California Environmental Protection Agency

Air Resources Board

Final Statement of Reasons for Rulemaking

Including Summary of Comments and Agency Responses

PUBLIC HEARING TO CONSIDER ADOPTING REGULATIONS ON FUEL SULFUR AND OTHER OPERATIONAL REQUIREMENTS FOR OCEAN-GOING VESSELS WITHIN CALIFORNIA WATERS AND 24 NAUTICAL MILES OF THE CALIFORNIA BASELINE

Public Hearing Date: July 24, 2008
Agenda Item No.: 08-7-4

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I. GENERAL

In this rulemaking, the Air Resources Board (ARB or Board) is adopting a new regulation and an airborne toxic control measure (ATCM) to reduce emissions of diesel particulate matter (PM), nitrogen oxides (NOx), sulfur oxides (SOx), and "secondarily" formed PM (PM formed in the atmosphere from NOx and SOx) from main and auxiliary diesel engines, and auxiliary boilers, operated on ocean-going vessels within 24 nautical miles of the California baseline (referred to as "Regulated California Waters"). The regulation and the ATCM will hereinafter be referred to collectively as "regulations" unless otherwise noted.

The regulations will apply to ocean-going vessels operating within Regulated California Waters and visiting California ports beginning July 1, 2009 for main engines and auxiliary boilers. For auxiliary engines, the regulations will apply as soon as the regulation becomes legally effective, which is expected to occur prior to July 2009. This is because these engines were previously regulated by an earlier ARB regulation that was in place for approximately 14 months, but is no longer being enforced due to a federal court order. The new regulations re-establish requirements for the fuel used in auxiliary engines in a manner consistent with the court's holding in the earlier litigation.

The regulations will reduce the public's exposure to diesel PM, PM, NOx, and SOx by requiring the use of cleaner burning, lower sulfur distillate fuels on ocean-going vessels. The regulations are also a key element of the ARB's Diesel Risk Reduction Plan, the Goods Movement Emission Reduction Plan, and the State Implementation Plan (SIP).

This rulemaking was initiated by the May 27, 2008, publication of a notice for a public hearing on July 24, 2008 ("45-day Notice"). A "Staff Report: Initial Statement of Reasons" (Staff Report or ISOR) was also made available for public review and comment starting May 27, 2008. The Staff Report contains an extensive description of the purpose and necessity for the regulation. Appendix A to the Staff Report contained the text of the

proposed regulations, which would add a new section 2299.2 to title 13, CCR, and a substantively identical new section 93118.2 to title 17, CCR. These documents were also posted by May 27, 2008 on the ARB's internet site for the rulemaking: http://www.arb.ca.gov/regact/2008/fuelogv08/fuelogv08.htm ("ARB's internet site").

At the July 24, 2008 hearing, the Board received written and oral comments. At the conclusion of the hearing, the Board adopted Resolution 08-35, in which it approved the originally proposed regulations with modifications presented by staff at the hearing and another change as directed by the Board. The Board directed the Executive Officer to incorporate the modifications into the proposed regulatory text and to make such modifications available for a supplemental comment period of at least 15 days in accordance with section 11346.8 of the Government Code. The Executive Officer was then directed either to adopt the regulations with such additional modifications as he determined to be appropriate or to present proposed changes to the Board for further consideration if he determined further Board consideration was warranted.

The modified text of the regulations, the Supplemental Environmental Analysis prepared by ARB staff, and additional documents relied upon were made available for a supplemental 30-day comment period by issuance of a "Notice of Public Availability of Modified Text and Availability of Additional Documents" ("30-day Notice"). The 30-day Notice, a copy of Resolution 08-35, and the document entitled "Modified Regulation Order" were mailed on February 19, 2009, to all parties identified in section 44(a), title 1, CCR, and to other persons generally interested in the ARB's rulemaking concerning ocean-going vessels. These documents were also published on February 19, 2009, on ARB's internet site. An email message announcing and linking to this posting was transmitted to over 2,000 parties (combined) that have subscribed to ARB's "marine2005" and "maritime" list serves for notification of postings pertaining to marine vessels.

The 30-day Notice gave the name, telephone, and fax number of the ARB contact person from whom interested parties could obtain the complete texts of the additional documents relied upon and the modifications to the original proposal, with all of the modifications clearly indicated. The deadline for submittal of comments on the suggested modifications was March 23, 2009.

After considering the comments received during the supplemental 30-day comment period, the Executive Officer issued Executive Order R-09-003, adopting new section 2299.2 in title 13, CCR, and new section 93118.2, title 17, CCR. The Executive Officer also adopted findings under the California Environmental Quality Act.

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 and updating information in the Staff Report. The FSOR also summarizes written and oral comments the Board received on the proposed regulatory text during the formal rulemaking process and provides the ARB's responses to those comments.

Summary of Corrections to the Initial Statement of Reasons (Staff Report). The following is a summary of the modifications made to the Staff Report and the rationale for making them. The modifications were detailed (in strikeout and underline form) in Attachment 3 of the 30-day notice mailed on February 19, 2009:

- Several changes were made to the list of references at the end of Chapter VII. The references proposed for deletion were not used in the text of the chapter, while the added references were cited in the text but were inadvertently not included in the reference list.

- Corrections were made to some of the $PM_{2.5}$ emission factors in Tables II-6, II-7, and II-8, in Appendix D of the Staff Report. These correct errors in the emission factor values.

Supporting Documents and Information. In accordance with Government Code section 11347.1, ARB has added to the rulemaking record the following documents that support the proposed action:

- Electronic communication from the United States Coast Guard to ARB staff dated August 15, 2008.

- Electronic communication from the United States Coast Guard to ARB staff dated September 17, 2008.

- National Oceanic and Atmospheric Administration (NOAA) Chart 18720, Point Dume to Purisima Point (August 2008).

- Supplemental Environmental Analysis of Potential Impacts from Changes in Southern California Vessel Routing as a Result of the ARB Ocean-going Vessel Fuel Rule, and documents listed as references in the Supplemental Environmental Analysis.

The addition of these documents to the record was announced in the 30-day Notice, and the notice invited public comment on the addition of these documents to the record.

Supplemental Environmental Analysis. The "Supplemental Environmental Analysis of Potential Impacts from Changes in Southern California Vessel Routing as a Result of the ARB Ocean-Going Vessel Fuel Rule" was prepared in response to U.S. Navy concerns that the proposed regulation could result in vessels changing their routes to and from the Ports of Los Angeles and Long Beach, causing potentially significant adverse environmental impacts in addition to negatively affecting the U.S. Navy's utilization of missile test ranges. The analysis was provided in Attachment 4 in the 30-day Notice mailed on February 19, 2009.

Documents Incorporated by Reference. The following documents are incorporated by reference in the regulations: (1) International Standard ISO 8217:2005(E),

"Petroleum Products -- Fuels (class F) – Specifications of Marine Fuels," Third Edition, 2005-11-01; (2) International Standard ISO 8754: 2003(E), "Petroleum Products – Determination of Sulfur Content – Energy-Dispersive X-Ray Fluorescence Spectrometry," Second Edition, 2003-07-15; (3) ASTM Standard E 29-93a, Standard Practice for Using Significant Digits in Test Data to Determine Conformance Specifications, May 2003; (4) Nautical Chart 18600, Trinidad Head to Cape Blanco, National Oceanic and Atmospheric Administration Office of Coast Survey ("NOAA"), January 2002; (5) Nautical Chart 18620, Point Arena to Trinidad Head, NOAA, June 2002; (6) Nautical Chart 18640, San Francisco to Point Arena, NOAA, August 2005; (7) Nautical Chart 18680, Point Sur to San Francisco, NOAA, June 2005; (8) Nautical Chart 18700, Point Conception to Point Sur, NOAA, July 2003; (9) Nautical Chart 18720, Point Dume to Purisima Point, NOAA, August 2008; and (10) Nautical Chart 18740, San Diego to Santa Rosa Island, NOAA, April 2005. Each of these documents was listed in the 45-day Notice and included in the regulation as originally proposed, except that a 2005 version of Item 9, Nautical Chart 18720, was originally incorporated into the proposed regulation but replaced with the 2008 version at the time of the 30-day Notice.

The ten documents listed above consist of the following: (1) an international standard specifying the range of allowable properties for various marine fuels, including the fuels specified in the regulations; (2) an internationally recognized test method for measuring the sulfur content of fuel, to allow for enforcement of the fuel sulfur limits in the regulation; (3) a standardized protocol for rounding of test data to determine compliance with regulatory values for fuel sulfur content; and (4) seven nautical charts defining sections of the California baseline (i.e., coastline). Each instance of incorporation identifies the incorporated document by title and date. The documents are readily available from the ARB upon request and were made available in the context of this rulemaking in the manner specified in Government Code section 11346.5(b). Also, the referenced ISO and ASTM documents are published by the International Organization for Standardization and ASTM International, both well-established and prominent organizations. Similarly, the nautical charts are available from the National Oceanic and Atmospheric Administration, a U.S. federal agency. Therefore, all of the incorporated documents are reasonably available to the affected public from commonly known sources.

The documents 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 specifications, test procedures, and similar documents incorporated by reference rather than printed in the CCR because these specifications and test procedures are highly technical and complex. They include "nuts and bolts" engineering protocols and laboratory practices and have a very limited audience. Because the ARB has never printed complete test procedures and similar documents in the CCR, the directly affected public is accustomed to the incorporation format utilized for these documents. These test procedures and similar documents 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 the test procedures that are incorporated by reference would be

unnecessarily confusing to the affected public. For similar reasons, we are also incorporating by reference the detailed NOAA nautical charts specified above.

Fiscal Impacts. The Executive Officer has determined that this regulatory action will not impose a mandate upon any local agencies or school districts, whether or not it is reimbursable by the State pursuant to Part 7 (commencing with section 17500), division 4, title 2 of the Government Code. Except as discussed below, the Executive Officer has also determined that this regulatory action will not result in significant 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, or create costs other non-discretionary costs or savings to local agencies.

The Executive Officer has determined that some costs to the California Air Resources Board may be incurred beginning in the 2010-2011 fiscal year in order to implement and enforce these regulations. We estimated these added costs at about $340,000 annually for two additional enforcement staff and laboratory testing of fuel samples for sulfur content. Overall, the financial savings resulting from the health benefits of reduced exposures to diesel PM far exceed the cost of implementing and enforcing the regulations.

The Executive Officer does not expect any significant fiscal costs on local agencies since local agencies do not operate ocean-going vessels as defined in these regulations. Some minor impacts are possible on ports, which in California are operated by entities such as port authorities and departments of municipal governments. These impacts could result if ship operators choose to utilize alternative ports outside of California due to the added costs imposed by the regulations. However, this is not expected to occur to any significant degree because the fiscal impacts of the regulations on ship operators are expected to be minor.

Consideration of Alternatives. The regulations proposed in this rulemaking were the subject of discussions involving ARB staff, the affected owners and operators of ocean-going vessels that visit California ports, and other interested parties. A discussion of alternatives to the initial regulatory proposal is found in Chapter V of the Staff Report. Specifically, the following four alternative approaches were discussed: (1) Do nothing; (2) Rely on U.S. Environmental Protection Agency (U.S. EPA) and International Maritime Organization (IMO) regulation; (3) Implement the regulations as proposed, except without the lower sulfur limit of 0.1 percent in 2012; and (4) Implement the regulations within 24 nm of California's major ports rather than within 24 nm of the California coastline. For the reasons set forth in Chapter V of the Staff Report, in staff's comments and responses at the hearings, and in this FSOR, the Board has determined that none of the alternatives considered by the agency or that have otherwise been identified and brought to the attention of 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 AND ADDITIONAL DOCUMENTS MADE PUBLICLY AVAILABLE

At the July 2008 hearing, the Board approved the regulation with modifications and authorized the Executive Officer to make such additional modifications that he determined to be appropriate. All modifications made to the text of the regulation after publication of the 45-day Notice were circulated with the 30-day Notice for public comments. The following is a description of the modifications and clarifications, by section number.

A. Applicability (Subsection 2299.2(b) and 93118.2(b)): To improve clarity and organization of the regulation, the phrase "tanker and non-tanker" was deleted from subsection (b)(2), which concerns application of the regulation to both U.S.-flagged and foreign-flagged vessels. In place of this reference, language stating that the regulation applies to tankers and non-tankers was added to the definition of ocean-going vessel in subsection (d)(24).

B. Exemptions (Subsections 2299.2(c) and 93118.2(c)): The "temporary experimental or research exemption" was modified to allow ship operators complying under this exemption to apply for an extension of the initial three year maximum exemption period by up to three additional years (from the previous two years maximum extension). This change will provide an extra year for ship operators to resolve technical problems that may occur when installing and operating new emission control technologies. This extra time may be necessary based on existing projects using new control technologies. Specifically, such systems have sometimes encountered component failures and other difficulties that extend the time necessary to optimize these systems for maximum control of emissions, and to ensure long-term durability of marine engines.

C. Definitions (Subsections 2299.2(d) and 93118.2(d)): The definition of "Essential Modification" was modified to more clearly distinguish *essential* modifications from other types of modifications. The modified definition clarifies that essential modifications are modifications that can be demonstrated to be necessary to comply with the regulation. Specifically excluded are changes made for convenience in fuel switching, replacement of components that would have been replaced in the absence of the regulation, and modifications to increase fuel tank capacity when existing capacity is sufficient for a complete voyage within Regulated California Waters. The clarification of this definition is necessary to help implement the exemption provided in subsection (g) of the regulations. Under subsection (g), persons who cannot meet the fuel requirements without essential vessel modifications are granted an exemption, in whole or in part, from the fuels requirements specified in the regulations.

The definition of "Baseline" was also modified to incorporate an update to a chart that defines California's coastline. Specifically, the new August, 2008 version of Chart 18720 (Point Dume to Purisima Point) replaces the January, 2005 version of the same chart.

The definition of “Ocean-going Vessel” was modified so that it specifically states that tankers and non-tankers are included in the definition and are subject to the regulation. This language replaces a reference to tankers and non-tankers that previously appeared in subsection (b)(2), but the change has no effect on the regulation’s continuing applicability to tankers and non-tankers.

D. Recordkeeping, Reporting, and Monitoring Requirements (Subsections 2299.2(e)(2) and 93118.2(e)(2)): Language in subsection (e)(2)(A)(1) that provided an exception to certain recordkeeping requirements was deleted because it was unnecessary and redundant to the exemptions already provided in subsection (c). Subsections (c)(1) through (c)(5) provide five exemptions from the regulation for specified voyages, equipment, vessels and emergencies. These exemptions, because they apply to all requirements in the regulation, already covered recordkeeping requirements.

E. Noncompliance for Vessels Based on the Need for Essential Modifications (Subsections 2299.2(g) and 93118.2(g)): Several changes were made to the first paragraph of this subsection. First, the term “essential vessel modifications” was modified to say “essential modifications, as defined in subsection (d).” This change was made to clarify that the definition of “essential modifications” in subsection (d) is operative. Second, the language was modified to say that the Executive Officer will (rather than may) grant an exemption for applicants that meet the requirements of subsection (g). This change clarifies the intent of the provision. Finally, the sentence stating that “this provision terminates on December 31, 2014,” was removed. This language was included in the original proposal because it is expected that an Emission Control Area (ECA) will be established in 2015 that will achieve equivalent emission reductions in Regulated California Waters. However, because it is uncertain an ECA will be established by 2015, ARB decided the provision should not be automatically repealed on a specific date. This will allow the provision to stay in force if ARB’s regulation is continued beyond the end of 2014 due to a delay in the implementation of an ECA or other reason.

