

State of California
AIR RESOURCES BOARD

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

PUBLIC HEARING TO CONSIDER THE ADOPTION OF
EVAPORATIVE EMISSIONS CONTROL REQUIREMENTS FOR
SPARK-IGNITION MARINE WATERCRAFT

Public Hearing Date: February 19, 2015
Agenda Item No.: 15-2-2

I. GENERAL

**A. DESCRIPTION OF BOARD ACTION AND UPDATE OF INFORMATION
FROM THE INITIAL STATEMENT OF REASONS**

The Staff Report: Initial Statement of Reasons for Rulemaking (staff report), "Adoption of Evaporative Emissions Control Requirements for Spark-Ignition Marine Watercraft", released December 30, 2014 is incorporated by reference herein. The staff report contains a description of the rationale for the proposed amendments. On December 30, 2014, all references relied upon and identified in the staff report were made available to the public.

On February 19, 2015, Air Resources Board (ARB or Board) held a public hearing to consider the proposal to determine and control evaporative emissions from spark-ignition marine watercraft (SIMW). At the hearing, the Board received oral and written comments. At the conclusion of the hearing, the Board adopted Resolution 15-3, in which it approved the proposed regulations with subsequent amendments. The Board directed the Executive Officer to make the originally proposed SIMW regulation and test procedures, with proposed modifications, available for formal public comment for a period of at least 15 days.

The 15-day modifications to the regulation and test procedure were added in response to public comments made during the 45-day comment period. The proposed modified regulation and test procedure language, and the text or narrative description of each modification was contained in a document entitled, "Attachment G: Staff's Suggested Modifications to the Original Proposal, Presented at the February 19, 2015 Board Hearing," which was distributed at the beginning of the hearing and included as Attachment G to Resolution 15-3.

Resolution 15-3 directed the Executive Officer to incorporate the modifications described in Attachment G into the originally proposed regulatory text along with other modifications as necessary. The Executive Officer was directed to make the modified regulation (with the modifications clearly identified) and any additional documents or information available for a

supplemental 15-day public comment period, and to consider any comments on the modifications received during the supplemental 15-day public comment period. The Executive Officer was then directed to: (1) adopt the modified regulation as it was made available for public comment, with any appropriate additional modifications; (2) make all additional modifications available for public comment for a period of at least 15 days; and (3) present the regulation to the Board for further consideration if warranted.

In preparing the modified regulatory language, staff made various revisions in response to public comments received during the 45-day comment period. These post-hearing modifications were incorporated into the text of the proposed regulation, along with the modifications specifically identified in Attachment C to Resolution 15-3.

The text of the proposed modifications to the regulation, with the modified text clearly indicated, was made available for a 15-day public comment period starting on September, 17, 2015 and ending on October, 2, 2015 at 5:00 p.m., by issuance of a "Notice of Public Availability of Modified Text and Availability of Additional Documents and/or Information."

On the date that the notice of modified text and all attachments were posted on the internet, the posted documents were also electronically distributed to other parties identified, per Section 44(a), Title 1, CCR, in accordance with Government Code Section 11340.85, and to all persons having subscribed to the following ARB listserves: recmarine, simw2015.

This Final Statement of Reasons (FSOR) updates the staff report by identifying and providing the rationale for the modifications made to the originally proposed regulation. The FSOR also contains a summary of the comments received on the proposed new regulation during the formal rulemaking process and ARB's responses to those comments.

B. MANDATES AND FISCAL IMPACTS TO LOCAL GOVERNMENTS AND SCHOOL DISTRICTS

The Board has determined that this regulatory action will not result in a mandate to any local agency or school district the costs of which are reimbursable by the state pursuant to Part 7 (commencing with section 17500), Division 4, Title 2 of the Government Code.

C. CONSIDERATION OF ALTERNATIVES

For the reasons set forth in the staff report, in staff's comments and responses at the hearing, and in this FSOR, the Board determined that no alternative considered by the agency would be more effective in carrying out the purpose for which the regulatory action was proposed, or would be as effective as and less burdensome to affected private persons, or would be more cost-effective to affected private persons and equally effective in

implementing the statutory policy or other provisions of law than the action taken by the Board.

