State of California
AIR RESOURCES BOARD

Resolution 08-36

July 24, 2008

Agenda Item No.: 08-7-5

WHEREAS, sections 39600 and 39601 of the Health and Safety Code authorize the Air Resources Board (ARB or Board) to adopt standards, rules and regulations and to do such acts as may be necessary for the proper execution of the powers and duties granted to and imposed upon the Board by law;

WHEREAS, section 43013(a) of the Health and Safety Code authorizes the Board to adopt and implement emission standards and in-use performance standards for the control of air contaminants and sources of pollution which the Board has found to be necessary, cost-effective, and technologically feasible;

WHEREAS, section 43013(b) of the Health and Safety Code authorizes the Board, consistent with section 43013(a), to adopt emission standards and regulations for marine engines and vessels (to the extent permitted by federal law);

WHEREAS, section 43018 of the Health and Safety Code authorizes the Board to achieve the maximum degree of emission reduction possible from vehicular and other mobile sources in order to accomplish the attainment of the state standards for ambient air quality at the earliest practicable date;

WHEREAS, sections 43101, 43102, 43104, 43105, and 44036.2 of the Health and Safety Code authorize the Board to adopt emission standards and test procedures to certify, control air pollution caused by, and get service information concerning, motor vehicles, and effective emission control regulations must apply these sections to other ARB-regulated mobile source categories such as marine spark-ignited engines;

WHEREAS, the State Implementation Plan (SIP) for ozone, adopted by the Board in 1994 and approved by the United States Environmental Protection Agency (U.S. EPA) in 1995, established the state strategy for attaining the ambient air quality standards for ozone in all areas of the state by 2010, as required by federal law;

WHEREAS, the SIP included mobile source control measure M16, entitled "Pleasure Craft," which outlined the emissions inventory from recreational boats and personal watercraft and directed U.S. EPA to develop an appropriate control strategy to reduce emissions from spark-ignition marine engine exhaust;

WHEREAS, because ARB's assessment subsequent to SIP approval determined that pleasure craft contributed much more significantly to the total emissions inventory than estimated at SIP submission, the Board, in 1998, approved regulations to control exhaust emissions from spark-ignition personal watercraft and outboard marine engines more stringent than U.S. EPA requirements;

WHEREAS, in furtherance of and as a result of ongoing assessment, on July 26, 2001, the Board adopted amendments to the California regulations for recreational marine spark-ignition engines to include sterndrive/inboard pleasure craft, which included a combined hydrocarbon and oxides of nitrogen (HC+NOx) exhaust emission standard for them beginning in 2003;

WHEREAS, the original 2001 Amendments required the tier II sterndrive/inboard HC+NOx standard to be phased-in over a three year period beginning in 2007;

WHEREAS, on November 17, 2005, the Board amended the tier II sterndrive/inboard requirements to allow sterndrive and inboard engines to comply with the 5.0 grams per kilowatt-hour HC+NOx exhaust emissions standard fully across product lines in 2008 and required the installation of low permeation evaporative control fuel hoses on boats using engines certified using this option to preserve the emission benefits of the original regulation;

WHEREAS, technical obstacles may hinder the effective use of catalytic converters on high performance engines;

WHEREAS, the majority of high performance sterndrive/inboard engine manufacturers in California are single category small volume manufacturers without enough standard performance engine production to benefit from the existing averaging allowance;

WHEREAS, the overwhelming majority of high performance sterndrive/inboard engine manufacturers in California are small businesses with limited resources to conduct comprehensive emissions testing to certify engines;

WHEREAS, varying degrees of emission standards and other requirements have been adopted previously for large versus small volume manufacturers in other California regulations in recognition of a manufacturer's resources and other abilities to comply with technology forcing standards;

WHEREAS, the emissions contribution from sterndrive/inboard engines greater than 373 kilowatts is significant despite comprising only two percent of the total annual unit sales of sterndrive/inboard engines sold in California;

