OBD requirements for the full useful life of the vehicles. However, we understand that some are still concerned that light-duty diesels will fail to meet the emission standards and the higher thresholds will allow those emissions to go undetected. Although we believe this concern is misplaced and additional testing is not needed, we're willing to accept some additional testing to confirm emissions. The additional

testing, though, dramatically increases the burden unnecessarily on manufacturers and strains already limited resources that should be used to develop and test more robust emission control systems. Manufacturers typically conduct confirmatory testing on only three vehicles. Thus, from a testing standpoint, this is a six- to seven-fold increase that will strain the testing facilities needed for certification, calibration, and development testing, all of which actually improves the vehicle emission control system or OBD monitoring systems, potentially leading to real environmental benefits. In contrast, ARB's additional testing provides absolutely no environmental benefits.

The OBD regulations have always been technology forcing and many times with gasoline or alternative fueled vehicles, the regulations allowed higher thresholds to accommodate the technological needs and allow manufacturers to gain experience with monitoring technologies and strategies. At no time did ARB require emission tests unrelated to the OBD systems. Procuring ten qualified vehicles late in life is difficult, time consuming, expensive, and inconvenient for the customers particularly on low volume vehicle lines. Moreover, the requirement is to test 20 vehicles regardless of the test results from the first vehicles. For example, if emission tests from three vehicles (or five or eight) demonstrate the vehicles in that mileage category are well below the standard, additional tests must still be performed until ten vehicles have been tested in that mileage group. Such redundant testing is unnecessary, costly, and unjustified from an air quality standpoint.

ARB should adopt reasonable testing requirements that provide flexibility to manufacturers and should not add further testing beyond those proposed. ARB should eliminate the additional testing requirement beyond the 2009 model year. Beginning with the 2010 model year, the thresholds for light-duty diesel and gasoline vehicles are closely aligned and additional testing is unnecessary. (Alliance)

Agency Response: The test procedure and sample size used in the proposal mimic the procedures used by ARB itself when doing in-use testing of vehicles to confirm compliance with the tailpipe emission standards. That is, the significant burden this requirement places on manufacturers is no different than that which is incumbent on ARB when a vehicle is targeted for testing. ARB is, however, always working with industry on those procedures to make better use of both ARB and industry resources to better identify vehicles that may not be in compliance with emission standards. To the extent that modifications are made in the manner in which ARB does testing to determine non-compliances, the proposal would allow the same modifications to be used by the manufacturers in fulfilling this testing requirement. Further, as discussed earlier in agency response to comments 17-19, these light-duty diesel vehicles will not be as rigorously monitored by OBD II until the 2013 model year, so the testing requirement seemed to be an appropriate and necessary step to gain extra assurance that the vehicles were emitting at the levels they were designed to. As the commenter noted, gasoline vehicles have

often had higher interim monitoring thresholds, like these diesels, and not been subject to this extra scrutiny. However, unlike these diesels, the gasoline vehicles have typically only had higher interim thresholds for about one or two newly phased-in monitoring requirements at any one time. Diesels under this program will have higher interim OBD II thresholds on virtually every monitored component and additionally will have likely displaced a fully-compliant gasoline vehicle that otherwise would have been sold.

69. Comment: If ARB is considering phase-ins to meet the stringent thresholds for diesels, they must also adopt requirements to minimize any emission impact during this period. Diesel and gasoline vehicles must be held to the equivalent OBD II and inspection and maintenance program requirements. The in-use vehicle test program described in the proposal is critical in the absence of Smog Check, but is not equivalent to the combined OBD II and Smog Check program used for gasoline vehicles. The proposal to have manufacturers test 10 diesel vehicles per model year when the mileage reaches 30,000 to 40,000 miles and 90,000 to 100,000 miles would, based on EMFAC average annual mileage accrual rates, be met between years two and three and years six and seven from the date of vehicle purchase. The large interval in-between (a 60,000 mile gap) is likely to result in completion of only one set of tests before 2013, and emission system deterioration and malfunction would go undetected for a three to four year period with excess emissions. Additional testing at 60,000 to 70,000 miles (4 or 5 years of ownership) should be required to ensure any emission control problems are detected early and repaired, and would prevent any design or equipment deficiencies from being incorporated in vehicles designed to meet the final OBD II requirements in 2013. (Environmental Group)

Agency Response: Staff does not think it is necessary to add an additional testing requirement at 60,000 miles. There is another testing requirement through ARB and EPA regulations that results in in-use vehicles being tested by the manufacturer near 50,000 miles. While such a program generally tests only a few cars instead of the ten per model year mentioned by the commenter, this extra check, combined with the earlier and later emission testing required by ARB, should be sufficient to identify likely patent defects in the vehicles. Further, emission warranty reporting regulations cover the vehicles for the first 3 years and 50,000 miles, providing additional insight as to the number of vehicles needing emission repair. ARB, regardless of the special testing required by the OBD II regulation, has the authority to conduct in-use testing on vehicles at any point up to approximately 90,000 miles. If any of the manufacturer testing, warranty reporting, or any other information leads ARB to believe the vehicles may not be complying, in-use testing may be undertaken at any time to confirm the emission levels of the vehicles.

