State of California
AIR RESOURCES BOARD

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

PUBLIC HEARING TO CONSIDER AMENDMENTS TO THE CURRENT INBOARD AND STERNDRIVE BOAT REGULATIONS

Public Hearing Date: November 17, 2005
Agenda Item No.: 05-11-3

I. GENERAL

In this rulemaking, the Air Resources Board (ARB or Board) is amending California's emissions regulations for new 2007 and later spark-ignition (gasoline) inboard and sterndrive pleasurecraft. These amendments provide industry with additional flexibility for complying with the 5.0 grams per kilowatt-hour (g/kW-hr) combined hydrocarbon and oxides of nitrogen (HC+NOx) exhaust standard, while preserving the emission benefits of the existing regulation. The proposed amendments would also allow marine engine manufacturers to comply with the 5.0 g/kW-hr HC+NOx standard for engines with power ratings above 373 kW by averaging emissions with those of engines less than or equal to 373 kW. Additionally, the amendments allow marine engine manufacturers the choice of certifying engines with power ratings greater than 485 kW (650 horsepower) by either providing actual emissions test data or by opting to use a default value of 30.0 g/kW-hr HC+NOx. Engine manufacturers and builders of gasoline inboard or sterndrive engines will continue to be subject to, and to have responsibilities under, the amended regulation.

This rulemaking was initiated by the September 30, 2005, publication of a notice for a public hearing scheduled on November 17, 2005. The Staff Report: Initial Statement of Reasons, entitled "Public Hearing to Consider Amendments to the Current Inboard and Sterndrive Boat Regulations" (Staff Report or ISOR) was also made available for public review and comment starting September 30, 2005. The Staff Report, which is incorporated by reference herein, described the rationale for the proposal.

The proposed amended text of title 13, California Code of Regulations (CCR), sections 2111, 2112, 2441, 2442, 2444.2, 2445.1, 2445.2, and 2446, and related amendments to the "California Exhaust Emission Standards and Test Procedures for 2001 Model Year and Later Spark-Ignition Marine Engines" were included as attachments to the Staff Report.

These modifications and additions to the regulations and test procedures provide manufacturers with several compliance flexibility options to ease the transition to the 5.0 g/kW-hr HC+NOx standard and to preserve the estimated emission benefits attributed to the existing regulations. The modifications and additions also provide relief regarding the certification of high performance engines that may otherwise require

special test facility and/or equipment accommodations not readily available to all engine manufacturers. A copy of Board Resolution 05-57 approving the regulatory action described above and the regulatory documents for this rulemaking were also posted on the ARB's internet site for this rulemaking at http://www.arb.ca.gov/regact/boatregs/boatregs.htm ("ARB's internet site").

On November 17, 2005, the Board conducted a public hearing to consider the staff's proposal as described in the Staff Report. At the hearing, staff proposed amendments to California's emissions regulations for new 2007 and later spark-ignition (gasoline) inboard and sterndrive pleasurecraft. Staff also proposed various editorial corrections and several modifications to the proposed regulatory action. Written and oral comments were received at the hearing concerning staff's proposal.

At the conclusion of the hearing, the Board adopted Resolution 05-57, in which the Board approved the adoption of the originally proposed regulations with the modifications presented by staff at the hearing and directed staff to work with commenters to finalize the regulatory proposal. The staff's proposed modifications were identified in a document appended to Resolution 05-57 as Attachment C. Attachment C showed the originally proposed regulatory text and incorporated documents, with the text of all suggested modifications clearly identified. In accordance with section 11346.8 of the Government Code, the Board in Resolution 05-57 directed the Executive Officer to incorporate the modifications to the proposed regulatory text approved by the Board, with such other conforming modifications as may be appropriate, and to make the modified text available to the public for a period of at least fifteen days. The Executive Officer was then directed either to adopt the amendments with such additional modifications as may be appropriate in light of the comments received, or to present the regulations to the Board for further consideration if warranted in light of the comments.