WHEREAS, the tier II sterndrive/inboard emissions standard for high performance engines greater than 373 kilowatts could be modified if the emissions benefits anticipated from the existing regulations are maintained through other means;

WHEREAS, staff has presented evidence to demonstrate that the incorporation of readily-available and/or easily implementable and relatively inexpensive (compared to catalytic converters) evaporative control technologies, which are constructed from material(s) designed to limit the seepage of hydrocarbon from the inside to the outside of fuel tanks and hoses, would completely compensate – on a boat-by-boat basis – for the loss of emission benefits due to the less stringent exhaust standards as proposed for sterndrive/inboard engines greater than 373 kilowatts produced by small volume engine manufacturers;

WHEREAS, ARB and U.S. EPA have conducted test programs demonstrating the efficacy of low permeation hoses and fuel containers and passive purge carbon canisters in reducing evaporative emissions in a marine environment;

WHEREAS, sterndrive/inboard marine engine manufacturers have requested relief for the certification of high-performance engines with rated power greater than 373 kilowatts to the existing catalyst-based standards beginning in 2009;

WHEREAS, it is possible to provide a choice of implementation options to high performance engine manufacturers that would preserve the emission benefits of the original regulation and increase flexibility resulting in more cost effective regulations;

WHEREAS, the sterndrive/inboard regulations adopted in 2001 by the Board would reduce emissions of approximately 56 tons per weekend summer day of HC+NOx emissions statewide in 2020 and the outboard/personal watercraft regulations adopted in 1998 would reduce emissions of approximately 110 tons per weekend summer day of HC+NOx statewide in 2020;

WHEREAS, U.S. EPA has proposed additional exhaust and evaporative emissions requirements for spark-ignition marine engines and vessels including inboard and sterndrive engines and vessels, but will not be able to finalize those regulations in time to affect production of 2009 model year engines including high performance sterndrive/inboard engines greater than 373 kilowatts;

WHEREAS, high performance sterndrive/inboard marine engine manufacturers must finalize product plans expeditiously to ensure complying products are available in 2009;

WHEREAS, sterndrive/inboard engine marinizers are not self sufficient and rely on the automotive engine manufacturers, such as General Motors, to supply base engines;

WHEREAS, General Motors has announced the discontinuation of two engine families commonly marinized by the sterndrive/inboard industry (i.e., 4.3 and 8.1 liter families);

WHEREAS, the marine industry maintains that substitute replacement engines are not readily available that can be integrated into existing hulls without substantial redesign efforts;

WHEREAS, industry requests relief from having to invest resources into these engines that it will not be able to recover to make them comply with the tier II sterndrive/inboard standards for the remaining years of production life;

WHEREAS, while corporate averaging could provide relief from having to redesign an engine scheduled for imminent discontinuation, it would also add complexity and uncertainty to California's enforcement and certification efforts;

WHEREAS, full corporate averaging is not appropriate for standard performance sterndrive/inboard engines since most of these as of 2008 have already been certified to the fixed tier II sterndrive/inboard standards;

WHEREAS, staff acknowledges that unforeseen circumstances beyond the control of the manufacturer can and do occur from time to time;

WHEREAS, carbon monoxide emissions may increase the risk of asphyxiation to vessel occupants and those engaging in activities that put them in direct or close proximity to vessel exhaust (e.g., wakeboarding and teak surfing);

WHEREAS, the United States Coast Guard and the California Department of Boating and Waterways have identified carbon monoxide poisoning as the cause of a significant number of boating accidents involving injury and/or death;

WHEREAS, carbon monoxide standards are not currently required for spark-ignition marine engines sold in California or nationally;

WHEREAS, the technologies incorporated by industry to comply with the required standards for hydrocarbon and oxides of nitrogen, in particular catalytic converters, are also effective in reducing carbon monoxide emissions;

WHEREAS, a corporate averaged standard for carbon monoxide emissions could result in some engines being certified to emission levels greater than the standard, thereby increasing the risk of injury or death to those in close proximity to that engine's exhaust;

