## California Environmental Protection Agency

# Air Resources Board

**STAFF REPORT:**
**INITIAL STATEMENT OF REASONS FOR PROPOSED RULEMAKING**

**PROPOSED AMENDMENTS TO THE VERIFICATION PROCEDURE, WARRANTY AND IN-USE COMPLIANCE REQUIREMENTS FOR IN-USE STRATEGIES TO CONTROL EMISSIONS FROM DIESEL ENGINES**

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## EXECUTIVE SUMMARY

In 1998, the Air Resources Board (ARB or Board) identified diesel particulate matter (PM) as a toxic air contaminant (Title 17, California Code of Regulations (CCR), section 9300) following a ten-year review process. A toxic air contaminant is an air pollutant which may cause or contribute to an increase in mortality or serious illness, or which may pose a present or potential hazard to human health. Many toxic air contaminants are volatile and are found primarily in the atmosphere as gases, but some are atmospheric particles or liquid droplets. Diesel PM is of particular concern because of its prevalence in California.

The amount of diesel PM emitted into California's air and the potential cancer risk it poses make diesel PM the most harmful toxic air contaminant in the state. To address this significant health concern, the ARB adopted the Diesel Risk Reduction Plan (DRRP) in 2000, which outlines possible control measures to reduce diesel PM. One of the key components in the DRRP involves using diesel emission control strategies with the existing fleet, which consists of diesel vehicles and equipment in on-road, off-road, and stationary applications. To date, regulations (fleet rules) targeting emission reductions from nearly all in-use diesel vehicles and engines have been adopted by the Board. However, before a diesel emission control strategy may be used to satisfy a regulatory requirement, ARB must first determine if it can effectively and durably reduce emissions.

To ensure that diesel emission control strategies (DECS) achieve real and durable reductions of PM and oxides of nitrogen (NOx) emissions, staff developed the *Verification Procedure, Warranty and In-Use Compliance Requirements for In-Use Strategies to Control Emissions from Diesel Engines* (the Procedure), which the Board initially adopted in May 2002 and subsequently amended a number of times since. The Procedure is used by staff to evaluate DECS through emissions, durability, and field testing. In addition, it permits further evaluation after installation through warranty and in-use compliance requirements. The Procedure is therefore ARB's key tool for ensuring that DECS used by fleet owners are an effective means to achieving the emission reduction goals of the DRRP.

The verification process is designed to assess technologies, determine that the emissions reduction claims of the manufacturer are real and durable, and to define proper in-field application of the devices. The Procedure also requires device manufacturers and installers to warrant their product and work thereby ensuring the purchaser of the device has substantial protection of their investment.

To improve the verification process and better support ARB's in-use fleet rules, ARB staff is proposing a number of amendments to the Procedure. The amendments proposed by staff will:

- Require a pre-installation assessment of compatibility to ensure the suitability of a DECS,
- Clarify the range of remedial action available to ARB if reported DECS warranty claims exceed 4 percent of units sold,
- Reduce the incident notification period from 90 days to 45 days during durability/field demonstrations,
- Require filter-based DECS to store exhaust backpressure and temperature data for a specified period,
- Identify transport refrigeration units, auxiliary power units, locomotive and marine applications as off road sub-categories and clarify appropriate test cycles,
- Require engine speed, date and time to be continuously measured during durability and field demonstration trials,
- Require installations of DECS used in durability and field demonstrations to comply with California's industrial safety requirements,
- Require applicants to submit digital photographs of DECS, vehicles, and equipment used in durability and field demonstrations,
- Require DECS maintenance information to be provided to end users,
- Extend the ability to exchange DECS components across fleets,
- Clarify that all the provisions of a DECS Executive Order apply wherever a DECS is sold and that potential remedial action exists for failure to follow the provisions, and
- Other minor clarifications and modifications

The proposed changes are intended to further the objectives of the verification program and to strengthen the protections and remedies for the system purchasers. The changes will improve matching of devices with applications, strengthen ARB's ability to quickly and effectively address systems with high warranty claim rates, provide additional information to fleets on the maintenance and appropriate use of their DECS, and provide better information to staff regarding durability performance. The proposed changes are based on information and feedback arising from experience with the fleet rules, which require both particulate matter (PM) and oxides of nitrogen (NOx) reductions. In addition, staff incorporated input from device manufacturers, distributers, and end-users in the development of this proposal.

# I. BACKGROUND AND RECOMMENDATION

## A. Introduction

This report describes proposed amendments to the *Verification Procedure, Warranty and In-Use Compliance Requirements for In-Use Strategies to Control Emissions from Diesel Engines* (Procedure), which is provided in the California Code of Regulations, Title 13, Sections 2700-2710. The Procedure arose out of the need to support California's Diesel Risk Reduction Plan, whose goal is to dramatically reduce Californians' exposure to diesel PM through, among other things, regulations to reduce emissions from existing diesel vehicles and equipment (also known as the fleet rules). Subsequent fleet rules also required emissions reductions in NOx. Verification of an emissions control system under the Procedure is the key to participating in the diesel emission control market in California. Staff determined that changes should be made to improve the Procedure to both better enable the ARB to meet the goals of the Diesel Risk Reduction Plan and to better support the various fleet rules. This report describes staff's proposed changes and the rationale behind them, as well as their potential impact.