OTHER DIESEL-RELATED REQUIREMENTS

70. Comment: ARB should not adopt the amendment to require manufacturers to incorporate software strategies to detect the use of fuel system components that have incorrect tolerance (“component tolerance compensation matching”) on 2013 and subsequent model year vehicles (section 1968.2(f)(15.2.2)(E)). ARB staff indicated that this provision was to ensure service technicians make the right repairs and do not have to manually code in the tolerance compensation features of the fuel system component being replaced/repaired. EMA has indicated with staff that modifying the design of the engine control system to automatically detect the use of the fuel system component without proper or “matched” tolerance compensation is not a practical solution to the perceived problem. The cost to add software code to automatically detect this error, creating a “smart” component because someone might make a mistake, is very costly and not justified. In fact, manufacturers question whether or not this is a problem that causes in-use emission issues. While accidentally coding in the wrong tolerance compensation features could occur, that is the case with many of the mechanical components on the engine. But it would be impractical to guess at and anticipate, and force manufacturers to make a fix for, every error that may or may not occur. Manufacturers rely on service technicians working on medium-duty engines to be properly trained to ensure the correct parts are installed when the engine is serviced. Those who want to service the product correctly – particularly those who service or rely on the product for commercial purposes – will have the information to do so. Manufacturers already and will continue to ensure that adequate and appropriate service information is provided to allow mechanics to be trained properly and have the ability to identify the proper parts for the specific applications. (EMA)

Agency Response: During discussions with manufacturers, staff discovered that virtually all manufacturers conduct highly accurate flow measurements on each and every injector prior to assembly and identify specific flow characteristics that are coded on the injector and ultimately, into the engine control module. With this information, the injection events for each injector can be tailored to match the specific flow characteristics, resulting in more consistency in injection quantity from injector to injector. Manufacturers and their suppliers go to great effort to make these measurements and ensure they are properly configured during engine assembly. Once out in the field, however, it is entirely incumbent on a repair technician that is replacing an injector to not only know about the injector coding but to also own and use manufacturer-specific reprogramming tools for each brand of engine that is worked on and to utilize such equipment to correctly enter in the new coefficients of any injector that is replaced. Staff is not convinced that repair technicians will consistently have access to the necessary equipment or will remember to take such steps upon undertaking such a formerly simple repair as replacing an injector. Further, manufacturers have indicated that such individual injector coding results in lower overall emissions. Correspondingly, staff expects higher emissions if one or more injectors are inappropriately configured and the proposal would require such an event to be detected as a malfunction. If the manufacturer has determined that it is important enough for proper emission

control to utilize such an individual injector compensation method, it is also important enough that the system detect a fault when one or more injectors is not being correctly compensated. Under the proposal, the OBD II system would also be able to detect if the manufacturer had made a mistake during assembly (e.g., swapped injectors from one cylinder to another) or if the engine control unit (ECU) could not get the proper information from the injector for any other reason. Staff recognizes that this will likely require hardware changes to meet the monitoring requirements (such as a network connection for each injector to be able to send its information directly to the ECU) and, as such, provided additional leadtime up to the 2013 model year.

71. Comment: EMA has very significant concerns with the emission increasing auxiliary emission control device (EI-AECD) requirements, which are extensive and very onerous. There is no justification for including the requirements in the OBD II regulation. (EMA)
72. Comment: The requirement to track and report EI-AECD activity (section 1968.2(g)(6.2)) should be deleted since it provides no environmental benefit, is unrelated to the OBD system, and is a substantial burden on manufacturers. Manufacturers of diesel engines will need to develop software to individually track and report in a standardized format the total engine run time during the time period that each separate EI-AECD is active. In addition, for any EI-AECDs that have variable actions or degrees of action, those EI-AECDs will need to be tracked with two separate counters. The first counter is required to be incremented whenever the EI-AECD is commanding some amount of reduced emission control effectiveness up to but not including 75% of the maximum effectiveness that the EI-AECD is capable of commanding during in-use vehicle/engine operation, while the second counter is required to be incremented when the EI-AECD is commanding more than 75% or more of the maximum effectiveness. (Alliance)(EMA)
73. Comment: The ISOR does not attempt to calculate a benefit from the EI-AECD requirement. Rather, staff anticipates using this information to “support modifications to future model year applications and better ensure equity among all manufacturers.” Thus, this requirement is, in fact, completely unrelated to the OBD system (i.e., monitoring the vehicle emission system). (Alliance)
74. Comment: ARB has made no showing whatsoever of the cost-effectiveness of the EI-AECD requirements. The EI-AECD requirements are not in any way related to the identification, diagnosis, or remediation of malfunctions in engine emission control systems or their various components. Instead, they are only potentially germane to initial engine family certification determinations. Thus, there are no emissions benefits with these requirements, which is particularly obvious since the EI-AECDs at issue are specifically defined to exclude AECDs that might occasion an NTE deficiency and so are not those that would result in any non-compliance with the emission standards in any event. Thus, the cost-effectiveness simply

cannot be established. ARB staff has not demonstrated why the current certification process – which requires engine manufacturers to provide ARB with extensive disclosures, detailed descriptions and data relating to the necessity for and operation of any AECD – is insufficient to protect ARB interests and prevent unwarranted uses of AECDs. Even if the EI-AECDs could impact emissions compliance in-use (again, not the case here), any such deficiency-related AECDs, by their very nature, may only be provisional measures that manufacturers are required to phase-out over time, and may not be carried over routinely from one model year to another. ARB's existing regulations are very clear on this point (40 CFR Subpart N, section 86.1370-2007). ARB already has ample means at the time of certification to ensure that AECDs are not claimed or relied upon inappropriately by engine manufacturers. ARB has failed to demonstrate the technical feasibility of implementing the proposed EI-AECD requirements (including the dual tracking requirements for EI-AECDs that have variable degrees of action). The potential impacts and strains that the EI-AECD requirements will impose on already-strained ECM storage and operational limits have not been assessed, nor has feasibility of discerning the 75% threshold been established. Until ARB has demonstrated this, those requirements should not be adopted or implemented. (EMA)

Agency Response to Comments 71-74: As was re-iterated many times to the commenters, the argument that this requirement is unrelated to the detection, diagnosis, or repair of malfunctions is irrelevant. There is no restriction on what can or cannot be put into a specific regulation as long as it is properly noticed and follows required procedures. Further, the OBD regulation is indeed the only ARB regulation that specifies standardized communication between a vehicle and an off-board tool (e.g., a scan tool) and specifies the entire content of what information must be available through that link. The requirement to track and report EI-AECDs is an example of one piece of information that must be reported over that very same data link. ARB can and has required other information to be made available through this data link that also are not solely related to the detection, diagnosis, or repair of malfunctions but are intended to facilitate the Smog Check inspection or make ARB's job of determining compliance on in-use vehicles easier. The OBD regulation is the appropriate place for all required data link information to be specified.