Language in subsections (g)(1) and (g)(2) was revised to clarify that the notification requirement in (g)(1) applies to each voyage by a vessel into Regulated California Waters, while the demonstration of need required in (g)(2) is a one-time requirement for those who assert their vessels cannot comply with the requirement in subsection (e)(1) without essential modifications. In addition, language was added to (g)(2) to provide that the 45-day lead time for demonstration of need will not apply if the vessel is relying on subsection (g) to enter California Regulated Waters sooner than 45 days after the effective date of the regulation.

Language was added to the first paragraph of subsection (g)(2) to require that each mandatory component of an Essential Modification Report be provided “to the satisfaction of the Executive Officer,” and similar language was deleted from subsection (g)(2)(B). These modifications were needed to clarify that the Executive Officer has discretion to require additional information related to all three components of an

Essential Modification Report, and not just in the case of the demonstration of necessity required in (g)(2)(B).

In subsection (g)(2)(A), the wording “as defined in subsection (d)” was added to “essential modifications” for the same reason discussed above, and a reference to engines and boilers was deleted as unnecessary.

The word “maximum” was added to subsection (g)(2)(C) to clarify that an Essential Modification Report must identify the *maximum* extent to which a vessel can comply with the regulation’s fuel use requirements without essential modifications. This change was necessary to clarify that a vessel that cannot fully comply with the regulation without essential modifications must still identify and comply with requirements to the full extent it can short of making essential modifications. The word “maximum” was deleted from three sentences in subsection (g)(3); since each of the sentences in (g)(3) already reference (g)(2)(C), it was not necessary to specify “maximum extent” in both subsections.

In subsection (g)(3), a reference to “this section” was modified to “this subsection” to clarify the provision only applies to persons demonstrating the need for essential modifications. In (g)(3)(A), (B) and (C), the requirements that “any” engine or boiler be operated in maximum compliance with subdivision (e)(1) were modified to require that “each” engine and boiler be so operated; these changes were needed to clarify that the requirements in (g)(3) apply to all engines and boilers on vessels subject to subdivision (g). In addition, the term “feasible and safe” was removed (three times) because it is duplicative. In each case, the reference to (g)(2)(C) achieved the same result by referring to similar language providing that ship operators that receive an exemption for “essential modifications” must operate on the cleaner fuel specified in the regulation to the extent feasible and safe.

F. Noncompliance Fee (Subsections 2299.2(h) and 93118.2(h)): In subsection (h)(5)(A), column headings in a table showing the fees to be paid for port visits by vessels using a noncompliance fee provision were modified to read “Port Visit” and “Per-Port Visit Fee.” These changes were intended to further clarify that the fees listed in the table are for each single visit and not a running total of fees for all visits combined.

In subsection (h)(5)(C), the limited-use fee waiver provision applicable in years 2012-2014 was modified to require that the specified fuels be used in each engine and boiler on a vessel, not just on any engine and boiler.

G. Sunset Provision (Subsections 2299.2(j) and 93118.2(j)): This provision was modified at the direction of the Board so that the fuel requirements in the regulation will be repealed without further action by the Board if the U.S. EPA adopts and enforces International Maritime Organization or U.S. EPA requirements that will achieve equivalent emission reductions within Regulated California Waters. The repeal would take effect if the Executive Office makes a finding that federal requirements are in

place that will achieve equivalent emissions reductions. This change was made to allow for an expeditious transition to equivalent IMO or U.S. EPA requirements in California and avoid any future redundancy between state and federal measures.

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

The Board received numerous written and oral comments during the formal 45-day rulemaking comment period which began with the notice publication on May 27, 2008 and ended with the Board hearing on July 24, 2008. A list of commenters is set forth below, identifying the date and form of all comments that were timely submitted. Following the list is a summary of each objection or recommendation made regarding the proposed action, together with an explanation of how the proposed action has been changed to accommodate the 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 towards the rulemaking or to the procedures followed by the ARB in this rulemaking are not summarized below.

We received written and/or oral comments in support of the regulation or the rulemaking process from the following persons:

Heather Tomley, Port of Long Beach
Christopher Patton, Port of Los Angeles
Barry Wallerstein, South Coast Air Quality Management District
Jack Broadbent, Bay Area Air Quality Management District
John Kaltenstein, Friends of the Earth and Others
Tim Carmichael, Coalition for Clean air
Diane Bailey, National Resources Defense Council

Persons on the preceding list did not raise comments specifically directed at the regulation or at the procedure followed by ARB, so their comments are not separately summarized and responded to in this FSOR.

Comments Received during the 45-day Comment Period

Abbreviation	Reference Number	Commenter
INTERTANKO	INTERTANKO	Joe Angelo Deputy Managing Director International Association of Independent Tanker Operators Oral testimony: July 24, 2008
MATSON	MATSON	Ronald J. Forest Senior Vice President Matson Navigation Company Written testimony: July 16, 2008
NAVY	NAVY 1	Randall Friedman California Government Affairs U.S. Navy Written testimony: May 18, 2008 Issue Paper submitted July 24, 2008
NAVY	NAVY 2	Randall Friedman California Government Affairs U.S. Navy Oral testimony: July 24, 2008
PMSA	PMSA 1	John McLaurin President Pacific Merchant Shipping Association Written testimony: July 23, 2008
PMSA	PMSA 2	T.L. Garrett Vice President Pacific Merchant Shipping Association Oral testimony: July 24, 2008
FOE	FOE	John Kaltenstein, Friends of the Earth and Others Written testimony: July 21, 2008

A. Fuel Requirements

1. **Comment:** In the spirit of cooperation and achieving our collective goals without litigation, the Board should pursue a more creative and collaborative approach to regulation that is less legally problematic. (PMSA 1)

Agency Response: Clearly the approach used to develop the regulatory proposal was done in the spirit of cooperation and collaboration. ARB staff worked extensively with the shipping lines and other interested parties in a cooperative process to develop the regulation. As detailed in Chapter I of the ISOR, the process included six public workshops and working group meetings, as well as numerous individual meetings. This extensive public process provided numerous opportunities for ARB to hear and consider the comments of all interested parties. The ARB is not aware of another regulatory approach that would achieve the emission reduction benefits in a more cost-efficient manner. Furthermore, the commenter did not provide a fully formed alternative that could realistically provide equivalent benefits as compared to the regulation. We disagree that the regulation is legally problematic. As discussed in greater detail in response to comment G-6, ARB has the authority to regulate marine vessels' fuel use affecting California air quality. In addition, no federal authorization is required to implement this regulation because section 211 of the federal Clean Air Act does not preempt California from adopting fuel regulations for nonroad sources, including marine vessels, and section 209 does not preempt California from adopting an in-use operational requirement.

2. **Comment:** PMSA advocates for an international approach to solving vessel emission problems that is uniform and consistent across local, state, national and international political boundaries. We endorse the proposed amendments to Annex VI that are scheduled to be approved by International Maritime Organization (IMO) in October 2008. These amendments, when fully implemented, will create new, strict rules on vessel emissions and fuel use with air quality benefits that will far exceed the emission reductions of the proposed regulation. This is because the Annex VI amendments include emission standards for engines, world-wide limits on marine fuel sulfur, and because the international agreement is the only legal method available that allows for regulation that extends beyond the jurisdictional boundaries of nations, much less the territorial limits of the state. These additional benefits are not included or accounted for in the proposed regulation. (PMSA 1)

Agency Response: As discussed in Chapter V of the ISOR (see page V-11) and by Board members during their deliberations on the regulation, ARB advocates an international approach to solving vessel emissions problems and we agree that it would be preferable to adopt regulations for ocean-going vessels on an international basis provided the emission reductions are timely and are of sufficient stringency to meet California's air quality needs. ARB supports the now approved amendments to IMO Annex VI mentioned by the commenter and the more recent application by the United States and Canada for IMO to establish an Emissions Control Area (ECA) around much

of North America. We agree that an ECA, if approved, could provide benefits that meet or exceed the proposed ARB regulation by January 1, 2015 (at the earliest). In fact, to help California transition to national or international controls, we included a provision in the regulation to sunset the ARB rule if the IMO or the U.S. EPA adopts controls that will achieve equivalent benefits from ocean-going vessels emission reductions in California. That said, it is imperative that we not forego needed emission reductions in the 2009-2015 timeframe from ocean-going vessels. These reductions are critical to our ability to fulfill federal State Implementation Plan obligations and to protect the public health of California citizens. Given the significant adverse health effects from ocean-going vessels that visit California ports while burning heavy fuel oil, as detailed in the Staff Report (ISOR Chapter VII and Appendices E1, E2, and E3), we believe it is critical to implement the regulation rather than wait at least six years for the IMO Annex VI regulations to achieve equivalent benefits. In addition, for the IMO regulation to achieve equivalent benefits, the proposed ECA must be established and implemented on an ambitious schedule. There is no guarantee that IMO will approve the ECA as proposed.

We disagree with the commenter's statement that the IMO Annex VI amendments, when fully implemented (which we interpret as implementation of a potential 0.1% fuel sulfur limit in 2015), would achieve air quality benefits that far exceed the ARB proposal. In the Staff Report ARB conducted a detailed analysis comparing the benefits of the proposed ARB regulation to the amendments to the IMO Annex VI rule. ARB focused on the particulate matter (PM) emissions because they are of the greatest concern in terms of the risk to public health.

The analysis assumed that an ECA would be implemented in California with a 1% sulfur fuel standard by 2010 and a 0.1% sulfur fuel requirement by 2015, although the amendments were not approved at the time the Staff Report was written and approval and implementation of an ECA is still not a certainty. The analysis showed that the benefits of the IMO rule would be equivalent in 2015. It is true that some slight additional benefits are possible from the IMO Annex VI rule that were not shown in the analysis. For example, as the commenter pointed out, more stringent new engine NOx standards will be implemented beginning in 2011. These new engine standards will reduce the NOx emissions from some of the newer vessels visiting California ports. These benefits were not shown because the analysis focused on PM emissions, and the benefits would be modest in the near term through 2015 because ship turnover is a slow process. In addition, a global 3.5% sulfur fuel limit (reduced from the previous 4.5% limit) will slightly reduce PM and SOx emissions affecting California. However, the impact will be slight because most fuels are already at or below 3.5% sulfur, and because this would only reduce emissions outside the expected ECA zone, which is expected to be far offshore.

The combined effect of these factors, which were not included in the analysis, is much less significant than the difference in emissions between the PM reductions from the ARB's fuel regulation, and the potential fuel requirements in an ECA zone for 2009 to 2015. In 2015, it is true that the PM and SOx emission reductions achieved by the IMO rule would slightly exceed those of the proposed ARB rule, due to the factors

mentioned by the commenter. However, as stated above, the ARB rule would be subject to the sunset provision at this stage as long as the IMO (or U.S. EPA) rule achieved equivalent benefits.

Finally, we disagree with the statement that "international agreement is the only legal method available that allows for regulation that extends beyond the jurisdictional boundaries of nations." The reason that we disagree is discussed at length in the response to comment G-6.

3. **Comment:** Substantial benefits will soon begin to result from the efforts to reduce vessel emissions at the international level. These international steps will minimize even the short term benefits of the proposed regulation. In light of the questions regarding CARB's authority to implement this regulation and the substantial efforts by the international and federal authorities, we recommend the following to the Board:

(1) Direct staff to include language in the proposed regulation to ensure that this proposed regulation will only be enforced if any of the following conditions fail to occur:

a) IMO fails to approve the amendments to Annex VI at MEPC 58;
b) U.S. EPA fails to achieve designation of an Environmental Control Area under the terms and conditions of the Annex VI amendment, on or before March 31, 2010; and
c) Equivalent emission reduction efforts are in place to make up the differences between the proposed CARB regulation and the IMO ECA provisions off California after 2012.

(2) Upon approval by IMO of the amendments of Annex VI, work cooperatively with the industry and Port authorities to provide public health benefits equivalent or greater to the proposed regulations prior to the implementation of Annex VI. One example of such an effort would be to expand the Clean Marine Fuels Incentive Program throughout California.

(3) Direct staff to work closely with the U.S. EPA and supportive industry stakeholders to prepare and file the petition for an Environmental Control Area (ECA) at the earliest possible date to take full advantage of the benefits provided by Annex VI. (PMSA 1)

Agency Response: We disagree that substantial benefits will soon begin to result from international efforts to reduce vessel emissions. Benefits from international efforts are not likely to be equivalent to ARB's regulation until 2015 at the earliest. Furthermore, as explained in the response to A-2 above, potential equivalent benefits in 2015 are only certain if IMO grants U.S. EPA's and Canada's application for a North American ECA. The application for an ECA has been filed and ARB provided support for that effort, however, it is not certain if the application will be approved by IMO and ARB simply cannot wait for this process to be completed. As discussed in the ISOR (see

Chapter V), prior to 2015, the PM emission reductions that would potentially be achieved under the IMO Annex VI amendments would fall far short of the reductions that would be achieved by the proposed ARB regulation. Specifically, the Annex VI amendments would achieve less than half the emission reductions of the proposed ARB rule from 2009 through 2014. Further, the alternative approach proposed by the commenter is unrealistic. Even assuming the IMO amendments are implemented on schedule and the ECA is established as expected, this still leaves a huge gap in emission reductions to make up (as discussed above). The vague suggestion to "work cooperatively with the industry and Port authorities to provide public health benefits equivalent or greater to the proposed regulations…." provides no concrete path to achieve the same benefits as the proposed ARB rule. The only specific recommendation mentioned, to implement the Clean Fuels Incentive Program throughout California, is not a likely solution. This existing program, implemented locally by the Ports of Los Angeles and Long Beach, pays the ship operators for the difference between standard heavy fuel oil and the cleaner distillate fuel. However, it was only designed to be a temporary program that terminates upon the implementation of the proposed ARB rule (due in part to the significant cost to the ports). The participation in this voluntary program has been low to date (less than 25% of port visits) even though the ports pay for the bulk of the higher cost to use the cleaner fuel. It is unclear who would fund a similar statewide program.