The ARB has already adopted a number of fleet rules as part of the Diesel Risk Reduction Plan that requires emissions reductions from in-use fleets of diesel vehicles and equipment. One of the primary paths to compliance with the fleet rules is for fleet owners to retrofit their engines with diesel emission control systems (DECS) that are verified by ARB under the Procedure. The Verification Program is therefore a critical element of the Diesel Risk Reduction Plan. It ensures that the benefits from a verified emission control system are both real and durable. It also affords protections to the purchasers of the verified devices via warranty and in-use compliance requirements.

## B. Background

In 1998, following a ten-year review process, ARB identified diesel PM as a toxic air contaminant. A toxic air contaminant is an air pollutant that contributes to mortality or serious illness, or poses other potential hazards to human health. Diesel PM is of particular concern because it is distributed over large regions, thus resulting in widespread public exposure.

Diesel PM is the largest contributor to health risk posed by toxic air pollutants, constituting approximately 70 percent of the total statewide risk. To address this large-scale health concern, the ARB adopted the Diesel Risk Reduction Plan in 2000 (ARB, 2000). One of the primary goals of the Diesel Risk Reduction Plan is to reduce emissions of diesel PM from the long-lived in-use fleet. The Plan outlines measures that include the use of diesel emission control systems with existing diesel vehicles and equipment in on-road, off-road, and stationary applications. To be able to implement those measures, ARB must first verify that candidate emission control technologies are effective in reducing emissions.

In response to that requirement, ARB staff developed the Procedure to verify systems that provide real and durable reductions in diesel PM emissions. The Board adopted the Procedure at a public hearing held on May 16, 2002, and has subsequently amended it several times since. The Procedure encompasses on-road, off-road, and stationary applications and is designed to evaluate a broad range of technologies, including aftertreatment systems, alternative diesel fuels, and fuel additives. It establishes emission and durability testing requirements that manufacturers of emission control technologies must meet in order for their products to receive verification, as well as warranty and in-use compliance testing requirements.

To date, 151 diesel emission control strategies (DECS) verifications, including subsequent extensions of the scope of existing verifications, have been issued through the Procedure. As the Procedure and fleet programs have matured, staff has identified a number of improvements to the Procedure to address actual in-field issues and practices (such as device swapping and the need to better pre-installation assessments). Staff is now proposing a number of modifications to the Procedure to effect these changes.

## C. Overview of the Verification Program

The verification process, as defined by the Procedure, ensures DECS used to satisfy fleet rule requirements achieve real and durable emissions reductions. A manufacturer seeking to verify its product must satisfy emissions testing, durability testing, warranty and in-use compliance requirements as required by the Procedure.

To initiate the verification process, an applicant first submits an application containing detailed information describing the product, the engineering scientific basis of how the product works, and information regarding how they will comply with the testing requirements of the Procedure. In this initial stage, staff is careful to evaluate the strengths and weaknesses of the technology, whether the proposed testing and test engine will enable a meaningful evaluation of the product's performance and durability, and any additional issues unique to the system that must be addressed over the course of the verification. Verification requires that testing and other submitted information supports the desired emissions control group (those engines and applications that will be covered by the verification) and demonstrates successful system performance.

Following verification, applicants must honor the warranty and in-use compliance requirements of the Procedure. Applicants must submit annual warranty reports to ARB which include production and sales information of systems sold in California, and provides a summary of warranty claims. The summary includes a description of the nature of the claims and what actions were taken by the applicant to address them.

## D. Recommendation

Staff recommends that the Board adopt the proposed amendments to sections 2700, 2701, 2702, 2703, 2704, 2705, 2706, and 2707, and adopt new section 2711, title 13, of

the California Code of Regulations, as set forth in the proposed Regulation Order in Appendix A.

## II. REGULATORY AUTHORITY AND PUBLIC OUTREACH

This chapter describes the legal basis on which ARB can adopt and modify the regulation and the public outreach conducted by staff in developing this proposal.

### A. Regulatory Authority

ARB has authority under California law to adopt the proposed regulatory amendments. California Health and Safety Code sections 43000, 43000.5, 43013(b) and 43018 provide broad authority for ARB to adopt emission standards and other regulations to reduce emissions from new and in-use vehicular and other mobile sources. Under Health and Safety Code sections 43013(b) and 43018, ARB is directly authorized to adopt emission standards for off-road vehicular sources, as expeditiously as possible, to meet state ambient air quality standards. ARB is further mandated by California law under Health and Safety Code section 39667 to adopt Air Toxic Control Measures (ATCM's) for new and in-use vehicular sources, including off-road diesel vehicles, for identified toxic air contaminants, such as diesel PM.

Under federal and California law, ARB is the primary agency in California responsible for making certain that all regions of the State attain and maintain National Ambient Air Quality Standards. To achieve this, California must adopt all feasible measures to obtain the necessary emission reductions, including measures for new and existing mobile sources.