The requirement targets a very specific type of AECD to be tracked and reported—specifically, *emission-increasing* AECDs that are not otherwise accounted for (such as through NTE deficiencies). The commenters' statements that there is no environmental benefit is wrong because, by definition, this data tracks emission-increasing events and would give certification staff additional data to ensure such events are limited to those technically necessary and justified.

Currently, manufacturers are required to disclose all AECDs to ARB during certification and to explain why they are needed, how they work, what the emission impacts are when they are activated, and how often they are expected to be

activated in-use. As one can expect, these software strategies are often very complex and difficult to assess how often they might really occur. Further, the onus is on ARB certification staff to discern those that are limited to conditions technically justified versus those that are overly protective or are being used to support an under-designed system—one that is inferior to that commonly used by competitors in the same area. By definition of AECDs and included in U.S. EPA guidance, manufacturers are not allowed to use AECDs to make-up for non-robust or inferior designs. Manufacturers typically include data from one or two vehicles operating for a few hours to give examples of in-use frequency despite the broad spectrum of vehicle types the engines are used in and the wide variety of driving patterns and ambient conditions that are relevant to activation. By requiring manufacturers to track how often each EI-AECD is activated, data can be gathered in-use to validate manufacturers' claims during certification and, importantly, ensure equity among all manufacturers by identifying outliers where emission controls are more frequently being deactivated, which could be a sign of an under-designed system.

Manufacturers already track numerous vehicle and engine activity events in the engine computer. Many are done at the request of the vehicle manufacturer for purposes of monitoring fleet driver activity and include data such as time spent in specific vehicle speed ranges, time at idle, etc. These data can be used by fleet operators to reward drivers who stay below the speed limit or to optimize routes to minimize idle or low speed driving due to traffic or other conditions. Likewise, the tracking and reporting of EI-AECDs would be information stored in the computer and available for download via an off-board tool. The amount of additional computer memory space to accommodate these values is negligible relative to the typical memory space in the computer. Further, staff included money in its cost analysis for additional computer memory and processing power to handle all of the OBD requirements including the EI-AECD storage. Regarding the additional burden this requirement places on engine manufacturers, EI-AECDs are only activated when specifically commanded to do so by the engine manufacturer. Thus, the software in the computer already has the information to discern whether or not it is currently commanding a specific activity to occur, so simply keeping track of cumulative time with it active is not a demanding software design or processor task. The commenter notes that it may not be feasible to meet the requirements to separately track when the action is commanding more or less than 75% of its full authority. This is not a valid argument. Working with manufacturers, staff modified the proposal to ensure that it would not take further testing or validation to determine a cut point (e.g., a certain emission level) on which to track the events. By linking it to 75% of the authority of the EI-AECD, manufacturers can strictly evaluate the system on paper, determine the maximum authority that they have calibrated that AECD to have, calculate 75% of that maximum authority, and divide the activation there. There is no question of technical feasibility given it is based not on physical quantities of what happens (such as tailpipe levels) but literally on the level of the action commanded by the manufacturer in the software.

75. Comment: ARB should remove the NTE-related tracking requirements from the OBD II regulation. Like the EI-AECD requirements, the NTE-related requirements have nothing to do with the purpose and function of OBD requirements - detecting and correcting malfunctions in key emission control system components – and the ISOR confirms this. There is no adequate basis to include NTE-related “in-use emission compliance testing” requirements in an OBD rulemaking. In fact, a separate in-use compliance rulemaking is being considered by the Board on the same day the OBD II amendments are. An assessment of that in-use emission compliance testing program, which is essentially identical to a federal EPA program and already implemented in California, demonstrates that the NTE-related components of the OBD II proposal are wholly unnecessary and unjustified. The in-use program would require engine manufacturers to utilize portable emissions measurement systems (PEMS) to assess the in-use compliance of designated diesel engine families with their applicable NTE emission limits – specifically, in-use vehicles with engines from ARB-designated engine families will be recruited and tested during their normal driving patterns pursuant to a detailed and comprehensive test program previously negotiated and agreed upon by EPA, ARB, and engine manufacturers. Very specific second-by second data – including all the NTE-related data at issue in the OBD II proposal – will be recorded and reported to ARB and EPA pursuant to an expansive electronic data submission template. The in-use regulation also already explicitly requires engine manufacturers to provide detailed information to ARB to enable ARB to gather the exact same NTE-related information at issue whenever ARB requests it (section 86.1370-2007). Thus, there is simply no justification for placing this additional, redundant, ineffectual, and unduly burdensome NTE-reporting requirements on all engine manufacturers with respect to all engines under the OBD II program. (EMA)

Agency Response: As noted in agency response to comments 71-74, the commenter’s argument that this requirement should not be included in the OBD regulation because it is not a diagnostic issue is completely irrelevant. The staff report, discussions at the workshop, meetings with manufacturers, meetings with the commenter, and discussions at the Board Hearing made it abundantly clear that the intent of the requirement was to simplify in-use testing. It was never argued by the staff that it was a diagnostic issue. It was, however, included in the OBD regulation because it is the only regulation that does provide detailed specification for communication of information from a vehicle to an off-board tool in a standardized manner. The specifications required to achieve the standardization in OBD encompass over 13 pages alone in the OBD regulation and reference several SAE and ISO documents. Placing this amount of information in another regulation just to require reporting of the NTE status would be unnecessarily duplicative and cause confusion by having multiple regulations that, in part, detail some of the required information. The OBD regulation is the appropriate place for all such information required to be made available in the same standardized manner for off-board equipment.

Notably, the commenter does not dispute ARB's authority to require NTE monitoring. It rather simply contends that this is not the appropriate place to regulate such requirement. The ability to post-process collected in-use data to determine NTE compliance or status does not preclude the authority of ARB to adopt this requirement nor does it obviate the need for it. While post-processing of the data can be done (and will need to be done on vehicles tested prior to implementation of the OBD system), most participants agree it will be a very detailed, complicated, and lengthy process that will heavily (if not solely) rely on the engine and vehicle manufacturer to provide access to engineering tools, special control units, and complex calculations. The regulatory requirement to output these data in a standardized manner greatly simplifies the data collection and processing, provides assurance to the manufacturer that the data were properly collected and processed, and greatly diminishes ARB and U.S. EPA's reliance on manufacturers to aid them in collection and processing of the data for enforcement.

