Appendix A: Proposed Regulation Order

California Code of Regulations, Title 13, Division 3

Chapter 14. Verification Procedure, Warranty and In-Use Compliance Requirements for In-Use Strategies to Control Emissions from Diesel Engines

Note: The pre-existing regulation text is set forth below in normal type. The amendments are shown in underline to indicate additions and ~~strikeout~~ to indicate deletions. ***** indicates sections of regulation not printed are not changed.

Amend sections 2700, 2701, 2702, 2703, 2704, 2705, 2706, 2707, 2708, 2709, 2710 and 2711 to read as follows:

§ 2700. Applicability.

These procedures apply to market-ready in-use strategies which, through the use of sound principles of science and engineering, control emissions of particulate matter (PM) and oxides of nitrogen (NOx) from diesel-fueled diesel engines. These strategies may include but are not limited to, diesel particulate filters, diesel oxidation catalysts, fuel additives, selective catalytic reduction systems, exhaust gas recirculation systems, and alternative diesel fuels. To be verified under these procedures, a strategy must either reduce emissions of PM or both PM and NOx. A strategy that reduces emissions of NOx alone may be verified only for use with on-road diesel engines certified to a PM emissions standard of 0.01 grams per brake-horsepower hour (g/bhp-hr) or less, or off-road diesel engines certified to a PM emissions standard of 0.03 g/bhp-hr or less. A strategy that reduces emissions of NOx alone may be verified for use with other diesel engines provided that they are not regulated by ARB in-use fleet regulations or Airborne Toxic Control Measures that require PM emissions control, or provided that they would otherwise potentially not be retrofit with PM emission control strategies.

NOTE: Authority cited: Sections 39002, 39003, 39500, 39600, 39601, 39650-39675, 40000, 43000, 43000.5, 43011, 43013, 43018, 43105, 43600 and 43700, Health and Safety Code. Reference: Sections 39650-39675, 43000, 43009.5, 43013, 43018, 43101, 43104, 43105, 43106, 43107 and 43204-43205.5, Health and Safety Code; and Title 17 California Code of Regulations Section 93000.

§ 2701. Definitions.

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(9) "Baseline" means the test of a vehicle or engine in its original equipment manufacturers configuration without the diesel emission control strategy implemented.

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(13) "Days" when computing any period of time, means normal working days on which the Air Resources Board is open for business unless otherwise noted.

~~(13)~~(14) “Diesel ~~e~~Emission ~~c~~Control ~~s~~Strategy” or “Diesel ~~e~~Emission ~~c~~Control system” means any device, system, or strategy employed with an in-use diesel vehicle or piece of equipment that is intended to reduce emissions. Examples of diesel emission control strategies include, but are not limited to, particulate filters, diesel oxidation catalysts, selective catalytic reduction systems, fuel additives used in combination with particulate filters, alternative diesel fuels, and combinations of the above.

~~(14)~~(15) “Diesel Emission Control Strategy Family Name~~.~~” ~~See~~ As defined in ~~S~~section 2706(j)(2).

~~(15)~~(16) “Diesel Engine” means an internal combustion engine with operating characteristics significantly similar to the theoretical diesel combustion cycle. The primary means of controlling power output in a diesel cycle engine is by limiting the amount of fuel that is injected into the combustion chambers of the engine. A diesel cycle engine may be petroleum-fueled (i.e., diesel-fueled) or alternate-fueled.

~~(16)~~(17) “Diesel-~~f~~Fueled ~~a~~Auxiliary ~~p~~Power ~~s~~System” or “APU” means any device that is permanently dedicated to the vehicle on which it is installed and provides electrical, mechanical, or thermal energy to the primary diesel engine, truck cab, and/or sleeper berth, bus passenger compartment or any other commercial vehicle’s cab, as an alternative to idling the primary diesel engine.

~~(17)~~(18) “Distributor” means any person or entity to whom a diesel emission control strategy is sold, leased or supplied for the purposes of resale or distribution in commerce.

~~(18)~~(19) “Donor Vehicle/~~e~~Engine” means any vehicle/engine whose installed diesel emission control strategy device has been removed for the purpose of re-designation or component swapping.

~~(19)~~(20) “Durability” means the ability of the applicant’s diesel emission control strategy to maintain a level of emissions below the baseline and maintain its physical integrity over some period of time or distance determined by the Executive Officer pursuant to these regulations. The minimum durability testing periods contained herein are not necessarily meant to represent the entire useful life of the diesel emission control strategy in actual service.

~~(20)~~(21) “Emergency Standby Engine” means a diesel engine operated solely for emergency use, except as otherwise provided in airborne toxic control measures adopted by ARB.

~~(21)~~(22) “Emergency Use” means using a diesel engine to provide electrical power or mechanical work during any of the following events and subject to the following conditions:

(A) The failure or loss of all or part of normal electrical power service or normal natural gas supply to the facility,

(B) The failure of a facility’s internal power distribution system,

(C) The pumping of flood water or sewage to prevent or mitigate a flood or sewage overflow,

(D) The pumping of water for fire suppression or protection,

(E) The powering of ALSF-1 and ALSF-2 airport runway lights under category II or III weather conditions,
(F) Other conditions as specified in airborne toxic control measures adopted by ARB.

~~(22)~~(23) "Emission control group" means a set of diesel engines and applications determined by parameters that affect the performance of a particular diesel emission control strategy. The exact parameters depend on the nature of the diesel emission control strategy and may include, but are not limited to, certification levels of engine emissions, combustion cycle, displacement, aspiration, horsepower rating, duty cycle, exhaust temperature profile, and fuel composition. Verification of a diesel emission control strategy and the extension of existing verifications are done on the basis of emission control groups.

~~(23)~~(24) "End user" means any individual or entity that owns or operates a vehicle or piece of equipment that has a verified diesel emission control ~~system~~ strategy installed.

~~(24)~~(25) "Executive Officer" means the Executive Officer of the Air Resources Board or the Executive Officer's designee.

~~(25)~~(26) "Executive Order" means the document signed by the Executive Officer that specifies the verification level of a diesel emission control strategy for an emission control group and includes any enforceable conditions and requirements necessary to support the designated verification.

~~(26)~~(27) "Fuel Additive" means any substance designed to be added to fuel or fuel systems or other engine-related systems such that it is present in-cylinder during combustion and has any of the following effects: decreased emissions, improved fuel economy, increased performance of the entire vehicle or one of its component parts, or any combination thereof; or assists diesel emission control strategies in decreasing emissions, or improving fuel economy or increasing performance of a vehicle or component part, or any combination thereof. Fuel additives used in conjunction with diesel fuel may be treated as an alternative diesel fuel. See ~~S~~section 2701 (a)(3) .

~~(27)~~(28) "Hot Start" means the start of an engine within four hours after the engine is last turned off. The first hot start test run should be initiated 20 minutes after the cold start for Federal Test Procedure testing following Section 86.1327-90 of the Code of Federal Regulations, Title 40, Part 86.

~~(28)~~(29) "Installer" or "Authorized Installer" means any individual or entity that equips any vehicle, engine or equipment with a diesel emission control strategy and has the authorization of the party that holds the verification for the diesel emission control strategy pursuant to section 2706(u).

~~(29)~~(30) "Locomotive" means a self-propelled piece of on-track equipment designed for moving or propelling cars that are designed to carry freight, passengers or other equipment, but which itself is not designed or intended to carry freight, passengers (other than those operating the locomotive) or other equipment.

~~(30)~~(31) “Marine Engine” means a compression ignition engine designed and used to provide propulsion or auxiliary power on water craft such as recreational boats, ocean going vessels, or commercial harbor craft.

(32) ”Market-ready” means ready for introduction into commerce. A market-ready diesel emission control strategy is not a prototype and requires no design modifications, part changes, revisions to control logic, or other changes prior to being sold to end-users for commercial use. All components that are necessary for a market-ready diesel emission control strategy to function properly are also commercially available.

~~(31)~~(33) “Portable Engine” means an engine designed and capable of being carried or moved from one location to another, except as defined in section 2701(a)(~~33~~42). Engines used to propel mobile equipment or a motor vehicle of any kind are not portable. Indicators of portability include, but are not limited to, wheels, skids, carrying handles, dolly, trailer, or platform. A portable engine cannot remain at the same facility location for more than 12 consecutive rolling months or 365 rolling days, whichever occurs first, not including time spent in a storage facility. If it does remain at the facility for more than 12 months, it is considered to be a stationary engine. The definitions in Title 13 California Code of Regulations section 2452(g) and section 2452(x) are incorporated by reference herein.

(34) “Quarterly Reports” refer to the following calendar periods: January 1 – March 31; April 1 – June 30; July 1 – September 30; October 1 – December 31.

(35) “Recall” means an inspection, repair, adjustment, replacement, or modification program of a diesel emission control strategy family required by the Executive Officer and initiated and conducted by the manufacturer, applicant, or its agent or representative for which direct notification of the end-user is necessary to remedy: the potential for catastrophic failure or other safety related failure, failure to meet the conditions for passing in-use compliance testing as defined in section 2709(m) of this Procedure, valid warranty claims in excess of four percent as defined in section 2707(c) of this Procedure, or the failure of an operational feature (e.g. strategy used to signal high backpressure) of a substantial number of units. Recalls must address all diesel emission control strategies within a specific diesel emission control strategy family and may include all diesel emission control strategies sold as California verified.

~~(32)~~(36) “Re-designation” means the removal, within the same common ownership fleet, of a complete used verified diesel emission control strategy from an appropriate engine in a vehicle/application and installation to another appropriate engine in a vehicle/application that meets the terms and conditions of the diesel emission control strategy Executive Order.

~~(33)~~(37) “Regeneration” in the context of diesel particulate filters, means the periodic or continuous combustion of collected particulate matter that is

trapped in a particulate filter through an active or passive mechanism. Active regeneration requires a source of heat other than the exhaust itself to regenerate the particulate filter. Examples of active regeneration strategies include, but are not limited to, the use of fuel burners and electrical heaters. Passive regeneration does not require a source of heat for regeneration other than the exhaust stream itself. Examples of passive regeneration strategies include, but are not limited to, the use of fuel additives and the catalyst-coated particulate filter. In the context of NOx reduction strategies, "regeneration" means the desorption and reduction of NOx from NOx adsorbers (or NOx traps) during rich operation conditions.

~~(34)~~(38) "Repower**"** means to replace the engine in a vehicle or piece of equipment with another engine that meets a subsequent engine emissions standard (e.g., replacing a Tier 1 engine with a Tier 3 or later engine).

~~(35)~~(39) "Revoke" means to cancel the verification status of a diesel emission control strategy. If a diesel emission control strategy's verification status is revoked by the Executive Officer, the applicant must immediately cease and desist selling the diesel emission control strategy to end-users.

(40) "Rubber-tired Gantry Crane" or "RTG Crane" means an off-road overhead cargo container crane with the lifting mechanism mounted on a cross-beam supported on vertical legs which run on rubber tires.

~~(36)~~(41) "Seller" means any person or entity that sells, leases or supplies a diesel emission control strategy.

~~(37)~~(42) "Stationary Engine" means an engine that is designed to stay in one location, or remains in one location. An engine is stationary if any of the following are true:

(A) The engine or its replacement is attached to a foundation, or if not so attached, will reside at the same location for more than 12 consecutive months. Any engine that replaces engine(s) at a location, and is intended to perform the same or similar function as the engine(s) being replaced, will be included in calculating the consecutive time period. In that case, the cumulative time of all engine(s), including the time between the removal of the original engine(s) and installation of the replacement engine(s), will be counted toward the consecutive time period; or

(B) The engine remains or will reside at a location for less than 12 consecutive months if the engine is located at a seasonal source and operates during the full annual operating period of the seasonal source, where a seasonal source is a stationary source that remains in a single location on a permanent basis (at least two years) and that operates at that single location at least three months each year; or

(C) The engine is moved from one location to another in an attempt to circumvent the residence time requirements [Note: The period during which the engine is maintained at a storage facility shall be excluded

from the residency time determination.] The definitions in Title 13 California Code of Regulations section 2452(g) and section 2452(x) are incorporated by reference herein.

~~(38)~~(43) "Transport Refrigeration Unit (TRU)" means a refrigeration system powered by an integral internal combustion engine designed to control the environment of temperature sensitive products that are transported in trucks and refrigerated trailers. TRUs may be capable of both cooling and heating.

~~(39)~~(44) "Unidirectional Device Design and Installation" means that an emission control device must be appropriately designed, manufactured and labeled to prevent reverse flow installation.

~~(40)~~(45) "Used Verified Device" means any verified diesel emission control strategy which has been sold or leased to an end user and installed on an engine/application.

(46) "Valid Warranty Claim" means a request from an end user, installer, or distributor to the applicant for an inspection, repair, adjustment, replacement, or modification of a specific part or component of the diesel emission control strategy, vehicle, or engine for which the applicant is invoiced for compensation pursuant to the warranty provisions and compensation is actually provided, excluding warranty repairs made solely for customer satisfaction purposes (i.e., good faith repairs). The number of valid warranty claims will be used to determine the 4 percent failure rate pursuant to sections 2707 and 2709.

~~(41)~~(47) "Verification" means a determination by the Executive Officer that a diesel emission control strategy meets the requirements of this Procedure. This determination is based on both data submitted or otherwise known to the Executive Officer and engineering judgment.

(48) "Warranty Claim" means a request from an end user, installer, or distributor to the applicant for an inspection, repair, adjustment, replacement, or modification of a specific part or component of the diesel emission control strategy, vehicle, or engine.

~~(42)~~(49) "Warrantable Condition" means any condition of the diesel emission control strategy, vehicle, or engine which triggers the responsibility of the applicant to take corrective action pursuant to ~~S~~section 2707.

NOTE: Authority cited: Sections 39002, 39003, 39500, 39600, 39601, 39650-39675, 40000, 43000, 43000.5, 43011, 43013, 43018, 43105, 43600 and 43700, Health and Safety Code. Reference: Sections 39650-39675, 43000, 43009.5, 43013, 43018, 43101, 43104, 43105, 43106, 43107 and 43204-43205.5, Health and Safety Code; and Title 17 California Code of Regulations Section 93000.

§ 2702. Application Process.

(a) Overview. Before submitting a final application for the verification of a diesel emission control strategy for use with an emission control group, the applicant must submit a preliminary verification application (pursuant to ~~S~~section 2702(b)) ~~at the Executive Officer's discretion~~ in the format shown in 2702(d). If the Executive Officer determines that an application includes more than one

emission control group, the applicant must propose a test plan that includes test engines and testing conditions that are representative of the least favorable conditions within the requested emission control groups for the diesel emission control strategy to demonstrate compliance with the requirements of the Procedure. To obtain verification, the applicant must conduct emission reduction testing (pursuant to ~~S~~section 2703), durability testing (pursuant to ~~S~~section 2704), a field demonstration (pursuant to ~~S~~section 2705), and submit the results along with comments and other information (pursuant to ~~S~~sections 2706 and 2707) in a final verification application to the Executive Officer, in the format shown in ~~S~~section 2702(d). If the Executive Officer grants verification of a diesel emission control strategy, it will issue an Executive Order to the applicant identifying the verified emission reduction and any conditions that must be met for the diesel emission control strategy to function properly. After the Executive Officer grants verification of a diesel emission control strategy, the applicant must provide a warranty, conduct in-use compliance testing of the strategy after having sold or leased a specified number of units, and report the results to the Executive Officer (pursuant to ~~S~~section 2709). A diesel emission control strategy that employs two or more individual systems or components must be tested and submitted for evaluation as one system. A verified diesel emission control strategy may not be installed on an engine with another diesel emission control strategy that is not included in the Executive Order. Applicants seeking verification of an alternative diesel fuel must follow the procedure described in ~~S~~section 2710.

(b) Preliminary Verification Application. Before formally submitting a final application for the verification of a diesel emission control strategy, the applicant must submit a preliminary verification application ~~at the Executive Officer's discretion~~. The Executive Officer reserves the right to require that an applicant's preliminary application be submitted with a market-ready diesel emission control strategy that is identical in all material respects to the product that will be sold upon receiving verification. If such a request is made by the Executive Officer the applicant must submit the market-ready diesel emission control strategy within 30 calendar days or the preliminary application will be terminated. This product must also be identical in all respects to any products used to support the verification activity. The submitted diesel emission control strategy must include all parts including, but not limited to, the aftertreatment components, sensors, control logic and algorithms, and the backpressure monitor as well as a complete parts list. Any changes to any part of the strategy including, but not limited to, control logic and algorithms, functionality, materials, catalyst loadings and formulation, hardware, etc., will be deemed not identical and not appropriate for verification purposes. Different sizes of the same strategy will be determined to be identical at the Executive Officer's discretion. For strategies that include multiple sizes of the same part (e.g., the diesel particulate filter), the Executive Officer will specify which size of the part must be submitted.

The Executive Officer shall return, at the applicant's expense, the market-ready diesel emission control strategy after the request for verification is either granted, denied, or withdrawn. The Executive Officer shall use the information in the preliminary verification application to help determine whether the strategy relies on sound principles of science and engineering to control emissions, the need for additional analyses, and the appropriateness of allowing alternatives to the prescribed requirements. The preliminary verification application must follow the format shown in ~~S~~section 2702(d) and at a minimum provide the information required in sections 1. through 5., and section 8.A.5~~, where applicable~~. In addition, the preliminary verification application must include the following information:

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(5) A brief statement that the applicant acknowledges and agrees to do the following:

(A) Provide a warranty pursuant to the requirements of section 2707.