### B. Public Outreach

In developing the proposed amendments, staff held a public workshop in El Monte, California on June 23, 2009. This workshop was also accessible via webcast. Staff presented the proposed amendments and received questions and comments from stakeholders. Attendees were predominantly comprised of DECS manufacturers, their representatives, distributors, and some DECS end-users, including regulated fleets. Staff also held multiple meetings and conversations with the Manufacturers of Emission Controls Association (MECA) and individual companies to further discuss the proposals. Staff considered all comments received during development of the proposed amendments.

## III. PROPOSED NEW PROVISIONS TO THE VERIFICATION PROCEDURE

This chapter discusses the motivation and rationale behind each of the proposed amendments that would become a new requirement if adopted by the Board. The chapter following this one discusses proposed amendments that would primarily serve to clarify existing requirements.

### A. Pre-Installation Compatibility Assessment

Most DECS have an exhaust temperature requirement that must be met for them to function properly. However, there are no specific requirements in the Procedure that spell out how an installer of a DECS is to determine if the temperature requirement is met for a given diesel engine. The Executive Orders for verified DECS simply state that for the verification to be valid, the exhaust temperature of the engine must meet the listed requirement. Having no specific guidance, many installers choose to measure and log exhaust temperature from a few representative diesel engines instead of all the engines in a fleet that are being considered for retrofit with the DECS, while others data-log every vehicle to be retrofit. This has resulted in large variations in the percentage of engines that installers assess as well as the methods they use to conduct an assessment. As a result, sometimes inappropriate assessment methods have been used and DECS have been installed on engines that are too cold.

To address this, staff proposes to add guidance in the Procedure that standardizes how the exhaust temperature of a candidate engine must be assessed prior to retrofit. For DECS that reduce PM only, staff's proposal would allow installers to continue to sample a representative number of engines but defines what constitutes a representative number. This is because if the temperature criterion is not met, most PM-only DECS would continue to get their verified PM reductions, but give the operator strong feedback that there is a problem. At first the DECS would illuminate backpressure warning lights, and eventually it would plug up, causing very noticeable problems with vehicle operation. However, for DECS that reduce NOx, staff's proposal would eliminate the practice of representative sampling and require that all candidate engines be assessed because there is no such feedback mechanism in inappropriate (too cold) applications. In such a situation, the DECS would not achieve its verified NOx reductions yet the vehicle would continue to run normally.

For PM-only DECS, staff proposes a number of minimum requirements for determining what constitutes a representative sample of candidate engines within a fleet. There are two parts to staff's proposal: establish a minimum number of engines within a fleet that must be data-logged per group of similar engines, and clarify how a similar group of engines is defined. Staff proposes that within a group of similar engines, as described below, at least 5 engines or 10 percent of the engines, whichever is greater, must be data-logged. This dual requirement ensures that there is always some diversity in datasets and that a given data-logged engine will never represent more than 9 other

engines. Staff defines a group of engines as similar if they meet the following requirements:

- All engines belong to the same common ownership fleet.
- All engines have the same make and model.
- All engines are certified to the same PM emissions standard.
- The maximum power ratings of all engines fall within a range that does not exceed 100 horsepower. For example, all engines are rated to between 250 and 350 horsepower.
- None of the engines have exhaust gas recirculation, or all of the engines have external exhaust gas recirculation, or all of the engines have internal exhaust gas recirculation.
- All engines are installed in similar vehicles or equipment that perform a like function. Examples of vehicle or equipment groups considered similar include solid waste collection vehicles, transit buses, class 8 tractors, excavators, wheel loaders, and back-up emergency generators.

Under staff's proposal, logged exhaust temperature data can only be used to represent engines with highly similar characteristics within the same fleet. Such a group of similar engines can include engines with different model years, engine family names, and maximum power ratings, but all have the same make and model and perform the same basic function. However, even with engine groups thus defined, staff recognizes that there can still be variability in exhaust temperature profiles within such a group. While staff's proposal controls several of the variables, it cannot control all of them. If a DECS manufacturer or installer chooses to take this option and not data-log every candidate engine, it also accepts any uncertainty and risk associated with the option. However, Staff's proposal provides a reasonable balance of these risks, while providing a consistent methodology to evaluating the appropriateness of a particular DECS installation.

The final requirement for those that choose the representative sampling option involves documentation. If all vehicles are data-logged, each will have a dataset and analysis associated with it. However, in a representative sampling scheme, there may be no documentation of an exhaust temperature assessment for some of the vehicles and engines, depending on the practices of a given manufacturer or installer. To address this and to ensure that there is a clear record, staff proposes that if a DECS is found to be compatible with a candidate engine through the use of the representative sampling option, the party doing the assessment must provide a written statement to the owner indicating that the terms and conditions of the Executive Order, including the temperature requirements, have been met. The statement must include detailed information on the DECS and on each vehicle and engine for which the determination is valid. It must also identify which engines were actually data-logged and what parameters were used to define groups of similar engines. Upon request, the manufacturer or installer must submit a copy of the statement to the Executive Officer within 30 calendar days.