COMMENTS ABOUT OTHER OBD II REQUIREMENTS

76. Comment: ARB should modify the OBD II regulation (section 1968.2(d)(3.2.1)) to allow the Executive Officer to grant an in-use performance ratio of 0.100 for the first three years a manufacturer implements a new diagnostic that they have not implemented on other vehicles, provided the monitor is designed for the final ratio. (Alliance)(EMA)
77. Comment: This could be limited to cases where the Executive Officer agrees that the new monitoring strategy is sufficiently more robust to warrant the additional flexibility. This change should be made because in some cases, manufacturers implement entirely different monitoring strategies that improve the ability of the OBD system to detect faults. For example, a manufacturer may use a vacuum pump evaporative system monitor for several years, but decide that an engine-off monitor is more robust in detection of small leaks. Even though the manufacturer is trying to improve the monitoring capability, this would place the manufacturer at a greater risk of non-compliance with the in-use performance ratio than continuing to use a less effective system. (Alliance)
78. Comment: It is necessary to provide manufacturers some flexibility in meeting the new and increasingly stringent monitoring requirements that become effective in 2007, 2010, and 2013. Added in-use flexibility for the in-use monitoring performance requirement is needed beyond 2012. The following language should be added in section 1968.2(d)(3.2.1): *For the first three years after a manufacturer introduces and meets requirements for a new monitor but after the required implementation date, the manufacturer must design the monitor to final ratio requirements, but a 0.100 minimum ratio would apply for in-use compliance determination. This provision may not be used beyond the first five years after a new monitor is required.* ARB staff have suggested that a more simple approach

would be to extend the in-use flexibility through 2015, which EMA supports as an alternative. (EMA)

Agency Response to Comments 76-78: Staff did not change the OBD II regulation language to allow manufacturers to use the 0.100 ratio for the first three years that a particular monitoring strategy is used by the manufacturer. Generally, the regulation does provide relief for the first three years that a monitor is required but does not link that to when a particular manufacturer enters the market, chooses to add a particular emission component, or, by its own choice, changes to a different monitoring strategy from what it has previously been using to satisfy the requirements. It would be inappropriate and unenforceable to allow manufacturers to continually make slight changes to an existing monitor, claim it to be a new strategy, and restart the clock for reduced in-use liability. Even if a manufacturer does change to a new monitoring strategy to meet an existing requirement, the manufacturer does not throw out all past experience and start from zero. The ratios are designed to ensure sufficient frequency of monitor operation on in-use cars. So regardless of what monitoring strategy a manufacturer changes to, it should be building up experience since the 2004 model year in learning what types of conditions are routinely encountered in-use (through analysis of data for all of its monitors) as well as refining development methods to accurately project what in-use frequency will likely be (e.g., through small test fleets, over a set of fixed driving cycles, through computer simulation). It is expected that a manufacturer would utilize all tools and information available to it when developing a new monitoring strategy to adequately ensure that it will meet the required minimum ratios in-use.

For both gasoline and particularly diesel vehicles, staff did modify the language in the OBD II enforcement regulation (section 1968.5(b)(6)(B)) to ensure that vehicles would only be held in-use to the interim 0.100 for the first three years that regulation requires the vehicle to be certified to the higher, non-interim (i.e., final) ratio. Thus, manufacturers will typically have three or more years of time where monitors are both certified and held in-use to the interim 0.100 and then an additional three years where they are certified to higher ratios but still held in-use to the interim 0.100. After this combined period, vehicles would be both required to be certified and held in-use to the higher final ratios. This change was made available as part of the First 15-Day Notice and clarified further in the Second 15-Day Notice.

79. Comment: We oppose the cold start strategy monitoring requirement for both gasoline and diesel vehicles to turn on the “check engine” light if any commanded element required for cold start doesn’t perform properly, regardless of how little each component is modulated during the start and the emission impact and even if emissions are below 1.5 times the applicable FTP standards. This requirement penalizes those manufacturers with a less sensitive emission control system that does not require significant changes during cold start. For example, one manufacturer could require a cold start idle boost of 20 rpm while another may

require a 500-rpm boost. Clearly the system with the 20-rpm boost is less sensitive, but detecting a 20-rpm change in idle speed is far more difficult than detecting a 500-rpm change. Moreover, detecting such a small incremental rpm increases the chances of false MILs. Thus, rather than encourage less sensitive emission control system design, this requirement penalizes the very behavior that ARB hopes to encourage. (Alliance)

80. Comment: This could result in a false MIL if, for example, the vehicle is filled with bad fuel and the engine control strategy increased the spark timing during the cold start to keep the engine from stalling. We do not support the adoption of this new requirement because it is repetitive and prone to false results. (Ford)
81. Comment: ARB notes that the OBD regulations contain similar requirements to monitor components below the typical 1.5 times the standard in the comprehensive component monitoring section, the rationale being to aid technicians with repairs. However, unlike comprehensive component monitors that detect a component malfunction to repair or replace, the cold start emission reduction strategies are just strategies with no component to repair or replace. Manufacturers have supported requirements that provide for more rapid diagnosis and repair of emission control systems; however, this requirement would not result in timely repair, and could in fact frustrate technicians. The MIL would be on and the OBD system would report a cold start system fault, but an emission test would show emissions within the limits. Such conflicting results would undermine repair technicians (and by extension public) confidence in the OBD II system.

ARB notes that without the requirement, vehicles could operate at a level above the standards. However, the cold start emission reduction strategy would still be monitored to 1.5 times the standards under section (e)(11.2.2)(B) and (f)(12.2.2). There is no justification to hold cold start monitoring to a more stringent threshold than the other monitors (e.g., catalyst, EGR). The emission standards are already really low, so 1.5 times the standard thresholds would ensure the vehicle's emission control system is operating at its optimal level. This new requirement is unnecessary.