(B) Submit in-use compliance information pursuant to the requirements of Section 2709.

(C) Keep records until the in-use compliance requirements are completed that contain information per ~~S~~section 2702(~~m~~n) including:

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(c) ~~When an applicant submits a preliminary verification application, the Executive Officer shall, within 30 days of its receipt, determine whether the applicant has identified the information necessary to support an application for verification and notify the applicant in writing that it may submit an application for verification. The Executive Officer may suggest modifications to the proposed preliminary verification application to facilitate verification of the diesel emission control strategy.~~ All applications, correspondence, and reports, with the exception of applications based on the use of fuel additives or alternative diesel fuels, locomotive applications, stationary applications, transport refrigeration units, rubber-tired gantry cranes, and marine applications, must be submitted in writing to:

CHIEF, HEAVY-DUTY DIESEL IN-USE STRATEGIES BRANCH
AIR RESOURCES BOARD
9480 TELSTAR AVENUE, SUITE 4
EL MONTE, CA 91731

All applications, correspondence, and reports for systems utilizing any form of fuel additive or alternative diesel fuel or ~~intended for locomotives,~~ must be submitted in writing to:

CHIEF, ~~CRITERIA POLLUTANTS~~ ALTERNATIVE FUELS BRANCH
AIR RESOURCES BOARD
1001 I STREET
SACRAMENTO, CA 95814

All applications, correspondence, and reports for systems intended for use with locomotive must be submitted in writing to:

CHIEF, FREIGHT TRANSPORT BRANCH
AIR RESOURCES BOARD
1001 I STREET
SACRAMENTO, CA 95814

All applications, correspondence, and reports for systems intended for use with stationary applications, transport refrigeration units, rubber-tired gantry cranes, or marine applications must be submitted in writing to:

CHIEF, EMISSIONS ASSESSMENT BRANCH
AIR RESOURCES BOARD
1001 I STREET
SACRAMENTO, CA 95814

(d) Application Format. The preliminary and final verification applications must be submitted in writing to the address shown in subsection (c) above. Electronic mail and verbal submissions do not constitute acceptable application formats. Supporting data in electronic format may be accepted as part of the application at the discretion of the Executive Officer. The preliminary and final verification applications for a diesel emission control strategy must follow the format shown below. If a section asks for information that is not applicable to the diesel emission control strategy, the applicant must indicate "not applicable." If the Executive Officer concurs with the applicant's judgement that a section is not applicable, the Executive Officer may waive the requirement to provide the information requested in that section. Final verification applications must include all of the information provided in the preliminary verification application as described in ~~S~~section 2702(b), including any additional information, updates, or changes, and all additional information shown below.

1. *Introduction*

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2. *Diesel Emission Control Strategy Information*

2.1 General description of the diesel emission control strategy
- 2.1.1 Detailed discussion of principles of operation and system design
- 2.1.2 Description of inducement method if applicable
- 2.1.3 Schematics depicting operation (as appropriate)
- 2.1.4 A list identifying all the parts of the diesel emission control strategy as described in ~~S~~section 2706(o)
- 2.1.5 Detailed description of measures taken to prevent reverse flow installation

2.2 Description of regeneration method
- 2.2.1 Operating condition requirements for regeneration
- 2.2.2 Thresholds and control logic to activate regeneration
- 2.2.3 Description of backpressure monitor including thresholds and control logic

2.3 Favorable operating conditions

2.4 Unfavorable operating conditions and associated reductions in performance

2.5 Fuel and lubricating oil requirements and misfueling considerations

2.6 Identification of failure modes and associated consequences

2.7 ~~Complete discussion~~ Analysis of potential safety and catastrophic failure issues per section 2706(w) *(e.g., uncontrolled regeneration, lack of proper maintenance, unfavorable operating conditions, use of inappropriate fuel, high exhaust temperatures, substrate failure, sensor failure, etc.)*, including a description of the mitigation strategies employed by the diesel emission control strategy for each potential safety and catastrophic failure issue

2.8 Complete discussion of the installation requirements *(e.g., appropriate system placement, space requirements, visibility, device orientation, engine oil consumption limits, etc.)*

2.9 Pre-installation compatibility assessment procedures

2.10 Maintenance requirements
- 2.10.1 Detailed description of all normal maintenance requirements for the diesel emission control strategy
- 2.10.2 An objective criteria for DECS ash removal (pressure drop across the filter, maximum clean filter weight, pre-installation filter weight comparison, etc.) for determination if a DECS is “cleaned” per section 2706(h)(2)(B)
- 2.10.3 A copy of the language that will instruct the end user of proper handling of spent components and/or materials cleaned from the diesel emission control strategy, identify any hazardous materials, and provide procedures for resetting any backpressure monitors after maintenance procedures are completed.

2.11 Description of noise level control compliance

3. ~~.~~Alternative Diesel Fuel and Fuel Additive Information~~.~~

(Use of an alternative diesel fuel/fuel additive requires a multimedia evaluation as required by Section 43830.8 California Health and Safety Code)

3.1 Alternative Diesel Fuel Information
3.~~1~~2 Additional information from ~~S~~section 2710(b), 2710(c), 2710(f), and 2710(g)
3.~~2~~3 Emission control group compatibility considerations
3.~~3~~4 Misfueling prevention strategies
3.~~4~~5 Multimedia evaluation
3.4~~5~~.1 Additional test data and information required for multimedia evaluation

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5. Testing Information
5.1 Emission reduction testing
5.1.1 Test facility identification including capabilities and identification of all analytical instruments
5.1.2 Description of test vehicle and engine *(make, model year, engine family name, PM and NOx certification levels if applicable, etc.)*
5.1.3 Statement indicating whether the test engine is in a proper state of maintenance, and/or has been rebuilt or modified from the original engine manufacturer configuration
5.1.4 Description of test fuel
5.1.5 Discussion of effects of elevated NOx emissions on diesel emission control strategy (effects on emission reduction performance, durability, safety, and control strategy response)
5.1.6 Test procedure description *(pre-conditioning period, test cycle, etc.)*
5.1.7 Test results and comments
5.1.8 Incomplete and aborted test data and explanations

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6. *Warranty and In-Use Compliance Requirements*
6.1 Statement that the applicant agrees to provide annual warranty reports and to follow the warranty requirements per ~~S~~section 2707
6.2 Statement that the applicant agrees to follow the in-use compliance requirements per ~~S~~section 2709
6.3 Statement that the applicant agrees to keep the required end user information per ~~S~~section 2702(~~m~~n)

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8. Appendices
A. ~~Laboratory~~Emissions test report information *(for all tests, including incomplete, aborted and failed tests)*
A.1 Actual ~~laboratory~~ emissions test data. Applicants must submit the raw, real-time data gathered by the laboratory's data acquisition system during emissions testing in electronic format on a compact

disc. These are the raw data from which emissions test results are derived. (e.g., analyzer voltage readings recorded at a frequency of 1 Hertz)

A.2 Plots of engine backpressure and exhaust temperature

A.3 Driving traces for chassis dynamometer tests

A.4 Quality assurance and quality control information

A.5 Testing equipment information and indication that testing equipment meets specifications and calibrations given in procedures required by sections 2703, 2704 and 2710 as appropriate.

B. Field test information

B.1 Engine backpressure and exhaust temperature data (as described in ~~S~~sections 2704(d)(2) and 2705(c)(1))

B.2 Third-party letters or questionnaires describing in-field performance

~~C. Diesel emission control strategy label~~

~~D~~C. Copy of the Owner's Manual (as described in ~~S~~section 2706(l))

~~E~~D. Copy of the Installation Manual

~~F~~E. Sample scale drawings of the original and replacement diesel emission control strategy label~~s~~ (See ~~S~~section 2706(j))

~~G~~F. Other supporting documentation

(e) ~~Within 30 days of receipt of the preliminary application, the Executive Officer shall notify the applicant whether the application is complete.~~Preliminary Verification Application Review Process. A preliminary application for verification is reviewed as follows:

(1) Review for Completeness. Within 30 days of receipt of the preliminary application, the Executive Officer shall notify the applicant indicating whether the application is complete. If the preliminary application is not complete the Executive Officer shall request any missing information from the applicant.

(A) If, after requesting missing information three times, the Executive Officer determines that the preliminary application is still not complete, the application will be terminated.

(2) Engineering and Compliance Review. After determining that the preliminary application is complete, the Executive Officer shall conduct a technical review of the preliminary application to determine whether the preliminary application is adequate to support development of a test plan approval letter. If the preliminary application is not adequate to support development of a test plan approval letter, the Executive Officer shall request additional information from the applicant.

(A) If, after requesting additional information three times, the Executive Officer determines that the preliminary application is still not adequate to support development of a test plan approval letter, the application will be terminated.

(3) Test Plan Approval Letter. Following the Engineering and Compliance review and upon determining that the preliminary application is satisfactory, the Executive Officer shall issue a test plan approval letter to the applicant within 45 days.
(4) If the preliminary application is terminated by the Executive Officer and the applicant wishes to attempt verification again, the applicant must wait at least 30 calendar days before submitting a new, revised preliminary verification application.

(f) ~~Within 60 days after a final application has been deemed complete, the Executive Officer shall determine whether the diesel emission control strategy merits verification and shall classify it as shown in Table 1:~~Final Verification Application Review Process. A final application for verification is reviewed as follows:
(1) The Executive Officer shall not review a final application unless the applicant has first received a test plan approval letter.
(2) Review for Completeness. Following receipt of the final application, the Executive Officer shall notify the applicant indicating whether the final application is complete. If the final application is not complete the Executive Officer shall request any missing information from the applicant.
(A) If, after requesting missing information three times, the Executive Officer determines that the final application is still not complete, the application will be terminated.
(3) Test Results and Compliance Review. Within 60 days of determining that the final application is complete, the Executive Officer shall determine whether the diesel emission control strategy merits verification and shall classify it as shown in Table 1:

Table 1. Verification Classifications for Diesel Emission Control Strategies

Pollutant	Reduction	Classification
PM	< 25%	Not verified
		Level 0* (see note below)
	≥ 25%	Level 1
		Level 1 Plus**
	≥ 50%	Level 2
		Level 2 Plus**
	≥ 85%, or ≤ 0.01 g/bhp-hr	Level 3
		Level 3 Plus**
NOx	< 25%	Not verified
	≥ 25%	Mark 1
	≥ 40%	Mark 2
	≥ 55%	Mark 3
	≥ 70%	Mark 4
	≥ 85%	Mark 5

*A diesel emission control strategy that reduces emissions of PM by less than 25 percent may be verified as a Level 0 strategy if it reduces emissions of NOx by at least 25 percent and meets the other criteria in section 2700.
**The diesel emission control strategy complies with the 20 percent NO_2 limit before January 1, 2009 (and after January 1, 2007).

~~The applicant and the Executive Officer may mutually agree to a longer time period for reaching a decision, and additional supporting documentation may be submitted by the applicant before a decision has been reached.~~ The Executive Officer shall notify the applicant of the decision in writing and specify the verification level for the diesel emission control strategy and identify any terms and conditions that are necessary to support the verification.

(4) If the final application is terminated by the Executive Officer and the applicant wishes to attempt verification again, the applicant must wait at least 30 days before submitting a new, revised final application.

(g) Application Termination. If at any point during the review process an applicant's application is terminated, the Executive Officer will cease review of all materials regarding the diesel emission control strategy and associated

application. The applicant may submit a new, revised application per section 2702 (e) – (f) after 30 days of the date of the termination notification. This time is intended to allow the applicant to correct any deficiencies in the application. If the preliminary application was terminated, a resubmitted preliminary application will be reviewed as a new application. The re-submission must address the concerns that caused the termination and must not be identical to the terminated application.

~~(g)~~(h) Extensions of an Existing Verification. If the applicant has verified a diesel emission control strategy with one emission control group and wishes to extend the verification to include additional emission control groups, it may apply to do so using the original test data, additional test data, engineering justification and analysis, or any other information deemed necessary by the Executive Officer to address the differences between the emission control group already verified and the additional emission control group(s). Processing time periods follow sections (e) and (f) above.

~~(h)~~(i) Conditional Extensions of an Existing Verification for On-Road Applications. If an applicant has an ARB verified diesel emission control strategy and wishes to extend the verification to include new on-road emission control groups, the applicant may apply to receive a conditional extension. If the Executive Officer determines that the diesel emission control strategy is technologically sound and appropriate for the intended application, the applicant may be granted conditional extension for up to one year. Upon receiving a conditional extension, the applicant may sell the diesel emission control strategy as a verified product for the duration of the conditional extension period. To obtain full verification, the applicant must complete the requirements set forth by the Executive Officer according to the requirements of the regulation. In granting a conditional extension, the Executive Officer may consider all relevant information including, but not limited to, the following: the design of the diesel emission control strategy, original test data, other relevant test data, the duty cycle of the prospective emission control group, and field experience. For the time period it is effective, a conditional extension is equivalent to a verification for the purposes of satisfying the in-use compliance requirements. Diesel emission control strategies that are conditionally verified for off-road and stationary applications are not eligible for conditional extensions (See ~~S~~section 2704(~~k~~l)).

~~(i)~~(j) Design Modifications. If an applicant modifies the design of a diesel emission control strategy during the review process, the Executive Officer will terminate the application. The applicant must re-submit an application per section 2702 (e) – (f) that includes details of the new design in order for the diesel emission control strategy to be considered for verification, a conditional verification, or a conditional extension. Re-submission must follow the requirements of section 2702(g). If an applicant modifies the design of a diesel emission control strategy that has already been verified ~~or is under~~

~~consideration for verification~~ by the Executive Officer, the modified version must be evaluated under this Procedure. The applicant must provide a detailed description of the design modification along with an explanation of how the modification will change the operation and performance of the diesel emission control strategy. To support its claims, the applicant must submit additional test data, engineering justification and analysis, or any other information deemed necessary by the Executive Officer to address the differences between the modified and original designs, to ensure that the verified emissions reductions are maintained, and to ensure that emissions of any pollutants remain compliant with the requirements per section 2706. Processing time periods follow section~~s~~ 2702 (e) ~~and~~ - (f) above. A design modification includes, but is not limited to:

(1) Any change of materials or specifications to the major parts of the diesel emission control strategy (e.g., the diesel particulate filter, the diesel oxidation catalyst, the canning components, etc.).

(2) Any change to the wash coat or catalyst formulas or composition.

(3) Any change to the catalyst loadings.

(4) Any change to the sensors, part sizes, or sizing methodology.

(5) Any change to the monitoring and notification system control logic or algorithms or parts.

~~(j)~~(k) Verification Transfers. If an applicant wishes to sell, lease, or supply another manufacturer's previously verified diesel emission control strategy, the applicant must do the following:

(1) Submit a letter of consent from the manufacturer that legally holds the original verification. The letter must give the applicant the right to hold a verification for the diesel emission control strategy and, if applicable, to use information that was previously submitted as support in the application for the original verification.

(2) Submit an application(s) per ~~S~~section 2702 of this Procedure. If previously submitted information is included, necessary additional information must be submitted that satisfies all applicable requirements of this Procedure (e.g. testing data, warranty statement, label, owner's manual, etc.).

(3) Submit a description of the diesel emission control strategy's principals of operation. The applicant must demonstrate understanding of how the product relies on sound principles of science and engineering to achieve emissions reductions.

(4) Submit a plan showing how the applicant will comply with the in-use compliance requirements of section 2709 of this Procedure.

~~(k)~~(l) Emission Control Strategies Approved under Other Verification Programs. Any applicant with a diesel emission control strategy that is verified under another diesel emission control verification program that wishes to receive ARB verification must submit an application that contains the information requested in part (d) above. Pre-existing data and information submitted in

support of verification approval from other programs may be submitted, but the applicant must meet requirements that are unique to this Procedure including, but not limited to, a system label compliant with ~~S~~section 2706(j), a California owner's manual compliant with ~~S~~section 2706(l), a warranty compliant with ~~S~~section 2707, in-use compliance requirements per ~~S~~section 2709, and multimedia evaluation if applicable. The Executive Officer may evaluate all information submitted including additional information required by this Procedure to determine if a diesel emission control strategy merits ARB verification.

~~(l)~~(m) Treatment of Confidential Information. Information submitted to the Executive Officer by an applicant may be claimed as confidential, and such information shall be handled in accordance with the procedures specified in Title 17, California Code of Regulations, ~~S~~sections 91000-91022. The Executive Officer may consider such confidential information in reaching a decision on a verification application.

~~(m)~~(n) Recordkeeping Requirements. Both applicants and authorized diesel emission control strategy installers are responsible for keeping records as described below.

(1) Applicants that receive a verification, conditional verification, or a conditional extension must keep records that have valid end user contact information (name, address, phone number), a description of the vehicles or equipment the units are applied to (type of vehicle/equipment, make, model year, vehicle identification number), and a description of the engines the units are applied to (make, model, model year, engine serial number, engine family name). The applicant must keep these records for each diesel emission control strategy family until the in-use compliance requirements of the diesel emission control strategy family are completed. Applicants that receive a conditional extension of conditional verification must submit these records to the Executive Officer one year after receiving the conditional extension or conditional verification. Applicants that receive verifications must submit these records upon request by the Executive Officer to an agent or employee of ARB. The Executive Officer may request that such records be made available at any time. The applicant must provide these records within 30 days of the request by ARB. Failure to submit these records may result in revocation or suspension of the verification and/or any other remedy available under Part 5, Division 26 of the Health and Safety Code.