Staff's proposal also establishes requirements for the procedures used to assess the exhaust temperature of a candidate engine for both PM and NOx DECS. Currently, the Procedure does not address how a candidate engine is to be data-logged, what kind of data must be recorded, and how much data are necessary. To address this, staff proposes that:

- The data-logging system must be a stand-alone system that is independent of the DECS,
- Data must be measured and recorded while the candidate engine is being used in a manner that is representative of its normal operation,
- Data must be measured at a point in the exhaust system that is within 6 inches of the proposed location of the inlet of the DECS,
- The recorded exhaust gas temperature must have an accuracy of ±4 degrees Celsius, and the temperature sensor must have an appropriate range,
- Data must be recorded long enough to ensure that the candidate engine's operating exhaust temperature profile can be determined, but not for less than 24 hours of representative, actual engine operation,
- The data-logging system must have sufficient memory to avoid any overwriting of logged data, and
- Data must be recorded at a frequency of at least once every 5 seconds. Each record must include the exhaust temperature in Celsius, the time and date, and any other parameters that are necessary to determine compatibility with the Executive Order of the DECS.

Given that a minimum of 24 hours of actual engine operation must be recorded, the data-logging strategy must include a means to determine when the engine is actually running. One way of doing this is to use a data-logging system that automatically starts when the engine starts and stops when the engine stops. Another way is to log data continuously but to redact data that correspond with the engine being off. Logging engine speed or using a temperature threshold, such as just below the temperature at idle, are two means of identifying when the engine is running.

Finally, staff's proposal also includes a requirement that the data used to determine the compatibility of a DECS with a given engine must be retained by the installer for the duration of the warranty period. This includes engine oil consumption records at the time of installation and documentation showing that the engine was tuned according to the manufacturer's maintenance specifications prior to installation. All such data must be made available to ARB upon request.

Staff's pre-installation compatibility assessment proposal will help to ensure that candidate engines are more systematically screened prior to retrofit. The new requirements will improve the matching of candidate engines with appropriate DECS, and ensure that candidate engines are operating properly before receiving a DECS resulting in fewer problems in the field. Because assessment procedures are better

defined and include specific recordkeeping requirements, staff's proposal also makes the terms and conditions of a DECS Executive Order more enforceable.

### B. Incident Notification Timeframe

Staff proposes to shorten the period applicants currently have to submit a report of any incidents during the durability or field demonstration period. This change will result in applicants having a period of no more than 45 days, rather than the currently allowed 90, within which they must submit a report describing device/component failures, unscheduled repairs or unscheduled maintenance events.

Given that the field demonstration period can be as short as 200 hours (or 10,000 miles) the current 90 day reporting window is impractical as it is almost half way over before ARB would even know about an issue. A problem during durability/field demonstrations can negatively affect ARB's acceptance of that information in support of a verification, and may require an applicant to reassess its system and/or restructure their testing. As a result, if ARB determines that the problem is significant enough to affect acceptance of the data, the device manufacturer has committed time and resources to an unproductive endeavor and could better utilize their resources working towards a successful durability/field demonstration. This can result in significant loss of time and capital which delays the verification process. Staff's proposal should minimize the occurrences of such issues, thereby providing better certainty to manufacturers of ARB acceptance of supporting verification data.

### C. Continuous Exhaust Temperature and Backpressure Monitoring

If a problem arises with an installed DECS, certain basic information must be obtained in order to investigate the cause and/or nature of the problem. In addition to engine history and maintenance information, this includes backpressure and temperature data showing what the device was experiencing prior to the problem, as well as any history of any warning codes and fault codes. Such information can also be critical if disputes arise over warranty claims and obligations. However, not all systems incorporate control units capable of storing information for any appreciable length of time. Therefore staff is proposing to require all temperature dependent DECS that are verified after the effective date of the proposed amendments to have the capability to measure and record certain operational parameters. These parameters include engine exhaust temperature, exhaust backpressure and any error codes that may result during the day-to-day operation of the DECS. All DECS must include an electronic device capable of measuring these parameters, except error codes, for a period of no less than 200 hours of actual engine operation at an interval of once every 30 seconds. Error codes must be logged for a period of no less than 500 hours of actual engine operation at the same interval.

## D. Compliance with California's Industrial Safety Regulations

The Division of Occupational Safety and Health of the California Department of Industrial Relations is in the process of developing safety regulations that will pertain to the installation of DECS on off-road vehicles and equipment. Staff proposes that an applicant for verification must conform to these regulations for all durability and field demonstrations conducted in California. Should all of an applicant's demonstrations be conducted outside of California, staff proposes that at least one must conform to these regulations. Staff's proposal will ensure that each applicant is familiar with California's industrial safety regulations and is able to comply with them.

## E. Photographic Documentation

To better illustrate and document durability and field demonstrations, staff proposes to require that the applicant submit digital photographs of DECS and demonstration vehicles or equipment as part of the application for verification. This is because all demonstrations are conducted under the oversight of the applicant, not ARB, so staff rarely has the opportunity to see the installation first hand. While most applicants already submit digital photographs of retrofitted demonstration vehicles as part of their application, there is neither a formal requirement for this nor standardization as to what photographs should show.

Staff's proposal would require photographs at three stages of a demonstration: before installation of the DECS, after installation, and after completion of the demonstration. Specifically, photographs must show:

- The entire vehicle or piece of equipment before and after installation,
- A close-up of the location in which the DECS will be installed before and after installation,
- All available identification for the vehicle or equipment, engine, and DECS including labels and license plates, and
- After completion of the demonstration, the outlet face of the filter if the DECS includes one.