II. MODIFICATIONS MADE TO THE ORIGINAL PROPOSAL

A. MODIFICATIONS APPROVED AT THE BOARD HEARING AND PROVIDED FOR IN THE 15-DAY COMMENT PERIOD

Subsequent to the Board hearing, staff proposed several additional modifications that would improve regulatory clarity, address minor technical concerns, and ease implementation of the new requirements for affected boat builders and evaporative system component manufacturers. These additional modifications were developed largely in response to input received during the 45-day public comment period. A detailed description of, and rationale for, each additional modification was included in the Notice of Public Availability of Modified Text and Availability of Additional Documents and/or Information, which was made available to the public on September, 17, 2015. The additional modifications were proposed to the following four documents:

Cal. Code Regs., Tit.13, section 2850 through 2871 - Evaporative Emissions Control Requirements for Spark-Ignition Marine Watercraft;

TP-1501 - Test Procedure for Determining Diurnal Evaporative Emissions from Spark Ignition Marine Watercraft (TP-1501);

TP-1503 - Test Procedure for Determining Diurnal Vented Emissions from Installed Marine Fuel Tanks;

TP-1505 - Test Procedure for Determining Pressure Relief Valve Performance: Durability Demonstration and Leak Test

The modified text of Cal. Code Regs., Tit.13, included:

1. New definitions clarifying intent and specifying watercraft category.
2. Clarification of an alternative to TP-1505 for testing pressure relief valves.
3. Language explicitly stating fill pipe sealing face requirements.
4. Clarification of primer bulb requirements.
5. Exclusion of personal watercraft from the deck fill plate requirement.
6. The addition of an ARB engineering evaluation requirement for deck fill plates.
7. Other minor edits to improve clarity and intent.

The modified text in the test procedure TP-1501 included:

1. The addition of qualifying language clarifying tank removal for the slosh test.
2. A sentence specifying canister preconditioning requirements.
3. Other minor edits to improve clarity and intent.

The modified text in the test procedure TP-1503 included:

1. The addition of a sentence clarifying applicability of durability requirements.
2. Revision of the number of vibration cycles.
3. Other minor edits to improve clarity and intent.

The modified text in the test procedure TP-1505 included:

1. The addition of a sentence clarifying applicability of durability requirements.
2. Revision of the number of vibration cycles.
3. The addition of a sentence denoting its use for design-based certification.
4. Revision of test temperatures to be consistent with TP-1503.
5. Other minor edits to improve clarity and intent.

B. NON-SUBSTANTIAL MODIFICATIONS

Subsequent to the 15-day public comment period mentioned above, staff identified the following additional non-substantive changes to the regulation:

- TP-1501, Section 9: Added more detail to reference document titles and dates.
- TP-1502, Section 10: Added more detail to reference document titles and dates.
- TP-1503, Section 9: Added more detail to reference document titles and dates.
- Other minor edits to the regulation text to correct spelling and grammatical errors, and improve clarity and intent.

The above described modifications constitute non-substantial changes to the regulatory text because they more precisely identify the reference documents and correct spelling and grammatical errors, but do not materially alter the requirements or conditions of the proposed rulemaking action.

III. DOCUMENTS INCORPORATED BY REFERENCE

The regulation and the incorporated test procedures adopted by the Executive Officer incorporate by reference the following document:

- *Certification Procedure for Vapor Recovery Systems at Gasoline Dispensing Facilities, CP-201, California Environmental Protection Agency, Air Resources Board, Sacramento, CA, Amended January 9, 2013.*

This document was incorporated by reference because it would be cumbersome, unduly expensive, and otherwise impractical to publish it in the California Code of Regulations. The document is lengthy and highly technical, and would add unnecessary additional volume to the regulation. Distribution to all recipients of the California Code of Regulations is not needed because the interested audience for this document is limited to the technical staff at fueling system component manufacturers, most of whom are already familiar with this document. Also, the incorporated document was made available by ARB upon request during the rulemaking action and will continue to be available through ARB's marine watercraft website in the future.