(2) Authorized ~~I~~installers must keep all pre-installation compatibility assessment records as described in ~~S~~section 2706(t)(~~3~~2) – (4).

~~(n)~~(o) The Executive Officer may at any time with respect to any diesel emission control strategy sold, leased, offered for sale, intended for sale, or manufactured for sale in California, order the applicant or manufacturer to

submit records pertaining to the diesel emission control strategy, at the applicant's expense, to a location specified by the Executive Officer.

~~(o)~~(p) Applicants that receive a verification, a conditional verification, or a conditional extension must demonstrate sales or the active pursuit of sales of their diesel emission control strategies in California upon request of the Executive Officer. If an applicant fails to provide such proof, the Executive Officer will evaluate whether the verification should be revoked.

~~(p)~~(q) The Executive Officer may, with respect to any diesel emission control strategy sold, leased, offered for sale, intended for sale, or manufactured for sale in California, order the applicant or strategy manufacturer to make available for testing and/or inspection a reasonable number of diesel emission control ~~system~~ strategies including but not limited to new diesel emission control strategies selected by ARB staff that are in the possession of authorized dealers or distributors but not yet installed on candidate engines, and may direct that they be delivered at the applicant's expense to the state board at the Haagen-Smit Laboratory, 9528 Telstar Avenue, El Monte, California or where specified by the Executive Officer. The Executive Officer may also, with respect to any diesel emission control strategy being sold, leased, offered for sale, intended for sale, or manufactured for sale in California, have an applicant test and/or inspect under the supervision of the Executive Officer a reasonable number of units at the applicant's or manufacturer's facility or at any test laboratory accepted by the Executive Officer. All such testing and inspection is confirmatory in nature. If the Executive Officer finds performance that is not consistent with either an existing or requested verification, the applicant must address and resolve the inconsistency to the satisfaction of the Executive Officer in order to maintain or receive verification. Any testing and inspection done by ARB cannot be used as a substitute for emissions test data or other support required in an application for verification.

(r) For the purpose of selecting new diesel emission control strategies for testing and/or inspection to determine compliance with this regulation, an agent or employee of ARB, with prior notice and upon presentation of proper credentials, has the right to enter any facility (with any necessary safety clearances) where diesel emission control strategies verified under these Procedures are located or kept.

~~(q)~~(s) The Executive Officer may lower the verification level or revoke the verification status of a verified diesel emission control strategy family, a conditionally verified strategy, or a strategy with a conditional extension or suspend all review of pending verification applications if the Executive Officer determines that there are errors, omissions, inaccurate information, fraudulent submittals, or a deficiency of required submittals, in the application for verification, supporting information, warranty report, recall plan, or in-use

compliance ~~testing~~ report. Any changes to the verified diesel emission control strategy family not approved by the ARB will subject the applicant to ARB enforcement actions. Additionally, penalties may be assessed under Part 5, Division 26 of the Health and Safety Code. The Executive officer may suspend the review of all other applications sent by an applicant if that applicant fails to submit warranty reports or any other requested information. The Executive Officer may also seek remedial action against the applicant if it is determined that the verified diesel emission control strategy does not comply with the requirements or provisions of the Executive Order.

NOTE: Authority cited: Sections 39002, 39003, 39500, 39600, 39601, 39650-39675, 40000, 43000, 43000.5, 43011, 43012, 43013, 43018, 43105, 43600 and 43700, Health and Safety Code. Reference: Sections 39650-39675, 43000, 43009.5, 43013, 43018, 43101, 43104, 43105, 43106, 43107 and 43204-43205.5, Health and Safety Code; and Title 17 California Code of Regulations Section 93000.

§ 2703. Emission Testing Requirements.

(a) Testing on an Emission Control Group Basis.

(1) The applicant must test the diesel emission control strategy on an emission control group basis and identify the emission control group. The applicant must identify the test engines and vehicles, if applicable, by providing the engine family name, make, model, model year, and PM and NOx certification levels if applicable. The applicant must also describe the applications for which the diesel emission control strategy is intended to be used by giving examples of in-use vehicles or equipment, characterizing typical duty cycles, indicating any fuel requirements, and/or providing other application-related information.

(2) If the Executive Officer determines that the applicant has requested more than one emission control group, the applicant must propose a test plan that includes one or more emission test engines that are representative of the least favorable conditions (e.g., PM levels, NOx-to-PM ratios, engine size) within the requested emission control groups for the diesel emission control strategy to demonstrate compliance with the requirements of the Procedure.

(3) The applicant must select an appropriate test engine or engines based on the proposed emission control group. Attributes of the emission control group which determine an appropriate test engine include, but are not limited to:

(A) Certification category (e.g., on-road or off-road)

(B) Certified emission levels (e.g., PM levels, NOx-to-PM ratios)

(C) Certified aftertreatment (e.g., diesel oxidation catalyst, diesel particulate filter)

(D) Exhaust gas recirculation (e.g., none, internal or external)

(E) Engine size (e.g., displacement, rated horsepower, exhaust flow rate)

(b) Test Engine Requirements and Pre-conditioning.

(1) For a diesel emission control strategy that has the potential to form NO_2 or other secondary emissions, the applicant must identify this potential to the Executive Officer and propose an emissions test engine accordingly. The applicant must provide detailed and comprehensive information showing how the proposed emissions test engine is an appropriate, representative test engine.

(2) The applicant may tune-up or rebuild test engines prior to, but not after, baseline testing unless rebuilding the engine is an integral part of the diesel emission control strategy. All testing should be performed with the test engine in a proper state of maintenance. Emissions of NO_2 from the test engine must not exceed 15 percent of the total baseline NOx emissions by mass. If there is a special category of engines with NO_2 emission levels that normally exceed 15 percent, this requirement may be adjusted for those engines at the discretion of the Executive Officer.

(c) Diesel Emission Control Strategy Requirements and Pre-conditioning.

(1) The diesel emission control strategy must be appropriately sized for the emissions test engine(s) based on the sizing information provided in the application and must be approved by the Executive Officer. If the sizing methodology or the test unit and engine combination indicated in the test plan approval letter changes during testing or during the application review process, the application will be re-evaluated and a new test plan approval letter, which may include additional testing, must be issued by the Executive Officer before any further testing commences. Any testing conducted prior to the sizing change may be rejected at the Executive Officer's discretion.

(2) If a diesel emission control strategy includes both single and multiple filter designs, the sizing of both designs is subject to the requirements and conditions in section 2703(c)(1). Both single and multiple configurations require complete emissions and durability testing (see section 2704) unless:

(A) The multiple-filter design has only one filter per exhaust manifold,

(B) The multiple filter design involves multiple filters housed within one can. Additional testing requirements for this configuration are at the discretion of the Executive Officer.

(C) The applicant demonstrates to the satisfaction of the Executive Officer that full testing of one configuration is worst case and therefore sufficient to support verification of the other configuration.

(3) The engine or vehicle installed with a diesel emission control strategy must be operated for a break-in period of between 25 and 125 hours before emission testing. Note that special pre-conditioning requirements may apply. See section 2706(a)(4) for details.

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NOTE: Authority cited: Sections 39002, 39003, 39500, 39600, 39601, 39650-39675, 40000, 43000, 43000.5, 43011, 43013, 43018, 43105, 43600 and 43700, Health and Safety Code. Reference: Sections 39650-39675, 43000, 43009.5, 43013, 43018, 43101, 43104, 43105, 43106, 43107 and 43204-43205.5, Health and Safety Code; and Title 17 California Code of Regulations Section 93000.

§ 2704. Durability Testing Requirements

(a) The applicant must demonstrate, to the satisfaction of the Executive Officer, the durability of the applicant's diesel emission control strategy through an actual field or laboratory-based demonstration combined with chassis or engine dynamometer-based emission tests.

(1) A laboratory-based durability demonstration is not acceptable as the primary durability data used to support verification with an emission control group that includes on-road, off-road, or APU applications. The applicant may request that the Executive Officer consider a laboratory-based durability demonstration as secondary supporting data. In evaluating such a request, the Executive Officer may consider all relevant information including, but not limited to, the degree to which the proposed laboratory-based demonstration simulates real-world conditions and subjects the diesel emission control strategy to operating conditions that are either favorable or unfavorable for proper operation based on its design.

(2) If the applicant chooses a laboratory-based durability demonstration, an additional field demonstration will be required to demonstrate in-field compatibility (pursuant to ~~S~~section 2705).

(3) If the applicant has demonstrated the durability of the identical strategy in a prior verification or has demonstrated durability through field experience, the applicant may request that the Executive Officer accept the previous demonstration in fulfillment of this requirement. In evaluating such a request, the Executive Officer may consider all relevant information including, but not limited to, the similarity of baseline emissions and application duty cycles, the relationship between the emission control group used in previous testing and the current emission control group, the number of engines tested, evidence of successful operation and user acceptance, and published reports.

(b) Demonstrating Durability on an Emission Control Group Basis.

(1) If the Executive Officer determines that the applicant has requested more than one emission control group, the applicant must propose a test plan that includes one or more durability test engines and applications that are representative of the least favorable conditions (e.g., PM levels, NOx-to-PM ratios, engine size) within the requested emission control groups for the diesel emission control strategy to demonstrate compliance with the requirements of the Procedure.

(2) The applicant must select an appropriate test engine and application based on the proposed emission control group. Attributes of the emission

control group which determine an appropriate test engine and application include, but are not limited to:
(A) Certification category (e.g., on-road or off-road)
(B) Certified emission levels (e.g., PM levels, NOx-to-PM ratios)
(C) Certified aftertreatment (e.g., diesel oxidation catalyst, diesel particulate filter)
(D) Exhaust gas recirculation (e.g., none, internal or external)
(E) Engine size (e.g., displacement, rated horsepower, exhaust flow rate)
(F) Exhaust temperature profile
(G) Vehicle or equipment usage
(H) Vehicle or equipment type (e.g., rubber-tired or crawler)

~~(b)~~(c) Engine Selection and Sizing.

(1) Subject to the approval of the Executive Officer, the applicant may choose the engine and application to be used in the durability demonstration. The engine and application must be representative of the emission control group for which verification is sought. The applicant must identify the test engine and vehicle, if applicable, by providing the engine family name, make, model, model year, PM and NOx certification levels if applicable, and vehicle identification number. The applicant must also describe the applications for which the diesel emission control strategy is intended to be used by giving examples of in-use vehicles or equipment, characterizing typical duty cycles, indicating any fuel requirements, and/or providing other application-related information.

(2) The selected engine need not be the same as the engine used for emission testing, but if the applicant does use the same engine, the emission testing may also be used for the initial durability tests.

(3) Emissions of NO2 from the emissions test engine must not exceed 15 percent of the total baseline NOx emissions by mass. If there is a special category of engines with NO2 emission levels that normally exceed 15 percent, this requirement may be adjusted for those engines at the discretion of the Executive Officer.

(4) The diesel emission control strategy must be appropriately sized for the durability test engine(s) and vehicle(s) based on the sizing information provided in the application and must be approved by the Executive Officer. If the sizing methodology or the test unit and engine combination indicated in the test plan approval letter changes during testing or during the application review process, the application will be re-evaluated and a new test plan approval letter, which may include additional testing, must be issued by ARB before any further testing commences. Any testing conducted prior to the sizing change may be rejected at the Executive Officer's discretion.

(5) If a diesel emission control strategy includes both single and multiple filter designs, the sizing of both designs is subject to the requirements and conditions in section 2703(c)(1). Both single and multiple configurations

require complete emissions and durability testing (see section 2704) unless:

(A) The multiple-filter design has only one filter per exhaust manifold,

(B) The multiple filter design involves multiple filters housed within one can. Additional testing requirements for this configuration are at the discretion of the Executive Officer.

(C) The applicant demonstrates to the satisfaction of the Executive Officer that full testing of one configuration is worst case and therefore sufficient to support verification of the other configuration.

~~(c)~~(d) Test Fuel.

(1) The test fuel must meet the specifications in the California Code of Regulations (~~S~~sections 2280 through 2283 of Title 13), with the exception of the sulfur content or other properties previously identified by the applicant and approved by the Executive Officer. The Executive Officer may approve test fuel(s) that do not comply with ~~S~~sections 2280 through 2283 of Title 13 of the California Code of Regulations if the fuel(s) are determined to be, based on sound science and engineering, representative of commercially available fuel typically used for the intended application(s).

(2) If operation or performance of a diesel emission control strategy is affected by fuel sulfur content, the sulfur content of the test fuel must be no less than 66 percent of the stated maximum sulfur content for the diesel emission control strategy, unless

(A) the testing is performed with fuel containing 15 ppmw or less sulfur for verification on 15 ppmw or less sulfur diesel fuel, or

(B) the testing is performed with diesel fuel commercially available in California for verification on CARB diesel fuel (i.e., fuel meeting the specifications in Title 13, California Code of Regulations, ~~S~~sections 2280 through 2283).

(3) Baseline testing may be conducted with commercially available diesel fuel or diesel fuel with 15 ppmw or less sulfur. Baseline and control tests must be performed using the same fuel unless the control fuel is specified as a component of the emission control strategy.

(4) The test fuel (or batch of fuel purchased) must be analyzed using American Society for Testing and Materials (ASTM) test methods listed in Table 6 (See ~~S~~section 2710), which are incorporated herein by reference. At a minimum, sulfur content, aromatic content, polycyclic aromatic hydrocarbons, nitrogen content, and cetane number must be reported. The Executive Officer may ask for additional properties to be reported if evidence suggests those properties may affect functioning of the diesel emission control strategy.

~~(d)~~(e) Service Accumulation. The durability demonstration consists of an extended service accumulation period in which the diesel emission control strategy is implemented in the field or in a laboratory accepted by the Executive Officer,

with emission reduction testing before and after the service accumulation. Service accumulation begins after the first emission test and concludes before the final emission test. The pre-conditioning period required in ~~S~~section 2703 (c) cannot be used to meet the service accumulation requirements.

(1) Minimum Durability Demonstration Periods. The minimum durability demonstration periods are shown in Table 3, below.

Table 3. Minimum Durability Demonstration Periods

Engine Type	Minimum Durability Demonstration Period
On-Road	50,000 miles or 1000 hours
Off-Road (including portable engines) Stationary, Marine, ~~Locomotives,~~ TRUs, and APUs	1000 hours
Stationary Emergency Standby Engines	500 hours
Locomotives	3000 hours

(2) Temperature and Backpressure Measurement Requirements. For strategies that include exhaust aftertreatment, engine backpressure, exhaust temperature, and engine speed must be measured and recorded for 1000 hours or over the entire durability period (whichever is shorter). The applicant must propose a measurement and recording protocol for approval by the Executive Officer. The protocol may include, but is not limited to, measurement and recording of values once every few seconds, or higher frequency measurement with recording of averages, minima, and maxima over longer time intervals. The data must include an accurate date and time stamp that corresponds with periods of actual engine operation. Data must be submitted electronically in columns as a spreadsheet or text file or another format approved by the Executive Officer. Failure to submit in an approved format will terminate the application process.

(3) NOx Emissions Measurement Requirements. For strategies that include exhaust aftertreatment to reduce emissions of NOx, the mass emissions of NOx both upstream and downstream of the aftertreatment device must be measured and recorded for at least the first and last 100 hours of the durability period. The applicant must propose a measurement method for approval by the Executive Officer. The method may include, but is not limited to, the use of NOx sensors before and after the device. Measurements of NOx emissions must occur on at least a 1 Hertz basis. Data must be recorded as averages over time intervals no greater than 10

seconds. The data must include an accurate date and time stamp that corresponds with periods of actual engine operation. Data must be submitted electronically in columns as a text file or another format approved by the Executive Officer.

(4) Electronic System Codes. Error codes, fault codes, and high backpressure codes, as defined in the applicants test plan approval letter, that are generated by a diesel emission control strategy's electronic control system and/or operational monitoring system during the durability demonstration must be submitted with the date and time each code occurs.

~~(4)~~(5) Fuel for Durability Demonstrations. The fuel used during durability demonstrations should be equivalent to the test fuel, or a fuel with properties less favorable to the durability of the emission control strategy. Durability demonstrations may, at the applicant's option and with the Executive Officer's approval, include intentional misfueling events so that data on the effects of misfueling may be obtained.

~~(5)~~(6) Industrial Safety Requirements. The installation of a diesel emission control strategy on an off-road vehicle or piece of equipment used for a durability demonstration within California must conform to all applicable industrial safety regulations (California Code of Regulations, Title 8, Division 1, Chapter 4). If all off-road durability demonstrations are conducted outside California, at least one must conform to these regulations.

~~(6)~~(7) Photographic Documentation. For each durability demonstration, the applicant must submit digital photographs in electronic format of the following:

(A) The vehicle or piece of equipment before installation of the diesel emission control strategy. Photographs must show:

1. The entire vehicle or piece of equipment.
2. A close-up of the location in which the diesel emission control strategy will be installed.
3. All available engine identification including the make, model, and engine label.

(B) The vehicle or piece of equipment after installation of the diesel emission control strategy. Photographs must show:

1. The entire vehicle or piece of equipment showing the diesel emission control strategy installed, if possible.
2. A close-up of the installed diesel emission control strategy.
3. All available diesel emission control strategy identification including labels and logos.

(C) For a filter-based diesel emission control strategy, the outlet face of the filter after completing the durability demonstration.