The revised regulations and test procedures, with the modified text clearly indicated, were made available to the public for a supplemental 15-day comment period by issuance of a "Notice of Public Availability of Modified Text." The Notice of Modified Text, staff's modifications to the proposed regulation order and test procedures, a copy of Resolution 05-57, and the Attachment C document (relabeled as Appendix IV) were mailed on August 11, 2006, to all parties identified in title 1, CCR, section 44(a), and to other persons generally interested in ARB's rulemaking concerning new 2007 and later spark-ignition recreational inboard and sterndrive marine engines. These documents were also published on ARB's internet site on August 10, 2006. Several written comments were received during the 15-day supplemental comment period.

After considering the comments received during the comment period, the Executive Officer issued Executive Order R-06-004, adopting the amendments, new regulatory text, and incorporated documents.

This Final Statement of Reasons (FSOR) updates the Staff Report by identifying and providing the rationale for the modifications made to the originally proposed regulatory text. The FSOR also contains a summary of the comments received on the proposed

regulatory amendments during the formal regulatory process and ARB's responses to those comments.

Incorporation of Test Procedures. The amended exhaust emission test procedures are incorporated by reference in title 13, CCR, section 2441(a)(51). The test procedures document is readily available from the ARB upon request and was made available in the context of this rulemaking in the manner specified in Government Code section 11346.5(b). The test procedures are available online at ARB's internet site.

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

Fiscal Impacts. The Board has determined that this regulatory action will not create costs or savings, as defined in Government Code section 11346.5(a)(5) and 11346.5(a)(6), to any state agency or in federal funding to the state, costs or mandate to any local agency or school district, whether or not reimbursable by the state pursuant to Part 7 (commencing with section 17500), Division 4, Title 2 of the Government Code, or other non-discretionary costs or savings to local agencies.

Consideration of Alternatives. The amendments and new regulatory language proposed in this rulemaking were the result of extensive discussions and meetings involving staff and the affected marine engine manufacturers, boat builders, United States Coast Guard, and other stakeholders. In the Staff Report, staff evaluated and rejected three potential alternatives to the proposed regulations: (1) preserve existing California regulations, (2) wait for the adoption of Federal regulations, and (3) accelerate the implementation of the standards.

The first alternative to this proposal was to retain the existing California recreational marine regulations. Although staff's proposal includes allowing manufacturers to continue complying with the existing regulation, the proposed amendments also provide industry with options for additional flexibility while achieving equivalent emission benefits, and the potential to achieve additional emission benefits. The existing regulation does not offer compliance flexibility options and may unnecessarily burden some segments of the marine industry. Therefore, staff rejected this alternative.

The second alternative was to wait for the federal government to promulgate emission standards for inboard and sterndrive engines and then to harmonize with those standards. Although U.S. EPA has published a Notice of Proposed Rulemaking for inboard and sterndrive engine standards, a federal regulation is not expected to be promulgated until late 2006 or early 2007 nor is it expected to be implemented prior to 2009 at the earliest. Considering that California has had regulations in place since 2001, and that staff's proposed amendments preserve the emission benefits of those requirements, postponing these amendments would only serve to deny reasonable relief to the regulated industry.

The advantage of a national regulation is harmonization. Manufacturers would have to comply with only one set of regulations for all nationwide sales. The disadvantage of relying on the federal rulemaking is largely one of uncertainty and timing. Staff fully intends to continue working with U.S. EPA in its development of a federal rule to ensure consistency of standards and other requirements. If after the federal rule has been promulgated, staff determines that additional amendments will help achieve harmonization without harming the California program, staff will return to the Board with additional amendments. However, delaying action until the federal regulation is finalized would unnecessarily burden the marine industry. Therefore, staff rejected this alternative.

The third alternative was to accelerate the implementation schedule of the standards to get cleaner engines into California earlier. While this alternative would provide emission benefits sooner, manufacturers would have less lead-time to develop the necessary emission control technologies, and manufacturers would have fewer years over which to spread out and recoup the development expenses. This would also make the proposal far less cost-effective. Therefore, staff rejected this alternative.