WHEREAS, corporate averaging complicates enforcement efforts by introducing an array of varying compliance levels that are difficult to readily quantify in the field;

WHEREAS, methane, a component of total hydrocarbon emissions, has been identified as a greenhouse gas responsible in part for contributing to manmade global warming;

WHEREAS, most technologies for controlling total hydrocarbon also reduce the methane component of hydrocarbon;

WHEREAS, jet boat applications with personal watercraft engines often compete for the same market share as similarly performing vessels with sterndrive/inboard engines;

WHEREAS, the U.S. EPA has proposed a definition for "sterndrive/inboard engine" that includes jet boat applications with personal watercraft engines;

WHEREAS, jet boat manufacturers have requested leadtime to transition from the outboard/personal watercraft standards to the sterndrive/inboard standards;

WHEREAS, only two manufacturers are known to sell jet boat applications with personal watercraft engines in California and the total number of sales is small, limited to a single engine family each, compared to standard performance sterndrive/inboard engine sales;

WHEREAS, manufacturers are not allowed to produce a new engine to replace an existing engine unless the new engine complies with current year emission standards;

WHEREAS, the marine industry maintains that substantial modifications to the vessel hull could be necessary to allow the installation of a new engine with a catalytic converter or to create the electronic interface for supporting on-board diagnostics;

WHEREAS, the rebuilding of spark-ignition marine engines is currently an unregulated practice and has the potential to negatively impact the emissions performance of an engine should the engine not be restored to its original certified configuration or to that of a more stringent emissions configuration;

WHEREAS, the sterndrive/inboard marine industry has concluded as a whole that engine misfire can significantly degrade the conversion efficiency of catalytic converters resulting in premature failure;

WHEREAS, virtually every sterndrive/inboard engine manufacturer has voluntarily incorporated misfire monitoring as part of its on-board diagnostics marine system;

WHEREAS, a requirement for mandatory misfire monitoring could enable on-board diagnostics marine systems to be used to facilitate production line testing;

WHEREAS, some vendors of marine vessels falsely believe it is legal to sell used, rebuilt, or new replacement engines in new vessels to circumvent compliance with current year emission standards;

WHEREAS, a periodic inspection and maintenance program does not exist for spark-ignition marine engines and boats;

WHEREAS, an in-use compliance program would provide some assurance that engines are continuing to perform within the required standards throughout their useful lives;

WHEREAS, in conjunction with a public hearing notice dated May 27, 2008, ARB staff proposes that the Board adopt the proposed amendments to the Spark-Ignition Marine Engine sections and related in-use compliance and test procedures sections of title 13,

California Code of Regulations as set forth in Attachment A hereto, and amendments to the incorporated test procedures as set forth in Attachments B and C hereto;

WHEREAS, the Board has considered the effects of the proposed regulatory requirements on the economy of the state;

WHEREAS, the California Environmental Quality Act and Board regulations require that no project which may have significant adverse environmental impacts be adopted as originally proposed if feasible alternatives or mitigation measures are available to substantially reduce or eliminate such identified impacts, if any;

WHEREAS, a public hearing and other administrative proceedings have been held in accordance with the provisions of chapter 3.5 (commencing with section 11340), part 1, division 3, title 2 of the Government Code;

WHEREAS, the Board finds that:

Despite advances in reducing emissions from motor vehicles and other mobile sources, California still has one of the most severe air pollution problems in the United States;

To meet Federal and California Clean Air Act emissions reductions requirements, ARB must continue to seek reductions from all sources under its authority, including spark-ignition marine engines;

Industry representatives have stated that retention of the existing tier II sterndrive/inboard standard for high performance engines greater than 373 kilowatts could result in failure for companies to sell compliant products in California;

Adoption of the proposed amendments would address industry's uncertainty over its ability to meet the current tier II sterndrive-inboard standards for high performance engines with maximum power greater than 373 kilowatts;