Sections (e)(11.2.2)(A) and (f)(12.2.1) should be deleted and sections (e)(11.2.2)(B) and (f)(12.2.2) maintained, since these latter requirements do not penalize manufacturers with a robust emission control system but still ensures the emission control system is operating properly. At a minimum, there should be a requirement to detect the cold start fault only if a failure causes emissions to exceed by 15 percent or more, since this is the requirement for comprehensive component monitoring. The language in the regulation for the cold start monitor (section 1968.2(e)(11.2.2)(A)) should be changed to detect a malfunction if "To the extent feasible, any single commanded element, where that element would cause emissions to increase by the amount specified in (e)(11.2.2)(A), does not properly respond to the commanded action while the cold start strategy is active..." The language in section 1968.2(f)(12.2.1) should be similarly changed. (Alliance)

Agency Response to Comments 79-81: Cold start emission reduction strategies are specifically added by the manufacturer to reduce emissions and to help meet the emission standards. As cars get cleaner, more and more manufacturers have strategies or components that collectively bring the car down to low emission levels, but individually have a small impact. To assist repair technicians as well as calibration engineers, OBD has traditionally required monitoring of each individual component to verify it, by itself, is operating as expected. This can help pinpoint any specific component that is no longer working as well as create a manageable task for a calibration engineer, since he will not have to evaluate every possible permutation and combination of various components in different states of deterioration and try to determine which combinations of events result in a failure that must be detected. Accordingly, the proposal requires a manufacturer to monitor each element for proper response to what it was commanded to do. The commenter's argument that this requirement penalizes systems with a less sensitive emission control system (one that does not rely as heavily on the cold start strategy) is incorrect. The requirement does continue to 'reward' robust emission control strategies by allowing such systems to have much further degradation, deterioration, or level of malfunction before a fault is detected. In the commenter's example of a system that requires a 20-rpm increase versus a 500-rpm increase, the argument is that a 20-rpm error is much smaller (and thus, harder to detect and likely to happen earlier) than a 500-rpm error. However, in proper context, the two systems would use similar idle control systems. In the case of the 500-rpm increase vehicle, the system would have to have sufficient capability left in it to be able to add a substantial amount of airflow (by opening the throttle or a bypass valve) to achieve the 500-rpm increase. As the system degrades (e.g., due to restricted throttle or bypass valve movement, restricted passageways) and cannot add as much airflow, it would gradually be able to add less and less airflow until it could no longer add enough to get the 500-rpm increase. On the 20-rpm increase vehicle, however, the same system would have to deteriorate much further to get all the way to the point that it cannot even add enough air to get a 20-rpm increase. In this example, the 20-rpm increase vehicle can withstand much more deterioration before a fault is detected and must have a larger restriction (which is easier to detect) in the system than the 500-rpm increase vehicle.

The comment that a malfunction detected by this system would have no component to repair or replace is also incorrect. By definition, the monitor will only detect a malfunction when one more of the system elements are not properly responding to what it was commanded to do. Thus, something on the vehicle is no longer working properly and can (and should) be repaired to restore proper function of the emission control strategy. If it was simply that a strategy was not working correctly, either the system must have been designed incorrectly and turning the MIL on in every car that rolls off the assembly line or the computer itself has malfunctioned and the software to run the vehicle has been corrupted or damaged. The proposal was not modified to include the suggested language tying

detection of malfunctions only to elements that cause a 15% or more increase in emissions. Monitoring requirements in the regulation already are typically linked to a measurable increase in emissions to ensure that manufacturers are not liable for items that cannot even be measured as causing an increase. As stated above, OBD systems typically do not comprehend the impact of multiple components in various states of deterioration that cumulatively cause high emissions. To minimize the impact from vehicles with multiple items partially malfunctioning leading to undetected faults and high emissions in the field, OBD requires each individual component that causes a measurable increase in emissions to be monitored for proper function, regardless of how big or small the emission impact is. Further, the premise of this particular monitoring requirement is that these are, by definition, cold-start *emission-reduction* strategies that do indeed reduce emissions when properly functioning (and consequently, increase emissions when malfunctioning). Other strategies that are not emission-reducing strategies are not subject to this requirement.

82. Comment: The reference to “best available monitoring technology” (BAMT) should be deleted from the “to the extent feasible” definition in section 1968.2(f)(17.7) and the chassis dynamometer-based threshold language in section 1968.2(f)(17.1.5). This is a variation of a “standard-but-not-a-standard”. This requirement would mean in practice that when a manufacturer presented its monitoring plan on a given component to ARB for approval, ARB could review and reject the plan because it did not use the technology that another manufacturer used, and on that basis deny certification. BAMT is not an appropriate measure for ARB to use in establishing OBD standards, and would subject manufacturers to a standard that is, at worst, completely unknown (and therefore not a standard at all) and, at best, a moving target that unquestionably violates the 4-year leadtime and 3-year period of stability requirement. Essentially, the language would require manufacturers to use their competitors’ technology when ARB decided it was appropriate, which results in no clear standard at all, since manufacturers do not know their competitors’ technology. Even if they know what technologies their competitors may be using generally, they do not have access to the specific information and details required to successfully apply the OBD monitoring technology to the engine component at issue. Moreover, each manufacturer must develop OBD technologies appropriate to its own engine systems and technologies used to meet the emission standards, so one manufacturer’s technology may or may not be appropriate for another manufacturer or technology. Emission standards and OBD standards must be developed based on what is technologically feasible, as determined by looking at various technologies which manufacturers are developing, and are meant to be technology-neutral. The standards do not – nor should they – prescribe technologies manufacturers must use in meeting those standards, which ARB’s amendment does. This would also create a “standard” that is constantly moving and would codify ARB’s practice of playing manufacturers off against each other year after year. Staff has acknowledged that their current practice is to review what manufacturers are doing every year and suggest changes to OBD monitoring technology that must be incorporated for the next

year's OBD certification, thereby changing the standards on a yearly basis. Staff also indicated that ARB could, in fact, deny certification for any given year (i.e., without giving manufacturers even a year to adopt the new suggested approach) based on consideration of BAMT and the other criteria being proposed. Such an approach ignores, even violates, the leadtime and stability requirements of the CAA (and California law) by forcing yearly changes in monitoring strategies. Instead of having the BAMT language, ARB should include specific language in the regulation that maintains leadtime and stability and prohibits the Executive Officer from forcing yearly changes in years between the implementation of adopted OBD thresholds and monitoring requirements. ARB staff indicated it may revise the criteria to tie BAMT to what manufacturers "knew or should have known" and to the limitation of manufacturer hardware. While EMA support this improvement as a way to minimize some of the unknown, this change does nothing to eliminate the risk that a standard may change year to year. (EMA)