Additional proposed alternatives were submitted by commenters during the rulemaking process and considered by the Board. For the reasons set forth in the Staff Report, in staff's comments and responses at the hearing, and in this FSOR, the Board has determined that none of the alternatives considered by the agency would be more effective in carrying out the purpose for which the regulatory action was proposed or would be as effective and less burdensome to affected private persons than the action taken by the Board.

II. MODIFICATIONS MADE TO THE ORIGINAL PROPOSAL

At the November 17, 2005 hearing, the Board approved the adoption of the staff's proposed regulatory action. Further, the Board directed staff to work with stakeholders regarding modifications or clarifications to the approved regulations. The following is a description of the modifications and clarifications, by section number.

TITLE 13, REGULATION

§ 2441 – Definitions

The (a)(5) definition of “Boat Manufacturer” was added to clarify the scope of entities responsible for installing low-permeation fuel line hoses on new boats equipped with an engine (or engines) certified to Option 2. Specifically excluded from this definition are persons or businesses who sell or service inboard or sterndrive pleasurecraft, but who are not involved in the manufacture of those vessels. All subsequent definitions were renumbered to accommodate this new addition.

The (a)(8) definition of “CE10 Fuel” was revised to include specific reference to publication D471-98 of the incorporated American Society of Testing and Materials (ASTM) fuel standards. New conforming modification.

The (a)(12) definition of “Direct Emissions Device” was added to clarify its usage regarding the applicability of certain engine components referenced in Section 2445.1 (c)(3)(C)2.(i) and (c)(3)(C)3.(i) of the regulation. All subsequent definitions were renumbered to accommodate this new addition. New conforming modification.

The (a)(30) descriptor “Low-permeation hose” was replaced by the descriptor “Low-permeation fuel line (or supply) hose” to conform with usage modifications in the standard-setting section of the regulation meant to clarify the intended scope of Option 2 implementation. New conforming modification.

The (a)(35) definition of “Maximum Rated Power” was made more specific by associating the reference of the rating to only a single source document – the certification application.

The (a)(51) definition of “Test Procedures” was revised to clarify the date of reference of the source document as the most recently revised iteration of previously adopted test procedures.

§ 2442 – Emission Standards

The Table 2 entry “Evaporative Low-Permeation Liquid Fuel Line Hoses” under the “Supplemental Measure” column was renamed to “Low-Permeation Fuel Line Hoses” to clarify that only the primary fuel supply hose need be replaced with a low-permeation version under the provisions of Option 2.

The Table 2 entry for “Durability” corresponding to 2009 engines with rated power between 373 kW and 485 kW was revised to correlate with the mechanical warranty requirements for the same power category of engines, which is 3 years or 150 hours. New conforming modification.

Footnote 3 in Table 2 was added to clarify the applicability of corporate averaging with

respect to the listed compliance options and certification standards. All subsequent footnotes were renumbered to accommodate this new addition.

Footnote 5 in Table 2 was reconstructed to resolve the potential paradox of demonstrating emissions performance with specific components that may require replacement before the demonstration is complete. The revised footnote now clarifies that while an engine manufacturer may petition for a shorter warranty period for specific components per the provisions of (c)(3)(C)4., the durability period of the engine as a whole does not change. New conforming modification.

Paragraph (b)(2)(E) was revised to permit manufacturers additional time to report sales information after the end of the model year to ensure a more complete assessment.

Paragraph (b)(3) with subparts (A) and (B) were added to delineate the responsibilities of engine manufacturers and boat manufacturers with respect to the installation of low-permeation fuel line hoses under Option 2. All subsequent subsections were renumbered to accommodate this new addition.

Paragraph (b)(4) was rephrased to clarify that manufacturers electing to certify under Option 2 may use methods other than low-permeation fuel supply hoses to comply with the supplemental emission reduction requirements.

Paragraph (b)(4)(A) was revised to clarify that only the primary fuel supply hose need be replaced with a low-permeation version under the provisions of Option 2.