4. **Comment:** Emissions equivalency with the proposed regulation could be achieved prior to the implementation of Annex VI by convening the Marine Technical Working Group comprised of CARB, U.S. EPA, local air districts, Port authorities, academics, environmental groups, and industry to evaluate measures to achieve equivalent emission reductions with the proposed CARB regulation, including but not limited to: 1) Expanding the Port of Los Angeles/Port of Long Beach Marine Fuel Incentive Program that requires 0.2% sulfur distillate fuel throughout California, providing greater benefits than the regulation until January 1, 2012; 2) Modify the Marine Fuel Incentive Program to 0.1% sulfur distillate fuel on or before January 1, 2012 to maintain equivalency until 2015; 3) Continue voluntary use of the distillate fuel in auxiliary engines; 4) Investigate the potential of a North American ECA designation with U.S. EPA that would require 0.1% sulfur distillate fuel prior to 2015; 5) Investigate an ECA boundary further from the California coast that will provide emission benefits beyond those of the proposed regulation 24 nm limit; 6) Provide for technology advancements and demonstration projects such as on-board fuel emulsifiers, Advanced Marine Emission Control System (sock on a stack), sea water scrubbers, selective catalytic reduction, particulate filters, and others. (PMSA 1)

Agency Response: We disagree that emission reduction equivalency with the regulation could be achieved prior to 2015, even with the best efforts of all the parties mentioned by the commenter. In addition, the commenter's specific suggestions cannot realistically be expected to achieve the same benefits. As discussed in the response to Comment A-3, it is not feasible to expand the Marine Fuel Incentive Program statewide, and there is no reason to expect that voluntary participation would be higher than under

the existing program. Regarding the third suggestion, to continue the voluntary use of distillate fuel in auxiliary engines, we appreciate the efforts of participating ship operators but voluntary use will fall far short of use that is required by regulation. Quantification of the difference between benefits obtained by voluntary use and by the regulation cannot be determined because of the uncertainty in the extent of voluntary participation, especially for ship operators that are not PMSA members. Regarding the commenter's fourth suggestion, to investigate the potential for an ECA designation prior to 2015, we are not aware of any path for the U.S. EPA to achieve this without renegotiation of the international treaty and the application for an ECA proposes a 2015 implementation. On the commenter's fifth point, the U.S. EPA and Canada are proposing an ECA boundary 200 nautical miles offshore, but the ECA could not be implemented prior to 2015. Finally, ARB already promotes new technology advancement and demonstration projects, in some cases financially. However, it is not realistic to expect that the installation of new technology on the roughly 2,000 vessels that visit California's ports can provide the same short-term emission reduction benefits as an "across-the-board" fuel requirement would apply to all vessels visiting California beginning in mid-2009.

5. **Comment:** We do not believe that the proposed regulation can or should be implemented in its current form from a safety, technical, logistical, jurisdictional and legal perspective. Meaningful reductions can still be achieved and we are committed to assisting CARB in addressing these issues. We hope to work together to explore all feasible and workable mechanisms to achieve the goal of reducing emissions from vessels to the maximum extent practical at the earliest possible date. We believe the question facing the Board is not whether or not vessel emissions will be reduced, but whether you will decide to work with us to address vessel emissions within the federal and international context. (PMSA 1)

Agency Response: As discussed in the response to Comment A-1, ARB worked with the shipping lines and other interested parties (including PMSA) to develop the regulation. The process included six public workshops and working group meetings, which were attended by PMSA, as well as numerous individual meetings. This extensive public process provided numerous opportunities for ARB staff to hear and consider the comments of all interested parties. The staff investigated the concerns raised by the commenter, including the technical, logistical, safety, jurisdictional and legal issues (see ISOR Chapter VI and Appendix B). After investigating each of these issues, we found the regulation to be feasible and cost-effective, and have not identified or had anyone else identify an alternative that would more efficiently achieve equivalent benefits. The voluntary and incentive programs advocated by PMSA will not achieve equivalent reductions, even as interim measures employed until ECA controls are potentially implemented beginning in 2015.

6. **Comment:** We believe the continuation and expansion of efforts such as the Ports of Long Beach and Los Angeles "Clean Marine Vessel Fuel Incentive Program" at ports throughout California offers the best means of achieving the near-term emission benefits needed until the pending international regulations

are implemented. The Clean Marine Vessel Fuel Incentive Program will compensate registered vessels 100% of the incremental cost between residual fuel and maximum 0.2% sulfur content distillate fuels in main engines. Not only is the fuel required under this program significantly lower in sulfur content than the proposed regulation, it also makes use of the same low-sulfur fuel in auxiliary engines and compliance with the voluntary vessel speed reduction program mandatory in order for vessels to be eligible for the incentive. This program recently went into effect on July 1, 2008 and already has 14 ocean-carrier lines, with over 120 vessels subscribed. Other members have pioneered the use of shore-power for at-berth vessels. The voluntary vessel speed reduction program, initiated in May 2001, has achieved over 90% compliance by the vessels arriving and departing from the Ports of Long Beach and Los Angeles.

It is important to note that no quantification of the benefits of these voluntary efforts has been provided to the Board in the ISOR. We firmly believe that the Board's emission reduction goals can be achieved in advance of the full implementation of amended Annex VI. Based on our members' direct experiences with these programs, and their own initiatives to make their fleets more environmentally-friendly, PMSA respectfully requests that the Board direct staff to complete an evaluation of the costs and benefits of this rule compared to existing voluntary efforts and the feasibility of meeting the Board's goals through cooperative, non-regulatory measures before the regulation is pursued any further. (PMSA 1)

Agency Response: PMSA has not identified a stable finding source to allow for the expansion of the Clean Marine Fuel Incentive Program beyond the time period budgeted by the Ports of Los Angeles and Long Beach, or to other California ports. Due in part to the cost the program, the Ports of Los Angeles and Long Beach intended the program to be a short-term "stop gap" program in place only until the ARB's regulation is implemented. Other California ports have not implemented and are unlikely to have the funding for such a program, and even if they all participated, they would not cover the entire California coastline like the ARB's regulation. In addition, even though the incremental cost of the cleaner distillate fuel is reimbursed by the ports, voluntary participation by the shipping lines has been low to date (less than 25% of ship calls). We agree that the 0.2% sulfur fuel under this program is lower than the initial sulfur limits in the proposed ARB regulation (1.5% for marine gas oil and 0.5% for marine diesel oil). However, despite the higher limits in the proposed ARB rule, ARB has found that the average sulfur level for complying distillate fuels is about 0.3% (see ISOR, Appendix F), just slightly higher than fuels under the Incentive Program. In addition, the regulation must accommodate the ability of all ship operators to bunker the low sulfur fuel, not just those shipping lines that choose to participate in a voluntary program.

The commenter pointed out that participation in the Fuel Incentive Program requires the use of the cleaner distillate fuel in the auxiliary engine and participation in the Vessel Speed Reduction (VSR) Program. However, the VSR program was started in 2001 and

many vessels coming to the Ports of Los Angeles and Long Beach have for several years voluntarily participated in this VSR program. There is no reason to believe participation in this long-standing voluntary VSR program would cease upon implementation of the proposed regulation. Regarding the quantification of the benefits of voluntary efforts, ARB does include the benefits of the Vessel Speed Reduction program in the emissions estimates provided in the ISOR. There is no estimate of the benefits of the Fuel Incentive Program because it began after the ISOR was issued, but as noted previously, voluntary participation in those programs has been limited and the benefits from participation is far below that that will result from implementation of the regulation. As discussed previously in the response to Comment A-4, ARB is not aware of any alternative that will more efficiently achieve comparable benefits to the regulation.

7. **Comment:** This regulation does not qualify as an Airborne Toxic Control Measure since the reduction in fuel sulfur content addresses the criteria pollutants of SO2 and particulate sulfate and not the chemical constituents associated with diesel toxicity. Therefore, any reference to airborne toxic control and the cancer risk benefits assumed should be removed from this regulation. (PMSA 1)

Agency Response: The regulation qualifies as an Airborne Toxic Control Measure because ARB, in consultation with the California Office of Health Hazard Assessment, concluded that particulate matter emissions from ocean-going vessel diesel engines operated on heavy fuel oil or marine distillate fuels constitute “diesel particulate matter” emissions. This conclusion was reached based on the following: (1) marine distillate fuels have properties nearly identical to on-road diesel fuel; (2) the fuel specifications for marine distillate fuels are very similar to the diesel fuel specifications that existed prior to 1993; (3) marine heavy fuel oil is a blended petroleum product containing the same classes of hydrocarbons as diesel fuel; (4) heavy fuel oil contains some diesel fuel; (5) the emissions characteristics of a marine diesel engine using heavy fuel oil are similar to those of a diesel engine using diesel fuel; and (6) the particle size distribution of the exhaust emissions from a marine diesel engine using heavy fuel oil is similar to the particle size distribution from a diesel engine using diesel fuel.

8. **Comment:** We believe that there could be potentially very serious safety and financial implications from using low sulfur fuels in main engines before adequate studies have been completed, and we support the more realistic phase in schedule being proposed by the International Maritime Organization. (MATSON)

Agency Response: Based on discussions with the engine manufacturers, and the existing use of these fuels in ship main engines, ARB staff concluded that low sulfur distillate fuels can safely be used in ocean-going ship main engines. A detailed discussion of ARB’s investigation is included in the Staff Report (ISOR, Chapter VI). Furthermore, as seen with the Ports of Los Angeles and Long Beach “Clean Marine Fuel Incentive Program,” many ship operators have chosen to voluntarily switch to low sulfur distillate fuel when operating near these ports, further demonstrating that vessel operators can safely use these fuels. We also note that the recent amendments to

international IMO Annex VI regulations allow for the creation of Emission Control Areas requiring the same type of fuel (0.1% sulfur fuel by 2015). Regarding the financial implications, the Staff Report analyzed the economic impacts on ship operators in great detail (ISOR, Chapter VIII). Specifically, ARB staff applied the estimated costs of the regulation on typical representative businesses and then estimated their change in profitability. Based on this analysis, staff concluded that most affected businesses would be able to absorb the costs of the regulation with no significant impacts on their profitability (see ISOR, p. VIII-19).

9. **Comment:** Concerned with technical feasibility, availability of fuels and jurisdictional issues. Recommend ARB include language in the regulation for a contingency plan. Specifically, change existing language to include a provision that the regulation would go into affect only if IMO fails to act in October, if the U.S. EPA fails to achieve an environmental control area in an expeditious manner, and if the industry along with partnership with CARB, local air districts and port authority fail to come up with a strategy that plugs the differential between 2009 and 2015. Advantages to this approach: it maintains pressure on the IMO and U.S. EPA to act expeditiously, avoids competitive disadvantages for the State of California goods movement system; provides early action and early emission benefits to the citizens of California, provides motivation for ocean carriers to continue to investigate and develop technologies that will further reduce emissions from vessels, finally, it avoids any disputes about the jurisdictional issues. (PMSA 2)

Agency Response: Please see responses to comments A-3, A-4, A-5, B-1, B-2, and B-4, and B-5.

10. **Comment**: Other strategies are available such as port incentive programs which could be expanded statewide or an extension or early implementation of the ECA could be used to achieve the needed emission reductions in lieu of proposed regulation. (PMSA 2)

Agency Response: Please see responses to comments A-4 and A-6.

11. **Comment:** Recommend the Board adopt the same implementation dates as are proposed in the amendments to Annex VI. (INTERTANKO)

Agency Response: Incorporating Annex VI implementation dates into the regulation would require ARB to defer the regulation's requirements until 2015, the earliest date that an ECA establishing low-sulfur fuel requirements could be established under Annex VI. This proposal is not acceptable because it would defer vessel emissions reductions from mid-2009 to 2015, depriving the state of reductions needed to meet air quality goals and continuing adverse health impacts on California residents during these years. Please see response to comment A-2 for additional response.

12. **Comment:** If the Board takes action formally adopting these amendments, it could jeopardize negotiations at IMO. The resolution should be adopted with the language noted on page 9 wherein it reads, “the Board is initiating steps toward the adoption of these rules“, and in the last paragraph where it reads ”and that final action to adopt the proposed regulation will be taken by the executive officer.” If this is done, negotiations should not be jeopardized. (Intertanko)

Agency Response: The language that is quoted from the draft resolution was included in the resolution adopted by the Board, as urged by the commenter. But we disagree that formal adoption of the regulation will jeopardize negotiations at IMO. In fact, we believe that the development of the regulation helped to convince the IMO that stronger international regulations of ship emissions are necessary. In any case, we note that since this rulemaking process was commenced, IMO approved Annex VI and the United States and Canada applied for creation of an ECA that, if approved, could result in the sunset of the substantive requirements of this regulation by 2015. ARB will continue to support establishment of a North American ECA.

B. Fuel Requirements

1. **Comment:** The proposed regulation is inherently unfair in that it places the burden for obtaining fuel on the end user rather than the fuel provider. The ISOR states that vessel operators will experience “challenges in both the procurement and onboard fuel management are significant…” (ES-15). While we understand that a vessel may get relief from the noncompliance fee once a year if the vessel buys compliant fuel while at berth in California there is no requirement that compliant fuel be available for sale under the terms of this regulation.

This is in direct contrast to other fuel-use regulations where the requirements actually do not regulate fuel use at all, but rather fuel sales. For practical purposes, these requirements are placed on the fuel provider, not the end user. For example, except in limited circumstances, the recent requirements for Locomotives and Harborcraft are sales requirements, not end-user requirements.

Unlike the above regulatory approach (which even takes place in a relatively small, limited domestic marketplace for fuel), the proposed regulation to be enforced on vessel operators from all over the globe expects ocean carriers to identify the source of compliant fuel and pay whatever premium is charged by the fuel provider. If the fuel isn’t available, the vessel will pay substantial fees to California for availability of fuel outside of their control.

On the other hand, there is no requirement that a fuel provider, even in California, produce or make available for sale compliant fuel for vessels, and there is no restriction on the sale of non-compliant fuel within California. This entire regulatory scheme seems to be backwards as compared to most other “fuel only” rules, by assigning the burden of fuel compliance on the end-user and

not on the fuel provider. The question of fuel availability, that is key to the effectiveness of this regulation, must be addressed in a more comprehensive manner prior to implementation and cannot be put off on a promise of future monitoring of noncompliance fees collected or some undefined measurement of increased compliant fuel sales in California as a future indicator of fuel availability.

We request that the Board direct staff to rewrite this regulation as a fuel provision rule, like other "fuel only" rules on mobile sources of emissions. (PMSA 1)

Agency Response: It is necessary to regulate fuel *use* by ocean-going vessels rather than fuel *sales* in California because much of the fuel burned by ships visiting California ports is purchased outside of California. ARB staff conducted an extensive analysis of the availability of fuels worldwide to ensure compliant fuel was available in ports where ocean-going vessel typically fuel prior to coming to California. As discussed in detail the Staff Report (see ISOR Appendix F), there is a sufficient worldwide supply of low sulfur marine distillate fuel meeting the Phase I fuel specifications and this fuel is available at key fueling ports servicing California-bound vessels. This is based on an extensive database of the sulfur content of marine fuels sold at ports worldwide. We also note that this same fuel was required under the ARB's ship auxiliary engine regulation, and there were not significant supply issues. Specifically, there were only three vessel operators that met the regulatory requirements over the 14 months the regulation was in place by paying "noncompliance" fees because they were unable to find complying fuel (see ISOR, Chapter VI, Table VI-1).

While the analysis concluded that there is not currently sufficient supply of the Phase II (0.1% sulfur) fuel at key Pacific ports, availability should improve by 2012, when this fuel would first be required, due to an on-going trend by refineries to produce additional supply of lower sulfur distillate fuels. Refineries will also be preparing for the revised IMO Annex VI amendments which will require 0.1% sulfur fuel as early as 2015 in ECAs worldwide. For the rare cases where a ship operator is unable to source the complying fuel, the regulation contains provisions to allow the ship operator to comply with the regulation by alternative means. Specifically, the "noncompliance fee provision" allows ship operators to pay a fee in lieu of using the cleaner fuel under certain circumstances, and there is a provision that waives the fee once per vessel during each calendar year for the Phase II fuel requirement that begins in 2012.