IV. SUMMARY OF COMMENTS AND AGENCY RESPONSE

Written comments were received during the 45-day comment period in response to the February 19, 2015 public hearing notice, and written and oral comments were presented at the Board Hearing. Listed below are the organizations and individuals that provided comments during the 45-day comment period:

Commenter	Affiliation
Ostrosky, Dan (email 1/20/15)	Yamaha Motor Corporation (YAM)
Bellwoar, George (email 1/26/15)	Perko, Inc. (PER)
Bostwick, Chris (email 1/31/15)	Attwood, Inc. (ATW)
Begley, Chris (email 1/23/15)	Delphi Automotive (DEL)
Naylor, Michael (email 1/9/15)	Tohatsu (TOH)
Passavant, Glenn (email 1/28/15)	Mead West Vaco (MWV)
Brown, Chris (email 2/3/15)	Bluskies International (BLU)
Hellesen, Denzil (email 2/18/15)	Tracker Marine Group (TRA)
Hosokawa, Spencer (email 2/17/15)	Kawasaki Motors Corp, USA (KAW)
Kubsch, Joseph (Oral, date of hearing)	Manufacturers of Emissions Control Association (MECA)
McKnight, John (Oral, date of hearing)	National Marine Manufacturers Association (NMMA)

1. Comment: The deck fill plate requirement should not apply to personal watercraft and portable fuel containers. Personal watercraft (PWC) and portable fuel containers do not have filler necks and may not be able to have gasoline nozzles inserted fully to create a seal. **[YAM]**

Agency Response: Portable fuel containers are not applicable for this regulation and therefore are not required to have a fuel fill deck plate. Personal watercraft may have fuel tanks that mate up to the fill opening by design and would not be able to meet the requirement without a complete design change of the watercraft. Staff agrees that the requirement should exclude personal watercraft, and has amended the proposal accordingly.

2. Comment: Evaporative Emissions Control Component Labeling PWC manufacturers certify engines that include an Emissions Control Label (ECL) which is placed on the engine and secondary locations if obscured when installed. Due to the small engine space available on PWC's, EPA has allowed the flexibility that the Evap family names can be placed on a secondary label for easier viewing. Yamaha includes our fuel tank, fuel line and venting family names on the ECL for this compliance. We request that ARB allow the same flexibility to continue to label in the current manner with the inclusion of the EVAP family names in lieu of a separate label. I have included a sample label drawing of a current ECL for your review. This would minimize the labeling burden and, ECL labels are pre-approved and part of the Engine Exhaust application process. Warranty Statement has the combination language at 2862 (b). **[YAM]**

Agency Response: The proposed regulation already allows for the flexibility of alternate label format, language, and location provided that the intent of the watercraft label specifications in Section 2860 is met. Section 2860 (h) describes the allowance for alternate labels and locations. Staff clarified this with the commenter and determined that the regulation is sufficiently clear, so no change is required.

3. Comment: EPA 1060.240 (d) (1) allows for Design base certification of a fuel tank using a continuous ethylene vinyl alcohol barrier layer as prescribed in 1060.240 (d) (1) ARB does not have this allowance which our testing indicates 0 permeation. This approach should be adopted as a Designed Based practice and not subject to performance based testing. Allow compliance using EVOH barrier processes per 1060.240 (d) (1) as a "Design Based" application. **[YAM]**

Agency Response: Before ARB can approve of fuel tank design allowance, ARB will consider validation testing and existing data for fuel tanks with continuous ethylene vinyl alcohol barrier layer to ensure no compliance problems. ARB does not have sufficient data to determine if the allowance is feasible for ARB standards. The current U.S. EPA fuel tank allowance is for less stringent fuel tanks and may not be applicable to ARB standards.

4. Comment: The fuel fill deck requirement includes a set of requirements which include filler neck specifications. Manufacturers want to clarify the intent of this requirement and explicitly state what requirements need to be met. **[PER] [NMMA] [ATW]**

Agency Response: Staff has made a 15-day change that explicitly states the intent of the fuel fills requirement. The requirement refers to the filler pipe sealing surface of Figure 1 of the ISO 13331:1995 (E) and the regulation now reflects this change.

5. Comment: Some watercraft constitute the need for a tether near the fuel fill. Also, the outside flange of some deck fill plates are larger than the outside

diameter limits but can still mate for a sealing surface. The deck fill requirement should allow for outside diameter limits and allow for tethers. **[PER]**

Agency Response: Staff understands that certain watercraft have design limitations that require the use of tethers. The current requirement does not prohibit the use of tethers. As the outside diameter limits should not affect the sealing surface, staff has amended the proposed regulation to allow flexibility in the fill plate outside diameter limits, so long as the filler plate provides a surface that is suitable for sealing with a vapor recovery nozzle.