~~(e)~~(f) Third-Party Statement for In-field Durability Demonstrations. For in-field durability demonstrations, the applicant must provide a written statement from an Executive Officer approved third party, such as the owner or operator of

the vehicle or equipment used, at the end of the durability period. The statement must describe overall performance, maintenance required, problems encountered, and any other relevant comments. The results of a visual inspection conducted by the third party at the end of the demonstration period must also be described. The description should comment on whether the diesel emission control strategy is physically intact, securely mounted, leaking fluids, and should include any other evaluative observations. The third party statement must clearly identify the demonstration engine and vehicle or equipment using a unique identifier such as a vehicle identification number and engine serial number along with the engine family name, and must provide the name and contact information of the third party.

~~(f)~~(g) Test Cycle. Testing requirements are summarized in Table 4. Note that the same cycle(s) must be used for both the initial and final tests.

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~~(g)~~(h) Test Run. The requirements for emissions reduction testing are summarized in Table 4, below. Note that special pre-conditioning requirements may apply. See section 2706(a)(4) for details.

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~~(h)~~(i) Maintenance During Durability Demonstration. Except for emergency engine repair, only scheduled maintenance on the engine and diesel emission control strategy and re-fill of additives (if any) may be performed during the durability demonstration. If normal maintenance includes replacement of any component of the diesel emission control strategy, the time (miles, years, or hours) between component change or refill must be reported with the results of the demonstration.

~~(i)~~(j) Functional Testing of Monitoring and Notification Systems. The applicant must demonstrate the durability of all monitoring and notification systems employed by the diesel emission control strategy. Such systems include, but are not limited to, backpressure monitors, reductant level monitors, malfunction indicator systems, and mechanisms to de-rate an engine's maximum power output. The applicant must propose test procedures to demonstrate the durability of the monitoring and notification systems on a diesel emission control strategy that has completed the service accumulation period.

~~(j)~~(k) Performance Requirements. The diesel emission control strategy must meet the following requirements throughout the durability demonstration period:

(1) If the applicant claims a percent emission reduction, the percent emission reduction must meet or exceed the initial verified percent emission reduction level.
(2) If the applicant claims to achieve 0.01 g/bhp-hr for PM, the PM emission level must not exceed 0.01 g/bhp-hr.
(3) The diesel emission control strategy must maintain its physical integrity. Its physical structure and all of its components not specified for regular replacement during the durability demonstration period must remain intact and fully functional.
(4) The diesel emission control strategy must not cause any damage to the engine, vehicle, or equipment.
(5) The backpressure caused by the diesel emission control strategy should not exceed the engine manufacturer's specified limits, or must not result in any damage to the engine.
(6) No maintenance of the diesel emission control strategy beyond that specified in its owner's manual will be allowed without prior Executive Officer approval.

~~(k)~~(l) Conditional Verification for Off-road and Stationary Applications. If the Executive Officer determines that the diesel emission control strategy is technologically sound and appropriate for the intended application, he may grant a conditional verification for off-road and stationary applications upon completion of 33 percent of the minimum durability period. In making this determination, the Executive Officer may consider all relevant information including, but not limited to, the following: the design of the diesel emission control strategy, filter and catalyst substrates used, similarity of the strategy under consideration to verified strategies, the intended application of the diesel emission control strategy, other relevant testing data, and field experience. Where conditional verification is granted, full verification must be obtained by completing the durability testing and all other remaining requirements. For stationary, marine, RTG crane, and TRU applications, ~~T~~these requirements must be completed within a year after receiving conditional verification. For off-road applications, the requirements must be completed within two years after receiving conditional verification. For the aforementioned time periods, conditional verification is equivalent to verification for the purposes of satisfying the requirements of in-use emission control regulations except as otherwise provided in section 2709. For all applications, failure to complete the requirements within the specified time may result in revocation of the conditional verification and the recall provisions of section 2709 of this Procedure. Strategies that include the use of alternative diesel fuels or fuel additives are not eligible for conditional verification.

~~(l)~~(m) Failure During the Durability Demonstration Period. If the diesel emission control strategy fails to maintain its initial verified percent emission reduction or emission level for any reason, the Executive Officer may downgrade the

strategy to the verification level which corresponds to the lowest degraded performance observed in the durability demonstration period. If the diesel emission control strategy fails to maintain at least 25 percent PM reduction or 25 percent NOx reduction at any time during the durability period, the diesel emission control strategy will not be verified. If the diesel emission control strategy fails, requires repair or maintenance, suffers any type of component failure, or the demonstration is aborted at any point in the course of the durability demonstration period, the applicant must submit a report explaining the circumstances within 45 days of the occurrence. The Executive Officer may then determine whether to deny verification or allow the applicant to correct the failed diesel emission control strategy and either continue the durability demonstration or begin a new durability demonstration.

NOTE: Authority cited: Sections 39002, 39003, 39500, 39600, 39601, 39650-39675, 40000, 43000, 43000.5, 43011, 43013, 43018, 43105, 43600 and 43700, Health and Safety Code. Reference: Sections 39650-39675, 43000, 43009.5, 43013, 43018, 43101, 43104, 43105, 43106, 43107 and 43204-43205.5, Health and Safety Code; and Title 17 California Code of Regulations Section 93000.

§ 2705. Field Demonstration Requirements.

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(c) Reporting Requirements.

(1) Temperature and Backpressure Measurement Requirements. For strategies that include exhaust aftertreatment, engine backpressure, exhaust temperature, and engine speed must be measured and recorded over the entire demonstration period. The applicant must propose a measurement and recording protocol for approval by the Executive Officer. The protocol may include, but is not limited to, measurement and recording of values once every few seconds, or higher frequency measurement with recording of averages, minima, and maxima over longer time intervals. The data must include an accurate date and time stamp that corresponds with periods of actual engine operation. Data must be submitted electronically in columns as a <u>spreadsheet or</u> text file or another format approved by the Executive Officer. <u>Failure to submit in an approved format will terminate the application process.</u>

(2) NOx emissions Measurement Requirements. For strategies that include exhaust aftertreatment to reduce emissions of NOx, the mass emissions of NOx both upstream and downstream of the aftertreatment device must be measured and recorded over the entire demonstration period. The applicant must propose a measurement method for approval by the Executive Officer. The method may include, but is not limited to, the use of NOx sensors before and after the device. Measurements of NOx emissions must occur on at least a 1 Hertz basis. Data must be recorded as averages over time intervals no greater than 10 seconds. The data must include an accurate date and time stamp that corresponds with

periods of actual engine operation. Data must be submitted electronically in columns as a text file or another format approved by the Executive Officer.

(3) Electronic System Codes. Error codes, fault codes, and high backpressure codes, as defined in the applicants test plan approval letter, that are generated by a diesel emission control strategy's electronic control system and/or operational monitoring system during the field demonstration must be submitted with the date and time each code occurs.

~~(3)~~(4) Third Party Statement. The applicant must provide a written statement from a third party approved by the Executive Officer, such as the owner or operator of the vehicle or equipment used in the field demonstration. The written statement must be provided at the end of the test period and must describe the following aspects of the field demonstration: overall performance of the test application and the diesel emission control strategy, maintenance performed, problems encountered, and any other relevant information. The results of a visual inspection conducted by the third party at the end of the demonstration period must also be described. The description should comment on whether the diesel emission control strategy is physically intact, securely mounted, leaking any fluids, and should include any other evaluative observations. The third party statement must clearly identify the demonstration engine and vehicle or equipment using a unique identifier such as a vehicle identification number and engine serial number along with the engine family name, and must provide the name and contact information of the third party.

~~(4)~~(5) Photographic Documentation. For each field demonstration, the applicant must submit digital photographs in electronic format of the following:

(A) The vehicle or piece of equipment before installation of the diesel emission control strategy. Photographs must show:

1. The entire vehicle or piece of equipment.
2. A close-up of the location in which the diesel emission control strategy will be installed.
3. All available vehicle or equipment identification including the make, model, license plate, and vehicle number.
4. All available engine identification including the make, model, and engine label.

(B) The vehicle or piece of equipment after installation of the diesel emission control strategy. Photographs must show:

1. The entire vehicle or piece of equipment showing the diesel emission control strategy installed, if possible.
2. A close-up of the installed diesel emission control strategy.
3. All available diesel emission control strategy identification including labels and logos.

(C) For a filter-based diesel emission control strategy, the outlet face of the filter after completing the field demonstration

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NOTE: Authority cited: Sections 39002, 39003, 39500, 39600, 39601, 39650-39675, 40000, 43000, 43000.5, 43011, 43013, 43018, 43105, 43600 and 43700, Health and Safety Code. Reference: Sections 39650-39675, 43000, 43009.5, 43013, 43018, 43101, 43104, 43105, 43106, 43107 and 43204-43205.5, Health and Safety Code; and Title 17 California Code of Regulations Section 93000.

§ 2706. Other Requirements.

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(4) Pre-conditioning requirements. If the Executive Officer determines that a diesel emission control strategy has a propensity to increase emissions of NO_2 and that the NO_2 emissions from a diesel emission control strategy could be affected by the presence of particulate matter or ash (as with a catalyzed diesel particulate filter), the strategy must be preconditioned according to the following procedure:

(A) Initial test (prior to service accumulation). Before conducting the initial emissions test, the unit being tested must be pre-conditioned as follows:

1. Install a new, unused unit on an engine that is an appropriate size for the unit, in a good state of maintenance, and certified to a PM standard equal to or more stringent than that of the engines in the emission control group for which the applicant seeks verification.
2. Operate the engine on one of the test cycles specified below for 25 to 30 hours. For on-road verifications, use either the FTP (hotstart) or UDDS cycle as identified in 2703(e), or the 13-mode Supplemental Emissions Test (SET) in the Code of Federal Regulations, Title 40, Part 86. For off-road and stationary verifications, use either the steady-state test cycle of the Nonroad Composite Transient Cycle (NRTC) (California Code of Regulations, Title 13, ~~S~~section 2423) from ARB off-road regulations. For up to 10 hours of the 25 to 30 hour period, beginning after at least the first three test cycle repetitions or ending before at least the last three test cycle repetitions, an applicant may alternatively:
   a. Run the engine at high load such that the exhaust temperature is between 350 and 450 degrees Celsius, or
   b. Alternate back and forth between high and low loads such that the exhaust temperature never exceeds 525 degrees Celsius and the low load operation does not result in significant soot accumulation at the end of the pre-conditioning period.

~~2~~3. Measure and record the backpressure, ~~and~~ exhaust temperature, date, and time on a second-by-second basis (1 Hertz) for the duration of the 25 to 30 hour pre-conditioning period. Determine the average backpressure for at least the first three and last three test cycle repetitions.

~~3~~4. Following the 25 to 30 hour period of operation, remove the unit from the pre-conditioning engine and install it on the emissions test engine, if applicable. Proceed with the initial emissions test and determine NO_2^i, as defined in section 2706(a)(5). Determine the average backpressure over each of the emissions test repetitions and then average those values. The resulting average backpressure is compared with that of the aged unit per subsection (B), below.

* * * * *

(C) In-Use Compliance Testing. Before conducting ~~the first phase of~~ in-use compliance emissions testing, the test units may need to be pre-conditioned. Using the required test cycle, measure and record the backpressure on a second-by-second basis (1 Hertz) over one hot-start test with a cleaned (or pre-conditioned per subsection (A) above) reference unit installed on the engine to be used for in-use compliance testing. The reference unit must be identical to the test units. Measure and record the backpressure of the test units retrieved from the field using the same engine and test cycle (one hot-start) as used with the reference unit. If the backpressure of a given test unit is either within 30 percent of the average backpressure recorded for the reference unit or, for transient test cycles, the backpressure does not exceed 60 inches of water for more than two percent of the time, or, for steady-state test cycles, the backpressure never exceeds 60 inches of water, it does not require pre-conditioning. Otherwise, the test unit must be pre-conditioned following subsection (B) above. Other units may not be substituted for the selected test units.

* * * * *

(b) Limits on Other Pollutants

(1) Limits on non-methane hydrocarbon (NMHC) and NOx. In order for a diesel emission control strategy to be verified, the applicant must comply with one of the following:

(A) The diesel emission control strategy must not increase the emissions of either NMHC or NOx by more than ten percent of the baseline emissions level as reported under section 2708 (a) except that NMHC emissions may be increased by up to 0.1 g/bhp-hr provided the increase does not cause the emissions to exceed the applicable NMHC emissions standard or 0.5 g/bhp-hr if no standard exists, or

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(c) Fuel Additives. Diesel emission control strategies that use fuel additives must comply with ~~S~~section 2710 and meet the following additional requirements for

verification. Fuel additives must be used in combination with a level 3 diesel particulate filter unless they can be proven to the satisfaction of the Executive Officer to be safe for use alone. In addition, the applicant must meet the following requirements:

(1) The applicant must submit the exact chemical formulation of the fuel additive,

* * * * *

(4) The applicant must conduct additional emission tests of fuel additives.

(A) Except as provided in (B) below, the additional emission tests must follow the same test procedures, test cycles, and number of test runs as indicated in ~~S~~section 2703, except that the concentration of the additive must be at least 50 ppm or 10 times higher than that specified for normal use, whichever is highest. In all other respects, the additive in the high concentration test solutions must be identical to that in the fuel additive submitted for verification.

* * * * *

(5) Fuel additives must be in compliance with applicable federal, state, and local government requirements. This requirement includes, but is not limited to, registration of fuel additives with the U.S. EPA. Registration of fuel additives with U.S. EPA must be completed prior to submission of an applicant's preliminary verification application.

* * * * *

(d) Alternative Diesel Fuels. Alternative diesel fuels must be in compliance with applicable federal, state, and local government requirements. This requirement includes, but is not limited to, registration of the alternative diesel fuel with the U.S. EPA. Registration of alternative diesel fuels with U.S. EPA must be completed prior to submission of an applicant's preliminary verification application. The applicant must conduct additional emission tests of alternative diesel fuels if the Executive Officer determines that such tests are necessary. The Executive Officer may consider all factors including, but not limited to, fuel components that could adversely affect emissions reductions and/or the applications to which they are applied.

* * * * *

(f) Operational Data Monitoring and Storage Requirements. The following requirements apply to all diesel emission control strategies that include exhaust aftertreatment:

(1) During emissions and durability testing, the applicant must:

(A) Measure and record exhaust backpressure and temperature pursuant to sections 2703 and 2704.

(B) Demonstrate that the backpressure caused by its diesel emission control strategy is within the engine manufacturer's specified limits, or will not result in any damage to the engine.

(2) If operation of the engine with the diesel emission control strategy installed will result in a gradual build-up of backpressure exceeding the engine's specified limits over time (such as due to the accumulation of ash in a filter), the applicant must submit information describing how to reduce the backpressure.

(3) All ~~filter-based~~ diesel emission control strategies that include a diesel particulate filter or other device that can cause exhaust backpressure to increase over time must be installed with a backpressure monitor to notify the operator of high backpressure conditions. The monitor must have a minimum of two stages of notification: when the high backpressure limit, as specified by the engine manufacturer or included in the verification application, is approached and when the high backpressure limit is reached or exceeded. These notifications must occur and be clearly visible to the operator while the vehicle or equipment is in use. Vehicles or equipment that can be operated from multiple locations by end-users must include a secondary notification system on the vehicle or equipment to alert the operator of a high backpressure condition. The applicant must identify the proposed high backpressure limits ~~of~~ for the strategy in its application for verification. Each high backpressure notification event must be recorded pursuant to section 2706(f)(5).

(A) The final, maximum high backpressure notification must be non-resettable by the operator and must meet the following requirements:

1. If the notification is triggered, it must remain on until a qualified technician can examine the engine and filter to determine the cause of the high backpressure condition.
2. If the notification is triggered and the engine is subsequently turned off, it must immediately resume when the engine is turned back on.
3. If the notification is triggered and the notification system subsequently either loses power or otherwise becomes nonfunctional, the notification must immediately resume when the system becomes operational.

(4) The Executive Officer reserves the right to require monitors that identify low backpressure limits in those cases where failures leading to low backpressure are unlikely to be detected, or have the potential to cause environmental damage beyond that caused by the engine prior to being equipped with the emission control strategy (e.g., systems that introduce additives into the fuel).

(5) ~~If the Executive Order for a diesel emission control strategy includes an exhaust temperature requirement, the strategy~~ All backpressure monitors must include an electronic device that is able to do the following:

(A) Measure and record exhaust backpressure and exhaust gas temperature data. Each record must include the date and time of measurement.

(B) Have the capacity to record exhaust backpressure, ~~and~~ exhaust temperature, date, and time data as described in (A) above for a period of at least 200 hours of actual engine operation without overwriting any stored data. ~~Data~~Measurements must be recorded at least once every 30 seconds. Each record must consist of the instantaneous measured exhaust backpressure and exhaust gas temperature or an average of such measurements over no more than the preceding 30 seconds provided the maximum and minimum values are also recorded for the same averaging period.

(C) Have the capacity to record error codes and high backpressure codes for a period of at least 500 hours of actual engine operation without overwriting any stored data. Each record must include the code and the date and time it occurred.

(6) An applicant must submit to the Executive Officer at the time of application all software and hardware that are required to interface with the diesel emission control strategy and download and view all recorded data. All such software and hardware associated with a diesel emission control strategy that is already verified must be submitted to the Executive Officer by the applicant no later than six months following the effective date of this part of the regulation.

(i) Component Swapping and Re-Designation Practices

(1) Component Swapping Practices.

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(2) Device Re-Designation Practices. Applicants may authorize the complete removal of a verified diesel emission control strategy from the original installation to another vehicle or equipment within the end user's commonly owned fleet, provided the following provisions are met:

(A) Applicants must receive written approval from the Executive Officer prior to approving a diesel emission control strategy re-designation.