§ 2445.1 – Defects Warranty Requirements for Model Year 2001 and Later Spark-Ignition Marine Engines

Paragraph (c)(3)(B)2. was revised to append the application of an hourly warranty period to the existing yearly warranty period.

Paragraph (c)(3)(C)1. was revised to apply to engines with rated power less than or equal to 373 kW, and to append the application of an hourly warranty period to the existing yearly warranty period.

Paragraph (c)(3)(C)2. was added to apply to engines with rated power greater than 373 kW and less than or equal to 485 kW. Subparagraphs (i) and (ii) were added to specify separate warranty limits for electronic/direct emission-related components and mechanical emission-related components. Subparagraph (i) is a new conforming modification.

Paragraph (c)(3)(C)3. was added to define specific warranty provisions for engines with rated power greater than 485 kW. Subparagraphs (i) and (ii) were added to specify separate warranty limits for electronic/direct emission-related components and mechanical emission-related components. Subparagraph (i) is a new conforming modification.

Paragraph (c)(3)(C)4. was added to clarify the provisions mentioned in Footnote 5 of Table 2 in Section 2442 whereby engine manufacturers may request alternate warranty intervals for specific components. The paragraph also describes the procedure for demonstrating that an alternate warranty period is appropriate.

§ 2445.2 – Emission Control Warranty Statements

Paragraph (a) was revised to provide correlation between emission control warranty statements and the revised warranty coverage requirements in § 2445.1. Previously enumerated subsection identifiers were eliminated in order to provide better consistency with the existing structure of the warranty requirements. Restrictions on the use of integrated electronic control unit hour-meters were also eliminated in accordance with the establishment of hourly warranty and durability periods for all categories of marine engines. The proposed warranty amendments for 2009 and later spark-ignition inboard and sterndrive marine engines are new conforming modifications.

TEST PROCEDURES

Part I

Table 2 in subpart 9(b) was revised to be identical to Table 2 in § 2442 (b)(1) of the Final Regulation Order.

As part of the proposed 15-day Notice package, Staff has made several other non-substantial modifications throughout the regulations and test procedures to correct grammar, spelling, and typographical errors, correct references and citations, and improve the clarity of the regulations and test procedures.

"SECTION 100" AMENDMENTS

Concurrent with the filing of this regulatory action, the ARB submitted the following nonsubstantive changes for approval by the Office of Administrative Law. If approved, they will appear in the final regulations and test procedures.

The 2nd to last sentence under "MANUFACTURER'S WARRANTY COVERAGE:" in 13 CCR 2445.2(a) was revised to reference the correct definition in 13 CCR 2441(a)(13) regarding integrated hour-meters. The previous reference had not been updated to reflect the numbering changes which occurred due to the insertion of a new definition earlier in the numbering scheme. The intent of the reference is obvious from the context of its usage, which specifically addresses integrated hour-meters, which are only defined in (a)(13).

Subpart 9(b) of the incorporated test procedures was reorganized into subparts (b)(1), (b)(2), (b)(3), and (b)(4) to be identical to the corresponding regulatory text of 13 CCR 2442 (b)(1), (b)(2), (b)(3), and (b)(4) of the Final Regulation Order. This revision addresses an inadvertent omission from the originally proposed modifications.

III. SUMMARY OF COMMENTS AND AGENCY RESPONSES TO THE ORIGINAL PROPOSAL AND NOTICE OF MODIFIED TEXT

At the November 17, 2005 hearing, there were two organizations represented that provided oral and written comments. Additional written comments were received by the hearing date. Written comments were also received subsequent to the Notice of Modified Text. A list of commenters is set forth below, identifying the date and form of all comments that were timely submitted.