6. Comment: The performance requirement for nontrailerable marine watercraft refers to the use of 9 RVP fuel but trailerable refers to the use of California E10 CERT 7 RVP fuel. I thought all testing was done with E10 CERT fuel. **[DEL]**

Agency Response: Nontrailerable watercraft testing was designed to be harmonized with the U.S. EPA testing requirements, which specify 9 RVP fuel. Staff performed testing with E10 with trailerable watercraft and has designed the trailerable standard and testing based on in-house testing. Use of E10 fuel is consistent with ARB test protocols for a wide variety of motor vehicles, and is therefore considered to be appropriate for use with trailerable watercraft.

7. Comment: Tohatsu sells 15kW engines that are carbureted. Are these engines required to have fuel injection under the SIMW regulation? **[TOH]**

Agency Response: The SIMW regulation only applies to engines greater than 30 kW. Therefore, these engines do not need to be fuel-injected. Staff performed a cost analysis during the rulemaking process that determined the engine redesign of smaller engines to be cost prohibitive. Staff clarified this with the commenter and determined that the regulation is sufficiently clear, so no change is required.

8. Comment: The proposed procedure calls for the use of a flame ionization detector (FID) in the sealed housing for evaporative determination (SHED). We have been using (with EPA approval) a trap canister on the marine canister testing due to the large (40 grams or more) of emissions during the diurnal. Is this something that should be brought up now or can be brought up as an approved test modification with CARB? **[DEL]**

Agency Response: The test procedure harmonizes with the U.S. EPA rule, which allows for gravimetric testing. The process that manufacturers have used to comply with EPA requirements can also be used to satisfy the proposed requirements, and therefore the test procedure does not need to be modified in order to address this comment.

9. Comment: Section 6.1 of TP-1501 and section 5.1 TP-1503 do not address anything related to canister stabilization or pre-conditioning, such as would be found in US light-duty procedures at 86.132-96(h). There are already tank permeation standards. It is not clear what the slosh test in 6.1 accomplishes. The test procedure is not clear that the tank can be removed from the watercraft before the slosh test and re-installed afterwards. **[MWV] [MECA]**

Agency Response: Staff agrees that preconditioning of the canister should be addressed. Modifications were proposed that harmonize ARB requirements with the comparable U.S. EPA test procedures. The canister preconditioning procedure was added to TP-1501 and TP-1503 as part of the 15-day modifications.

10. Comment: The test procedures TP-1501 and TP-1503 prescribes bench purging at 400 bed volumes of dry air or nitrogen before the test. This 400 bed volumes of purge seems too high and a specification of nitrogen or dry air seems unrepresentative. ARB should consider something like 300 bed volumes of air at 50+/- 25 grains water vapor per lb. of dry air at 20-30°C. **[MWV] [MECA]**

Agency Response: Staff agrees that water vapor should be considered when bench conditioning a carbon canister for testing and that 300 bed volumes is sufficient to provide adequate moisture exposure. Staff has amended the test procedures accordingly as part of the 15-day modifications.

11. Comment: TP-1503 does not appear to present any opportunity for purge after the prescribed butane load, making the test basically unimplementable as written. I looked back at 40 CFR 1060.525 and the ABYC standard (C-2) and they are silent as well. However, if you go back to the final rule preamble from EPA it indicates that the three day test is to be preceded by placing the loaded canister in the SHED and allowing one full diurnal cycle in the SHED before starting the official three day test. This basically creates the situation where the canister back purge from the first day is the purge for the upcoming 3-day test (see 73 FR 59114, Oct 8, 2008 bottom of column 1 top of column 2). If this is the approach intended it should be clarified in the regulations. Also, if the approach intended by CARB is not to measure the first day, it is not a three day test and there are potential SHED contamination problems from the breakthrough which will occur on the first day. This breakthrough on the first day (before measurement) will dump 30+ grams of vapor in to the SHED before the test starts. In any event this is not clear in any part of TP 1503. An alternative way would be to start the test with the canister, fuel tank, and SHED stabilized at 96 F and let the 12-hr back purge occur as the tank cools to 72F, then follow with three consecutive days of diurnal tests. This shortens the test by 12 hours and avoids the breakthrough problem discussed above. I think this has merit and should be considered in the 15-day changes. **[MWV] [MECA]**

Agency Response: TP-1503 describes a canister purge after the butane load but is not explicit about the protocol for the three day test. Staff agrees that the purge protocol should be explicitly described for this portion of the test procedure and has added the purge requirement into TP-1503 as part of the 15-day modifications.