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(G) A diesel emission control strategy installed on a vehicle or piece of equipment that is repowered (see section 2701(a)(3~~4~~8)) may remain installed provided:

* * * * *

(j) System Labeling

(1) The applicant must ensure that identical, legible, and durable labels are affixed on both the diesel emission control strategy and the engine (or an alternate location approved by the Executive Officer) on which the verified diesel emission control strategy is installed except as noted in (3) below. All labels must be constructed and affixed so that they resist tampering and remain legible for the duration of the diesel emission control strategy's minimum warranty period. One label shall be welded, riveted, or otherwise permanently attached to the diesel emission control strategy and the other affixed to the engine in such a manner that it cannot be easily removed (e.g., bolted). The required labels must identify the name, address, and phone number of the manufacturer, the diesel emission control strategy family name (defined in (2) below) of the installed system, a unique serial number, and the month and year of manufacture. The month and year of manufacture are not required on the label if this information can be readily obtained from the applicant by reference to the serial number. ~~The applicant and installer must ensure that the label is affixed such that it is resistant to tampering and degradation from the conditions of its environment.~~ The applicant and/or installer must ensure that the label is visible after installation. In the event that the original strategy label is damaged, ~~or~~ destroyed, or missing ~~by the end-user~~, the device manufacture shall issue an ARB approved replacement. The replacement label must be identical to the original label with the exception of the words "REPLACEMENT LABEL" which must be included at the bottom line of information. A sample scale drawing of the original and replacement labels must be submitted with the verification application. The end user must notify the applicant in the event of a damaged, destroyed, or missing original strategy label. The applicant must issue a replacement label within 45 days of notification by an end user of a damaged, destroyed, or missing label. All labels must be approved by the Executive Officer and must only be used with an ARB verified diesel emission control strategy. Unless an alternative is approved by the Executive Officer, the label information must be in the following format:

Name, Address, and Phone Number of Manufacturer
Diesel Emission Control Strategy Family Name
Product Serial Number
ZZ-ZZ (Month and Year of manufacture, e.g., 06-02)
REPLACEMENT LABEL*

* "Replacement Label" to be used only when a replacement of the original label has been issued by the device manufacturer.

(2) Diesel Emission Control Strategy Family Name. Each diesel emission control strategy shall be assigned a family name defined as below:

CA/MMM/YYYY/PM#/N##/APP/XXXXX

CA: Designates a diesel emission control strategy verified in California.

MMM: Manufacturer code (assigned by the Executive Officer).

YYYY: Year of verification.

PM#: PM verification level 0, 1, 1+, 2, 2+, 3, or 3+ (e.g., PM3 means a level 3 PM emission control system).

N##: NOx verified reduction level in percent, if any (e.g., N25 means NOx reduction of 25 percent).

AP: Verified application that includes one of the following: On-road (ON), Off-road (OF), ~~or~~ Stationary (ST), Marine (MA), Locomotive (LO), Transport Refrigeration Unit (TR), or Auxiliary Power System (AP).

XXXXX: Five alphanumeric character code issued by the Executive Officer.

(3) The applicant may request that the Executive Officer approve an alternative label format. In reviewing this request, the Executive Officer may consider all relevant information including, but not limited to, the informational content of an alternative label as proposed by the applicant.

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(l) Owner's Manual. The applicant must provide a copy of the diesel emission control strategy owner's manual to the Executive Officer and, upon delivery of the diesel emission control strategy, to the end-user, which must clearly specify at least the following information:

(1) A Table of Contents located at the beginning of the owner's manual identifying the location of subsections (2) through (18) identified below.

(2) A statement alerting the end-user of their responsibility for maintaining the candidate engine such that it continues to meet the pre-installation compatibility assessment conditions identified in section 2706(t).

~~(1)~~(3) Warranty statement including the warranty period over which the applicant is liable for any defects.

~~(2)~~(4) Installation procedure and maintenance requirements for the diesel emission control strategy.

(5) An objective criteria for DECS ash removal (pressure drop across the filter, maximum clean filter weight, pre-installation filter weight comparison, etc.) for determination if a DECS is "cleaned" pursuant to section 2706(h)(2)(B)

~~(3)~~(6) Possible backpressure range imposed on the engine.

~~(4)~~(7) Fuel consumption penalty, if any.

~~(5)~~(8) Fuel requirements including sulfur limit, if any.

~~(6)~~(9) Handling and supply of additives, if any.

~~(7)~~(10) Instructions for reading and resetting the backpressure monitor.

~~(8)~~(11) Requirements for lubrication oil quality and maximum lubrication oil consumption rate.

~~(9)~~(12) The following statements must be included verbatim in the owner's manual:

* * * * *

~~(10)~~(13) Contact information for replacement components and cleaning agents.

~~(11)~~(14) Contact information to assist an end-user to determine proper ways to dispose of waste generated by the diesel emission control strategy (e.g., ash accumulated in filter-based systems). At a minimum, the owner's manual should indicate that disposal must be in accordance with all applicable Federal, State, and local laws governing waste disposal.

~~(12)~~(15) Appropriate methods of removing the diesel emission control strategy from the original installed configuration and installing the strategy on a different vehicle or piece of equipment, if such practices are allowed. The applicant must state possible repercussions to the end-user if such practices are done in an inappropriate manner. (See section 2706(i)).

~~(13)~~(16) Appropriate methods of swapping identical components in strategies that share the same diesel emission control strategy family name.

~~(14)~~(17) Parts List. Those parts not covered by the warranty provision of section 2707 must be specifically identified by a common description and part number.

~~(15)~~(18) Notification of potential safety concerns associated with the operation of the diesel emission control strategy.

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(n) Installation Manual. The applicant must provide ~~the Executive Officer,~~ a copy of the diesel emission control strategy installation manual that the applicant intends to provide to installers and/or owners. The installation manual must include sufficient detail to enable the installer to properly install the diesel emission control strategy such that the installation is free from defects in workmanship, materials, or operation which could cause any of the components of the diesel emission control strategy to fail and allow the installer to warrant the installation pursuant to section 2707(a)(2)(A).

(1) The installation manual must include the criteria that will be used by the applicant to authorize a person or company to install their verified diesel emission control strategy.

(2) The installation manual must also include the criteria that will be used by the applicant to revoke a person or company's authorization to install their diesel emission control strategy.

* * * * *

(t) Pre-Installation Compatibility Assessment. The applicant~~, distributor,~~ or authorized installer (i.e., the party conducting the pre-installation compatibility assessment) must be able to demonstrate, to the satisfaction of the Executive Officer, that a candidate engine being considered for retrofit is compatible with the verified diesel emission control strategy by ensuring that each candidate engine meets all the terms and conditions of the Executive Order prior to installation.

(1) Each applicant must establish specific criteria to determine the suitability of a candidate engine prior to installation and provide this information to their authorized installers. This must include but is not limited to: a smoke opacity limit, oil consumption limits, fuel inspection requirements, visual inspections, and other assessment criteria that may be used to determine that the candidate engine is appropriate for use with the diesel emission control strategy and that the candidate engine is in a proper state of maintenance and operating within the engine manufacturers specifications. Candidate engines that do not meet the suitability criteria or that have a smoke opacity measured in accordance with Society of Automotive Engineers J1667 test procedures that exceeds the limit established by the applicant must not be retrofit with the diesel emission control strategy.

(A) The applicant must select and define specific criteria (e.g., oil consumption limits, fuel inspection requirements, visual inspection requirements, ensure adherence to all the terms of the verification Executive Order, etc.) that can be used by the installer to ensure that the candidate engine is appropriate for use with the diesel emission control strategy.

(B) The applicant must select a smoke opacity limit measured in accordance with Society of Automotive Engineers J1667 test procedures that serves to prevent installation of a diesel emission control strategy on an engine that is not appropriate for use with the diesel emission control strategy.

(C) For a diesel emission control strategy that is already verified, the holder of the verification must establish and implement specific criteria, including a smoke opacity limit, which may be used to determine the suitability of a candidate engine no later than six months following the effective date of this part of the regulation.

(D) For engines that operate at a constant-speed or are otherwise designed such that they are unable to follow Society of Automotive Engineers J1667 test procedures, the applicant must propose an alternate criterion instead of a smoke opacity level to determine the suitability of a candidate engine prior to installation.

~~(1)~~(2) For diesel emission control strategies that have exhaust gas temperature requirements for successful operation, the applicant~~, distributor,~~ or authorized installer (i.e., the party conducting the pre-installation compatibility assessment) must measure and record the exhaust gas temperature for each candidate engine to determine if the temperature requirements are satisfied. These measurements must

represent the most challenging duty cycle (i.e., pattern of use) of the candidate engine with respect to the temperature requirements. Notwithstanding, the applicant is responsible for ensuring that the candidate engine is properly assessed. In lieu of logging data for each candidate engine, only the applicant may choose to data-log a representative number of candidate engines, provided the following requirements are met:

(A) The diesel emission control strategy is verified to reduce emissions of diesel particulate matter only,

(B) At least 5 representative engines must be data-logged from within each group of similar engines, or 10 percent of each group, whichever is larger. All engines in a group of 5 or fewer engines must be data-logged. Data from engines outside the group cannot be used to support retrofit of engines within the group. A group of engines is similar if:
   1. All engines belong to the same common ownership fleet.
   2. All engines have the same make and model.
   3. All engines are certified to the same PM emissions standard.
   4. 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.
   5. 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.
   6. All engines are installed in similar vehicles or equipment that perform a like function and have similar duty cycles. 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.

(C) If the diesel emission control strategy is determined to be compatible with the candidate engine in its current application, the applicant~~, distributor,~~ or authorized installer (i.e., the party conducting the pre-installation compatibility assessment) must provide a written statement to the end user ~~no later than the date~~ at the time of installation and, upon request, to the Executive Officer within 30 calendar days of the request, that includes:
   1. A statement that the exhaust gas temperature profile of the candidate engine was found to satisfy the requirements of the diesel emission control strategy's Executive Order,
   2. The date of this determination,
   3. The name and contact information of the owner of the common ownership fleet,
   4. The Executive Order number and the diesel emission control strategy family name,
   5. The engine family name, engine make and model, and power rating of each candidate engine along with a unique identifier such as a vehicle identification number or an engine serial number,

6. A description of the vehicle or equipment type for each candidate engine,
7. Identification of which candidate engines were data-logged and the groups they represent,
8. Identification of the parameters used to define each group of similar engines, ~~and~~
9. The name of the authorized installer and the date of installation, ~~if applicable.~~and
10. A statement that any change in the duty cycle (i.e., pattern of use) used to measure the exhaust gas temperature profile of the candidate engine may cause the diesel emission control strategy to fail to meet the requirements of the strategy's Executive Order and information regarding how such a change will affect the performance of the strategy.

(D) In cases where representative sampling is selected, the party conducting the pre-installation compatibility assessment is still responsible for ensuring that all diesel emission control strategy installs comply with all the terms and conditions of the Executive Order.

~~(2)~~ (E) Data must be measured and recorded using a stand-alone data logging system that is independent of the diesel emission control strategy and must adhere to the following criteria:

~~(A)~~1. The measured and recorded data must be representative of the actual duty cycle and operation of the candidate engine as best it can be anticipated at the time.

~~(B)~~2. The exhaust gas temperature of the candidate engine must be measured at a point in the exhaust system that is within 6 inches of the proposed location of the inlet of the diesel emission control strategy.

~~(C)~~3. The recorded exhaust gas temperature must have an accuracy of at least ±4 degrees Celsius. The temperature sensor must have a range sufficient to accommodate the highest exhaust gas temperature measured plus 10 percent without exceeding the sensor's full scale rating while ensuring that 90 percent of the measured values fall between 10 and 90 percent of the sensor's full scale rating.

~~(D)~~4. The exhaust gas temperature of the candidate engine must be measured and recorded for a period that is long enough to determine the exhaust gas temperature profile associated with the candidate engine's duty cycle, but not less than 24 hours of representative, actual engine run time, unless the candidate engine is an Emergency Standby Engine permitted under the authority of a California Air District, as defined in section 39025 of the Health and Safety Code. Emergency standby engines with restricted use requirements may propose a period of less than 24 hours at the Executive Officer's discretion. The data logging strategy must include a means to accurately determine when the engine is actually running. This may

include use of a data logging system that starts automatically when the engine starts and stops automatically when the engine stops, or a means to identify and remove data that correspond to the engine being off such as by simultaneously logging data from an engine RPM sensor or applying a temperature threshold that corresponds to a temperature just below the idle temperature of the engine.

~~(E)~~5. The memory of the data logging system must be of sufficient size to ensure that data are not overwritten prior to retrieval.

~~(F)~~6. All data must be recorded at a frequency of at least once every 5 seconds (0.2 Hertz)

~~(G)~~7. At a minimum, the following parameters must be measured and recorded:

~~1.~~a. Exhaust gas temperature in degrees Celsius

~~2.~~b. Time and date for each data point

~~3.~~c. Other parameters deemed necessary by the Executive Officer to meet the terms and conditions of the Executive Order.

(3) At the Executive Officer's request, the applicant must submit all data used to determine the suitability of a candidate engine with a verified diesel emission control strategy. All logged data must be submitted electronically in Microsoft Excel or Microsoft Access or another format approved by the Executive Officer. The ~~installer~~ party conducting the pre-installation compatibility assessment must keep a record of the data used to determine the suitability of the candidate engine for the duration of the warranty period of the diesel emission control strategy and make the data available to the applicant and the Executive Officer upon request. These data must include all logged data, the date of the determination, the name and contact information of the end user, the date of installation, the name and contact information of the installer, the Executive Order number, the diesel emission control strategy family name, and clearly identify the candidate engine and vehicle or equipment using a unique identifier such as a vehicle identification number and an engine serial number along with the engine family name.

(4) Prior to installation of a diesel emission control strategy, the applicant or authorized installer (i.e., the party performing the installation of the diesel emission control strategy) must conduct a basic assessment of each candidate engine~~'s state of maintenance~~ to ensure that it is appropriate for use with the diesel emission control strategy using the applicant criteria identified in section 2706(t)(1). The assessment must be performed no more than 15 days prior to installation. The ~~installer~~ party performing the installation of the diesel emission control strategy must maintain a record of all documentation used to make the determination that the candidate engine was appropriate for use with the diesel emission control strategy. All such records maintained by the ~~installer~~ party performing the installation of the diesel emission control strategy must be made available to the Executive Officer within thirty days upon written request. ~~For this basic assessment, the installer must at a minimum do the following:~~

~~(A) Review oil consumption and engine maintenance records if available,~~
~~(B) Obtain a fuel sample from the fuel tank and visually inspect the sample for contamination,~~
~~(C) Inspect the engine for signs of poor maintenance including oil leaks,~~
~~(D) Inspect the tailpipe for signs of oil contamination, and~~
~~(E) Inspect the exhaust plume for signs of high PM emissions and oil burning.~~

(u) Requirements for Installers of Diesel Emissions Control Strategies
(1) Any party that installs a diesel emission control strategy must be authorized and trained by the party that holds the verification for the diesel emission control strategy.
(2) Any party that installs a diesel emission control strategy must comply with the pre-installation assessment requirements in section 2706(t).
(3) All installations must strictly adhere to the requirements of the party that holds the verification for the diesel emissions control strategy and must not relocate the original equipment manufacturers exhaust system:
(A) Over any occupied space (e.g., driver or passenger compartments); or
(B) That would result in any noncompliance with any applicable safety standards such as but not limited to Federal Motor Carrier Safety Administration, Subpart G, Miscellaneous parts and accessories, section 393.83 Exhaust systems; or
(C) Any other location deemed unacceptable by the applicant.
(4) Any party that installs a diesel emission control strategy must offer a warranty pursuant to section 2707(a)(2).

(v) Training Requirements. The applicant is responsible for developing training to ensure end-users can safely operate and maintain their diesel emission control strategy. This training must include, at a minimum: a review of the pre-installation compatibility assessment criteria results, the effects of engine maintenance on the strategy's performance, identification of all warning and/or fault alarms and appropriate end-user responses, and cleaning and maintenance information for the strategy. The applicant or their authorized installer is responsible for ensuring that this training is presented to the end-user before the vehicle, equipment, or engine is put back into service following the installation of the strategy and must be available to the end-user on an on-going basis (e.g., online training materials).

(w) Safety Considerations. The applicant must give consideration to safety and catastrophic failure in the design of the diesel emission control strategy. The Executive Officer addresses safety as follows:
(1) The applicant must provide an analysis of all potential safety and catastrophic failure issues associated with the use of the diesel emission control strategy including an analysis of all potential failure modes. This analysis must include, but is not limited to, the effects of: uncontrolled regeneration, improper maintenance, unfavorable operating conditions,

use of inappropriate fuel, high exhaust temperatures, substrate failure, and sensor failures. For any potential safety or catastrophic failure issues identified, the applicant must provide a detailed description of the safety risk mitigation strategies that it employs.

(2) The Executive Officer may require additional safety testing and design modifications to the diesel emission control strategy both before and after verification of the diesel emission control strategy. In making these determinations, the Executive Officer may consider all relevant information including, but not limited to, the safety and catastrophic failure analysis provided by the applicant, system design, properties of the materials used by the diesel emission control strategy, field experience, and warranty report data. The Executive Officer may require that safety testing be conducted by an independent test facility that has appropriate safety testing experience.

(3) If the Executive Officer determines that an applicant has not made a satisfactory demonstration of the safety of its diesel emission control strategy, the Executive Officer may deny the applicant's request for verification or revoke an existing verification.