Agency Response: Staff does not agree with the commenter, and thus did not delete "best available monitoring technology" from the regulatory language. In past cases where ARB staff has reviewed whether or not a manufacturer has monitored a component "to the extent feasible", staff has always considered what the "best available monitoring technology" is. By definition, this includes "available" and would preclude proprietary or confidential items known or able to be used only by one of their competitors. It refers to monitoring technology including hardware and software that is available to manufacturers to meet the requirement. This has been ARB's practice for almost a decade to ensure equity is maintained among the manufacturers in meeting the requirements. This process is also familiar to manufacturers as, from the start of OBD, they have had to discuss and seek approval of their future monitoring plans to ensure they were on track to meeting the requirements. Nevertheless, as the commenter mentioned above, to appease manufacturers' concerns, staff modified the language to consider the "best available monitoring technology to the extent that it is known or should have been known to the manufacturer and given the limitations of the manufacturer's existing hardware". This modification was made available in the First 15-Day Notice.

Regarding the commenter's assertion that ARB staff currently force manufactures to change their OBD monitoring technology for the next year's OBD certification based on reviewing what other manufacturers are doing and that staff could deny certification in any given year based on consideration of the BAMT and other criteria, ARB disagrees that this has ever been done or could be done as a result of this language. ARB routinely provides feedback to manufacturers when they present future monitoring proposals to ARB as to areas of concern or areas where they might be falling short of meeting the requirements. It has been common practice for ARB to provide feedback in the OBD certification approval letters when, upon seeing the final calibrations of the monitors and the interactions between monitors, staff has identified additional problem areas. In some cases, the problems are clearly non-compliances and result in deficiencies which, by definition, require the manufacturer to implement changes to remove the deficiency

in an expeditious manner. In other cases, the problems are not as egregious non-compliances but still represent loopholes or areas of overlap where the system is not as robust to all types of failures as it should be. For these latter cases, rather than be extremely rigid and label everything deficient, staff attempts to work with the manufacturers to identify the need for improvement and an appropriate timeframe to implement such an improvement. Generally, this has worked to the manufacturers' benefit by avoiding additional deficiencies, making the certification process easier, and providing them time to coordinate the changes with other scheduled changes. Lastly, in some cases where staff believes a substantial change in technology has occurred and suddenly made something feasible that was no longer feasible, staff has historically issued guidance documents in addition to identifying it in OBD approval letters and eventually adding it to the regulation during a biennial review. In all cases, manufacturers are afforded the necessary time to make the changes in a cost-effective manner. Regarding the 4-year leadtime and 3-year period of stability comment, see agency response to comment 32.

83. Comment: The regulation currently requires manufacturers to make available CVN and CAL ID information in a "standardized electronic format" for 2005 and later model year vehicles. There are three issues with this. First, automobile manufacturers issue thousands of CVNs and CAL IDs each year. Consequently, complying with this requirement and populating the electronic database in a meaningful way will require significant resources. Manufacturers are concerned that the extraordinary amount of data in the database will result in vehicles failing I/M if a single data point is corrupt (due to, for example, data errors, out-of-date data, hacking). Second, the requirement to populate the databases with legacy information back to the 2005 model year adds unnecessary burden and the possibility of corrupt data. Third, manufacturers have not had adequate time to review the proposed standardized format and comment on it to ensure that data is useful for I/M testing, as ARB had just issued the format in draft form on September 8, 2006. ARB staff should work with I/M stations, EPA, and manufacturers to develop a robust "standardized electronic format" that provides the most useful information to I/M stations, does so with the least burden on manufacturers, and reduces the likelihood of corrupt data. This recommendation should not be trivialized, since this format will be the backbone of a vast database that will house millions of constantly changing data points that directly interface with consumers already distrustful of I/M programs. Once the format is finalized, manufacturers should begin populating the database with information for the next model year provided that the model year begins at least six months after ARB finalizes this format. ARB should develop and conduct a pilot program to test the stability and usefulness of this system. This program will interact with consumers across the country who are already distrustful of I/M programs. A system that might be used to fail vehicles should be thoroughly tested before it is released for wide-spread implementation. This is a reasonable stepwise approach that should minimize potential confusion and inaccuracies and result in useful information. The start date for the requirement for making available the CVN and CAL ID

combination information (section 1968.2(f)(4.7.4)) should be changed from 2005 to 2008. (Alliance)

Agency Response: Staff agreed to change the start date to the 2008 model year and made this change in the First 15-Day Notice. Staff also asked for manufacturers to turn over 2005 through 2007 model year information in whatever format, if any, that the vehicle manufacturer had kept and maintained CAL ID and CVN records, thereby eliminating any extra burden on reformatting or recreating the data if they did not exist. Regarding the format of the data for 2008 and subsequent model years, staff did work with I/M program personnel to develop the format and ensure that it will likely be sufficient for use in future I/M data analysis. That said, ARB also has indicated to manufacturers that it initially plans to keep these data in-house at ARB and use them for study and analysis purposes, not for passing and failing vehicles in I/M. Although the long term intended use is indeed to help identify vehicles in I/M that are not correctly being tested or have corrupted or non-legal software, staff believes a substantial amount of data analysis is necessary before the data can be used as such and expects further refinements will occur as experience is gained.