12. Comment: TP-1505 requires relief valves used as diurnal control undergo pressure/vacuum test is performed under both high 176°F (80°C) and low -40°F (-40°C) temperature. The assumption is/was that these valves are fuel tank mounted and that temperatures will exceed ambient. This is a flawed assumption, inasmuch most (if not all) all marine diurnal valves (non PWC) are deck and fuel cap mounted and will never see these extremes. Additionally why perform a pressure relief test at -40°F (-40°C) I can guarantee as there is no diurnal venting going to occur naturally at that temperature? FYI The hottest air temperature ever recorded on earth was in Death Valley CA was 134 °F(57 °C) on July 10, 1913, at Furnace Creek. Again I will bring up that the dust concentration (surface or column) in CA barely ever reaches 10 µg/m³ (in fact today it reads 0-1 µg/m³) <http://airquality.weather.gov/sectors/pacsouthwest.php>. So why are we testing to 100 µg/m³? These test protocol parameters will be financially burdensome and will drive up cost and limit the available technologies capable of meeting them. **[BLU] [KAW]**

Agency Response: Staff agrees that the originally proposed temperatures are not representative of the actual temperatures that would be experienced by watercraft. Temperature cycles for testing should be more representative of real world conditions, so staff has amended the temperature cycle to harmonize with the U.S. EPA temperature cycle as part of the 15-day modifications.

Regarding dust concentrations, according to ARB PM10 and PM2.5 data (<http://www.arb.ca.gov/aqmis2/aqdselect.php>), cities in Southern California can be exposed to high concentrations of dust that can periodically reach up to 100 ug/m³. The proposed dust concentration assures that components are durable and that maximum reductions are achieved throughout the life of the component by exposing it to conditions that can be reached in California. The proposed dust concentrations are representative of California conditions and will not be changed.

13. Comment: Vibration testing to 6.1 g accelerations in both principle axis for 1,000,000 cycles, which is normally classified as steel fatigue rate, will not define if relief valves are functional over the life of product. A chance of actual fatigue crack failure occurring during actual use is close to non-existent (is possible with defective material). Relief valves will more than likely be non-corroding materials such as stainless steel springs, aluminum, polymers housing, elastomeric seals and etc. Biggest issue will be internal component wear. What is needed is a test that will determine that the relief valve will continue to function within the pressure range required by EPA and CARB emission requirements. Fatigue failure is defined as crack initiation in

materials (normally metals) due to repeated reversals of stress well below the ultimate tensile strength of same materials. Likelihood that any boat will undergo 1,000,000 6.1 g accelerations at principle axis, would destroy the boat long before 1,000,000 cycles. I normally design my boats for 2-3 g vertical acceleration and 1 g horizontal acceleration. High speed Combat and USCG service watercraft have been recorded up to 18 g vertical loads but the survival rates at more than 2-3 impacts is low without special shock mitigation seating. Normal recreational boat seat design criteria is 2-3 g and a maximum of 6 g vertical accelerations and even at that rate, 1,000,000 cycles would not be survivable. I would propose that a test endurance limit of 25,000 cycles at 3-6 g be used to determine that gaskets, springs and etc would not wear, (fatigue, loss of elastic memory and etc), to the point that the relief valves would not perform the EPA/CARB emissions requirements. Below is the current ABYC shock test for fuel tank and also the ASTM definition of fatigue limit or strength. **[TRA]**

Agency Response: Staff agrees that the vibration exposure is extreme for watercraft and not representative of exposures that a normal marine watercraft in California would be expected to encounter. Staff agrees that the commenter's recommended limit is more representative of watercraft vibration exposure conditions, and the test procedures have been amended accordingly as part of the 15-day modifications.