2. **Comment:** The availability of fuels in foreign ports is uncertain. The assumption of the regulation seems to be that vessels can purchase marine gas oil at any port of call in the world for use in complying with the regulation. It seems to assume that all MGO will be 0.5 percent sulfur content or less regardless of where it is purchased. It is also apparent that CARB staff is not convinced that compliant fuels will be generally available since the regulation specifically includes noncompliance fee options for vessels that either can't purchase enough compliant fuel or has unexpectedly purchased fuel that does not comply. Until the worldwide availability of compliant fuels can be assured, the regulation

should not be adopted. At the minimum, a vessel should not be subjected to fees and penalties until the availability of compliant fuels for all vessels calling at California ports can be assured. (PMSA 1)

Agency Response: As discussed in the response to Comment A-1, based on an extensive analysis by ARB staff, the Phase I distillate fuel is widely available, and the Phase II fuel is expected be sufficiently available by 2012. The Phase I fuel standard allows for the use of marine gas oil or "MGO" (the most commonly used distillate fuel) up to 1.5% sulfur, not the 0.5% noted by the commenter. The Phase I standard also allows for the slightly dirtier marine diesel oil ("MDO"), and this is capped at 0.5% sulfur. However, we do not assume that all MDO will be below this level. We demonstrate in the Staff Report that there is sufficient supply of the Phase I fuel --either MGO up to 1.5% sulfur or MDO up to 0.5% -- to allow ship operators to comply with the regulation in all but rare cases. We view the noncompliance provision as an alternative only for the rare cases when the complying fuel cannot be located. This is exactly how the previous ARB Ship Auxiliary Engine Rule worked. We also note that the "noncompliance fee provision" includes language that waives the fee once per vessel during each calendar year for the Phase II fuel requirement that begins in 2012. It would not be appropriate to include a more expansive exemption from noncompliance fees due to the economic advantage ships would derive from using the less expensive noncompliant heavy fuels.

3. **Comment:** We view the 0.5% and 0.1% sulfur limits as arbitrary standards that are not associated with current fuel specifications. CARB's definition of MDO in section (d) as "fuel that meets all the specifications for DMB grades as defined in Table I of International Standard ISO 8217, as revised in 2005." However in section (e) of the regulation, "Fuel sulfur content limits," CARB is ignoring ISO 8217 specifications for MDO by reducing the sulfur content to 0.5% (July 2009) and 0.1% (2012). The maximum sulfur content specified by ISO 8217 is 2%. (MATSON)

Agency Response: The Phase I and Phase II fuel standards were set with the goal of achieving the maximum emission reductions possible, while still ensuring the widespread availability of these fuels to ship operators. The Phase I 0.5% sulfur limit for MDO and the Phase II 0.1% sulfur limits are intentionally lower than the maximum fuel sulfur limits allowed under ISO 8217. The lower fuel sulfur level reduces exhaust emissions of diesel particulate matter and sulfur dioxide.

4. **Comment:** Although the Fuel Availability Study indicates sufficient quantities of this fuel are available, Matson's experience has been that most of the MGO sold in California is actually on road diesel containing no more than 15 ppm sulfur. Likewise, MGO supplied in Hawaii contains 50 ppm sulfur. This fuel cannot be mixed with any other fuels and therefore requires dedicated tanks. With increased demand for additional quantities related to burning low sulfur fuel in the main engines and boilers, due to the logistic and capacity issues, it is very unlikely that the ships will be able to bunker large quantities of MGO from tanker

trucks. Matson believes that dedicated barges will be required to deliver MGO on board, and we are concerned that suppliers are not taking action to meet this anticipated demand. (MATSON)

Agency Response: We agree that much of the marine distillate fuel sold in California meets the specifications for on-road diesel fuel. However, this fuel can also be used for marine uses as long as it meets all of the international specifications under ISO 8217. Contrary to the commenter's statement, this fuel can generally be mixed with other fuels, although, as with all marine fuels (even heavy fuel oil), there can sometimes be instances where fuels are incompatible. We are aware that marine fuel suppliers are preparing for the implementation of the regulation through increased storage capacity of the cleaner distillate fuels at their facilities.

5. **Comment:** Ultra low sulfur fuel has significantly different chemical properties than marine MGO and MDO fuels which lead to even greater concerns regarding its use in main engines. We strongly urge CARB to re-evaluate their fuel availability study to consider which portion of available fuels is actually ultra low sulfur fuel. It should also be noted that there are currently no marine specifications for ultra low sulfur fuels so the properties can be highly variable (MATSON).

Agency Response: We disagree. All fuels specified in this regulation are required to meet the International Standard ISO 8217:2005(e), "Petroleum Products – Fuels (class F) – Specifications of Marine Fuels." Generally, ultra low sulfur on-road California diesel fuels can be used in marine engines to comply with the regulation as long as these fuels meet all the specifications for marine fuels under international standard ISO 8217. However, during the development of the regulation, concerns were raised about the lower levels of lubricity and viscosity in distillate fuels, particularly those with ultra low sulfur levels. ARB staff analyzed these and other concerns at length in the Staff Report (see ISOR, Chapter VI). Specifically, ARB staff examined the viscosity and lubricity of a number of different distillate fuels of various sulfur contents, and did not find a strong correlation between the sulfur content of the fuel and these properties. Nevertheless, ARB staff agrees that distillate fuels with unusually low levels of viscosity or lubricity can be a potential concern, and ship operators may in some cases want to insure higher levels of these properties by specifying fuels with higher lubricity or viscosity when purchasing their fuel, adding lubricity additives, or cooling fuel to increase its viscosity.

6. **Comment:** This is a fuel only requirement. There is the potential for new technologies coming on line which this regulation does not allow. (PMSA 2)

Agency Response: The previous ARB ship fuel regulation for auxiliary engines contained a provision that allowed for the use of alternative control technologies, but it was never utilized. Furthermore, we do not foresee any new technology in the near future that will achieve the dramatic emission reductions achieved by the use of the cleaner distillate fuels specified in the regulation. In addition, providing alternative

means of complying with the regulation makes it possible that the regulation might be viewed as establishing an emission standard, requiring U.S. EPA authorization, which would significantly delay full implementation of the rule. Because vessel operators did not use alternative control technologies in the auxiliary engine regulation, because new technologies for marine engine emissions controls do not appear imminent, and because emissions reductions must be achieved as soon as possible, ARB decided not to include a provision allowing use of alternate control technologies.

If new technologies do emerge, the regulation contains a Temporary Experimental or Research Exemption to ensure the regulation does not impede development and testing of the new technologies. This exemption may be granted by the Executive Officer for experimental purposes for up to three years with one extension for up to three additional years. This exemption is granted based on a demonstration that the exemption is an "express part of a formal, executed research contract or project" and "advances the state of knowledge of exhaust control technology or characterization of emissions". The exemption is not available, however, for non-experimental deployment of new control technologies as an alternative to the regulation's fuel use requirements.

7. **Comment:** We are disappointed by the two-year delay for Phase 2 cleaner fuels relative to the previous timelines, such as the 2010 deadline in the original auxiliary engine fuel rule for OGVs. However, although we would like to see this cleaner, 0.1 percent sulfur marine fuel phased into use immediately, we strongly support this regulation, as proposed by staff. (FOE)

Agency Response: The Phase I and Phase II fuel standards were set with the goal of achieving the maximum emission reductions possible, while still ensuring the widespread availability of these fuels to ship operators and minimizing technical and operational issues associated with fuel switching. As discussed in the ISOR, pages ES-15 and 16, operational challenges stem from running engines, designed to operate primarily on HFO, on a cleaner marine distillate that has very different physical properties than HFO. These differences include much lower viscosity and potentially lower lubricity. Because of the significant operational challenges, a number of stakeholders, including some shipping companies and the United States Coast Guard, recommended phasing in the fuel sulfur levels in two phases, to reach the 0.1% sulfur marine distillate. Phase 1 sulfur levels will be somewhat easier to manage, in terms of delivery and on-board fuel management than the lower Phase 2 level, thus allowing the operators to focus on the operational challenges of using the distillate fuel. Because the sulfur levels are not as restrictive, the operators will have more flexibility in specifying viscosity levels when purchasing the fuel and may not have the possible lower lubricity issues that have been observed, to a very limited extent, in the very low sulfur distillate fuels.

C. Technical and Safety Issues

1. **Comment:** We have not received satisfactory assurances from our main engine manufacturers and fuel oil suppliers that such fuel can be safely used in our existing vessel engines for any specific period of time. In fact, many operating manuals include strong cautionary language regarding use of distillate fuels (see Attachment 1[1]).

Use of non-recommended fuels could void our warranties and lead to significant potential liabilities. We are continuing to investigate technical issues with the engine manufacturers and fuel oil and lubricating oil suppliers as we examine the impact of this proposed regulation, but there is an absence of adequate data regarding the consequences of burning low and ultra low sulfur fuel in marine engines. Recently a Shell Marine product specialist stated that in response to mandates for vessels to use 0.1% sulfur fuels, "Lubricants suppliers need to respond to this in turn with a completely new cylinder oil," We understand that CARB is sponsoring research and bench-scale test in cooperation with engine manufacturers to confirm the feasibility and safety of burning low or ultra low sulfur fuel in marine engines for extended periods, and we believe that adoption of this proposed regulation should be delayed until these studies are completed. (MATSON)

Agency Response: Distillate can safely be burned in marine engines with proper procedures. At a July 24, 2007 Maritime Working Group meeting organized by ARB, both MAN and Wärtsilä/Sulzer, the two largest manufacturers of marine engines for ocean-going vessels, stated that fuel switching from HFO to distillate in their slow-speed two-stroke propulsion engines was feasible subject to certain technical considerations, such as transitioning properly between different fuel types. MAN indicated that there would be no difference in performance between low sulfur fuel, MDO/MGO and HFO. However, necessary precautions have to be taken by operators. At the same meeting, Wärtsilä/Sulzer indicated that fuel switching may be undertaken when necessary for environmental reasons. Furthermore, both engine manufacturers provide guidelines for fuel switching procedures. We are aware of no cases where the proper use of these fuels would void the manufacturer warranty.

[1] Attachment: MV RJ Pfeiffer, Main Engine, Kawasaki MAN, 8L80 MC, From Engine Operating Manual: Recommendations for the Fuel Changeover. Section 4.3, Fuel Changeover (See also "Pressurized fuel oil system" earlier in this Chapter), The engine is equipped with uncooled, "all-symmetrical," light weight fuel valves – with built-in fuel circulation. This automatic circulation of the preheated fuel (through the high-pressure pipes and the fuel valves) during engine standstill, is the background for our recommending constant operation on heavy fuel. In addition, there is a latent risk of diesel oils and heavy fuels of marginal quality forming incompatible blends during fuel change over. Such blends, as well as too rapid temperature changes, can evoke problems such as: fuel pump and injector sticking/scuffing, poor combustion, and fouling of the gas ways. Therefore, apart from the exceptions mentioned below, we strongly advise not to use diesel oil for the operation of the engine – this applies to all loads. Consequently, the engine should at all times be operated on heavy fuel oil, thus benefitting from the much more attractive prices of these fuels [emphasis added by commenter].

Actual in-use experience demonstrates that marine vessels are able to operate both on HFO and low sulfur marine distillate fuel (MGO/MDO), and it is feasible to switch fuels during operation. Marine vessels currently perform the same type of fuel switches that are likely to occur under this regulation. Vessel operators perform many of these fuel switches prior to dry-dock maintenance operations to prevent heavy fuel oil from solidifying in fuel lines and engine components after engine shut down. In addition, these engines are certified by the manufacturer to International Maritime Organization nitrogen oxide emission standards through engine testing while the engine is operating on a distillate fuel, since heavy fuel oil properties are too variable. The vast majority of ocean-going vessels visiting California ports during the 14 months that the Auxiliary Engine Regulation was enforced complied with the regulation by switching the fuel for their auxiliary engines to distillate fuel prior to entering within 24 nm of the California coastline. No significant problems associated with the fuel switching were reported to ARB during that time.

There are also vessels that routinely switch from heavy fuel oil to distillate fuels in their main engines during California port visits. As noted in the Staff Report, (see ISOR, p. VI-7), A.P. Moller-Maersk Group, a major container ship operator, has a Pilot Fuel Switch West Coast Initiative (Maersk Pilot Program) where they are voluntarily using low (0.2% maximum) sulfur marine gas oil in their main engines within 24 nm of port. The Maersk Pilot Program began in March 31, 2006 and as of April 2008, included 577 fuel switches. The participating vessels have main engines manufactured by either MAN Diesel or Wärtsilä/Sulzer. Maersk's program includes using MGO with a sulfur level at or below 0.2% sulfur, for both the main engine and auxiliary engines. In 2006, Maersk reported an average MGO fuel sulfur level of 0.17% for all participating visits in both the main and auxiliary engines. In 2007, the average MGO fuel sulfur level was 0.09%. Maersk also reported that while running on low sulfur MGO, the main engines are operated on a BN 70 cylinder lubricant which is typically used with HFO, but with a lower feed rate than would be used for HFO operation. Other operators are also now switching fuels under the Port of Los Angeles and Long Beach's Clean Marine Fuel Incentive Program, which reimburses ship operators the difference between the purchase price of standard heavy fuel oil and 0.2 percent or lower sulfur distillate fuel within a region as far as 40 nautical miles from the ports. We also note that the recent amendments to IMO Annex VI provide for the creation of Emission Control Areas that could restrict marine vessels to 0.1% sulfur fuel, the same as the Phase II fuel specified in the regulation. The parties that negotiated the amendments to this international treaty apparently reached the same conclusion as ARB staff -- that the use of this fuel is feasible in marine engines.

The risk of incompatible fuel blends when switching fuels is addressed in the Staff Report (see ISOR, p. VI-11). There is always a slight risk of incompatibility when blending fuels, even two heavy fuels. However, the theoretical risk has not translated into real-world problems with the prior ARB Auxiliary Engine Fuel Regulation. Regarding the use of special lubricants for low sulfur distillate fuels, the engine manufacturers have said this is not necessary for the short term use of these fuels under the regulation (see ISOR, p. VI-11 to VI-12). Finally, as noted by the commenter,

ARB is working with the engine manufacturers to test the lower limits of distillate fuel lubricity and viscosity on fuel injection pumps. However, the manufacturers already have recommendations for their customers, some of which (as noted above) are routinely using the low sulfur distillate fuels. The testing will further refine the fuel property extremes under which their engines can operate.

2. **Comment:** The current record is deficient in appropriately addressing significant technical issues. We have previously expressed concerns that ships that are designed to operate primarily on residual fuel, will need to retrofit vessel to switch to and from low sulfur distillate fuels when entering and leaving California. We have also previously raised concerns about switching of fuels that could result in problems that would effect the safe operation of the vessel. These problems include, but are not limited to the following:

(1) The lower viscosity of low sulfur distillate fuel may result in excessive fuel leakage from the fuel oil pumps and fuel injectors.
(2) The potential for seizing of fuel injector pumps due to lower lubrication properties of such fuels.
(3) During switch over, the asphaltenes from residual fuel may be precipitated out by the distillate fuel and result in the clogging of fuel filters.
(4) The change in combustion temperature between residual and distillate fuel can result in differential expansion and consequent fuel line leakage.
(5) Switching from residual fuel with its required high combustion temperature to distillate can result in the vaporization of the fuel, which then becomes unpumpable.
(6) Switching from distillate back to residual fuel at lower temperatures can result in elevated fuel viscosity, threatening injection pump and high pressure fuel failure.