ORGANIZATION AND PERSON PROVIDING COMMENTS	WRITTEN TESTIMONY	ORAL TESTIMONY
Dr. Joseph Kubsh, Manufacturers of Emission Controls Association (MECA)	11/15/2005 [MECA]	11/17/2005
John McKnight, National Marine Manufacturers Association (NMMA)	11/17/2005 [NMMA-1]	11/17/2005
Dick Rowe, Indmar Marine Engines	11/17/2005 [IND]	11/17/2005
Mark McKinney, Pleasurecraft Engine Group	11/17/2005 [PC-1]	11/17/2005
Mark Riechers, Mercury Marine	11/17/2005 [MM-1]	11/17/2005
Mark Riechers, Mercury Marine	08/28/2006 [MM-2]	
John McKnight, NMMA	08/28/2006 [NMMA-2]	
Richard Kolb, Volvo Penta of the America, Inc.	08/28/2006 [VPA]	
Chuck Thurman, Pleasurecraft Engine Group	08/29/2006 [PC-2]	

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

In general, the recreational marine industry supported the modification of the regulations in that the amendments provided additional compliance flexibility provisions. NMMA, including some of its individual members, had specific comments and recommendations

for modification on portions of the proposed regulations which are discussed in further detail below. The comments by MECA supported the adoption of the regulations with no request for modification.

A. General Supporting Comments

1. **Comment:** The Air Resources Board is strongly encouraged to adopt staff's proposed amendments to facilitate the development and deployment of cleaner engines in California for 2008. [MECA] [NMMA-1] [IND] [MM-1]

   Comment: Staff's proposed amendment of an option allowing manufacturers to delay the introduction of catalyst-equipped engines until 2008 is necessary for compliance and is emissions neutral. Additionally, the amendment of an averaging scheme for high performance engines will make compliance with the regulation more cost effective without sacrificing emission benefits. [MM-1]

   Comment: NMMA supports the amendments to the rule as presented by the ARB staff during the November 17, 2005, board hearing and documented in the amended text of the 15-day notice for public comment. [NMMA-2] [VPA]

   Agency Response: We agree that the amendments provide industry with additional compliance flexibility options without sacrificing previously projected gains in air quality.

B. Comments Related to the Fresh and Salt Water Demonstration Programs

2. **Comment:** Although the marine industry has learned a lot from the fresh water catalyst test program, most of it positive, we cannot consider the program to have completed satisfactorily since two of the test engines experienced exhaust manifold cracks near the catalyst at 300 hours that have never been adequately explained. Such cracks, which occurred under ideal conditions, would be a source of deadly carbon monoxide leakage. [NMMA-1] [IND] [PC-1]

   Agency Response: The commenter is referring to the ARB fresh and salt water demonstration programs. This comment is not relevant to the proposed regulatory amendments because it is not directed to the adequacy of the relief to industry proposed in this regulatory action. Therefore, the following response is provided for information only.

   The Board heard this objection at the hearing on November 17, 2005, and was satisfied that the cause of the cracked manifold was not directly related to the incorporation of the catalytic converter. Southwest Research Institute (SwRI), the contractor of the demonstration program, evaluated the manifold after the incident and maintained that the likely failure mode was the manifold design. Specifically, the manifold was designed decades ago for use on low power and low exhaust temperature carbureted engines. Carbureted engines typically use

more fuel than necessary for complete combustion, which tends to lower engine operating temperature through a process known as quenching. However, in order to achieve optimal emissions performance for the demonstration program, SwRI modified the fuel system of the test engine to operate at a stoichiometric air/fuel ratio, which increased engine temperature. The manifolds cracked where the exhaust gas temperature was at a maximum in the area near the exhaust port. This is nowhere near the catalyst. SwRI further attributes insufficient water-jacketing in the original manifold design as a contributing factor to the cracks. That design allowed temperature differentials to occur between jacketed and non-jacketed areas of the manifold, which likely weakened the manifold through thermal cycling. The manifold used on another engine in the same test program were newer and fully water jacketed, and that manifold did not experience similar problems. This issue was originally addressed in the ARB Staff Report titled "Status Report on Catalyst Testing of Spark-Ignition Inboard/Sterndrive Pleasurecraft," which was released on October 19, 2004, and which can be found on the ARB website at: www.arb.ca.gov/msprog/offroad/recmarine/documents/inboard-staff-report.pdf