This proposal should not add any significant burden to applicants because, as mentioned previously, most of them already submit digital photographs.

## F. Information on DECS Maintenance Practices

The Procedure currently requires that DECS manufacturers provide owners with the maintenance requirements for the DECS in the owner's manual. This basic information lists the maintenance that must be done, but no additional information, such as the procedure for properly cleaning a component, is required. To better enable the owner to take care of the DECS, staff proposes that DECS manufacturers provide more comprehensive maintenance information to owners, and that this information be provided upon delivery of the DECS. This additional information includes routine maintenance procedures, filter cleaning procedures, the identification of any equipment

necessary to clean and maintain DECS components, the identification of any prohibited or harmful maintenance practices, and any performance criteria used to determine a proper state of maintenance, such as the pressure drop across a fully cleaned filter. The information provided must be sufficient to enable an owner to properly maintain the DECS without requiring that services be provided exclusively by the applicant or the applicant's distributor.

Requiring this level of maintenance information is important because it helps to give an owner a choice when deciding how to maintain his or her DECS. A DECS manufacturer may have grounds to deny a warranty claim if an owner does not properly maintain a DECS, but cannot deny a claim simply because the owner did not use an authorized service provider. Nevertheless, if comprehensive maintenance information is not available, an owner may have little choice but to use the authorized service provider. The proposed amendment serves to balance this situation.

For those DECS manufacturers that are concerned about anyone other than an authorized provider performing maintenance, there is another option they can consider. A manufacturer may require that a DECS be serviced by an authorized provider if the maintenance is covered under warranty at no cost to the owner. This is the only circumstance in which specifying the service provider is acceptable.

**G. Component Swapping**

The Procedure provides a limited pathway for an end-user to exchange, or "swap," specific DECS components among vehicles that are retrofitted with the same DECS. For DECS swapping to be permitted, the vehicles must belong to the same common ownership fleet and the swapping procedures must be approved by both the DECS manufacturer and ARB. Staff is proposing to modify this provision by removing the restriction that components may only be swapped within a given common ownership fleet. Staff's proposal would allow swapping across different fleets upon approval of this practice by the manufacturer and ARB. As a result, end-users, manufacturers, and installers would have another means by which to address the logistical challenge of removing DECS components that are in need of service while minimizing vehicle downtime. Also, staff's proposal could potentially reduce or even eliminate the need for a fleet to purchase costly spare components as it would have access, most likely through a service provider, to a large pool of spare components as needed.

Another element of staff's proposal is a clarification that applies to both component swapping and DECS re-designation. The proposed change clarifies that whether a vehicle is receiving a component or entire system from another vehicle, both the end-user and the installer must verify that the recipient vehicle meets the terms of the Executive Order, not the end-user alone.

## H. Requirement to Log Date, Time, and Engine Speed Data

Staff proposes to add language to Sections 2704 (Durability Testing Requirements), and 2705 (Field Demonstration Requirements), to clarify the type of data that must be recorded during durability demonstrations and field demonstrations. Staff routinely receives logged durability data that has no date or time stamp. In addition, applicants often submit data without any corresponding engine speed data, making analysis extremely difficult. Given that these data are used to evaluate the ability of a DECS to meet the emission reductions and durability requirements as required by the Procedure, it is essential that the data be properly identified such that it can be correlated to specific dates and times. Therefore, staff is proposing to require applicants to measure and record engine speed data and to ensure that all measured data has an accurate date and time stamp that corresponds with engine operation.

## IV. PROPOSED CLARIFYING AMENDMENTS TO THE VERIFICATION PROCEDURE

This chapter discusses the motivation and rationale behind the proposed amendments that would serve to clarify several of the existing requirements in the Procedure.

### A. Remedial Action for High Warranty Claim Rates

Currently, the Procedure requires annual warranty reporting, but does not clearly spell out possible ramifications if a high number of warranty claims are reported. Most verified device manufacturers recognize that ARB can revoke a verification if a system has catastrophic problems in the field, and ARB has always had the authority to take appropriate remedial action if necessary. However, staff believes it is appropriate to add clarifying language to remind device manufacturers that ARB can also modify or suspend a verification if the warranty claim rate exceeds the four percent threshold provided in the Procedure. Modifications include, for example, reducing the scope of engines that a verification covers and increasing the minimum exhaust temperature requirement. Suspension of a verification means that the DECS is not verified for some period of time. A suspension can end when the problem with the DECS has been resolved.

### B. Identification of Off-road Categories

While marine vessels, locomotives, transport refrigeration units, and auxiliary power units are currently grouped into the off-road engines category under the Procedure, they typically are tested very differently for verification (this includes both emissions and durability testing). These applications are tested according to the most appropriate test protocol and durability demonstration that best suites the application. These subcategories are characterized by very different duty cycles and operating conditions making it inappropriate to utilize a single off-road certification test cycle (such as the Non-Road Transient Cycle) to substantiate DECS performance.