All of the technical problems identified above can result in a loss of power and possibly catastrophic engine room incidents such as fire or explosion, any of which can result in a consequent loss of ship's power and navigation. The potential for a resultant loss of property, life and environmental damage, in this instance is cause alone to refrain from adoption of this proposed regulation. We appreciate that CARB staff has acknowledged that additional work is necessary to address these issues and has also proposed additional studies on the effects of low viscosity fuels on vessel fuel pumps, and on the long term impacts of fuel switching on main engine performance (ES-29).

We believe that the potential for catastrophic environmental, economic and public safety impacts that could result from even one vessel mishap is sufficient reason for the Board to delay approval of this regulation until these proposed studies are completed. We would respectfully request that the Board consider these important safety issues before they proceed with this rulemaking. (PMSA 1)

Agency Response: As discussed in detail in Chapter VI of the ISOR, ship operators can safely switch between heavy fuel oil and distillate fuels – in most cases without any vessel modifications. As noted in the response to comment C-1, even prior to this regulation, most vessel operators occasionally switch to the use of these fuels prior to dry-dock maintenance. We also note that some vessel operators are voluntarily switching to the use of these distillate fuels on a routine basis near California ports. In fact, numerous shipping lines are switching fuel to the use of 0.2% or lower sulfur distillate under the Ports of Los Angeles and Long Beach's Clean Marine Fuel Incentive Program. We also note that the recent amendments to IMO Annex VI provide for the creation of Emission Control Areas that could restrict marine vessels to 0.1% sulfur fuel, the same as the Phase II fuel specified in the regulation. Finally, we note that the same safety concerns were raised during ARB's consideration of the Ship Auxiliary Engine Fuel Regulation. That regulation was implemented, to our knowledge, without any of the incidents mentioned by the commenter. ARB takes safety and health issues very seriously -- in fact, this regulation's purpose is to achieve early reductions in emissions that ARB has demonstrated will save lives and improve human health. But ARB is not aware of evidence that switching fuels as required in the regulation will endanger vessels and their crews and as noted elsewhere, some vessel operators have already been burning cleaner fuels without known problems.

Regarding the commenter's specific technical points, these issues are addressed in chapter VI of the Staff Report. Item #1 relates to excessive leakage from fuel injectors. As noted in the ISOR (see ISOR, p. VI-10), a small number of participants in ARB's Ship survey reported that they may need to modify engine components such as fuel injectors to use the fuel specified in the regulation. However, to our knowledge, this has not been encountered by ship operators currently using the distillate fuel. As noted in the Staff Report (see ISOR, p. VI-7), one such operator reported successfully completing 577 fuel switches on 105 different vessels with various engine models as of early 2008, without vessel modifications. Nevertheless, if a ship operator encounters excessive fuel leakage with a particular engine model's fuel injectors, and the problem cannot be traced to excessive wear or other defects with the existing injectors, then replacement fuel injectors will likely address the issue. If the problem is more extensive and requires extensive vessel modifications, the ship operator can apply for the "essential modifications" exemption under subsection (g) of the proposal. Item #2 relates to the risk of seizing fuel injector pumps due to the lower lubricating properties of the low sulfur distillate fuel. As noted above, ship operators already periodically switch to distillate fuel prior to dry-dock maintenance without incident.

One difference between these fuel switches and fuel switches conducted to comply with the regulation is the fuel sulfur limits specified in the regulation. The ARB conducted a study to determine the lubricity of numerous fuel samples (including very low sulfur fuels) and found no clear trend showing a relationship between fuel sulfur level and lubricity (see ISOR, p. VI-18). As noted above, a major shipping line reported successfully completing 577 fuel switches on 105 different vessels with various engine models as of early 2008, using fuel with an average sulfur content of 0.09% sulfur in 2007. Regarding the risk of fuel incompatibility and precipitation of asphaltenes, there is

always a slight risk of incompatibility when blending fuels, even two heavy fuels. As discussed in the Staff Report (see ISOR, p. VI-11), the risk resulting from compliance with the regulation is low because the distillate and heavy fuels are only briefly in contact during fuel transitions. In addition, the theoretical risk has not translated into real-world problems with the prior ARB Auxiliary Engine Fuel Regulation.

Regarding the commenter's concern that fuel line leakage could result due to the temperature difference between residual and distillate fuel, this would be an issue even in the absence of the regulation since vessel operators switch over to distillate prior to dry-dock maintenance. As discussed in the Staff Report, leaks can be prevented through maintenance, such as replacement of deteriorated seals, gasket materials or o-rings, and tightening of connections as needed (ISOR, p. VI-22). The last two issues (#5 and #6) are problems that can result from improper fuel switching. However, as noted earlier, ship operators already perform periodic fuel switches prior to ship maintenance, or in some cases, for air quality reasons. The safety of fuel transitions is demonstrated by the many vessels that routinely perform them. The potential problems noted by the commenter can be avoided through proper crew training, or through the optional purchase of equipment that vessel owners can use to automatically handle these fuel transitions. (see ISOR, p. VI-4 and VI-5)

D. Ship Modifications

1. **Comment:** The results of the vessel survey are insufficient to anticipate the true impacts resulting from implementation of the regulation. According to the survey completed by staff in Section VI of the ISOR, 22 percent of those responding believed that the regulation would require modifications to their vessels. We believe these results likely underestimate the number of vessels requiring modifications since less than 40 percent of the vessels calling in California in 2006 responded to the survey. We believe that the vessel operators that responded have multiple vessels that call regularly in California and are aware of the regulation and its effects on their operations. In contrast, vessels that call infrequently would have been less likely to respond but may have a greater need to make modifications to their vessels to comply. This would result in a bias of the responses to the survey, and we believe that it is more likely than not that the rate of necessary modifications in the other 60 percent of vessels that did not respond would actually be higher than those captured by the survey.

The survey also likely resulted in an underestimate of the modifications required by the responders. The questions of the modifications required at 24 nm, 50 nm, and 100 nm are misleading in that the transit distance into Los Angeles and Long Beach with a 24 nm boundary would be well over 100 nm of transit distance. This is because a vessel calling in southern California enters and leaves the 24 nm boundary off Point Conception, not 24 nm from the Ports. Further extension to 50 nm would result in the entire transit of a vessel from southern California to the Bay Area and/or the Pacific Northwest as the traffic

lanes along the California coast are within the 50 nm boundary. This additional transit distance is much more likely to result in needed modifications than were reported under the survey as written. This can be readily seen on the map on page III-6, where the vast majority of the vessel transit distance to and from California ports occurs within the 24 nm boundary. Even the brief distances north of Point Conception where the vessel track goes outside of the 24 nm limit are extensive enough to result in the ship switching back to residual fuel.

Further underestimating the potential cost impacts of the regulations is the statement in the ISOR that "modifications (for the fuel system piping and pumps) most likely would have been performed to comply with the Auxiliary Engine Regulation" (VI-10). This statement ignores the vastly greater fuel requirements of the main engines and boilers that would not require modifications of pumps and piping and additional tanks for the distillate fuels far beyond that required for auxiliary engines alone. This statement also ignores the data in the survey itself, which shows that the number one modification required in the responses to the survey reported in Table 19 of the Appendix being the fuel tanks. There is also the issue of matching lube oil to the fuel type that is far more critical for two-stroke main propulsion than for four-stroke auxiliary engines that could require the addition of duplicate lube oil systems to meet engine manufacturer recommendations. Modifications to the lube oil system was the third most reported required modification listed in Table 19, behind fuel pumps and piping.

Clearly, additional work on the needs of vessels calling in California to meet the requirements of the regulation is required. We would respectfully request that the Board find that the current survey results are insufficient bases on which to act and to require additional research before this regulation is acted on. (PMSA 1)

Agency Response: We disagree with the commenter's contention that the survey results are likely to underestimate the number of vessels needing modifications. In fact, for the numerous reasons discussed in the Staff Report (see ISOR, p. VI-10), we believe the survey greatly overestimates the need for modifications. Specifically, a major shipping line is voluntarily using marine distillate fuel in 105 vessel main engines while visiting California ports, and reportedly did not need to modify its vessels. We also note that over half of the vessels reported to require modifications in the survey came from vessels owned by only two shipping lines, and neither could provide follow-up information to confirm that these modifications were essential to comply with the regulation.

We disagree with the commenter's suggestion that the 40 percent response rate to the ARB Ship Survey somehow skews the results toward a lower rate of modifications. The commenter provides no information to indicate that the 40 percent of ship operators that responded are less likely to need modifications than the remaining 60 percent that did not respond.

We also disagree with the commenter's suggestion that the shipping lines misinterpreted the survey questions related to the need for modifications based on the potential offshore boundary. We believe the shipping lines are well aware of the fact that their travel within 24 nautical miles of the coastline can exceed 24 nm. Under the ARB's previous Ship Auxiliary Engine Regulation, the shipping lines regularly travelled over 100 nm within the 24 nautical mile regulatory zone when they visited the ports of Los Angeles and Long Beach (via the most common shipping lanes). They were required to use the cleaner distillate fuel for all travel within this 24 nm offshore boundary.

2. **Comment:** If extended usage of low sulfur fuel is mandated, in addition to any required modification of the main engines, modifications of our ships for increased capacity of MGO tanks would be required. This could involve separation of current heavy fuel tanks and lay out and installation of new piping, vents, sounding pipes and various valves. As indicated in our survey responses, these would be both extensive and expensive modifications. Our ships are engaged in the domestic (Jones Act) trade with frequent CA port calls and often in extended coastwise navigation within 24 nm. Matson supports that position of the Pacific Merchant Shipping Association that the lawful reach of the regulation should not extend beyond the state's 3 nm limits. Imposition of the rule to the 24 nm limit would make it more likely that costly vessel modifications will be required. (MATSON)

Agency Response: We agree that a 24 nm regulatory zone potentially could make it more likely that vessel modifications will be required, compared to a regulatory boundary closer to the California coastline. However, under the regulation, an exemption is provided in subsection (g) for vessels requiring modifications to comply with the regulations. This exemption for "essential modifications" would apply to vessels that need additional tankage for the cleaner distillate fuel because existing available tankage is less than the capacity required for a complete voyage within Regulated California Waters, allowing a vessel with inadequate tankage to limit distillate fuel use to what is possible with its existing tankage.

ARB has authority to regulate beyond 3 nm. For instance, it can exercise its police powers to regulate extraterritorial conduct that causes substantial harm within the state if its regulations do so in a reasonable manner. The regulation here is reasonable in part because it is limited to vessels that are visiting California ports (see ISOR, Appendix B, pgs. B-19 to B-21 and response to comment G-6).

E. Cost Impacts

1. **Comment:** The current record is deficient as it fails to appropriately address significant economic impact issues. We believe the ISOR greatly underestimates the modifications to the vessels and the amount of fuel required transiting along the California Coast needed to comply with the proposed regulation. More

importantly there is an assumption that the fuel necessary to comply will be readily available in the quantities required. Although the fuel survey information in Appendix F shows that fuel of the appropriate quality is available in California it does not address whether or not that fuel is available in sufficient quantity. The same survey also shows that fuel of the appropriate quality will be difficult, if not impossible, to obtain in most ports in Asia. With the incremental cost of compliant fuel already double the cost of residual fuel, and no consideration of the additional premium of the even lower sulfur fuels that will be required in 2012, we believe that the costs of complying with the regulation are significantly underestimated.

While we appreciate the recent addition of the "Essential Modification" exemption to the proposed regulation, we continue to be concerned about the ever increasing "non-compliance fees" provisions of the regulation. Vessels that cannot find compliant fuel, or is sold non-compliant fuel without their knowledge, or is unexpectedly re-directed to California, must pay a fee beginning at $45,500 that increases by $45,500 each subsequent visit until it reaches a maximum of $227,500 on the fifth visit. In theory a vessel that makes ten calls to California would be subject to paying $1,365,000 the first year and $2,275,000 each subsequent year.

Also not considered in the costs is the need of vessels to carry additional lube oil to match the pH and viscosity of the lower sulfur fuels resulting in additional lube oil tanks and plumbing. The actual need for a far greater number of fuel coolers, blenders, and filtration systems, to make a safe and efficient switch from residual fuels to distillates while underway exists on many more vessels than the Oceangoing Ship Survey results indicated.

Therefore, additional consideration of the real costs to retrofit the vessels to comply with this regulation is in order. If the cost of compliance is under-estimated then the cost-effectiveness is overestimated and needs to be adjusted as well. We respectfully request that the Board direct staff to reevaluate their cost-benefit analysis based on these cost factors, especially in addition to the reduced benefits vis-à-vis existing voluntary efforts underway and a future expanded ECA. (PMSA 1)

Agency Response: The Staff Report (see ISOR, Chapter VIII) estimates the costs and resulting economic impacts in great detail. The commenter makes several points questioning this analysis, which we will address below. First, the commenter suggests that we underestimated the amount of cleaner fuel needed to comply with the regulation. However, the commenter does not explain why they believe this, or provide any information to indicate that our estimates are inaccurate. As described in Chapter VIII of the Staff Report, the increase in the use of distillate fuel that would occur as a result of the regulation was derived from the amount of energy consumed by vessels within the 24 nm boundary (from the emissions inventory contained in

Appendix D), the appropriate brake specific fuel consumption figures for the different types of marine engines, and the estimated average auxiliary boiler fuel consumption by vessel type. It should be noted that this is a gross simplification of the analysis, which relied on extensive data regarding individual vessels visiting California, the engine types and power from these vessels, the ports visited, the likely routes through the 24 nm zone to reach these ports, the existing use of distillate (not all vessels use heavy fuel oil), and the effects of the vessel speed reduction program at the Ports of Los Angeles and Long Beach. ARB believes its costs estimates and economic impact analysis are sound and are based on the best information available.

Regarding the commenter's statement that the number of modifications that would be needed under the proposal is underestimated, we believe the reverse is true, as explained in the response to Comment D-1 above. We also note (as mentioned by the commenter) that there is an exemption provided in the proposal for vessels needing "essential modifications" to comply with the regulation. Therefore, vessel operators will not have to incur costs associated with modifications that can be demonstrated to be necessary to comply with the regulation.

The commenter mischaracterizes the analysis of fuel availability contained in Appendix F of the Staff Report. As discussed in more detail in the responses to comments B-1 and B-2 above, the Phase I distillate fuel is widely available, and the Phase II fuel is expected be sufficiently available by 2012. The analysis also determined that the amount of fuel needed to comply with the Phase I fuel requirement in the regulation is unlikely to have a significant impact on worldwide supply or demand for this fuel. For the Phase II fuel, the analysis predicted that the worldwide volume of this fuel would be sufficient to meet the regulation in 2010, although not at certain Asian ports (although this is two years prior to the 2012 implementation of the Phase II fuel, when we expect the fuel to be more widely available).