84. Comment: ARB should allow four free deficiencies in the 2007 through 2009 timeframe, three of which may be used for any reason, and one of which may be used in connection with an aftertreatment system. Engine manufacturers have substantial concerns with the technical feasibility of various aspects of the amendments, in particular the aggressive OBD thresholds. Although ARB is proposing to “relax” the stringency of those thresholds in the existing rule, those thresholds have not been changed sufficiently to make them technologically feasible. Moreover, ARB has added new threshold requirements for which it has failed to provide sufficient leadtime. With the 2007 model year having already begun months ago, ARB’s biennial review is occurring too late to be meaningful. Manufacturers have already been asked to meet these new requirements as they attempt now and over the next three months to OBD-certify their 2007 model year engines. EMA does not by any means advocate deficiencies as a substitute for timely, thorough, and appropriate analysis and evaluation of technological feasibility. Having said that, however, the reality is that the OBD II requirements, existing and proposed, put manufacturers at too great a risk to proceed without a “backstop” such as deficiencies if, despite their best efforts, they cannot achieve what ARB has established. (EMA)

Agency Response: ARB staff does not agree with allowing four free deficiencies, and thus did not make this change in the OBD II regulation. Staff believes the modification made with the 45-day notice, which allowed for 2007 through 2009 model year light-duty diesel vehicles to have three free deficiencies in cases where one or more of the deficiencies applied to certain diesel aftertreatment monitors, is sufficient. Staff also further revised the regulation to allow this for 2007 through 2012 model year medium-duty diesel vehicles. As a reminder, medium-duty diesel vehicles have been subject to the OBD II regulation since the 1997 model year and

have routinely been certifying with no deficiencies. While engine manufacturers are now adding more emission controls (and thus the OBD monitors to go with those controls), they already have ten years of OBD experience and should not warrant the need for additional free deficiencies. This change was made available in the First 15-Day Notice. See also agency response to comment 65.

COMMENTS ABOUT OBD II ENFORCEMENT REQUIREMENTS

85. Comment: Section 1968.5(b)(6)(C)(ii) was modified to include all possible communication failures that would prevent an I/M station from obtaining a valid test result, which dramatically increases the number of failures that fall into the “mandatory recall” provisions. We do not agree that the very costly mandatory recalls are appropriate for communication system failures. Nonetheless, the issue raised is the retroactive nature of the requirement. As written, section 1968.5(c)(3)(vi), which is the applicable mandatory recall language for these faults, appears to apply to vehicles produced before these regulations are adopted. Such retroactive requirements are inappropriate. ARB should revise the applicable mandatory recall section for these specific failures (section 1968.5(c)(3)(vi)) to apply to 2009 and subsequent model year vehicles. (Alliance)

Agency Response: The ARB staff does not agree with the commenter and thus did not modify the regulation. The modifications at issue do not change the intent of the previous language. Whereas the previous language states that a mandatory recall would be considered for failures where the vehicles “cannot be tested so as to obtain valid test results in accordance with the procedures of the California Inspection & Maintenance (I/M) program,” the modified language merely deleted the reference to the “procedures of the California I/M program” and instead listed the specific OBD parameters and criteria used during an I/M test that must be working correctly. Under the old language, a vehicle manufacturer had to reference the OBD II regulation as well as the I/M procedures (documented and administered by the Bureau of Automotive Repair) to identify the applicable non-compliances that would put it in mandatory recall jeopardy. The new language provides a single source—the OBD II enforcement regulation—as the document that identified all parameters that must be working correctly to avoid mandatory recall.

86. Comment: The staff’s suggested changes presented at the hearing shows language proposing to give light-duty vehicles additional time in the switch over from the lower to higher ratios for rate-based monitoring. We believe it’s also appropriate to give this same relief to medium-duty vehicles for the 2013 and 2014 model years. (EMA)

Agency Response: Staff believes that the commenter is actually referring to the staff’s suggested change presented at the hearing (and made available as part of the First 15-Day Notice) in the OBD II enforcement regulation (section 1968.5(b)(6)(B)) that allows 2007 through 2012 model year vehicles additional in-

use relief by still being held to the lower interim 0.100 ratio for the first three years that they are certified to the higher, non-interim in-use performance ratios. Staff's intent was to allow all vehicles, including light- and medium-duty diesel vehicles, to be held liable to the lower, 0.100 ratio in-use for the first three years the monitor is certified to the final, more stringent in-use ratios. For diesel vehicles, that would apply up to and including the 2015 model year. However, the regulatory enforcement language in the First 15-Day Notice mistakenly only applied the relief for diesel vehicles up to the 2012 model year. Thus, staff further modified the OBD II regulatory language in the Second 15-Day Notice to correct this oversight and to also further modify the enforcement language to apply the relief for the first three years the monitor is "required" to be certified to the final, more stringent in-use ratios. For example, the last year the diesel monitors are allowed to be certified and held in-use to the 0.100 ratio (section 1968.2(d)(3.2.1)(D)(iv)) is the 2012 model year. With the additional relief, the diesel monitors would be continue to be held in-use to the 0.100 ratio for the 2013 through 2015 model years even though they will be certified to the higher non-interim ratios.

FIRST 15-DAY COMMENTS

87. Comment: ARB proposed 15-day changes to the emissions-related malfunction thresholds for the EGR low flow, high flow, and cooler performance and the VVT system target errors and slow response monitoring requirements to address concerns with the originally-proposed NOx thresholds (additive threshold of 0.3g), which did not take into account phase-in allowances and the high probability that engine manufacturers would certify to higher NOx FELs for 2007 through 2009 model year engines. The originally proposed thresholds would have resulted in MIL illumination at a level well below 1.5 times the FEL for NOx. However, in making this 15-day change, ARB inappropriately modified the NMHC and CO malfunction thresholds. The NMHC and CO standards do not change for phase-in engines between 2007 and 2009, and for all engines 2010 and beyond. Diesel medium-duty vehicle phase-in engines and engine families meeting "split engine family" FEL provisions (most 2007 through 2009 model year engines, in fact) must meet 0.14 g/bhp-hr NMHC and 15.5 g/bhp-hr CO standards regardless of the NOx FEL the engine is certified to. These engines also will be certified to NOx FELs above 0.5 g/bhp-hr in most, if not all, cases. As a result, ARB's 15-day change to implement dual-threshold multipliers for NMHC and CO based on the NOx FEL being above or below 0.5 g/bhp-hr would result in more stringent malfunction NMHC and CO thresholds (i.e., 1.5 times the standards) for most 2007 through 2009 model year engines, and then revert back to the correct, less stringent threshold (2.5 times the standard) that was approved by the Board at the September hearing. This does not make sense and is not appropriate. Though EMA believes the dual-threshold approach is appropriate for the NOx threshold based on the NOx FEL, the NMHC and CO thresholds must be modified for the EGR and VVT system monitors and retain the single threshold multiplier (2.5 times the standard) regardless of the NOx FEL to which the engine is certified, as originally approved by the Board. (EMA)