(x) Technical service bulletins, pre-installation compatibility assessment criteria, other service related information, or any other documentation that effects the proper operation and maintenance of the diesel emission control strategy provided to end-users, authorized installers, or distributors must be submitted concurrently to ARB. Submission of such information does not relieve applicants from the design modification requirements of section 2702(j) nor does it constitute ARB approval.

NOTE: Authority cited: Sections 39002, 39003, 39500, 39600, 39601, 39650-39675, 40000, 43000, 43000.5, 43011, 43013, 43018, 43105, 43600, 43700 and 43830.8, Health and Safety Code. Reference: Sections 39650-39675, 43000, 43009.5, 43013, 43018, 43101, 43104, 43105, 43106, 43107, 43204-43205.5, Health and Safety Code; and Title 17 California Code of Regulations Section 93000.

§ 2707. Warranty Requirements.

* * * * *

(2) Installation Warranty

(A) A person or company who installs a verified diesel emission control strategy must warrant that the installation is free from defects in workmanship or materials which cause the diesel emission control strategy to fail to conform to the emission control performance level it was verified to or the other requirements of sections 2700-2706 for the minimum time periods shown in Table 5.

(B) For each engine type and size listed in Table 5, the ~~minimum defects~~ installation warranty period is terminated by that listed event whichever occurs first. The installation warranty must cover the full repair or

replacement cost of the diesel emission control strategy, including parts and labor.

(C) The installation warranty coverage provided by installers must ~~be~~ meet the same requirements as the warranty coverage provided by the applicant as established in subsection (a)(1) (C)-(E) and the same exclusions apply.

* * * * *

(b)(1) Product Warranty Statement. The applicant must furnish a copy of the following statement in the owner's manual, a copy of which must be provided to each owner upon delivery of the diesel emission control strategy. The applicant may include descriptions of circumstances that may result in a denial of warranty coverage, but these descriptions shall not limit warranty coverage in any way.

YOUR WARRANTY RIGHTS AND OBLIGATIONS

(Applicant's name) must warrant the diesel emission control system in the application for which it is sold or leased to be free from defects in design, materials, workmanship, or operation of the diesel emission control system which cause the diesel emission control system to fail to conform to the emission control performance level it was verified to, or to the requirements in the California Code of Regulations, Title 13, ~~S~~sections 2700 to 2706, and 2710, for the periods of time listed below, provided there has been no abuse, neglect, or improper maintenance of your diesel emission control system, vehicle or equipment, as specified in the owner's manuals. Where a warrantable condition exists, this warranty also covers the engine from damage caused by the diesel emission control system, subject to the same exclusions for abuse, neglect or improper maintenance of your vehicle or equipment. Please review your owner's manual for other warranty information. Your diesel emission control system may include a core part (e.g., particulate filter, diesel oxidation catalyst, selective catalytic reduction converter) as well as hoses, connectors, a back pressure monitor (if applicable), and other emission-related assemblies. Where a warrantable condition exists, (applicant's name) will repair or replace your diesel emission control system at no cost to you including diagnosis, parts, and labor.

WARRANTY COVERAGE:

For a (engine size) engine used in a(n) (type of application) application, the warranty period will be (years or hours or mile of operation) whichever occurs first. If any emission-related part of your diesel emission control system is defective in design, materials, workmanship, or operation of the diesel emission control system thus causing the diesel emission control system to fail to conform to the emission control performance level it was verified to, or to the requirements in the California Code of Regulations,

Title 13, ~~S~~sections 2700 to 2706, and 2710, within the warranty period, as defined above, (Applicant's name) will repair or replace the diesel emission control system, including parts and labor. This coverage also applies to any parts replacements, sizing changes, or adjustments that are required to appropriately match the diesel emission control system to the engine on which it is installed.

* * * * *

(c) Diesel Emission Control Strategy Warranty Report. The applicant must submit a warranty report to the Executive Officer annually by April 1 of each calendar year for each verified ~~system~~ strategy with a unique diesel emission control strategy family name. The warranty report must include all warranty claims, even those that did not result in warranty service, and must delineate claims that resulted in warranty service (i.e., valid claims) from those that did not result in warranty service. The applicant must also submit a warranty report within 30 calendar days if, at any time, the cumulative number of valid warranty claims for the same part or component of the diesel emission control strategy exceed four percent of the ~~number of diesel engines using the~~ cumulative sales or leases for the diesel emission control strategy family. Where valid warranty claims exceed four percent, the Executive Officer may modify, revoke or suspend the existing verification or order a recall per the requirements of section 2709 of this Procedure. The warranty report must include the following information and shall be submitted in the format specified by the Executive Officer:

(1) ~~Annual~~The manufacturers corporate name, sales for the given calendar year and cumulative sales, and ~~annual~~ leases for the given calendar year and cumulative leases of diesel emission control ~~systems~~ strategies (California ~~only~~ verified).

(2) ~~Annual~~Production for the given calendar year and cumulative production of diesel emission control ~~systems~~ strategies (California ~~only~~ verified).

(3) Annual summary of warranty claims for the given calendar year (California ~~only~~ verified). The summary must include:

(A) A description of the nature of the claims and of the warranty replacements or repairs. The applicant must categorize warranty claims for each diesel emission control strategy family name by the part(s) or component(s) replaced or repaired.

(B) The number and percentage of diesel emission control ~~systems~~ strategies of each ~~model~~ family for which a warranty replacement or repair was identified.

(C) A short description of the diesel emission control ~~system~~ strategy part or component that was replaced or repaired under warranty and the most likely reason for its failure.

(D) For each part or component replaced or repaired under warranty, the number of annual and cumulative replacements or repairs of each part or component.

(E) Name and contact information of the end-user that filed the warranty claim and, if applicable, company name.

(4) Date the warranty claims were filed and the engine family and application the diesel emission control ~~systems~~ strategy were used with.

(5) Delineate the reason(s) for any instances in which warranty service is not provided to end-users that file warranty claims.

(6) A current list of authorized installers for the diesel emission control strategy family name.

(7) An applicant that fails to submit a complete diesel emission control strategy warranty report by April 1, or if required, within 30 calendar days for valid warranty claims in excess of four percent for the same part or component, may be subject to civil penalties as specified in state law and regulations, including, but not limited to, Health and Safety Code Sections 39600, 39660, and 39674.

(8) A diesel emission control strategy warranty report that does not contain all required information will not be considered complete. A diesel emission control strategy warranty report will be considered to be complete as of the date that all required information is submitted.

(d) Installation Warranty Report. Authorized installers of diesel emission control strategies must submit an installation warranty report to the Executive Officer annually by March 1 of each calendar year. The installation warranty report must include all installation warranty claims, even those that did not result in warranty service, for each verified strategy with a unique diesel emission control strategy family name for which they are authorized. Authorized installers must delineate all installation warranty claims by manufacturer and diesel emission control strategy family name and identify claims that resulted in warranty service (i.e., valid claims) and those that did not result in warranty service. The required information may be included in one annual report to the Executive Officer. An authorized installer must also provide each applicant a copy of the information that pertains to the applicant's products at least annually by March 1. The installation warranty report must include the following information submitted electronically as a spreadsheet or text file or another format approved by the Executive Officer:

(1) Name of the person or company installing verified diesel emission control strategies including contact information (business phone number, mailing address, and physical address if different from mailing address).

(2) Name and contact information of the person responsible of submitting the installation warranty report.

(3) Identification of each unique diesel emission control strategy family name the installer is authorized to install.

(4) Annual and cumulative installations for each diesel emission control strategy family name.

(5) For each installation warranty claim the following information must be provided:

(A) Name and contact information (business phone number and mailing address) of the end user.
(B) Diesel emission control strategy family name and serial number.
(C) Engine family name of the vehicle or equipment upon which the strategy is installed.
(D) Date of installation of the strategy.
(E) Mileage or engine hours at time of installation.
(F) Date of installation warranty claim.
(G) Hours of use or mileage at the time of installation warranty claim.
(H) Location of vehicle or equipment at the time of installation.
(I) Indication that the pre-installation assessment records per section 2706(t) are available for Executive Officer review upon request.
(J) A detailed description of the reason for the claim.
(K) Date of resolution of the claim.
(L) Identification if the installation warranty claim was honored (i.e., valid warranty claim) or denied.
(M) If the installation warranty claim was denied, a detailed explanation for the denial.

(6) An authorized installer of a verified diesel emission control strategy that fails to submit a complete installation warranty report by March 1 may be subject civil penalties as specified in state law and regulations, including, but not limited to, Health and Safety Code Sections 39600, 39660, and 39674.

(7) An installation warranty report that does not contain all required information will not be considered complete. An installation warranty report will be considered to be complete as of the date that all required information is submitted.

NOTE: Authority cited: Sections 39002, 39003, 39500, 39600, 39601, 39650-39675, 40000, 43000, 43000.5, 43011, 43013, 43018, 43105, 43600, 43700, Health and Safety Code. Reference: Sections 39650-39675, 43000, 43009.5, 43013, 43018, 43101, 43104, 43105, 43106, 43107, 43204-43205.5, Health and Safety Code; and Title 17 California Code of Regulations Section 93000.

§ 2708. Determination of Emissions Reduction.

(a) Calculation of Emissions Reduction. The emissions reduction verified for a diesel emission control strategy is based on the average of all valid test results before (baseline) and after (control) implementation of the diesel emission control strategy. Test results from both emission testing and durability testing are to be used. If the applicant chooses to perform either the initial or the final durability baseline test, but not both, it must use those results to calculate the reductions obtained in both the initial and final control tests.

(1) Percentage Reduction. The percentage reduction for a given pair of baseline and control test sets (where a “set” consists of all test cycle repetitions, e.g., the test set of 3 hot-start UDDS tests) is the difference between the average baseline and average control emissions divided by

the average baseline emissions, multiplied by 100 percent. The average of all such reductions, as shown in the equation below, is used in the verification of a diesel emission control strategy.

$$\text{Percentage Reduction} = 100\% \times \frac{\Sigma\,[(\text{baseline}_{AVG} - \text{control}_{AVG})/\text{baseline}_{AVG}]}{\text{Number of control test sets}}$$

Where:

Σ = sum over all control test sets

baseline_{AVG} or control_{AVG} = average of emissions from all baseline or control test repetitions within a given set

(A) For any test set involving cold and hot starts, the time weighted emission result is to be calculated by weighting the cold-start emissions by one-seventh (1/7) and the hot-start emissions by six-sevenths (6/7) as shown below.

Weighted Emission Result = 1/7* average cold-start emissions + 6/7* average hot-start emissions

(B) For applicants <u>that request</u> ~~seeking~~ verification of NOx reductions from on-road applications <u>and submit additional test data pursuant to section 2703(e)(1)(C)</u>, weighted test results from the additional test set ~~described in subsection 2703(e)1(C)~~ are included in the percentage reduction equation above. The Executive Officer shall determine an appropriate weighting factor in consultation with the applicant based on factors including, but not limited to, the amount of time that vehicles within the selected emission control group have elevated NOx emissions and the breadth of engines and applications encompassed by the emission control group.

(2) The absolute emission level is the average control emission level, as defined in the following equation:

$$\text{Absolute Emission Level} = \frac{\Sigma\,(\text{control}_{AVG})}{\text{Number of control test sets}}$$

(b) Categorization of the Diesel Emission Control Strategy. The Executive Officer shall categorize diesel emission control strategies to reduce PM and NOx emissions based on their verified emission reductions <u>according to Table 1 in section 2702</u>. <u>For a diesel emission control strategy to be verified at a given Level or Mark, the emission reductions demonstrated by each test set submitted with the application must be greater than or equal to the minimum reduction that</u>

defines the Level or Mark. It is not sufficient for the average reduction to exceed the minimum value of the Level or Mark if one of the reductions in the average is below the minimum. ~~Diesel emission control strategies that reduce NOx will be assigned their verified emission reduction (Mark 1, 2, 3, 4, or 5) in 15 percent increments starting at 25 percent (See Table 1 in section 2702).~~

(1) Diesel emission control strategies are categorized by their PM reductions as follows:

~~(1)~~(A) Level zero: the system has been demonstrated under these procedures to reduce PM emissions by less than 25 percent from the baseline emission level and to reduce NOx emissions by at least 25 percent from the baseline emission level.

~~(2)~~(B) Level one: the system has been demonstrated under these procedures to reduce PM emissions by at least 25 percent from the baseline emission level.

~~(3)~~(C) Level two: the system has been demonstrated under these procedures to reduce PM emissions by at least 50 percent from the baseline emission level.

~~(4)~~(D) Level three: the system has been demonstrated under these procedures to reduce PM emissions by at least 85 percent from the baseline emission level, or to achieve PM emission levels of 0.01 grams per brake-horsepower-hour (g/bhp-hr) or less.

(2) Diesel emission control strategies are categorized by their NOx reductions as follows:

~~(1)~~(A) Mark 1: the system has been demonstrated under these procedures to reduce NOx emissions by at least 25 percent from the baseline emission level.

~~(2)~~(B) Mark 2: the system has been demonstrated under these procedures to reduce NOx emissions by at least 40 percent from the baseline emission level.

~~(3)~~(C) Mark 3: the system has been demonstrated under these procedures to reduce NOx emissions by at least 55 percent from the baseline emission level.

~~(4)~~(D) Mark 4: the system has been demonstrated under these procedures to reduce NOx emissions by at least 70 percent from the baseline emission level.

~~(5)~~(E) Mark 5: the system has been demonstrated under these procedures to reduce NOx emissions by at least 85 percent from the baseline emission level.

NOTE: Authority cited: Sections 39002, 39003, 39500, 39600, 39601, 39650-39675, 40000, 43000, 43000.5, 43011, 43013, 43018, 43105, 43600, 43700 and 43830.8, Health and Safety Code. Reference: Sections 39650-39675, 43000, 43009.5, 43013, 43018, 43101, 43104, 43105, 43106, 43107, 43204-43205.5, Health and Safety Code; and Title 17 California Code of Regulations Section 93000.

§ 2709. In-Use Compliance Requirements.

(a) Applicability. These in-use compliance requirements apply to all diesel emission control strategies for on-road, off-road, ~~and~~ stationary, marine, RTG crane, APU, and TRU applications. It is the responsibility of the applicant to perform in-use compliance testing for each verified diesel emission control strategy family (see ~~S~~section 2706~~-~~(j)(2)). Field ~~T~~testing is required when ~~50~~ 100 units within a given diesel emission control strategy family have been sold or leased in the California market and emissions testing when 300 units have been sold or leased in the California market. Diesel emission control strategies that consist solely of a fuel additive or an alternative diesel fuel are only required to perform in-use compliance emissions testing or comply with other tests and conditions approved by the Executive Officer at the time of verification. For entirely fuel-based strategies, in-use compliance emissions testing is required, if not specified in the Executive Order, when:

(1) 6 million gallons of treated or alternative fuel are sold in the California market or 3 years after receiving verification, whichever comes first, or;

(2) The Executive Officer determines an alternative strategy is necessary based upon economic and engineering justifications provided by the applicant at the time of verification.

Applicants must submit an in-use compliance testing proposal for approval by the Executive Officer prior to performing either ~~the~~ in-use compliance field or emissions testing. ~~Applicants who have sold 50 units or more but have less than 50 units installed may submit a request for the Executive Officer to delay the in-use compliance deadlines specified in this section.~~

(b) Alternative Test Schedule. Applicants may elect to skip field testing and perform only in-use compliance emissions testing when 100 units within a given diesel emission control strategy family name have been sold or leased in the California market. Applicants selecting this option must test a minimum of 4 diesel emission control strategies for each family name per the Emissions Testing requirements of section 2709(c)(2) and the In-Use Compliance Emissions Testing procedures of section 2709(i).

~~(b)~~(c) ~~Test Phases.~~ Age of Test Units. ~~In-use compliance testing, as described below in subsections (d), (e), (f), and (g), must be conducted per an approved in-use compliance testing proposal at two different phases~~ For both field and emissions testing, applicants must select test units for each diesel emission control strategy family based on the following:

(1) ~~Phase 1~~ Field Testing. For field testing, ~~A~~applicants must ~~obtain~~ identify and test diesel emission control ~~systems~~ strategies once they have been operated for at least 25 percent of their minimum warranty period or for one year, whichever comes first.

(2) ~~Phase 2~~ Emissions Testing. For emissions testing, ~~A~~applicants must obtain and test diesel emission control ~~systems~~ strategies once they have been operated ~~between~~ for at least 60 ~~and 80~~ percent of their minimum

warranty period or for three years, whichever comes first. For all systems used with heavy heavy-duty vehicles, ~~the 60 to 80 percent window must be applied to the~~ only test units that adhere to the 5 year or 150,000 mile minimum warranty period may be selected.

~~(c)~~(d) In-Use Compliance Testing Proposals. Applicants with entirely fuel-based strategies must submit to the Executive Officer an in-use compliance emissions testing proposal no later than 90 days after meeting the requirements specified in section 2709(a). All other ~~The~~ applicants must submit to the Executive Officer a ~~Phase 1~~ separate in-use compliance testing proposal for both field and emissions testing for each family name. The in-use compliance field testing proposal must be submitted to the Executive Officer no later than 90 days after selling or leasing in the California market the ~~50~~100th unit. Applicants that fail to submit their field testing proposal within 90 days after selling or leasing the 100th unit will be required to follow the Alternate Test Schedule. The in-use compliance emissions testing proposal must be submitted to the Executive Officer within 90 days after selling or leasing in the California market the 300th unit. ~~The applicant must submit a Phase 2 in-use compliance testing proposal to the Executive Officer no later than 3 years after the 50th unit is sold. The following information must be included in both~~ Each in-use compliance testing proposal~~s~~ shall be submitted in the format specified by the Executive Officer and at a minimum include:

1. In-Use Compliance Field Testing Proposal

1.1 A cover letter signed by the applicant that includes the following information:

1.1.1 Diesel emission control strategy family name.

1.1.2 A statement that the author of the cover letter has the authority to represent the applicant with their in-use compliance field testing for this diesel emission control strategy family name.