Staff's proposed changes clarify this distinction by acknowledging these applications as individual and unique subcategories within the off road arena. Staff has proposed adding a definition for each one as part of the Procedure. Furthermore, the proposed amendments also specifically list the most appropriate test procedure to be used for each category. This clarification is necessary so that the testing and durability requirements are obvious to an applicant and not confused with those for general off-road applications. This change will not require different or additional testing relative to what the Procedure currently provides for and what is currently required of applicants targeting those subcategories. However, separating these as individual subcategories provides clarity to manufacturers in the verification process and to end users in the Executive Order by identifying that a DECS is verified to be used specifically for one of these applications. The proposed distinction will help ensure misapplications are less likely to occur by clearly identifying the appropriate subcategory.

## C. Installation Warranty Clarifications

Staff proposes to add clarifying language to Section 2707 (Warranty Requirements) making it clear that the installation warranty requirements are identical to the product warranty requirements. The product warranty covers defects in the DECS, and the installation warranty covers defects in the installation of the DECS, but both warranties have the same warranty period, cover any damage caused to the engine, and must meet the same set of additional requirements as outlined in the Procedure.

The proposed clarification does not in any way alter the warranty period or coverage for either the applicant or installer. This clarification is necessary because the section has been misinterpreted in a number of instances, requiring ARB to reiterate the responsibility of installers to honor the full extent of their warranty responsibilities. Additionally, misinterpretation by end-users resulted in failures to recognize their rights, and the remedies available to them under the Procedure leading to a lack of clarity in the market place.

## D. Re-Designation Practices for Repowered Engines

Currently the Procedure allows for the transfer of an entire DECS from one engine to another within a common ownership fleet provided all the terms of the Executive Order are met. This is known as DECS re-designation. DECS manufacturer and ARB approval is required and other restrictions and conditions apply.

However, the current language in the Procedure does not address situations where the DECS remains on a chassis, but the engine is replaced with a different one. This action is equivalent to a DECS re-designation. Staff therefore proposes to allow re-designation to include this situation. All existing re-designation requirements apply.

## E. Component Swapping and DECS Re-Designation Warranty Clarifications

The Procedure is clear on the applicant's warranty responsibilities in the context of component swapping and DECS re-designation, but less so on the installer's responsibilities. The applicant must agree to continue to honor the product warranty for the duration of the original warranty period as both components and entire DECS get moved from one vehicle to another. Concerning the installation warranty, the Procedure only addresses the circumstance in which a DECS is re-designated after the original warranty expires. It requires that the installer issue a new one-year installation warranty.

Staff's proposal clarifies the installer's warranty responsibilities for both component swapping and DECS re-designation that occur both before and after expiration of the original warranty. Before expiration of the original warranty, the installer must honor it just as the applicant does. If the installer of either a swapped component or re-designated DECS is not the same as the installer who did the original installation, the new installer must honor the installation warranty for the remainder of the original

warranty period or until another installer swaps the component or re-designates the DECS. If the original warranty has expired or has less than one year remaining, the installer must issue a new one-year installation warranty.

The proposed requirements ensure that every aspect of a DECS installation warranty is intact throughout potentially multiple component swaps or re-designations. Responsibility is assigned to the installer that performs the service. In this way, each installer is held accountable for his or her own actions and not those of other installers.

## F. Labeling Requirement Clarification

For a DECS to be "verified", it must comply with all requirements in the Procedure. Awarding of verification status by ARB entitles a device manufacturer to market, sell, and install their devices as a fleet rule compliance option for end-users. Since regulated fleets may only meet their compliance obligations with verified DECS, they need assurance that the "verified" designation includes performance requirements and warranty protection. Additionally, this designation distinguishes verified devices from non-verified aftermarket parts, and from similar Federal programs which offer no warranty recourse or protections.

All verified devices are assigned a DECS name by ARB, which must be included on a label complying with Title 13, CCR, section 2706 of the Procedure. This label is an important compliance and consumer protected tool to distinguish an ARB verified device from non-verified devices. To ensure that only ARB verified systems carry a label compliant with section 2706, and have the assigned DECS name, staff is proposing to clarify that such a label may only be used with verified systems. Therefore, any DECS carrying an ARB approved label is presumed to be verified, and the manufacturer is obligated to honor all terms and conditions of verification including, but not limited to, warranty requirements, regardless of where the devise is installed or the retrofit vehicle is used.

## G. Unidirectional Design Clarification

Staff proposes to clarify the unidirectional design requirement contained in section 2706(r). As currently specified in the Procedure, this requirement becomes effective January 1, 2010. However, due to the effects of the current global recession, and recent changes to some of the in-use diesel fleet rules, sales of verified DECS are lower than expected, resulting in some DECS manufacturers having excess inventory of DECS that do not meet the unidirectional design requirement. To address this, staff proposes to provide a "sell through" period that would allow DECS manufacturers and installers to sell and install, for an additional 6 months, DECS that are manufactured before December 31, 2009.

## H. Scope of Compliance

In conjunction with the proposed changes to the labeling requirements, staff proposes to add a new section 2711, Title 13, CCR, to the Procedure which clarifies the scope of the verification program and ARB's ability to take necessary and appropriate enforcement action in response to violations of the Procedure. Currently, ARB can enforce or revoke a verification if the verified DECS manufacturer fails to meet the requirements of the Procedure. Section 2711 clarifies ARB's authority to take enforcement action regardless of the location of the sale, installation, or use of a verified DECS.