The commenter is mistaken with respect to the statement that the cost premium for Phase II fuel (above Phase I fuel) was not considered. As shown in Table VIII-6, we estimated the price premium for Phase II fuel as $433 per tonne above standard heavy fuel oil (as compared to $373 per tonne above standard heavy fuel oil for the Phase I fuel). The premium for Phase II fuel over and above the Phase I fuel is thus estimated at $60 per tonne.

Regarding the payment of noncompliance fees, these fees do not apply to the use of the "essential modifications" exemption. However, we note that ship operators must use the cleaner distillate fuel to the maximum extent possible while avoiding the need for vessel modifications (e.g. for some engines or boilers, or for a shorter distance within the 24 nm regulatory zone). For the other situations mentioned by the commenter, noncompliance fees are necessary to prevent ship operators using noncompliant fuel from receiving an unfair economic advantage, and to ensure that ship operators take all necessary steps to avoid noncompliance in the future. We note in Chapter VI (see ISOR p. VI-6) that only six vessel operators paid noncompliance fees associated with the similar ARB Ship Auxiliary Engine Fuel Rule that was in place for approximately

14 months. None of these operators paid the fees more than once, and we believe ship operators would take the necessary steps to avoid the higher fees associated with repeated noncompliance of the same vessels. Finally, under the regulation, the fees will be waived once per vessel during each calendar year from 2012 through 2014 for the Phase II fuel.

We disagree with the commenter's assertion that we underestimated the cost for additional lube oil tanks, coolers, blenders, filtration systems, and other modifications. As discussed in the Staff Report (see ISOR, p. VI-10) we believe the vast majority of vessels will not require modifications to comply with the regulation. In part, this is based on the experience of Maersk, the world's largest shipping line, which has been voluntarily switching to 0.2% sulfur distillate when visiting California ports, and has not found it necessary to make capital investments. Regarding the commenter's specific mention of additional lube oil tanks, we note that the engine manufacturers have indicated that the use of different cylinder lubricants (and the need for tanks for these lubricants) would not be necessary for the relatively short duration of travel within the 24 nm boundary of California (see ISOR, p. VI-12). Finally, we again note that there is an exemption provided in the proposal for vessels needing "essential modifications" to comply with the regulation. Therefore, vessel operators will not have to incur costs associated with modifications that can be demonstrated to be necessary to fully comply with the regulation.

For the reasons above, we believe the costs and cost-effectiveness values are robust estimates based on the best available data. We do not believe revisions to these estimates are needed based on the commenter's suggestions.

F. Miscellaneous Issues

1. **Comment:** The current record is deficient in failing to address the benefits of pending international and U.S. regulations. In the time since the staff began to draft the previous rule and the currently proposed regulations, there has been substantial activity by the International Maritime Organization (IMO) to regulate the emissions from ocean-going vessels under MARPOL Annex VI. The recent proposed amendments are listed in the ISOR on page V-14, but the ISOR does not account for the full benefits of the proposed amendment as they have not been identified or assessed. The most important example of the quickly evolving federal and international situation is that MARPOL Annex VI has been signed into law by President Bush on July 21, 2008, as the "Marine Pollution Prevention Act of 2008" (H.R. 802).

We fully support and expect the Annex VI amendments to go into force on schedule. Our belief is supported by the U.S. Senate's advice and consent to Annex VI in April 2006 as well as the recent passage of the implementing legislation to enforce the provisions of Annex VI by both the House and the Senate and the passage of the implementing legislation by the President. It is

important to note that authority to enforce the pending amendments to Annex VI has been incorporated into the implementing and ratifying legislation, and upon the final ratification by the United States, no additional action at the Congressional level will be necessary. That leaves the process by which the U.S. EPA applies for designation of Environmental Control Areas (ECAs) in the United States as the only federal action necessary to achieve the benefits of Annex VI implementation.

Following the filing of the instruments of ratification of Annex VI, the U.S. EPA will petition IMO for the creation of an ECA that could go into force as soon as March 1, 2010. This is only eight months after the July 1, 2009, implementation date of the proposed regulation.

The ISOR states that the benefits of the proposed regulation exceed the benefits of an ECA. However, the ISOR fails to acknowledge that the jurisdictional limit of the ECA will almost certainly exceed the 24 nautical mile (nm) limit of the proposed regulation. According to the U.S. EPA, in their Advance Notice of Proposed Rulemaking for the "Control of Emissions from New Marine Compression-Ignition Engines at or Above 30 Liters per Cylinder" (December 7, 2007), it is expected that the limit will be determined by a science-based approach to determine the appropriate geographical distance for the ECA. Further indication that the ECA boundary will exceed that of the proposed regulation can be found in the pending federal legislation by Senator Barbara Boxer (Senate Bill 1499) that specified a limit of 200 nm. The ISOR is only able to reach the conclusion that the benefits of the IMO-U.S. EPA efforts would achieve less emission and health based benefits than the proposed regulation only because it fails to evaluate the entire benefits that will occur by extending the ECA beyond the arbitrary 24 nm limit selected by CARB staff.

We request that the Board direct staff to revise the analysis of the benefits of an extended ECA with the goal of assisting U.S. EPA in determining the most appropriate distance to achieve the desired benefits for California and the U.S. (PMSA 1)

Agency Response: The Staff Report clearly addresses the benefits of the revisions to IMO Annex VI (which were pending at the time the report was drafted). As noted by the commenter, the revisions are described on page V-14 of the ISOR. These revisions would provide for the possibility of an Emission Control Area (ECA) off the California coastline that would allow for a 1% fuel sulfur limit starting March 1, 2010, and a 0.1% fuel sulfur limit starting on January 1, 2015. We recognize that the establishment of an ECA with a 0.1% fuel sulfur requirement off the California coastline would likely achieve equivalent emission reductions compared to the regulation, and therefore we included a provision in the regulation that would "sunset" the ARB rule if this occurs.

We also provide data demonstrating that a potential interim 1% sulfur fuel standard under an ECA would achieve far less emission reductions and health benefits. Specifically, the benefits of a 1% sulfur fuel limit are estimated and compared with ARB's regulation in Table V-2, Figure V-1, and Figure V-2 in the ISOR. These benefits were estimated assuming a California ECA is established by March 1, 2010, although we believe that implementation is likely to begin later than this. As discussed in the Staff Report, for vessels currently using heavy fuel oil in their engines, the ARB proposal would achieve an estimated 74 percent emission reduction when implementation begins in 2009, and about 83 percent in 2012, compared to an estimated 30 percent emission reduction from a 1 percent sulfur limit. Even if an ECA is established with a boundary that is farther offshore than the 24 nm limit in the ARB regulation, as suggested by the commenter, the benefits of the 1 percent fuel standard would still not be comparable to the more stringent fuel standards in the regulation.

G. Legal Authority

1. **Comment:** The proposed regulation frustrates the U.S. ability to "speak with one voice." We note that Governor Schwarzenegger, joined by the Governors of Oregon and Washington, recently filed a joint letter to the President of the United States supporting enforcement of IMO MARPOL Annex VI. The letter stated that "….it is imperative that the United States is able to take a strong position in support of strict vessel emission limits at a meeting of the IMO in October 2008. We believe an international regulatory solution is needed to reduce diesel emissions from ships. Implementation of the U.S. proposal by the IMO will reduce emissions of soot and nitrogen dioxide, action that will significantly improve local air quality in our coastal states and will also help to address global climate change…We hope you will seize this unique opportunity in which industry, environmental organizations and regulatory agencies are aligned in moving forward for the common good of the people of the United States." (PMSA 1)

Agency Response: We agree that the regulation of ocean-going vessels is ideally implemented on an international basis. This is why the ARB has supported the ratification of Annex VI by the United States. We also support the recent amendments to Annex VI that would provide for the potential to create an emission control area (ECA) off the West Coast (including California), with a potential requirement to use 0.1% sulfur fuel by January 1, 2015. Recognizing this, the Board directed staff to include a provision in the proposed ARB regulation that would allow for the termination of the requirements if equivalent emission reductions are achieved under an IMO ECA. However, despite recent promising developments that include application by U.S. EPA and Canada to IMO for creation of a North American ECA, the regulation is an important step to meeting air quality standards in California and to protecting the health of California residents. First, it is not certain that IMO will approve the ECA as proposed. Second, even if the ECA is approved, the international standard will fall far short of the

emission reduction benefits provided by the ARB regulation until 2015, as discussed in the response to comment F-1. For a response to the comment regarding the need for the country to speak with one voice, see response to comment G-2.

2. **Comment:** We agree with the sentiments of the ISOR (page ES-26) that "having a patchwork of district regulations…may frustrate the efficient execution of the nation's foreign policy to speak with one voice." However, we disagree that it is an issue limited to any concurrent jurisdiction questions that may arise between CARB and the local air districts. This is our fundamental jurisdictional issue that arises with respect to CARB's attempts to regulate ocean-going vessels without seeking U.S. EPA waivers. To our point, the legal concept of regulatory uniformity and speaking with "one voice" is from the Japan Line case, which was litigated over who had jurisdiction of the containers from ocean carriers calling in California – the concept of "one voice" is how the U.S. Supreme Court established the traditional "foreign commerce clause" test still used today. (PMSA 1)

Agency Response: Congress has clearly chosen *not* to preempt state regulation of marine fuels and in-use operational requirements for vessels. It is up "to Congress ... to evaluate whether the national interest is best served by ... uniformity, or state autonomy." *Barclays BankPLCv. Franchise Tax Bd,* 512 U.S. 298, 331 (1994). "[H]ad Congress, the branch responsible for the regulation of foreign commerce, *see* U.S. Const., Art. I, § 8, cl. 3, considered nationally uniform [regulations] 'essential,' *Japan Line,* 441 U.S., at 448, 99 S.Ct, at 1821, it could have enacted legislation prohibiting the States from" adopting their own regulations. *Barclays Bank,* 512 U.S. at 324. But Congress has not enacted legislation prohibiting states from regulating the fuel used by marine vessels.
On the contrary, the Clean Air Act allows states to regulate fuel for marine vessels. Specifically, U.S. EPA and the courts have interpreted section 209 as allowing states to prescribe in-use requirements, which include sulfur limits on fuel. And, section 211 allows states to regulate fuels for nonroad sources, which includes marine vessels.

Congress recently confirmed its intent not to mandate national uniformity in the area of regulating fuel use by marine vessels when it adopted the Maritime Pollution Prevention Act of 2008. By including section 15 of that Act, Congress chose not to limit anyone else's authority to act in this field: "Authorities, requirements, and remedies of this Act supplement and neither amend nor repeal any other authorities, requirements, or remedies conferred by any other provision of law. Nothing in this Act shall limit, deny, amend, modify, or repeal any other authority, requirement, or remedy available to the United States or any other person, except as expressly provided in this Act."

The regulation does not frustrate or conflict with federal laws or policy, and no representative of the federal government has complained that the regulation is undermining federal efforts to establish an ECA through IMO or with any other federal policy or regulation relating to ship emissions. ARB is acting within the federal-state architecture of the Clean Air Act, which invites states to prescribe in-use requirements

for nonroad mobile sources such as vessels without preemption under Clean Air Act section 209(e). By deciding not to preempt California from applying in-use requirements on vessels, the federal government has in essence already answered this issue and determined that it is not a matter for uniform national regulation.

That said, the regulation is designed to integrate with requirements contained in MARPOL Annex VI for fuel use in ECAs. The regulation's Phase II fuel use requirement of 0.1 percent maximum sulfur content is the same as in Annex VI but would begin three years sooner. The California regulation will cease to be implemented from the time the Executive Officer determines that equivalent requirements are being enforced by the federal government, which could happen as soon as 2015 if the IMO approves U.S. EPA's application for an ECA.

The *Japan Line* case involved California's attempt to impose an ad valorem property tax on shipping containers that were based, registered, and subjected to property tax in Japan and were used exclusively in foreign commerce. (Japan Line, at 434). In that case, the Court held that the California tax on shipping containers, as instrumentalities of foreign commerce, was unconstitutional because such a tax created a substantial risk of multiple taxation by different nations and prevented the federal government from "speaking in one voice when regulating commercial relations with foreign governments." This regulation, unlike the container tax that was overturned in *Japan Line*, falls within the state-federal collaborative framework that Congress enacted with the Clean Air Act. Congress has already "spoken" with "one voice" by establishing and authorizing the process by which states could impose in-use operational requirements on nonroad sources. Notably, the 9th Circuit Court of Appeals has opined that, "while design standards need to be uniform nationwide so that vessels do not confront conflicting requirements in different ports and so that the Coast Guard can promote international consensus on design standards, *there is no corresponding dominant national interest in uniformity in the area of coastal environmental regulations…in fact, the local community is more likely competent than the federal government to tailor environmental regulations to the ecological sensitivities of a particular area.*" (emphasis added). (Chevron, U.S.A. v. Hammond, (9th Cir. 1984) 726 F.2d 483, 492-493))**.**

3. **Comment:** CARB is not a nation and by taking unilateral action it frustrates the ability of the United States to "speak with one voice when regulating commercial relations with foreign governments," a traditional role of the federal government. It is this fundamental conflict of law, where the federal government preempts states from adopting regulations that could adversely affect interstate commerce and foreign trade, that we challenged the previous auxiliary engine regulation. We firmly believe that this regulation also subverts the carefully conceived system to have uniform regulations for all states and could lead to a patchwork of conflicting and confounding regulation. These rules also put California's ports at a competitive disadvantage for cargo growth, jobs growth and the critical investment that is necessary for us to finance the development of some of the cleanest public port authorities in the world. (PMSA 1)

Agency Response: See response to comment G-2 for ARB's response to the concern the regulation usurps the federal government's traditional role. ARB does not believe the regulation will have an adverse impact on California ports or their potential for future growth. This is because ARB does not believe the regulations will result in California ports being at a competitive disadvantage. As discussed in the ISOR (see page VIII-2) ARB believes it is unlikely that vessel operators will consider alternative ports outside California to avoid the requirements of the regulation. This is because, among other things, a significant portion of the goods that come to California are consumed in California, importers and exporters have found that the overall cost of transporting goods to their final destination beyond California is lowest by using California ports due to the ports' existing and well established infrastructure, and the added costs resulting from the regulation are a very small fraction of the overall operating costs for vessels. Furthermore, both the Port of Long Beach and Port of Los Angeles, the two largest ports in the state, have affirmatively supported the regulation.

4. **Comment:** Ironically, by insisting that this regulation is actually an "in-use" requirement and arguing that it is not subject to the U.S. EPA waiver provisions of the Clean Air Act (section 209(e)(2)(B)) the State has possibly jeopardized postponing the ability of other states to adopt this regulation since, if a waiver is ultimately needed, no other state can replicate a California adopted standard until the regulation has been authorized and in place for two years. (PMSA 1)

Agency Response: The fuel use requirements in the regulation clearly constitute "in-use" requirements. As discussed in the Staff Report (see ISOR, p. ES-25), under U.S. EPA implementing regulations for the Clean Air Act section 209(e), direct fuel sulfur limits do not constitute emission standards. Instead, fuel sulfur limits are non-preempted in-use operational requirements, like limits on hours of operation and speed limits. In addition, Clean Air Act section 211 allows states to regulate fuels for nonroad sources, which includes marine vessels. The purpose of the regulation is to improve air quality and public health in California, and other states can separately consider the issue.