1.1.3 A statement that the applicant agrees to adhere to the in-use compliance requirements of this Procedure.

1.1.4 Anticipated dates of in-use compliance field tests and final test report submittal.

1.2~~(1)~~ Applicant identification information including:~~.~~

1.2.1 Primary contact responsible for in-use compliance field testing information including contact information (e.g. name, mailing address, email address, telephone numbers).

1.2.2 Brief description of the contact's association to the verification holder.

1.3~~(2)~~ Diesel emission control strategy family name.

1.4~~(3)~~ Parties to be involved in conducting in-use compliance field tests.

1.5~~(4) Test facility i~~Identification and description of all test equipment, test personnel, and qualifications or certifications.

1.6~~(5)~~ Quality control and quality assurance procedures for the test equipment.

1.7~~(6)~~ List of 10 candidate test units ~~(at least 10 choices per phase)~~ for Executive Officer review with the following information for each: ~~vehicle/equipment information on which the unit is installed (make, model, model/year), location, engine information (family name, make, series, model year, displacement), date of manufacture, date of installation, and cleaning/repair history.~~

1.7.1 Vehicle or equipment make, model, and model year upon which the proposed test unit is installed.

1.7.2 Statement that the applicant has access to and has reviewed each vehicles' or equipments' maintenance records.

1.7.3 Vehicle or equipment location of operation and description (e.g. route delivery, trash collection, front-end loader, etc.).

1.7.4 Engine information including engine family name, make, model, series, displacement, model year, and horsepower upon which the proposed test unit is installed.

1.7.5 Proposed test unit serial number and serial number of each component of the diesel emission control strategy.

1.7.6 Date of manufacture of the proposed test unit.

1.7.7 Date of installation of the proposed test unit and name of installer.

1.7.8 Proposed test unit size information, if applicable.

1.7.9 Proposed test unit cleaning/repair history, if available.

1.8 A description and explanation of the methodology used to ensure that the proposed test units are representative of the engines or vehicles equipped with the applicant's diesel emission control strategy (e.g. statistical analysis, sales data, etc.).

1.9~~(7)~~ Cumulative sales of the diesel emission control strategy family name ~~in each application~~.

1.10~~(8)~~ Current and p~~P~~redicted mileage or hours of use each ~~diesel emission control system~~ proposed test unit will have accrued by the time it is ~~obtained~~ tested by the applicant ~~of diesel emission control strategy~~.

1.11~~(9) Description of test vehicles and engines (engine family name, make, model, model year, displacement).~~Information regarding warranty claims for the diesel emission control strategy family and a statement that these claims for the same properly maintained and used part or component of the diesel emission control strategy have not exceeded the four percent threshold of section 2707(c), if accurate. If not, additional information as required.

1.12~~(10) Testing plan for meeting the requirements of part (g) below.~~ Identification of the specific test methodology that will be used to assess the in-field diesel emission control strategies.

1.13 Identification of the additional functional and visual tests that will be performed by the applicant to demonstrate the continuing functionality and durability of their diesel emission control strategy, including the criteria that will be used to analyze the results and determine compliance.

2. *In-Use Compliance Emissions Testing Proposal*

2.1 A cover letter signed by the applicant that includes the following information:
  2.1.1 Diesel emission control strategy family name.
  2.1.2 A statement that the author of the cover letter has the authority to represent the applicant with their in-use compliance testing for this diesel emission control strategy family name.
  2.1.3 A statement that the applicant agrees to adhere to the in-use compliance requirements of this Procedure.
  2.1.4 Anticipated dates of in-use compliance tests and final test report submittal.
2.2 Applicant identification information including:
  2.2.1 Primary contact responsible for in-use compliance testing information including contact information (e.g. name, mailing address, email address, telephone numbers).
  2.2.2 Brief description of the contact's association to the verification holder.
2.3 Diesel emission control strategy family name.
2.4 Parties to be involved in conducting in-use compliance emissions tests including: contact person for the selected emissions test facility or on-site testing company and identification of person or company responsible for removing test units.
2.5 Emissions test facility or on-site testing company identification and description of capabilities.
2.6 Quality control and quality assurance procedures for the test equipment, test procedures, and test facility.
2.7 List of 10 candidate test units for Executive Officer review with the following information for each:
  2.7.1 Vehicle or equipment make, model, and model year upon which the proposed test unit is installed.
  2.7.2 Statement that the applicant has access to and has reviewed each vehicles' or equipment's' maintenance records.
  2.7.3 Vehicle or equipment location of operation and description (e.g. route delivery, trash collection, front-end loader, etc.).
  2.7.4 Engine information including engine family name, make, model, series, displacement, model year, and horsepower upon which the proposed test unit is installed.
  2.7.5 Proposed test unit serial number and serial number of each component of the diesel emission control strategy.
  2.7.6 Date of manufacture of the proposed test unit.
  2.7.7 Date of installation of the proposed test unit and name of installer.
  2.7.8 Proposed test unit size information, if applicable.
  2.7.9 Proposed test unit cleaning/repair history.
2.8 A description and explanation of the methodology used to ensure that the proposed test units are representative of the engines or vehicles equipped with the applicant's diesel emission control strategy (e.g. statistical analysis, sales data, etc.). If an applicant's representative sample would

require multiple test engines to comply with the requirements of the this section, the applicant may propose an alternative selection strategy but must provide a detailed engineering argument that clearly shows that the alternative selections represent test units from the representative group that provide the greatest challenge in meeting the requirements of section 2709(m). All such requests require the approval of the Executive Officer.

2.9 Cumulative sales of the diesel emission control strategy family name.

2.10 Current and predicted mileage or hours of use each proposed test unit will have accrued by the time it is obtained by the applicant for in-use compliance emissions testing.

2.11 Information regarding warranty claims for the diesel emission control strategy family and a statement that these claims for the same properly maintained and used part or component of the diesel emission control strategy have not exceeded the four percent threshold of section 2707(c), if accurate. If not, additional information as required.

2.12 Description of the emissions test vehicles and/or engines (engine family name, make, model, series, model year, displacement, horsepower, verification that the test engine(s) are California exhaust emissions certified, verification that the test engine is listed in the applicants emission control group, identification of any maintenance, repairs, or reflash).

2.13 A testing plan for meeting the requirements of part (h) below including:

2.13.1 Identification of the procedures and equipment that will be used by the applicant, the applicant's emissions test facility or on-site testing company.

2.13.2 For strategies that were determined to have a propensity to increase emissions of NO_2 during the initial verification process, identification of the reference test units specified in section 2706, the preconditioning procedures that will be used, and the determination of backpressure procedures that will be used during emissions testing.

2.13.3 For strategies that have a distinct regeneration event, identification of the procedures that will be used to quantify the regeneration emissions.

2.13.4 Identification of all test cycles and how many repetitions of each cycle will be performed.

2.13.5 Identification of the type of dynamometer testing that will be performed or the use of any load banks or other such devices.

2.13.6 Identification of the procedures that will be used to validate the test engine(s).

2.13.7 Identification of the specific sequence of events that will be followed during emissions testing.

2.13.8 Identification of the test fuel that will be used during emissions testing and any analytical procedures that will be used to validate the test fuel.

2.14 Identification of the additional functional and visual tests that will be performed by the applicant to demonstrate the continuing functionality and

durability of their diesel emission control strategy, including the criteria that will be used to analyze the results and determine compliance.

Within 45 days of receipt of ~~the~~ any completed testing proposal, the Executive Officer shall determine whether the applicant has an appropriate testing proposal to support in-use compliance testing. The in-use testing proposal will not be considered approved until the Executive Officer issues the applicant an in-use compliance test plan approval letter ~~of approval~~. If the Executive Officer determines that the testing proposal is insufficient or inappropriate, the applicant must, within 30 days, submit a revised testing proposal.

~~(d)~~(e) Selection of Diesel Emission Control ~~Systems~~ Strategies for Testing. For each diesel emission control strategy family and for both ~~test phases~~ field and emissions testing, the applicant must propose a representative sample of ten installed diesel emission control ~~systems~~ strategies for in-use compliance testing based on information provided per ~~S~~section 2709~~(c)~~(d) ~~to be approved~~ for review and approval by the Executive Officer. The selected diesel emission control ~~systems~~ strategies should come from a representative sample of engines or vehicles equipped with the control ~~systems~~ strategies. The applicant must provide an explanation of the methodology used to ensure that the proposed test units are representative of the engines or vehicles equipped with the applicant's diesel emission control strategy. This methodology must be based on relevant data (e.g. cumulative sales information, size distribution, operating conditions, etc.) and these data must be provided with a detailed explanation for Executive Officer review and approval. The engines or vehicles equipped with the selected diesel emission control ~~systems~~ strategies ~~must have good maintenance records and~~ may receive a tune-up or normal maintenance prior to the applicant obtaining the diesel emission control ~~systems~~ strategies for testing. The applicant must obtain information from the end users regarding the diesel emission control ~~systems'~~ strategies' accumulated mileage or hours of usage, maintenance records (to the extent practicable), operating conditions, cleaning history (if available), and a description of any unscheduled maintenance that may affect the emission results.

~~(e)~~(f) Selection of Test Engines. The Executive Officer must approve the appropriate emissions test engines or vehicles for in-use compliance emissions testing. The applicant must provide ~~candidate~~ proposed test vehicles/engines for the Executive Officer's review in their in-use compliance emissions testing proposal. If the Executive Officer determines that a diesel emission control ~~system~~ strategy affects the performance of the engine, the Executive Officer may require the applicant to test the selected diesel emission control ~~system~~ strategy with the engine on which it is installed (e.g. fuel-based strategies). The applicant may tune-up or rebuild test engines prior to, but not after, baseline testing unless rebuilding the engine is an

integral part of the diesel emission control strategy. All testing should be performed with the test engine in a proper state of maintenance. A test engine is generally determined to be in a proper state of maintenance if its emissions levels are within 10 percent of its original certification values. Emissions of NO_2 from the test engine must not exceed 15 percent of the total baseline NOx emissions by mass. If there is a special category of engines with NO_2 emission levels that normally exceed 15 percent, this requirement may be adjusted for those engines at the discretion of the Executive Officer.

~~(f)~~(g) Number of Diesel Emission Control ~~Systems~~ Strategies to be Tested. The number of diesel emission control ~~systems~~ strategies an applicant must test ~~in each of the two test phases~~ will be determined as follows:

(1) ~~A minimum of four diesel emission control systems in each diesel emission control strategy family must be tested. For every system tested that does not reduce emissions by at least 90 percent of the lower bound of its initial verification level (or does not achieve an emission level less than or equal to 0.011 g/bhp-hr of PM) or does not meet the NO_2 requirement in section 2709(k), two more diesel emission control systems from the same family must be obtained and tested.~~ For in-use compliance field testing, applicants must test a minimum of eight diesel emission control strategies per family name. For each diesel emission control strategy tested that fails to meet the requirements of section 2709(m), two more diesel emission control strategies from the same family must be identified and tested.

(2) For in-use compliance emissions testing, applicants must test a minimum of four diesel emission control strategies per family name. For each diesel emission control strategy that fails to meet the requirements of section 2709(m), two more diesel emission control strategies from the same family must be obtained and tested.

(3) The total number of ~~systems~~ strategies tested for either field or emissions testing shall not exceed ten per diesel emission control strategy family.

~~(2)~~(4) At the discretion of the Executive Officer, applicants may begin testing more than the minimum ~~four~~ number of diesel emission control ~~systems~~ strategies. Applicants may concede failure of their in-use compliance requirements for their diesel emission control strategy family ~~an emission control system~~ before testing a total of ten diesel emission control ~~systems~~ strategies.

(h) In-Use Compliance Field Testing. Applicants must propose a test methodology that can be used in-field to determine if the applicant's diesel emission control strategy continues to successfully reduce emissions such as a smoke opacity test that meets the requirements of the Society of Automotive Engineers J1667 test procedures or similar (i.e., portable emissions monitoring system). Applicants must also perform tests to demonstrate the continuing functionality and durability of their diesel emission control strategy. Applicants must identify specific test procedures and

inspections that will be used to verify that all parts of the diesel emission control strategy are intact and functioning as originally verified (e.g. electronic control units, backpressure monitors, temperature sensors, hoses, brackets, etc.). These test procedures and inspections, including proposed criteria that will be used to analyze the results to determine compliance, must be defined in the applicant's in-use compliance field testing proposal and receive Executive Officer approval prior to performing in-use compliance field testing.

~~(g)~~(i) In-use Compliance Emissions Testing. Applicants must follow the test~~ing~~ procedures used for emission reduction verification as described in ~~S~~section 2703 (both baseline and control tests are required). Applicants must also perform tests to demonstrate the continuing functionality and durability of their diesel emission control strategy. Applicants must identify specific test procedures and inspections that will be used to verify that all parts of the diesel emission control strategy are intact and functioning as originally verified (e.g. electronic control units, backpressure monitors, temperature sensors, hoses, brackets, etc.). These test procedures and inspections, including proposed criteria that will be used to analyze the results to determine compliance, must be defined in the applicant's in-use compliance testing proposal and receive Executive Officer approval prior to performing in-use compliance emissions testing. As provided in ~~S~~section 2709~~(h)~~(j), the applicant may request the Executive Officer to review and approve an alternate testing procedure. If a diesel emission control strategy verified by U.S. EPA must perform engine dynamometer testing with the Heavy-duty Transient FTP cycle to fulfill the in-use compliance requirements of that program, but was verified by the Executive Officer with chassis dynamometer testing, the Executive Officer will also accept testing with the Heavy-duty Transient FTP cycle for the in-use compliance requirements of this Procedure.

~~(h)~~(j) Alternative Test Cycles and Methods. The Executive Officer may consider, on a case by case basis, an alternative test plan or method for applicants to satisfy the in-use compliance requirements of this section. For in-use compliance emissions testing, ~~T~~the proposed alternative test plan must be as scientifically sound as the testing described in ~~S~~section 2709~~(g)~~(i) of the Procedure and it must produce accurate results that will indicate if the emission control ~~system~~ strategy reduces emissions to the level for which it was verified. For in-use compliance field testing, the proposed alternative test plan must show that the diesel emission control strategy continues to function properly and indicate if the strategy is damaged or compromised in any way. Use of an alternative test procedure must be approved by the Executive Officer.

~~(i)~~(k) In-Use Compliance Report. The applicant must submit an in-use compliance report to the Executive Officer after ~~each phase of~~ either field or emissions in-use compliance testing. The applicant must submit the ~~phase 1~~

in-use compliance field testing report no later than ~~within~~ 18 months after selling or leasing ~~from when~~ the ~~50~~100th unit ~~is sold~~ in the California market, or for entirely fuel-based strategies, no later than 18 months after meeting the requirements specified in section 2709(a). ~~is sold~~. The ~~phase 2~~ applicant must submit the in-use compliance emissions testing report ~~must be submitted within 4 years~~ no later than 18 months ~~from when~~ after selling or leasing the ~~50th~~ 300th unit ~~is sold~~ in the California market. The following information must be reported for each of the ~~minimum of four~~ diesel emission control ~~systems~~ strategies tested:

(1) Diesel emission control strategy family name.

~~(1)~~(2) Parties involved in conducting the in-use compliance tests.

~~(2) Quality control and quality assurance information for the test equipment.~~

(3) ~~Diesel emission control strategy family name~~ Test unit serial number and serial number of each component of the diesel emission control strategy, installation date, and manufacture date.

(4) Vehicle or equipment and type of engine (engine family name, make, model year, model, displacement, etc.) the diesel emission control ~~system~~ strategy was applied to.

(5) Mileage or hours the diesel emission control ~~system~~ strategy was in use.

(6) Results of all emissions testing or field testing, documentation of any inspections, and results of all additional tests defined in the applicant's approved in-use compliance testing proposal.

(7) Summary of all maintenance, adjustments, modifications, and repairs performed on the diesel emission control ~~system~~ strategy.

(8) Results of any quality control and quality assurance procedures for the test equipment, test procedures, and test facility and identification of all test equipment.

(9) For in-use compliance emissions testing, the raw, real-time data for all baseline and control tests and, if required, the backpressure check specified in section 2706(a)(4)(C). These are the raw data from which emissions test results are derived. (e.g., analyzer voltage readings recorded at a frequency of 1 Hertz).

~~(j)~~(l)The Executive Officer may request the applicant to perform additional in-use testing if, at any time, the cumulative number of valid warranty claims for the same part or component of the diesel emission control strategy exceed four percent of the ~~number of diesel engines using the~~ cumulative sales or leases for the diesel emission control strategy family, or based on other relevant information. As noted in ~~S~~section 2707(c), if the cumulative number of valid warranty claims for the same part or component of a diesel emission control strategy exceed four percent of the ~~number of diesel engines using the~~ cumulative sales or leases of the diesel emission control strategy family, the applicant must notify the Executive Officer and submit a warranty report within 30 calendar days of that time.

~~(k)~~(m) Conditions for Passing In-Use Compliance Testing.