The incorporation of readily-available and/or easily implementable and relatively inexpensive (compared to catalytic converters) evaporative control technologies will more than offset any potential loss of emission benefits due to the less stringent exhaust standards proposed for sterndrive and inboard engines greater than 373 kilowatts produced by small volume engine manufacturers;

The California regulations for spark-ignition marine engines can therefore be amended substantially as manufacturers have requested to provide substantially the relief they have requested, without losing the emission benefits assumed in the 2001 sterndrive/inboard Amendments;

It is necessary and appropriate that the proposed amended regulations provide a choice of implementation options for dual category large volume sterndrive/inboard engine manufacturers whereby they may choose to certify high performance sterndrive/inboard engines by averaging certification emission levels with those of standard performance sterndrive/inboard engines less than or equal to 373 kilowatts beginning with the 2009 model year, by supplementing evaporative emission reductions from vessels with standard performance engines beginning with the 2009 model year, or by other means approved in advance by the Executive Officer that are implementable and verifiable and that provide equivalent emission reductions to those of the 2001 Sterndrive/Inboard amendments;

It is necessary and appropriate that the proposed amended regulations require the introduction of enhanced evaporative control systems including carbon canisters, low permeation hoses, and non-permeable fuel tanks on all new vessels equipped with high performance engines beginning with the 2009 model year;

It is necessary and appropriate that the proposed amended regulations provide mechanisms to address unforeseen circumstances and extreme hardship primarily related to the discontinuation of engines, but that also preserve the emission benefits of the existing regulation;

It is necessary and appropriate that the proposed amended regulations impose limits on carbon monoxide emissions to protect public health by reducing the risk of asphyxiation;

It is necessary and appropriate that the proposed amended regulations impose limits on the entire hydrocarbon species including methane to reduce the impact of this greenhouse gas pollutant on manmade global warming;

It is necessary and appropriate that the proposed amended regulations require jet boat engines to comply with the same emissions standards as similarly performing sterndrive/inboard engines;

It is necessary and appropriate that the proposed amended regulations would permit engine manufactures to produce a new replacement engine for an in-use vessel that may not comply with current year emission standards so long as the replacement engine is the most stringent engine available that can be installed in the vessel without unreasonable modifications;

It is necessary and appropriate that the proposed amended regulations provide a standardized practice for the rebuilding and/or remanufacturing of engines to prevent against the downgrading of emissions performance below that of the engine's originally certified emissions configuration;

It is necessary and appropriate that the proposed amended regulations require misfire monitoring as a mandatory element of the on-board diagnostic marine (OBD-M) system to protect the long term viability of the catalytic converter in-use;

It is necessary and appropriate that the proposed amended regulations modify the definition of a "new engine" to clarify that it is a violation of and an attempt to circumvent the regulations to sell non-new engines installed in a new hull as a new vessel;

It is necessary and appropriate that the proposed amended regulations would require manufacturers to comply with not-to-exceed limits as a means of in-use compliance to confirm that engines continue to meet the standards throughout their useful lives;

It is necessary and appropriate that the proposed amended regulations continue to require engine manufacturers to certify spark-ignition marine engines sold in California to the adopted mandatory HC+NOx emission standards;

It is necessary and appropriate that the proposed amended regulations establish a carbon monoxide standard to reduce the risk of death and injury to vessels' occupants;

It is necessary and appropriate that the proposed amended regulations continue to require an in-use testing program to ensure that certified engines meet the standards throughout their useful lives;

It is necessary and appropriate that the proposed amended regulations continue to require defects warranty and repair to ensure that the engines have emission-related components that are reliable, durable and capable of complying with the applicable emission standards;

It is necessary and appropriate that the proposed amended regulations continue to require on-board diagnostic systems for all sterndrive/inboard engines to ensure that the engines and emission-related components are reliable, durable and continue to function. As such, misfire monitoring is a necessary component to the diagnostic system for protection of the catalytic converter;

It is necessary and appropriate that the proposed amended regulations continue to require other programs in the current spark-ignition marine regulations such as engine labeling to ensure that the regulations can be enforced properly;