5. **Comment:** This regulation is preempted by the Federal Clean Air Act. In 1990, Congress amended the Clean Air Act ("CAA") to authorize the U.S. EPA to adopt emission standards and other requirements related to the control of emissions from nonroad sources. Congress amended Section 209, which pertains to motor vehicle emissions adding Paragraph (e)(1):

> *"No State or any political subdivision thereof shall adopt or attempt to enforce any standard or other requirement relating to the control of emissions from either of the following new nonroad engines or nonroad vehicles subject to regulation under this chapter…."*

The Clean Air Act further defines nonroad engine as "an internal combustion engine (including the fuel system) that is not used in a motor vehicle" (42 U.S.C. section 7550(10))."

Here, the CARB vessel survey for the proposed rule estimated that 22 percent of the vessels calling California ports would have to make modifications to their internal combustion engines, including their fuel systems, in order to comply (ISOR, VI-8). Therefore, it is clear that this regulation is preempted by the Clean Air Act.

PMSA and CARB have both previously commented extensively on case law that make it clear that this proposed regulation is preempted by the Clean Air Act (including *Engine Manufacturers Association v. US EPA*, 88 F.3d 1075 (D.C. Cir. 1996) and *United States v. Locke*, 529 U.S. 89 (2000)). Through its court arguments and legal analysis for the previous regulations the CARB legal staff all but conceded this point, as the rule was specifically not drafted to be a fuel use standard in order to avoid the conclusion that engine and fuel system retrofits may have been necessary.

As such, PMSA respectfully requests that the Board direct staff to fully discuss the current justification for their position that they have the authority to enforce the proposed regulation in light of recent Court decisions and their past analyses. (PMSA 1)

Agency Response: The preemption provision quoted by the commenter applies only to construction equipment and vehicles, farm equipment and vehicles, and locomotives, and is therefore not relevant to the regulation. The preemption provision that is applicable to other nonroad sources, such as marine vessels, is found in Clean Air Act section 209(e)(2), which allows California to obtain authorization from U.S. EPA to adopt and enforce "standards and other requirements relating to the control of emissions" from nonroad engines other than those in construction or farm equipment and in locomotives. According to U.S. EPA regulations that have been upheld by the courts, in-use operational requirements for nonroad engines are not subject to the preemptive effects of section 209(e)(2), and fuel sulfur requirements are one such in-use requirement. We therefore disagree that the regulation is preempted under the federal Clean Air Act.

It is not clear what legal issue the commenter believes ARB conceded during litigation over the previous Auxiliary Engine Fuel Regulation. We disagree with the commenter's assertion that the previous regulation was "specifically not drafted to be a fuel use standard in order to avoid the conclusion that engine and fuel system retrofits may have been necessary." The auxiliary engine rule expressly regulated emission rates. While the primary means of meeting those rates was to use lower-sulfur fuel, the auxiliary engine rule allowed compliance through "alternative control of emissions" strategies for any vessel operator choosing not to use the lower-sulfur fuel. No shipping lines chose to comply by means of the alternative control of emissions strategies, however. Nevertheless, the court found the emission rates to be emissions standards, requiring U.S. EPA authorization under section 209(e)(2)(A). The new regulation, by contrast, expressly and directly regulates the fuel used by marine vessels, and does not contain

any emission rates. Section 211(c)(4) of the Clean Air Act does not preempt states from regulating the fuel used by nonroad sources, such as marine vessels. Moreover, under existing law, it is clear this regulation is an in-use requirement that does not require U.S. EPA authorization under section 209(e)(2).

Although some responders to the ARB's Ship Survey reported the need for vessel modifications, we believe that the vast majority of vessels will not require modifications to comply with the regulation. In addition, there is an exemption provided in the regulation for vessels needing "essential modifications" to comply with the regulation. Therefore, vessel operators will not need to make modifications if they supply the required "Essential Modification Report" and meet the notification timelines provided in subsection (g).

6. **Comment**: This regulation is preempted by the Submerged Lands Act. It is clear that the authority to regulate beyond the state's three mile limit is restricted to the federal government. The state of California lacks authority to impose any regulatory requirements on vessels in territorial and international waters beyond the California three mile limit and under federal law it may not do so without specific Congressional consent. The ISOR assumes that California has the authority to regulate the use of low-sulfur fuel on foreign-flagged vessels in international waters that are involved in international trade with the United States. Not only is the analysis presented in Section V facially flawed in that it assumes that the jurisdictional limit imposed by the IMO will be the same as the regulation, but it also assumes that California has authority beyond the traditional three-mile limit. We have reviewed CARB's legal opinion and respectfully disagree with its assumptions.

The federal Submerged Lands Act preempts CARB's assertion of extraterritorial rights to regulate commerce which is, by definition, exclusively foreign and interstate, since it is extraterritorial conduct. This issue has also been thoroughly briefed with regard to the previous rule. While the rather dismissive statement in the ISOR that "the Court did not reach the Submerged Lands Act issue" (ES-25) is a factual summation of the disposition of our claim, the ISOR legal appendix fails to analyze the Court's statements on the issues at hand. Specifically, the District Court has taken preliminary note of this issue as follows:

> *More importantly, the challenged regulations affect the field of international maritime commerce, which has historically been within the purview of the federal rather than the state government. United States v. Locke, 529 U.S. 89, 108 (2000). In Locke, the Supreme Court observed that maritime commerce is "an area where the federal interest has been manifest since the beginning of our Republic and is now well established." 529 U.S. at 99. Indeed during the debates on the ratification of the Constitution, the Federalist Papers touted the authority of Congress to regulate interstate navigation without intervention from separate states*

that would result in difficulties conducing foreign affairs, as a primary reason for adopting the Constitution. See Federalist Nos. 4, 6, and 22.

It is also obvious to us that staff does not fully believe they have the authority to regulate out to 24 nm since they specifically provided three geographic limits (3 nm, 12 nm, and 24 nm), in the definition of "Regulated California Waters." While severability language is certainly a valid drafting concept to apply to any rule, statute or contract, in this instance its use is contrary to the very stated policy bases for the creation of the fictional jurisdiction that has been labeled "Regulated California Waters." Indeed, because this jurisdiction does not exist in any federal or state statute, we are meant to believe that this definition is based on actual impacts or scientific estimate of public health impacts, but such a distinct analysis is missing. Coincidentally, this fictional definition is built around three internationally recognized limits to national jurisdiction and the previous rule's legal analysis predicted its enforceability on assuming that the term "coastal state" in the International treaties setting national boundaries referred to an individual state of the United States rather than a signatory nation.

Moreover, if the 3 and 12 mile limits are indeed distances that are alternative applicable definitions of "Regulated California Waters" they are alternatives that should be considered by the Board. If it was predetermined that a court may likely rely on the suggestion of the CARB legal staff that 3 or 12 mile limits would be as likely as 24 miles to define the state's jurisdiction, then the Board should also be afforded the same option to consider these alternative limits. Yet, missing from the ISOR, is any assessment of the impacts or benefits of implementing and enforcing the regulation at the 3 nm or the 12 nm distances.

We believe that the Board must be informed of the impacts and benefits of implementing the proposed regulation at those distances in order to reach a fully informed decision on the proposed regulation. If the CARB staff is truly suggesting that there is specific scientific relevance to these mileages, then this is particularly relevant for the Board to consider. In limiting the analysis to 24 nm the Board has no way of evaluating the proportionate costs and benefits of applying this proposed rule nearer to shore and within California ports adjacent to the most impacted communities. In order to reach a fully informed decision on the proposed regulation, PMSA respectfully requests that the Board delay approval until staff has completed a thorough analysis of the impacts and benefits of the proposed regulation limited to 3 nm and 12 nm, consistent with existing federal and international law. (PMSA 1)

Agency Response: The Submerged Lands Act (SLA) does not preempt the regulations. The SLA is a grant of lands to the states; it is not a limitation on states' power. *See Oregon ex rel. State Land Bd. v. Corvallis Sand & Gravel Co.*, 429 U.S. 363, 372 n.4 (1977).

In the litigation over the auxiliary engine rule, neither the District Court or Court of Appeals addressed this issue. The excerpt from the District Court opinion that the commenter quotes does not even relate to the issue of SLA preemption, but was part of the court's discussion as to whether ARB should benefit from a presumption against preemption under the Clean Air Act.

ARB has authority to regulate extraterritorial conduct that causes substantial harm within the state if its regulations do so in a reasonable manner. *Strassheim v. Daily*, 221 U.S. 280, 284-85 (1911); Restatement (Third) of Foreign Relations Law of the United States § 402(1)(c). The regulation is limited to 24 nm, although it is likely that vessel emissions from much farther offshore reach California. The 24 nm limit is a reasonable compromise that minimizes the burden on vessels while still regulating the zone in which much of the emissions that reach California occur.

ARB considered a range of alternatives to the regulation that it adopted. While the Board could have decided to regulate vessel fuel use out to just 3 or 12 nm instead of 24 nm, neither of the narrower zones would have achieved the emissions reductions or resulting air quality improvements and public health benefits of the regulation that was adopted. For that reason, those options were not fully developed as formal alternatives.

Finally, ARB disagrees with the commenter's statement that ARB's legal analysis of the auxiliary engine rule "predic[a]ted its enforceability on assuming that the term 'coastal state' in the International treaties setting national boundaries referred to an individual state of the United States rather than a signatory nation." ARB was aware that the term "coastal states" in the context of international treaties, such as the United Nations Convention on the Law of the Sea, refers to nations, including the United States, and not individual states, such as California.

7. **Comment**: CARB's legal analysis (Appendix B) is deficient and insufficient to support approval of the proposed regulation by the Board. Appendix B of the ISOR begins with the following statement:

> The following is the regulatory authority explanation included in the rulemaking documents for the ocean-going ship auxiliary engine regulation that was adopted by the Air Resources Board in December 2005. We believe the principal legal reasoning in this document also applies to the current regulatory proposal.

We disagree with this because this legal analysis and reasoning was the basis for an argument against preemption that was summarily rejected by a federal District Court and the 9th Circuit Court of Appeals. Also, because of the outcome of that case CARB has completely changed its approach to how to handle the principal of Clean Air Act preemption. As preemption is an entirely legal proposition dependent on the facts of the specific case at hand, a complete analysis should be provided in the ISOR.

Furthermore, this opening statement contradicts staffs own reasoning in other portions of the ISOR. For instance, the Executive Summary (ES-25) states that:

> The Court held that the Auxiliary Engine Regulation was an emission standard because it allowed vessel operators to comply by showing equivalence to the specified low sulfur. To address this holding, we have incorporated into the proposal direct fuel-use requirements for the main and auxiliary engines.

PMSA disagrees with this characterization of the Courts' reasoning on the issue which nowhere states that the previous regulation was a prohibited "standard" because it allowed alternative compliance. The Courts merely held that the provisions for alternative compliance did not save the regulation from preemption, not that the alternative compliance provisions were the reason that the regulation was a standard.

Also, the previous Legal Authority section contradicts this generalized statement as well since "the [previous] proposed regulation would apply *emission limits to the auxiliary engines* on ocean-going vessels" and goes on to say that the vessel operator can choose "*Alternative Compliance Plans…which allows the operator to implement alternative emission control strategies that the operator chooses*" (emphasis added).

Taken together, these inconsistent statements simply fail to describe the underlying reasons for how the Board can assert that the proposed regulation will not be preempted under the Clean Air Act. Simply labeling this a "fuel-use" regulation is not a substitute for such an analysis. It also fails to discuss why only the use of fuel that meets specific sulfur content levels for main engines and boilers, in addition to auxiliary engines, is not preempted. It fails to address the direction by the Court that CARB must apply and be granted a waiver by U.S. EPA, in order to implement the previous regulation.

The regulation is also beyond the scope of California's authority under federal law because it will require substantial retrofits of the fuel tank and piping systems on ships in interstate and international trade as well as significant changes in the ships' fuel purchasing practices at foreign ports, and their internal record-keeping and maintenance practices, procedures and requirements for the engines using the required fuels. This is beyond the scope of the state's police power as analyzed in United States v. Locke.

Even more deficient for rulemaking purposes, because the Legal Authority appendix appears to be a simple "cut and paste" of the previous auxiliary rule, it references provisions that no longer exist in the current rulemaking. That being the case, the Board and general public have not been provided with a current and complete rulemaking package. We would also note, because of this "cut and paste" of the previous legal analysis, that the Board is now relying on legal

arguments about preemption originally written for a rule that applied emissions standards in order to avoid the previous rulemaking being labeled as a fuel only rule – exactly what this rule was drafted to be. In other words, this legal analysis is a justification of a preemption avoidance strategy that not only failed, but now the staff has embraced the very regulatory form that they previously avoided because they believed it was preempted. How can the proposed regulation which will require modifications, which were acknowledged as a basis for preemption in the litigation process, now not be treated as a basis for preemption?

We disagree that the proposed regulation is not preempted by the Clean Air Act for reasons that have been extensively briefed to the Court. We are disappointed that these arguments have not even been acknowledged, much less discussed by staff in this legal analysis. There are other elements of the legal analysis that are equally dated and have been corrected by the Courts and PMSA's briefs that are missing from this discussion as well.

We must insist that CARB clarify their legal authority for this revised "fuel-use" regulation before it is approved by the Board. We would respectfully request the Board to direct staff to write a legal analysis specific to the rulemaking at hand and, at the very least, analyze the opinions of the District Court and Ninth Circuit when reviewing the legal authority under which they are recommending that the Board proceed (PMSA 1)

Agency Response: The Courts found that the auxiliary engine rule set "emission limits." Although virtually all ships complied with the rule by switching fuels, as was ARB's intent in drafting that rule, the court found that the rule was an emission standard and that fuel switching was just one means of compliance. As a result, the Court held that the auxiliary engine rule was subject to the authorization requirements under the Clean Air Act section 209(e)(2).

The current regulation corrects this problem. The regulation expressly and directly regulates fuel use; it does not contain emission limits. Therefore, it is not an emission standard and does not require U.S. EPA approval under Clean Air Act section 209(e)(2). See response to comment G-2.

The commenter mischaracterizes the reasons for ARB including alternative compliance measures in the auxiliary engine ship rule and misconstrues the role these measures played in the court rulings that concluded the rule was an emissions standard that required U.S. EPA authorization under Clean Air Act section 209(e)(2). The alternatives to low-sulfur fuel use that were provided in the earlier regulation were included to provide vessel owners with flexibility in reducing their emissions, not to prevent their being characterized as a fuel use requirement. It is clear that the courts viewed the presence of other compliance methods as a key factor in determining the regulations were emissions standards subject to U.S. EPA approval. For example, the trial court stated in its unpublished opinion that:

> …[T]he regulations do not require the use of these fuels. Subsection (g) of the regulations specifically allows alternative compliance plans. Thus, the regulations require a limitation on emissions in accordance with 13 C.C.R. § 2299.1(e), but give vessel owners various mechanisms to comply with the emissions limitation. Accordingly, the regulations, on their face, impose standards relating to the control of emissions, and thus are preempted by Clean Air Act § 209(e)(2).