3. **Comment:** ARB has an obligation to honor its commitment in Resolution 01-23 to evaluate the durability and safety of catalyst-equipped vessels in salt water. Therefore, staff's salt water demonstration program must be allowed to continue until all test vessels have accumulated the full 480 hours. [NMMA-1] [IND] [PC-1] [MM-1]

   Agency Response: The commenter is referring to the ARB fresh and salt water demonstration programs. This comment is not relevant to the proposed regulatory amendments because it is not directed to the adequacy of the relief to industry proposed in this regulatory action. Therefore, the following response is provided for information only.

   Although completion of the salt water test program may be a moot exercise now that a catalyst-equipped inboard engine has been certified in California, ARB intends to continue its salt water demonstration program, as promised by ARB's Executive Officer at the November 17, 2005, board hearing, until each test engine has accumulated 480 hours.

4. **Comment:** NMMA is very concerned with the progress of the salt water test program being conducted by SwRI. Multiple failures have already occurred with the test vessels and operational problems are ongoing. Two of the three test vessels have accumulated virtually no in-use hours and the third vessel has less than half of the 480 hours necessary to complete the testing. In light of these developments, NMMA requests that staff return to the Board to present the final results of the salt water demonstration program to determine whether any future revisions to this rule are required. [NMMA-2] [VPA] [PC-2]

Comment: Our company continues to have extreme concerns regarding the durability and resulting safety challenges that marine catalyst systems face in Saltwater environments. [PC-2]

Agency Response: The commenter is referring to the ARB fresh and salt water demonstration programs. This comment is not relevant to the proposed regulatory amendments because it is not directed to the adequacy of the relief to industry proposed in this regulatory action. Therefore, the following response is provided for information only.

ARB acknowledges that the salt water application of catalysts pose some additional challenges compared to fresh water applications, but we continue to believe that these challenges can be met with properly designed and integrated catalyst systems on the marine engine. As previously noted in the agency response to comment 3. above, at least one marine engine manufacturer is confident in its ability to design a catalyst that can survive in salt water for the required durability period. Furthermore, one of the catalyst-equipped engines in ARB's salt water program has shown great promise already with approximately 130 hours of salt water operation accumulated without significant incident. This catalyst uses a ceramic substrate whereas the other catalysts in the test program use metal substrates. Staff is confident that the engines with metal substrate catalysts will also be shown to function reliably in a salt water environment at the conclusion of the salt water demonstration.

5. **Comment:** The completion of the Southwest Research Institute (SwRI) salt water test program, and the availability of the information it generates, is probably more important to small engine manufacturers than to larger engine manufacturers. [PC-1]

   Agency Response: The commenter is referring to the ARB fresh and salt water demonstration programs. This comment is not relevant to the proposed regulatory amendments because it is not directed to the adequacy of the relief to industry proposed in this regulatory action. Therefore, the following response is provided for information only.

   While we appreciate the fact that small volume engine manufacturers may not have the same resources as large volume competitors, ARB's salt water demonstration program was never meant to develop production-ready catalyst systems for any segment of the recreational marine industry. The purpose of the demonstration was to establish the safeness and durability of catalysts when used in a marine environment. We have always maintained that the individual marine engine manufacturer would ultimately be responsible for designing engines to meet the requirements of the regulation. The details of the salt water demonstration program will be made available to the public at the program's completion, but it is highly unlikely that such information would be sufficient in itself to enable an engine manufacturer to produce and certify compliant engines.

6. **Comment:** NMMA has not received any recent updates, as the Board directed staff to provide, on the progress of the SwRI salt water test program since the program resumed earlier this year. Both the Board and NMMA need to learn about the technical challenges that SwRI has had, similar to the ones that NMMA members have had, and if so, how SwRI has been able to overcome them. [NMMA-2] [VPA] [PC-2]

   Agency Response: The commenter is referring to the ARB fresh and salt water demonstration programs. This comment is not relevant to the proposed regulatory amendments because it is not directed to the adequacy of the relief to industry proposed in this regulatory action. Therefore, the following response is provided for information only.