Specifically, staff's proposal clarifies that a DECS cannot be sold, offered for sale, or introduced into commerce anywhere as "verified" if the product does not meet all of the terms and conditions of the governing Executive Order, including the warranty and label requirements. Additionally, the proposed amendment would reiterate ARB's ability to modify, revoke or suspend an Executive Order if the applicant violates any of the terms and conditions thereof. Finally, the proposed language clarifies that a DECS cannot be represented as being ARB verified unless it has actually been verified under the Procedure.

As previously stated, for a DECS to be called "verified" means it complies with all requirements in the Procedure. Awarding of verification status by ARB entitles a device manufacturer to sell their devices as a fleet rule compliance option for end-users. Since regulated fleets must comply with the governing rule, they must choose from among verified retrofits, and deserve assurance that the "verified" designation includes performance and warranty protection. Additionally, this designation distinguishes "verified" devices from aftermarket parts and from similar Federal programs which offer no warranty recourse or protections.

ARB staff is aware that DECS manufacturers are selling systems outside of California as "ARB verified" that do not meet all the terms and conditions of the verification. In particular, these DECS are often sold an inferior warranty that offers less protection than the warranty required by the Procedure. As a result, members of the regulated community trying to comply with the same ARB fleet rule will receive different levels of warranty protection depending on their location. Interstate trucking companies and multi-state construction companies, for example, that have trucks and equipment operating both in and outside of California that must comply with the fleet rules. Because they need to purchase ARB verified DECS to comply with the fleet rules, they should be afforded the same warranty protection given to California-based companies. Under staff's proposal, all verified DECS must come with the minimum warranty protection as defined in the Procedure, regardless of where they are sold.

## I. Other Proposed Amendments

Staff clarified appropriate contacts and mailing addresses for all application submittals.

Staff modified the application outline in section 2702 to ask applicants to submit pre-installation compatibility procedures, and clarified the scope of information requested on DECS installation requirements.

## V. ECONOMIC and ENVIRONMENTAL IMPACTS

This chapter discusses the economic impacts staff anticipates as a result of the proposed amendments.

### A. Legal Requirement

Section 11346.3 of the Government Code requires State agencies to assess the potential for adverse economic impacts on California business enterprises and individuals when proposing to adopt or amend any administrative regulation. The assessment shall include a consideration of the impact of the proposed regulation on California Jobs, business expansion, elimination or creation, and the ability of California business to compete with business in other states.

State agencies are also required to estimate the cost or savings to any State or local agency and school district in accordance with instructions adopted by the Department of Finance. The estimate shall include any non-discretionary cost or savings to the local agencies and the cost or savings in federal funding to the State.

### B. Potential Impact on California Businesses

The requirements for verification under the Procedure apply to any business that elects to participate in the program regardless of its location. Staff's proposal does nothing to alter the applicability of the program, and does not hold California business to a different standard than non-California business. Manufacturers that participate in the verification program need to provide detailed information and data on their products in accordance with the Procedure. The proposed changes include basic requirements for pre-installation assessment of candidate vehicles as well as provide for more transparency relating to the proper maintenance of the devices. These changes may result in new services and businesses arising to address this market.

Additionally, the proposal includes the ability to swap device components across fleets, which is currently not allowed. By providing the opportunity to swap components among the regulated community, end users (those affected by ARB's fleet rules) may have access to a larger pool of spare components, thereby reducing the amount of vehicle down time necessary when a DECS needs servicing. This may serve to lower compliance costs to fleets affected by ARB's fleet rules.

### C. Potential Impact on Employment

The proposed amendments to the Procedure are not expected to cause a noticeable change in California employment and payroll. As previously noted, participation in the program is voluntary. However, staff can foresee secondary businesses potentially arising which conduct pre-installation compatibility assessments, and/or device

maintenance and cleaning. This may result in an unquantifiable increase in additional jobs.

## D. Potential Impact of Business Creation, Elimination or Expansion

The proposed amendment requiring manufacturers to make maintenance procedures more transparent will create new business opportunities in the service industry and allow capable fleets (including fleets that are small businesses) to maintain their own systems. The proposal to permit across-fleet component swapping may allow for new forms of service oriented business which can efficiently support multiple fleets' needs. Overall, staff expects that the proposed amendments to the Procedure will not negatively impact the status of California businesses, including small businesses.

## E. Potential Impact on Business Competitiveness

The proposed amendments to the Procedure would have no adverse impact on the competitiveness of California businesses to compete. As all applicants must adhere to the same requirements. The proposed labeling requirements maintain the integrity of the ARB verification program, while the proposed new section 2711 further protects successful participants in the verification program by preventing non-verified devices and/or configurations from being marketed as ARB verified, or giving advantage to out-of-state installations which may be done to circumvent warranty responsibilities. The proposal to make maintenance information publically available will enable more business to compete in the provision of maintenance services to end users. This will increase business competitiveness thereby lowering costs to DECS owners.

## F. Potential Impact to California State or Local Agencies

The proposed amendments to the Procedure will not create costs or savings, as defined in Government Code section 11346.5 (a)(6), to any State agency or in federal funding to the State, costs or mandate to any local agency or school district whether or not reimbursable by the State pursuant to Part 7 (commencing with section 17500, Division 4, title 2 of the Government Code), or other non-discretionary savings to local agencies.