14. Comment: When testing for a pressure relief valve testing using both TP-1503 and TP-1505, if a manufacturer fails one of the tests; can they pass for the other? Also, can a pressure relieve valve durability procedures for one be used for another? **[KAW]**

Agency Response: The regulation requires that a pressure relief valve pass either TP-1505 or TP-1503. The test procedures were designed to meet similar criteria and designed so that both tests could be passed with a compliant component. Staff clarified this with the commenter and determined that the regulation is sufficiently clear, so no change is required.

Regarding pressure relief valve durability procedures, staff agrees that they should be consistent across both test procedures. The durability test procedures have been amended accordingly as part of the 15-day modifications to be consistent between TP-1503 and TP-1505.

15. Comment: For pressure relief valve testing, is the PRV allowed to be connected to a test rig instead of the tank? Also, for durability testing, we would like to test only the pressure relief valve itself at "Thermal cycle test" and "Ozone test". The pressure relief valve durability and reliability requirements may be performed on a sealed fuel tank only or a sealed fuel system (manufacturer tank not required). **[KAW]**

Agency Response: For the pressure relief valve leak test in TP-1505, the pressure relief valve may be connected to a sealed test system that can

include a test rig, test tank, or a sealed representative system. For the durability portion of the test procedure, the pressure relieve valve may be tested by itself since the procedure is focused on the performance of the valve. Staff has amended section 3 of TP-1505 as part of the 15-day modifications to provide further clarification of these testing requirements.

16. Comment: In TP-1503, which temperature tolerance would be applied in stabilized condition? (within 1°Fdeg or no less than 0.2°Fdeg) **[KAW]**

Agency Response: The test procedure refers to holding the tank at a target test temperature for about 60 minutes when it is within 0.2°F of the target test temperature. If the temperature is outside this range (more than 0.2°F but no more than 2.0°F), the 60 minutes cannot be counted until the temperature is within the range. Staff clarified this with the commenter and determined that the regulation is sufficiently clear, so no change is required.

17. Comment: If performing consecutive 3 days test, emission measurement would be 4 times, right? (initial and end of high-temp stabilized period for each day.) When using pressure relief valve (PRV), we can omit stabilization step and the last two 24 hour periods? In this case, how should we set the starting temperature? (Would you confirm including tolerance?) Also, when we should seal the fuel system if omitting stabilization step? (I am also unclear for "sealing". Is it means controlling the pressure only by PRV?) **[KAW]**

Agency Response: TP-1503 requires a 3-day test for a carbon canister but only a one day test (omitting the stabilization step) for pressure relief valves. For sealing the fuel system with a pressure relief valve, the temperature and pressure should normalize to the starting conditions as stated in the test procedure. Staff clarified this with the commenter and determined that the regulation is sufficiently clear, so no change is required.

18. Comment: Manufacturers of Emissions Control Association (MECA) supports this regulation and agrees with ARB's approach for utilization of proven automotive evaporative control technologies for marine watercraft. The same control technology that has been successfully used for 30 years on passenger cars can be used on SIMW with the addition of low permeating fuel tanks and hoses and carbon canisters. **[MECA]**

Agency Response: ARB appreciates the support and agrees that proven automotive evaporative control technologies must be considered when applying evaporative controls to marine watercraft. The regulation includes durability procedures that are designed to ensure that the evaporative components are useful over the lifetime of the SIMW.

19. Comment: NMMA thanks ARB for collaboratively working on the SIMW regulation. NMMA would like to continue to work with ARB to address any administrative issues as the SIMW regulation is implemented. **[NMMA]**

Agency Response: The SIMW regulation reflects the collaborative nature of the process and was carefully designed to achieve maximum reductions without creating a burden to manufacturers. ARB staff appreciates NMMA's collaboration, and will continue to work with NMMA as the regulation is implemented.

V. Peer Review

Health and Safety Code Section 57004 sets forth requirements for peer review of identified portions of rulemakings proposed by entities within the California Environmental Protection Agency, including ARB. Specifically, the scientific basis or scientific portion of a proposed rule may be subject to this peer review process. Here, ARB determined that the rulemaking at issue does not contain a scientific basis or scientific portion subject to peer review, and thus no peer review as set forth in Section 57004 was or needed to be performed.