Agency Response: Staff has reviewed the myriad of certification options for manufacturers in the 2007 through 2009 model years and has defined thresholds that are appropriate for the expected level of technology on the vehicles and the corresponding likely OBD monitoring capability. The commenter is correct in that all engines certified to a NOx standard of higher than 0.5 g/bhp-hr must use OBD thresholds of 1.5 times the standard for NMHC, NOx, and CO, regardless of whether the vehicle is also certified to the 0.14 g/bhp-hr NMHC standard. Engines certified above these NOx levels typically do not use NOx aftertreatment and rely on more conventional engine technologies. Staff's experience with engines using these technologies is that 1.5 times the standard for NMHC and NOx is feasible for monitoring limits of EGR and VVT as well as other monitors. In fact, one manufacturer has already certified a 2008 model year engine meeting these OBD thresholds and certified to a 1.2 g/bhp-hr NMHC + NOx FEL and a 0.14 g/bhp-hr NMHC standard. While it may seem contradictory to then allow a 'relaxation' in the NMHC monitoring threshold to 2.5 times the standard for engines certified to less than 0.5 g/bhp-hr NOx levels even though the NMHC standard remains the same at 0.14 g/bhp-hr, staff again reviewed the likely technologies and resulting monitoring capability on engines meeting such NOx levels. While the NMHC standard is the same, the technologies to bring an engine down to both below 0.5 g/bhp-hr NOx and below 0.14 g/bhp-hr NMHC are very different and much more reliant on newer engine out technologies and exhaust aftertreatment than those engines meeting a more typical 1.2 g/bhp-hr NMHC + NOx level and a 0.14 g/bhp-hr NMHC level. While the presence of the aftertreatment provides a large source for this change, substantial differences also exist in engine out emission levels and represent much different monitoring challenges. Accordingly, staff proposed a 2.5 times the standard threshold for NMHC, CO, and NOx to provide extra margin for manufacturers entering into the new technologies, engine controls, and aftertreatment necessary to get to such levels. Staff does believe that a manufacturer that is able to achieve 1.5 times the 0.14 g/bhp-hr NMHC standard for an EGR monitor on an engine meeting 1.2 g/bhp-hr NMHC + NOx may not be able to maintain that NMHC stringency once NOx emissions are brought down to near 0.2 g/bhp-hr levels and has provided relief in the form of a higher NMHC to ensure manufacturer's likely success in meeting the requirements.

88. Comment: EMA requested in previous comments and hearing testimony for ARB to provide in-use compliance flexibility for meeting the minimum monitoring ratio requirements. ARB proposed that engine manufacturers could meet the "interim" monitoring ratio of 0.100 (rather than 0.33) until 2012 (section 1968.2(d)(3.2.1)(D)(iii)). Prior to the hearing, EMA proposed language that would allow in-use compliance flexibility for the monitoring ratio requirements for the first three years after the introduction of new monitors. This would allow manufacturers time after introduction where they would have to design monitors to the higher final ratio but would be held responsible to the lower 0.100 ratio in-use. But NOx aftertreatment will not be implemented until 2010, so the 0.100 ratio will only be available for three years total before the final ratios are required to be met in 2013.

Staff suggested a simple approach of extending in-use flexibility through the 2015 model year. At the hearing, EMA requested an additional two years (2013 and 2014, which are the first two years that the more stringent final ratios are effective for medium-duty diesels) of in-use flexibility for medium-duty diesel engines for meeting the monitoring ratio requirements, which ARB staff agreed to and the Board approved. But this was not included in the 15-day changes. (EMA)

Agency Response: As discussed in agency response to comment 86, staff added language in the Second 15-Day Notice to provide the additional model years with the appropriate in-use relief.

89. Comment: ARB included language in section 1968.2(g)(1) which allow the Executive Officer to approve a manufacturer's use of subsequently-revised final versions of SAE and ISO documents included within the regulation, which EMA supports. However, ARB should update the references to a number of SAE publications, some with 2006 and 2007 publication dates, in the OBD II regulation now while the rulemaking is still open. A list of updated, published J1939 standards is available on the SAE website. (EMA)

Agency Response: During each rulemaking, staff does identify newly adopted SAE or ISO documents and update the references to them. In some cases, however, the updates occur too late in the rulemaking process to be included until the next biennial review. This is the precise reason that the regulatory language was changed to allow manufacturers to use the more recent version in the time span between biennial reviews. In this particular review, staff did update most of the SAE documents to the most recent versions except for the SAE J1939 document. Staff was made aware of the updates to the SAE J1939 standards too late in the process to include them in this rulemaking. Further, with specific regard to SAE J1939, this standard is primarily targeted to heavy-duty vehicles and is relied upon heavily in the heavy-duty OBD regulation but plays a much more minor role in the light-duty OBD II regulation. Specifically, the OBD II regulation only uses SAE J1939 to reference a definition of engine load—a definition which has not changed in the newer version. The OBD II regulation also provides an option for manufacturers to alternatively comply with the standardization requirements of the heavy-duty OBD regulation but refers to the heavy-duty regulation itself for the details of that option. At the next biennial review of the heavy-duty OBD regulation, staff intends to update the references to SAE J1939.