   It is not the intention of ARB to withhold information on the progress of the salt water demonstration program from industry. Ever since the test program resumed with redesigned exhaust systems earlier this year, the accumulation of time on the water has occurred very slowly. This is due in part because the Texas Department of Parks and Wildlife, who had agreed to operate the vessels for the demonstration program, have found the vessels unsuitable for many of its patrol functions which frequently involve operation in shallow water – a condition for which the test vessels were not designed. Other factors such as leaking gaskets and improperly prepared exhaust system mating surfaces have also contributed to the lack of on-water accumulation time, although none of these failures is believed to be directly related to the incorporation of catalysts. Consequently, the dissemination of information has been slow because meaningful progress has been slow. Two of the redesigned engines have accumulated less than 50 hours each as of this writing. Furthermore, with the marine industry taking on a more active role in the salt water demonstration program since its resumption, frequent updates did not seem to staff to be as necessary in order to keep industry informed of developments of which staff believed the industry already had firsthand knowledge. Nevertheless, staff has taken action to ensure that more regular updates will again be provided to the recreational marine industry regarding the salt water demonstration.

C. Comments Related to On-Board Diagnostics Marine (OBD-M)

7. **Comment:** OBD does not work for marine engines at low speeds. Due to the unique sea water cooling system used in marine engines, the manifold temperature where the OBD sensor is located could not achieve the necessary operating temperature at low speeds. SwRI believes that this is a very serious problem. [PC-1]

   Agency Response: The ARB disagrees and is not proposing any changes in response to this comment. With the exception of circuit continuity monitoring, the OBD-M regulation does not require the continuous detection of malfunctions

under all operating conditions. Rather, an OBD-M system is only required to test a particular emissions control device or system (oxygen sensors and catalysts included) once per operating cycle during which conditions appropriate to perform the monitoring accurately and with adequate repeatability are present. Therefore, should low speeds and low temperatures prevent a particular OBD-M diagnostic from running reliably, then that diagnostic should be run at intermediate or higher speeds and temperatures where more stable conditions are present. The engine manufacturer is responsible for defining the engine operating conditions under which each monitoring strategy is expected to execute. The regulation provides a great deal of latitude in the determination of those conditions in order to suit each manufacturer's design objectives.

D. Comments Related to Warranty

8. **Comment:** The marine regulation requires that the product engine including catalyst has to have a three year warranty. It is unlikely that anyone in the industry has tested a production catalyst system for the same amount of time that they have to warranty it – three years. [PC-1]

   Agency Response: The ARB disagrees and is not proposing any changes in response to this comment. The Board first adopted catalyst forcing standards in 2001 for recreational marine inboard and sterndrive spark-ignited engines. Those standards were originally scheduled to begin in 2007. On November 17, 2005, the Board extended the implementation date for catalyst forcing standards to 2008. In other words, manufacturers have had up to seven years to develop, test, and produce engines that could meet the 5.0 grams per kilowatt-hour combined hydrocarbon and oxides of nitrogen standard. As previously noted in the agency response to comment 3. above, at least one marine engine manufacturer has certified a catalyst-equipped engine to meet this standard throughout both the 480 hour durability period and the three year warranty period. Furthermore, the warranty obligation for select components on high performance engines has been relaxed from the three year requirement to account for the higher wear characteristics of these engines which are used primarily for competitive racing.

9. **Comment:** The 2nd to last sentence under "MANUFACTURER'S WARRANTY COVERAGE" in § 2445.2(a) incorrectly references the definition at § 2441(a)(12). The correct reference should be § 2441(a)(13). [MM-2]

   Agency Response: We agree and have proposed a nonsubstantive change to cross-reference the correct definition. The previous reference had not been updated to reflect the numbering changes occurring from the insertion of a new definition earlier in the numbering scheme.