It is necessary and appropriate that the proposed amended regulations continue to incorporate emission test procedures to implement the regulations;

The economic and cost impacts of the amendments have been analyzed as required by California law, and the conclusions and supporting documentation for

this analysis are set forth in the Initial Statement of Reasons, as supplemented by the staff's presentation at the public hearing on this item;

The cost of controlling spark-ignition marine engines under the proposed amended regulation would not significantly change from those projected in 2001 for the original Inboard-Sterndrive Amendments to the Marine Spark-Ignition Engine regulations, and would range from a high of $3.39 to a low of $2.08 per pound of HC+$NO_x$ reduced for sterndrive/inboard engines and from $3.57 to $0.32 per pound of HC+NOx reduced for outboard/personal watercraft engines, depending on whether research and development costs are calculated against California sales only or against all sales nationwide, respectively;

The cost-effectiveness values above are similar to the values associated with other control measures adopted in furtherance of Health & Safety Code sections 43013 and 43018, and SIP measures; and

Based on the above, the Staff Report/Initial Statement of Reasons, and the information provided during the public hearing of this item, the proposed amended spark-ignition marine engine regulations are necessary, cost-effective, and technologically feasible to carry out the purposes of the state and federal clean air laws;

WHEREAS, the Board further finds that:

The proposed amended spark-ignition marine engine regulations and procedures are necessary to ensure the realization of the emission benefits projected for the original 1998 outboard/personal watercraft and 2001 sterndrive/inboard engine regulations for 2009 and later spark-ignition model year engines;

The proposed amended spark-ignition marine engine regulations and procedures facilitate the ability of sterndrive/inboard engine manufacturers to comply with the catalyst-based tier II sterndrive/inboard standard;

The adoption of the proposed amendments to the standards and test procedures would not affect the emission reductions estimated for the original 1998 and 2001 regulations of approximately 110 tons per weekend summer day for outboard/personal watercraft engines and 56 tons per weekend summer day for sterndrive/inboard engines of HC+NOx emissions statewide in 2020;

The adoption of the regulations approved herein will not have a significant adverse environmental impact and the regulations are projected to have either no impact or a slight but positive air quality impact;

The adoption of carbon monoxide standards further the Board's California Environmental Quality Act obligation to analyze potential adverse and beneficial impacts of the regulation as proposed;

The adoption of the regulations approved herein will not create costs or savings 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 nondiscretionary costs or savings to state or local agencies;

The adoption of the regulations approved herein will not have a significant statewide adverse economic impact directly affecting businesses, including the ability of California businesses to compete with businesses in other states, or on representative private persons;

The adoption of the regulations approved herein will not affect the creation or elimination of jobs within the State of California, the creation of new businesses or elimination of existing businesses within the State of California, or the expansion of businesses currently doing business within the State of California;

The adoption of the regulations approved herein will not affect small businesses because there will be no incremental cost, or an insignificant cost, associated with staff's proposal; and

No alternative considered by the Board would be more effective in carrying out the purpose for which the regulations are proposed or would be as effective and less burdensome to affected private persons.

NOW, THEREFORE, BE IT RESOLVED that the Board hereby approves the proposed amendments to sections 2111, 2112, and Appendix A, within Chapter 2, Article 2.1, Title 13, California Code of Regulations (13 CCR); section 2139 within Chapter 2, Article 2.3, 13 CCR, section 2147 within Chapter 2, Article 2.4, 13 CCR; sections 2440, 2441, 2442, 2443.1, 2443.2, 2443.3, 2444.1, 2444.2, and 2445, and proposed repeal of Section 2448, within Chapter 9, Article 4.7, 13 CCR, as set forth in Attachment A hereto, and proposed adoption of amendments to the following documents incorporated by reference in Section 2447, 13 CCR: "California Exhaust Emission Standards and Test Procedures for 2001 Model Year and Later Spark-Ignition Marine Engines," as set forth in Attachment B hereto, and in Section 2474, 13 CCR: "Procedures for Exemption of Add-On and Modified Parts for Off-Road Categories," as set forth in Attachment C hereto, with the modifications set forth in Attachment D hereto.