## G. Estimated Costs of the Proposed Amendments

The overall economic impacts of the proposed amendments on the State, affected businesses, and individual fleets are not expected to be significant. Participation in ARB's Verification Program is voluntary. Applicants electing to have their DECS verified under the requirements of the Procedure choose to do so for financial gain. Verification for these participants translates into increased sales and therefore, increased revenues. The proposed changes facilitate appropriate deployment of verified technologies and assist end-users in proper maintenance of the systems. These changes should foster a more competitive marketplace affording the end users more options at potentially less cost. Discussion specific to amendments that have potential cost implications is presented below.

### 1) Pre-Installation Assessment of Compatibility

The proposed amendment of pre-installation assessment provides an option by which applicants, installers, and vehicle owners can reduce their costs. All the terms and conditions of an Executive Order must be met for a device to be considered verified. Therefore, each candidate application must be individually assessed prior to installation of a device. This can involve temperature data-logging of each candidate vehicle. Staff's proposed amendment allows the option of representative sampling to evaluate exhaust temperature compatibility. This will potentially reduce the number of engines/vehicles which need to be data-logged thereby reducing compatibility assessment costs and affiliated vehicle down time. This should result in lower costs to fleets.

### 2) Operational Data Storage Requirement

The proposed amendment requiring the exhaust temperature and backpressure to be measured and recorded should have a negligible economic impact on DECS manufacturers. ARB staff contacted the manufacturers of all currently verified Level 3 devices and determined that this capability is already common practice and is reflected in the currently verified systems' designs. In part, this voluntary move towards this capability may have been driven by the need to have sufficient information in the case a system's functionally was every challenged or if a warranty dispute occurred. Therefore, staff believes that this proposal should have no additional economic impact on current or future verified device manufacturers.

### 3) Require Device Manufacturers to Disclose Maintenance Information

This requirement addresses the need for publicly available maintenance information. No requirements regarding the format of this information are proposed (i.e., electronic, PDF, pamphlet, etc.). Given device manufacturers currently provide a wide range of materials regarding their products in a range of media formats (e.g., websites, pamphlets, electronic files), and often provide maintenance documentation to their affiliates, this requirement is not expected to impose an additional cost on device manufacturers. In addition, it will likely result in a cost savings to end users as it may spur job growth and creation by supporting the establishment of cleaning and maintenance service providers, and/or by enabling end-users to become more self-reliant.

### 4) Component Swapping Among Fleets

The proposal to allow device components to move across fleets is an option which device manufacturers can allow if they so choose. Presumably, they will only support such a practice if they stand to benefit financially.

## H. Environmental Impacts

The proposal changes should have no significant environmental impacts. The changes do not affect verified device emission reduction designations (Levels or Marks), required testing, secondary emission concerns, or durability requirements.

## VI. REGULATORY ALTERNATIVES CONSIDERED

This section discusses a number of alternatives to staff's proposed amendments that were considered and the reasons why staff ultimately determined they are not better than the proposal described above.

### A. Do Not Define Pre-Installation Assessment Requirements

Failure to adopt this proposed amendment will perpetuate the current ambiguity surrounding how candidate engines are to be evaluated prior to DECS installation. This would result in the continuation of inconsistent installation policies, inequity in the market place, misapplications of DECS, system failures, negative impacts on engines and vehicle use, and non-resolvable warranty disputes.

### B. Do Not Require Operational Data Storage

Staff's proposal ensures all verified devices are capable of measuring and recording basic attributes of system functionality. This is critical information when assessing actual in-field device performance. This can facilitate warranty claim resolution, and should the need arise, ARB staff's investigation of a system's performance. However, while currently verified Level 3 device manufacturers currently employ such technology, failure to adopt this proposal means that no such guarantees exist for future verifications and verification activities.

### C. Do Not Require Disclosure of Maintenance Information

Failure to adopt this would result in potential unavailability of important information on proper system maintenance. This may also result in potential monopolies by retrofit manufacturers regarding filter cleaning and maintenance, inability to properly support systems, and inadvertent device damage due to inappropriate maintenance. Currently, information on proper maintenance practices is not widely available to most independent third parties. This is due, in part, to the device manufacturers wishing to maintain control over this information and/or releasing it only to authorized representatives. Many end-users are without complete maintenance information and therefore may not be able to appropriately support their devices. This can result in device performance issues, up to and including system failures. If inappropriately maintained, the device manufacturers have grounds to deny warranty claims.

### D. Do Not Adopt New Section 2711

This proposed change is meant to clarify existing ARB authority. Failure to adopt this new section may result in continued uncertainty amongst manufactures regarding ARB's ability to enforce on issues relating to verification. This may result in misrepresentation of non-verified product resulting in end-users purchasing devices

non-compliant with fleet rule requirements and not carrying the warranty protection provided by the Procedure.

## VII. REFERENCES

ARB, 2000. California Air Resources Board. *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles.* California Air Resources Board, October 2000. http://www.arb.ca.gov/diesel/documents/rrpFinal.pdf