(1) In-Use Compliance Field Testing. Each diesel emission control strategy subject to the in-use compliance field testing requirements of section 2709(h) passes in-use compliance field testing if:

(A) The strategy meets the average opacity level or meets the alternative test criteria defined in the applicants in-use compliance test plan approval letter issued by the Executive Officer, and

(B) The strategy meets the additional functional and visual test requirements defined in the applicant's in-use compliance test plan approval letter issued by the Executive officer.

If the first eight diesel emission control strategies tested within a diesel emission control strategy family meet these standards, the diesel emission control strategy family passes in-use compliance field testing. If any of the first eight diesel emission control strategies tested within a diesel emission control strategy family fail to meet these standards, and more than eight units are tested, at least nine units tested must meet these standards for the diesel emission control strategy family to pass in-use compliance field testing.

(2) In-Use Compliance Emissions Testing. Each ~~For a~~ diesel emission control strategy subject to the in-use compliance emissions testing requirements of section 2709(i) ~~to~~ passes in-use compliance emissions testing if:~~,~~

(A) ~~e~~Emission test results ~~must~~ indicate that the strategy reduced emissions by at least 90 percent of the lower bound of the emission reduction level the Executive Officer originally verified it to, and,~~.~~

(B) If required, the strategy meets the additional functional and visual test requirements defined in the applicant's in-use compliance test plan approval letter issued by the Executive officer, and

(C) If required ~~In addition~~, the strategy ~~must~~ meets the requirements of section 2706(a) with the exception that the strategy does ~~must~~ not increase emissions of NO_2 by more than an increment equivalent in mass to 33 or 22 percent of the baseline NOx emission level for systems verified under the 30 or 20 percent NO_2 limits, respectively.

If the first four diesel emission control ~~systems~~ strategies tested within a diesel emission control strategy family meet ~~both of~~ these standards, the diesel emission control strategy family passes in-use compliance emissions testing. If any of the first four diesel emission control ~~systems~~ strategies tested within a diesel emission control strategy family fail to meet ~~either of~~ these standards, and more than four units are tested, at least 70 percent of all units tested must meet ~~both~~ these standards for the diesel emission control strategy family to pass in-use compliance emissions testing. ~~For each failed test, for which the cause of the failure can be attributed to the product and not to maintenance or other engine-related problems, two additional units must be tested, up to a total of ten units per diesel emission control strategy family.~~ Within 30 days of a test unit failing to meet the requirements of section 2709(m)(1) or section 2709(m)(2), the applicant must submit to the Executive Officer ~~for approval a testing proposal for the additional test units that is~~

~~compliant with part (c) above. The testing proposal must include~~ an investigative report detailing the causes of the failure~~.~~ and if necessary, a new in-use compliance testing proposal compliant with section 2709(d) for approval requesting additional test units. The Executive Officer shall, within 45 days of its receipt, determine whether the in-use compliance testing ~~plan~~ proposal is acceptable. After receiving approval from the Executive Officer, the applicant must complete testing.

~~(l)~~(n) Failure of In-Use Compliance Testing. If a diesel emission control strategy family does not meet the minimum in-use compliance requirements of this section, the applicant must submit a remedial report within 90 days after the in-use compliance report is submitted. The remedial report must include:

(1) Summary of the in-use compliance report

(2) Detailed analysis of the failed diesel emission control ~~systems~~ strategies and possible reasons for failure.

(3) Remedial measures to correct or replace failed diesel emission control ~~systems~~ strategies as well as the rest of the ~~in-use diesel emission control~~ strategies ~~systems~~ in the diesel emission control strategy family.

~~(m)~~(o) The Executive Officer shall evaluate the remedial report, annual warranty report, and all other relevant information to determine if the diesel emission control strategy family satisfies the in-use compliance requirements. The Executive Officer may request additional information from the applicant. Based on this review, the Executive Officer may lower the verification level or revoke the verification status of a verified diesel emission control strategy family. The Executive Officer may also lower the verification level or revoke the verification status of a verified diesel emission control strategy family, if the applicant does not conduct in-use compliance testing or fails to adhere to the recall provisions in accordance with this section, or if the Executive Officer conducts in-use compliance testing in accordance with this section (including alternative testing) and the diesel emission control strategy family does not pass the standards in this section.

(p) Recall Provisions. If the Executive Officer determines after a review of an applicant's in-use compliance report, remedial report, warranty report, enforcement testing results, or any other information that a diesel emission control strategy family: has the potential to experience catastrophic failure or other safety related failure, fails to meet the conditions for passing in-use compliance testing as defined in section 2709(m), has valid warranty claims in excess of four percent as defined in section 2707(c), or a substantial number of units experience a failure of an operational feature, the Executive Officer may require a recall. In the event of a recall the Executive Officer shall provide notification to the applicant that includes a description of the nature of the failure or warrantable condition, the factual basis for the determination, and shall designate a date at least 60 days from the date of receipt of such notification by which the applicant shall submit a recall plan for review and

approval to address the failures or warrantable condition. Recalls must address all diesel emission control strategies within a specific diesel emission control strategy family and may include all diesel emission control strategies sold as California verified. Each recall plan must be approved by the Executive Officer in writing.

(g) Recall Plan. At a minimum, an applicant's recall plan shall contain the following information unless otherwise specified in the notification:
(1) A description of each diesel emission control strategy subject to the recall including the number of units to be recalled, the emission control group(s) affected, and any information required to identify the recalled units.
(2) A description of the type and nature of the failure or warrantable condition and the specific modifications, design changes, alterations, repairs, adjustments, or other changes to be made to correct the failures or warrantable condition with a description of the technical studies, data, or other information which support the applicant's decision regarding specific corrections to be made. If any modification requires a design change per section 2702(j) the recall plan must include a complete preliminary verification application per the requirements of section 2702(b).
(3) A description of the method by which the applicant will determine the names and addresses of the end users and the applicant's methods and schedule for notifying the end users, service facilities, and distributors.
(4) A description of the procedure to be followed by the end users to correct the failures or warrantable condition. This shall include the date on or after which the end user can have the failures or warrantable condition remedied, the time necessary to perform the remedy, and the designation of facilities at which the remedy can be performed.
(5) The plan may specify the maximum incentives (such as device cleaning or specified quantity of diesel fuel), if any, the applicant will offer to induce vehicle or equipment owners to present their diesel emission control strategies for repair, as evidence that the manufacturer has made a good faith effort to repair or replace all the diesel emission control strategies in the plan. The plan shall include a schedule for implementing actions to be taken including identified increments of progress towards implementation and deadlines for completing each such increment.
(6) A copy of the letter of notification to be sent to the end users.
(7) A description of the system by which the applicant will assure that an adequate supply of parts will be available to perform any repairs under the recall plan, including the date by which an adequate supply of parts will be available to initiate the repair or replacement campaign, and the method to be used to assure that the supply remains both adequate and responsive to end user demand.
(8) A copy of all necessary instructions to be sent to those persons who perform the replacement or repair.
(9) A description of the impact the proposed replacement or repairs will have on the vehicle, equipment, or engine including: exhaust backpressure,

exhaust temperature, durability, regeneration, maintenance, fuel economy, drivability, performance, safety, warranty, and a summary of the data and technical studies used to support such determinations.

(r) Reporting Requirements. Unless otherwise specified by the Executive Officer, the manufacturer shall report on the progress of a recall campaign by submitting subsequent reports for six consecutive quarters commencing with the quarter after the recall campaign begins. Such reports shall be submitted no later than 25 days after the close of each calendar quarter to: Chief, Mobile Source Control Division, 9528 Telstar Avenue, El Monte, CA 91731.

~~(n)~~(s) The Executive Officer may lower the verification level or revoke the verification status of a verified diesel emission control strategy family if the applicant fails to observe the requirements of ~~S~~sections 2706, ~~or~~ 2707, or 2709. The Executive Officer must allow the applicant an opportunity to address the possible lowering or revocation of the verification level in a remedial report to the Executive Officer and the Executive Officer may make this determination based on all relevant information. In addition, an applicant that fails to submit a recall plan as requested by the Executive Officer or to complete the requirements of an approved recall plan, including the reporting requirements, may be subject to civil penalties as specified in state law and regulations, including, but not limited to, Health and Safety Code Sections 39600, 39660, and 39674.

NOTE: Authority cited: Sections 39002, 39003, 39500, 39600, 39601, 39650-39675, 40000, 43000, 43000.5, 43011, 43013, 43018, 43105, 43600, and 43700, Health and Safety Code. Reference: Sections 39650-39675, 43000, 43009.5, 43013, 43018, 43101, 43104, 43105, 43106, 43107, and 43204-43205.5, Health and Safety Code; and Title 17 California Code of Regulations Section 93000

§ 2710. Verification of Emission Reductions for Alternative Diesel Fuels and Fuel Additives

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Table 6. Fuel Test Methods and Reference Fuel Specifications

Property	General Reference Fuel Specifications	ASTM Test Method
Sulfur Content	15 ppm max	D5453-93
Aromatic Hydrocarbon content, Vol. %	10% max	D5186-96
Polycyclic Aromatic Hydrocarbon Content, Wt. %	1.4% max	D5186-96
Nitrogen Content	10 ppm max	D4629-96
Natural Cetane Number	48 min	D613-84
Gravity, API	33-39	D287-82 or

		D4052-96
Viscosity at 40°C, cSt	2.0-4.1	D445-83
Flash point, °F	130 min	D93-80
Distillation, °F IBP 10%REC 50%REC 90%REC EP	 340-420 400-490 470-560 550-610 580-660	D86-96

* * * * *

(d) Emissions Test Procedures for Particulates, Nitrogen Oxides, Soluble Organic Fraction, Hydrocarbons, and Toxics.

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(3) Emission test requirements and test sequence for emissions test program.

(A) The applicant must follow the emission test requirements from Section 2703 subsections (a), (b), (k), (l), and (m). For all on-road diesel vehicles and equipment, the applicant must conduct engine dynamometer testing using the Federal Test Procedure (FTP) Heavy-duty Transient Cycle, in accordance with the provisions in the Code of Federal Regulations, Title 40, Part 86, Subpart N. For all off-road and stationary diesel vehicles and equipment, the applicant must conduct engine dynamometer testing in accordance with ~~S~~section 2703(e)(2) and 2703(e)(3). The applicant must use the following test sequences:

1. If both cold start and hot start exhaust emission tests are conducted, a minimum of ~~five~~ nine exhaust emission tests must be performed on the engine with each fuel, using either of the following sequences, where "R" is the reference fuel and "C" is the candidate alternative diesel fuel or fuel additive: RC CR RC CR RC (and continuing in the same order) or RC RC RC RC RC (and continuing in the same order). The engine mapping procedures and a conditioning transient cycle must be conducted with the reference fuel before each cold start procedure using the reference fuel. The reference cycle used for the candidate alternative diesel fuel or fuel additive must be the same as determined for the reference fuel.

2. If only hot start exhaust emission tests are conducted, one of the following test sequences must be used throughout the testing, where “R” is the reference fuel and “C” is the candidate alternative diesel fuel or fuel additive~~-~~:

Alternative 1: RC CR RC CR (continuing in the same order for a given calendar day; a minimum of ~~twenty~~ nine individual exhaust emission tests must be completed with each fuel)

Alternative 2: RR CC RR CC (continuing in the same order for a given calendar day; a minimum of ~~twenty~~ nine individual exhaust emission tests must be completed with each fuel)

Alternative 3: RRR CCC RRR CCC (continuing in the same order for a given calendar day: a minimum of ~~twenty one~~ nine individual exhaust emission tests must be completed with each fuel)

For all alternatives, an equal number of tests must be conducted using the reference fuel and the candidate alternative diesel fuel or fuel additive on any given calendar day. At the beginning of each calendar day, the sequence of testing must begin with the fuel that was tested at the end of the preceding day. The engine mapping procedures and a conditioning transient cycle must be conducted at the beginning of each day for the reference fuel. The reference cycle used for the candidate alternative diesel fuel or fuel additive must be the same as determined for the reference fuel. For fuel additives that accumulate within the fuel system, engine, or exhaust system, a test or tests using a multiple of the normal dosage rate will be required in post durability testing to determine any long term effects if accumulation is not shown to stabilize during the required durability time frame.

3. Alternative test sequence. The applicant may request the Executive Officer to approve an alternative test sequence in place of the above test sequences. In reviewing this request, the Executive Officer may consider all relevant information including, but not limited to, the following:
   a. Statistical and scientific equivalence to 1. or 2., and
   b. Body of existing test data using the alternative test sequence.

* * * * *

(e) Durability.

(1) The applicant must meet the durability demonstration requirements in ~~S~~section 2704 subsections (a), (b), (c), ~~(d)~~, ~~(e)~~(f), and ~~(h)~~(i) with the exceptions of emissions testing an fuel requirements. If the applicant's diesel emission control strategy includes hardware components in addition to the alternative diesel fuel or fuel additive, then the emissions testing requirements in Section 2704 apply.

(2) The applicant must provide test data obtained after completion of the service accumulation, described in ~~S~~section 2704~~(d)~~(e), showing that the candidate alternative diesel fuel or fuel additive does not adversely affect the

performance and operation of diesel engines or cause premature wear or cause damage to diesel engines. This must include but is not limited to lubricity, corrosion, and damage to engine parts such as fuel injector tips. The applicant must provide data showing under what temperature and conditions the candidate alternative diesel fuel or fuel additive remains stable and usable in California.

(3) For additives that accumulate within the fuel system, engine, or exhaust system, the same test engine used for emissions testing must be used for the durability demonstration.

* * * * *

(g) Other Requirements.

(1) The candidate alternative diesel fuel or fuel additive must be in compliance with applicable federal, state, and local government requirements.

(2) Applicants planning to market fuel in California must contact and register with the U.S. EPA and the California Dept. of Food and Agriculture. Contacts are listed below.

Office of Transportation and Air Quality
U.S. EPA Head Quarters
Ariel Rios Blvd.
1200 Pennsylvania Ave, N.W.
Washington DC 20468
Phone (202) 564-9303

Petroleum Products/Weighmaster Enforcement Branch
Division of Measurement Standards
Dept. of Food and Agriculture
8500 Fruitridge Road, Sacramento CA 95826
Phone (916) 229-3000

(3) Additional government agencies such as the California Energy Commission, Area Council of Governments, and Local Air Quality Management Districts may be contacted to facilitate the marketing of alternative diesel fuel in California.

(4) Labeling

(A) For strategies that do not include exhaust aftertreatment, labeling is required pursuant to section 2706(j) on the engine and the storage container for the alternative diesel fuel or fuel additive. This storage container may be either the fuel tank or a separate tank that is used to deliver the additive to the engine. Strategies that do not include exhaust aftertreatment are not required to identify the month and year of manufacturer or a unique serial number on their label.

* * * * *

(h) ~~Conditional Verification~~

~~(1) The Executive Officer may grant a conditional verification for an alternative diesel fuel or fuel additive for off-road or stationary applications only after the conditional verification for on-road application is granted. The Executive Officer may grant a conditional verification for on-road application if the applicant meets the following conditions:~~

~~(A) The applicant has applied for U.S. EPA registration of the alternative diesel fuel or fuel additive;~~

~~(B) The U.S. EPA has granted a research and development exemption or otherwise granted permission for the alternative diesel fuel or fuel additive to be used, and;~~

~~(C) All relevant requirements of Sections 2700-2710 have been met with the exception that registration with the U.S. EPA has not been completed.~~

~~(D) Multimedia Assessment as specified in Section 2710 (f).~~

~~(2) Where conditional verification is granted, full verification must be obtained by completing the U.S. EPA registration process within a year after receiving conditional verification. During that year, conditional verification is equivalent to verification for the purposes of satisfying the requirements of in-use emission control regulations.~~

~~(i)~~ Extensions of an Existing Verification. See ~~S~~section 2702-(~~g~~h).

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NOTE: Authority cited: Sections 39002, 39003, 39500, 39600, 39601, 39650-39675, 40000, 43000, 43000.5, 43011, 43013, 43018, 43105, 43600, 43700 and 43830.8, Health and Safety Code. Reference: Sections 39650-39675, 43000, 43009.5, 43013, 43018, 43101, 43104, 43105, 43106, 43107, 43204-43205.5 and 43830.8, Health and Safety Code; Section 71017, Public Resources Code, and Title 17 California Code of Regulations Section 93000.

§ 2711. Compliance.

(a) Any ARB verified diesel emission control strategy shall be properly installed and maintained.

(~~a~~b)No person shall sell, offer to sell, or introduce into commerce an ARB verified diesel emission control strategy unless all of the conditions of the governing Executive Order and this Chapter are met.

(~~b~~c)The Executive Officer may modify, revoke or suspend an existing verification for any violation of the governing Executive Order or the procedures of this Chapter and seek any other remedy available under Part 5, Division 26 of the Health and Safety Code.

(~~c~~d)No person shall represent a device as being an ARB verified diesel emission control strategy unless it has received verification pursuant to this article.

(e) No person shall alter, physically disable, disconnect, bypass, or tamper with an installed ARB verified diesel emission control strategy.

NOTE: Authority cited: Sections 39002, 39003, 39500, 39600, 39601, 39650-39675, 40000, 43000, 43000.5, 43011, 43013, 43018, 43105, 43600 and 43700, Health and Safety Code. Reference: Sections 39650-39675, 43000, 43009.5, 43013, 43018, 43101, 43104, 43105, 43106, 43107 and 43204-43205.5, Health and Safety Code; and Title 17 California Code of Regulations Section 93000.