BE IT FURTHER RESOLVED that the Board directs the Executive Officer to incorporate into the approved regulations and test procedures the modifications set forth in Attachment D, with such other conforming modifications as may be appropriate, and then to adopt the amended regulations and test procedures as modified, after making the modified regulatory language available for public comment for a period of 15 days, provided that the Executive Officer shall consider such written comments regarding the modifications as may be submitted during this period, shall make modifications as may be appropriate in light of the comments received, and shall present the regulations to

the Board for further consideration if the Executive Officer determines that this is warranted.

BE IT FURTHER RESOLVED that the Board hereby determines that the regulations approved herein will not cause the California emission standards, in the aggregate, to be less protective of public health and welfare than applicable federal standards.

BE IT FURTHER RESOLVED that the Board hereby finds that separate California emission standards and test procedures are necessary to meet compelling and extraordinary conditions.

BE IT FURTHER RESOLVED that the Board finds that the California emission standards and test procedures as approved herein will not cause the California requirements to be inconsistent with federal Clean Air Act section 209(e)(1) and raise no new issues affecting previous authorizations of the Administrator of the U.S. EPA issued pursuant to federal Clean Air Act section 209(e)(2).

BE IT FURTHER RESOLVED that the Executive Officer shall, upon adoption, forward the regulations to the U.S. EPA with a request for authorization or confirmation that the regulations are within the scope of an existing authorization pursuant to Federal Clean Air Act section 209(e)(2), as appropriate.

FILED
JUN - 5 2009
Resources Agency of California

I hereby certify that the above is a true and correct copy of Resolution 08-36, as adopted by the Air Resources Board.

Monica Vejar

Monica Vejar, Clerk of the Board

Resolution 08-36

July 24, 2008

Identification of Attachments to the Board Resolution

Attachment A: Proposed Amendments to the California Regulations for New 2009 and Later Spark-Ignition Marine Engines and Boats, sections 2111, 2112, and Appendix A to section 2112, within Chapter 2, Article 2.1; section 2139, within Chapter 2, Article 2.3; section 2147, within Chapter 2, Article 2.4; sections 2440, 2441, 2442, 2443.1, 2443.2, 2443.3, 2444.1, 2444.2, and 2445, and proposed repeal of Section 2448, within Chapter 9, Article 4.7, title 13, California Code of Regulations, as set forth in Attachment A to the Initial Statement of Reasons, released June 6, 2008.

Attachment B: Proposed Amendments to the "California Exhaust Emission Standards and Test Procedures for 2001 and Later Spark-Ignition Marine Engines," which is incorporated by reference in section 2447, title 13, California Code of Regulations, as set forth in Attachment B to the Initial Statement of Reasons, released June 6, 2008.

Attachment C: Proposed Amendments to the "Procedures for Exemption of Add-On and Modified Parts for Off-Road Categories," which is incorporated by reference in section 2474, title 13, California Code of Regulations, as set forth in Attachment C to the Initial Statement of Reasons, released June 6, 2008.

Attachment D: Staff's Suggested Modifications to the Original Proposal, as distributed at the July 24, 2008, Board hearing.

State of California
Environmental Protection Agency
AIR RESOURCES BOARD

Notice of Decision and Response to Significant Environmental Issues

Item:	AMENDMENTS TO THE CURRENT SPARK-IGNITION MARINE ENGINE AND BOAT REGULATIONS
Approved By:	Resolution 08-36
Adopted by:	Executive Order R-09-004
Agenda Item:	08-7-5
Public Hearing Date:	July 24, 2008
Issuing Authority:	Air Resources Board
Comment:	No comments were received identifying any significant environmental issues pertaining to this item. The Staff Report identified no adverse environmental effects.
Response:	N/A
Certified:	Trini Balcazar, Regulations Coordinator
Date:	June 3, 2009

FILED
JUN - 5 2009
Resources Agency of California