Pacific Merchant Shipping Association v. Cackette et al., 2007 WL 2492681 (Eastern Dist. Calif 2007).

In similar fashion, the 9th Circuit Court of Appeals reasoned that the auxiliary engine ship rule was not an in-use requirement because it did not require ships to use a particular kind of fuel:

> The Marine Vessel Rules create a limit on emissions (i.e. emissions must not be greater than what would be emitted using the specified fuels) that is presumed to be met if the specified fuels are used… Indeed, the Marine Vessel Rules do not impose an in-use fuel requirement because no particular fuel is required to be used at all.

Pacific Merchant Shipping Association v. Goldstene (9th Cir. Ct. of App., 2008), 517 F.3d 1108, 1115. For further response to the reasons ARB decided to drop alternative compliance measures from the regulation and make it strictly a fuel use requirement, see response to comment B-6.

Even though the analysis in Appendix B of the ISOR was previously used to support the auxiliary engine ship rule, much of the analysis is germane to the new regulation. Although the new regulation is exclusively a fuel use rule while the auxiliary engine ship rule provided alternative compliance methods, similarities between the former rule and new rule are evident, including the fact that both apply State requirements to vessels within 24 miles of the California coastline that are bound for or departing from California ports. ARB anticipates that if the new regulation is challenged in court, the challenge will raise arguments similar to those directed at the former rule.

For further response on the legal issues, see responses to comments A-1, D-2, G-1, G-2, G-3, G-4, G-5 and G-6 for further discussion of the legal issues alluded to by the commenter.

Finally, we agree with the commenter that this regulation will require vessel operators to make certain changes in fuel purchases and will require them to switch fuels. But the regulation does not require modifications to engines, fuel tankage or other equipment. The regulation provides an exemption to vessels to the extent that full compliance would require essential modifications to the vessel. See response to comments D-1 and D-2.

8. **Comment:** The ARB does not have the authority to go beyond three nautical miles. Recommend keeping regulation within three miles not 24 to keep from tying up regulation. (INTERTANKO)

Agency Response: See response to comment G-6.

H. U.S. Navy Concerns Regarding the Point Mugu Sea Range

1. **Comment:** A new area where the ship channel/emissions issue is gathering attention is a CARB regulatory proposal, to be considered in 2008, creating a mandatory speed reduction regulation in the current Santa Barbara Channel beyond the existing voluntary measure (15 knots out to 20 NM). CARB is considering controlling speed limits of ships while they are within the current shipping routes as a condition of entry to the Ports of Los Angeles/Long Beach. Coupled with the more expensive fuel requirements, we are concerned that this could influence commercial shipping to traverse the Sea Range instead of the Santa Barbara Channel. Under present definitions, traversing the Sea Range would avoid most of the new fuel requirements as well as most of the area covered by the proposed speed reduction regulation. Again, aside from the significant impacts to the military mission this would serve to increase air pollution in SOCAL. (NAVY 1)

Agency Response: ARB believes the commenter's concern that ship operators will traverse through the Point Mugu Sea Range to avoid possible future vessel speed reduction (VSR) measures and the cost of using the cleaner low sulfur distillate fuel required by the OGV Fuel Rule is misplaced. First, the commenter has incorrectly characterized ARB's actions with respect to VSR. There is no ARB regulatory proposal scheduled for consideration at this time, and none was advanced in 2008. As stated in several public documents including the AB32 Early Action Plan, the AB32 Scoping Plan, and the supplemental environmental analysis report circulated with the 30-day Notice for this rulemaking, ARB staff has committed to conduct a technical assessment of the use of VSR to achieve emission reduction benefits in California. The technical assessment will evaluate the emissions and health impacts, timing and geographical range, technical and economic feasibility, and what approaches might be considered such as regulatory or non-regulatory approaches when considering a VSR measure. The technical assessment is expected to be completed in 2009. Second, the economic impact analysis prepared for the OGV Fuel Rule (see ISOR Chapter VIII) clearly shows that the added cost of the fuel is relatively small compared to the overall operating expenses of the vessel and would not result in a significant impact on profitability. For these reasons, and others as outlined in the response to comment H-2, we do not believe ship operators will choose to traverse through the Point Mugu Sea Range.

Nevertheless, as directed by the Board, ARB staff conducted a supplemental environmental analysis to more closely examine the potential adverse environmental impacts that could result from the regulation if shippers use a route (through the Point

Mugu Sea Range. This analysis, "*Supplemental Environmental Analysis of Potential Impacts From Changes in Southern California Vessel Routing as a Result of the ARB Ocean-going Vessel Fuel Rule*," (Supplemental EIR) was released for a 30-day public comment period beginning on February 19, 2009 and ending on March 23, 2009. The analysis evaluated potential environmental impacts that might result from a shift in vessel traffic from the Santa Barbara Channel shipping lanes to a route (avoidance route) further south-west through the Point Mugu Sea Range. ARB analyzed the impact anticipated if 50 percent and 100 percent of all ocean-going vessel traffic that currently pass through the Santa Barbara Channel shifted to an avoidance route to the south-west. The assumed avoidance route use rates of 50 percent and 100 percent represent worst-case scenarios for regulation-caused changes in shipping routes.

For the reasons stated above and in comment H-2, ARB believes actual changes in shipping routes are likely to be negligible. Based on this analysis, ARB estimated that there could be small increases in oxides of nitrogen (NOx), hydrocarbons (HC) and carbon dioxide, (CO2), a greenhouse gas, if the regulation is implemented and causes half of the vessel traffic or all of the vessel traffic in the Santa Barbara Channel to take an avoidance route through the Sea Range. As shown in Table 1 of the Supplemental EIR, the increases for these pollutants were from 2 to 11 percent, depending on the percentage of ships using the avoidance route and the pollutant. However, the rule, even with the adoption of the avoidance route scenarios, would result in large and significant reductions in both PM and SOx. Statewide, the emissions of PM and SOx are reduced significantly by over 40 percent and 50 percent, respectively. Based on air quality modeling presented in the supplemental environmental analysis, the regulation, even with large-scale avoidance strategies, would also result in decreases in 8-hour ozone concentrations, particularly in the highly populated areas around the Ports of Los Angeles and Long Beach, and would also result in significant reductions in PM over most of the South Coast Air Basin (SCAB). These ozone and PM reductions will result in more than 500 premature deaths avoided each year in the South Coast Air Basin (SCAB). ARB determined that the projected increase in local NOx and ozone levels at certain locations that could result from the regulation if wide-spread avoidance routing should occur, as well as increased carbon dioxide emissions that will result from the regulation whether or not vessels use an avoidance strategy, constituted significant adverse environmental impacts from the regulation even though the impact on air quality and carbon dioxide levels are very small in comparison to existing levels and emissions. ARB determined that the substantial benefits of the OGV Fuel Rule on PM emissions, on-shore air quality and public health provide overriding considerations to support the regulation, even if shippers adopt avoidance strategies that ARB believes are not likely to occur.

2. **Comment:** The final way ship traffic speed in the Santa Barbara Channel creates potential encroachment concerns for the Sea Range is the increasing concern for marine mammal safety. Specifically, three blue whale strikes last fall in the Santa Barbara Channel have been attributed to ship strikes due to the heavy use of the ship channel by commercial shipping. Members of the Channel Islands National Marine Sanctuary Advisory Committee have already advocated

reducing speeds in the channel; and, some have advocated moving shipping out of the channel. In light of these ship strikes, the Center for Biological Diversity (CBD) filed a petition under the Endangered Species Act to set a 10 knot speed limit for commercial vessels through Santa Barbara, Ventura and portions of Los Angeles counties.

If all of the precautionary measures mentioned above (the existing voluntary speed reduction, CARB measures, and the CBD petition) became reality, the commercial ship transit from Point Conception to the Ports of Los Angeles/Long Beach would be subject to a 10 knot speed limit for 117 NM. These factors would increase transit times and make traversing the Sea Range, which lies outside the requested speed limit zone, a quicker alternative. The increased traffic could result in a substantial encroachment to military operations.

Based on the information available on the ship channel issue, such as the additional costs of staying in the Santa Barbara Channel, increased fuel costs, and delays due to speed limitations, the clear and rational conclusion for shipping companies is to choose a new course through the Sea Range for arrivals/departures to the Ports of LA/Long Beach. (NAVY 1)

The proposed regulation and future pending programs would adversely impact the Naval sea range. We are concerned that ship operators will avoid this regulation by transiting on the other side of the Channel Islands through the Naval sea range. This will have massive economic impacts on Ventura County as well as impact national offense and defense of allies. The Staff Report did not consider other pending issues related to shipping in the Santa Barbara Channel, including speed reduction and marine mammal issues. Going through the sea range will also add miles and in turn add greenhouse gas emissions. (NAVY 2)

Agency Response: ARB believes that the shippers' use of avoidance routing is entirely speculative and unlikely to materialize. As the commenter states, travel along the avoidance route could be quicker than the Santa Barbara Channel route if speed reduction measures are adopted. However, ARB has identified a number of issues that will discourage the wide scale use of an avoidance route by the shippers and keep vessels in the established Santa Barbara Channel route. These issues include the following:

- safety and liability concerns associated with leaving an established, charted and well-marked shipping channel to use a route through an active test range;
- total fuel costs are only reduced by about 3 percent from using an avoidance route;
- shippers will still need to carry and switch to the cleaner fuel as they enter the OGV Fuel Rule 24 nm zone as they approach the Port of Los Angeles and Port of Long Beach;
- ships would face the uncertainty of possible delays if they must wait for military exercises to be completed;

- since the avoidance route is longer than the channel route, transit on that route will burn more fuel, canceling out at least some of the monetary savings that could be achieved by burning heavy fuel oil longer; and
- because of the longer route, travel will take longer than continued use of the Santa Barbara Channel route if speed reduction measures are not adopted, potentially causing scheduling conflicts at port terminals; even if speed reduction measures are adopted, the longer route will tend to reduce the time, and fuel cost incentives for using the avoidance route

If vessel speed limitations are eventually implemented in the Santa Barbara Channel, slower speeds would result in reduced fuel costs, even considering the higher cost of the distillate fuel required by the regulation, due to the cubic relationship between vessel speed and fuel consumption. For example, a 20 percent decrease in speed results in approximately 50 percent reduction in fuel consumption. A 50 percent decrease in speed, as would occur if vessel speed limitations required speed reductions from 20 knots to 10 knots, would reduce fuel consumption by more than 80 percent. Even in light of the higher cost of distillate fuel that will be required in the regulated zone (about 2 times higher than heavy fuel oil), the total fuel cost would be lower for a Santa Barbara Channel route under a scenario where both the Vessel Fuel Rule and Vessel Speed Reductions are in place due to the much lower fuel consumption at the reduced speed.

In short, ARB disagrees that this regulation, in combination with possible future speed reduction measures, will have the adverse economic impact on Ventura County or national defense that the commenter warns of. While the U.S. Navy reports that a small number of shippers have approached it to discuss the possibility of transiting through the Sea Range, those shippers have worked in a cooperative manner and abided by the U.S. Navy's recommendations.

Although ARB does not believe that there will be any disruption to the Point Mugu Sea Range as a result of this regulation, ARB is committed to working with the Maritime Industry, U.S. Navy, Ocean Protection Council and others to monitor traffic patterns and to take other actions, if necessary, to help ensure that the implementation of this regulation does not interfere with U.S. Navy operations at the Point Mugu Sea Range.

To address the U. S. Navy's concern that the Staff Report did not consider possible adverse impacts resulting from a regulation-induced shift of shipping out of the Santa Barbara Channel, the Board ordered preparation of a supplemental environmental analysis. The supplemental environmental analysis was included as Attachment 4 to the Notice of Public Availability of Modified Text and Availability of Additional Documents which was posted February 19, 2009. The analysis addressed the combined impacts of this regulation and possible vessel speed reduction measures. It also evaluated the impact of avoidance routes through the Sea Range on greenhouse gas emissions and marine mammals. See response to comment H-1 for further discussion of the analysis' conclusions.

3. **Comment:** The Navy formally requests that CARB consider and respond to the comments already made on the adverse impacts (a NOx increase of at least 5 tons per day) that the extra distance and potentially higher ship speeds could have on SOCAL air quality and impacts to the military mission. Since the CARB report, the voluntary speed reduction measure has been implemented changing the baseline. Furthermore, if shipping companies move the route to avoid further regulation in the Santa Barbara Channel they could increase speeds through the Sea Range to make up lost time. The 5 ton per day increase did not assume any speed increases. The commenter requests to work with CARB to consider this issue in upcoming regulatory development relating to fuel standards and vessel speed reduction in California coastal waters. (NAVY 1)

Agency Response: See response to comment H-1 for a description of ARB's supplemental environmental analysis prepared to consider the impacts of avoidance route scenarios on the air quality in the South Coast Air Basin. The analysis included evaluating the impacts of the longer length of and potentially higher vessel speeds in the avoidance route compared to the Santa Barbara Channel route. This analysis was included as Attachment 4 in the "Notice of Public Availability of Modified Text and Availability of Additional Documents" for the OGV Fuel Rule that was released for a 30-day public comment period beginning on February 19, 2009 and ending on March 23, 2009. As discussed in comment H-2, due to the many issues that will impede adoption of avoidance routes by shippers, ARB does not believe there will be a substantial shift in vessel traffic to routes through the Sea Range, even if a vessel speed reduction measure is adopted in the future. As also discussed in comment H-2, although ARB does not believe that there will be any disruption to the Point Mugu Sea Range as a result of this regulation, ARB is committed to working with the Maritime Industry, U.S. Navy, Ocean Protection Council and others to monitor traffic patterns and to take other actions, if necessary, to help ensure that the implementation of this regulation does not interfere with U.S. Navy operations at the Point Mugu Sea range.

ARB does not understand the portion of the comment that notes "Since the CARB report, the voluntary speed reduction measure has been implemented changing the baseline." The baseline includes port-sponsored voluntary speed reduction programs that were in place in during baseline year, 2005. Any speed reduction programs that may have been implemented after the baseline year were not included in the baseline analysis.

4. **Comment:** At the appropriate time, ask that the California Ocean Protection Council convene a stakeholder group to consider options to commercial shipping in the Santa Barbara Channel that would improve air quality, protect marine mammal resources and fully protect the Sea Range. (NAVY 1)

Agency Response: ARB agreed with the commenter that it was appropriate for the Ocean Protection Council to convene a stakeholder group to help address the U.S. Navy's concerns. As reflected in Resolution 08-35, the Board directed the Executive Officer to work with the United States Navy, the California Ocean Protection

Council, and other stakeholders to address the Navy's concerns regarding the impacts of commercial shipping, environmental initiatives and coastal management activities on the operation of the Point Mugu Sea Range. ARB staff contacted the Ocean Protection Council and, on November 17, 2008, the OPC convened a group of key stakeholders to discuss issues pertaining to the Point Mugu Sea Range, whale strikes, and vessel traffic in the Santa Barbara Channel. At the meeting were representatives from Environmental Defense Center, California Air Resources Board, National Marine Fisheries Service, United States Coast Guard, National Oceanic and Atmospheric Administration Channel Islands National Marine Sanctuary, United States Navy, Center for Biological Diversity, Marine Exchange of Southern California, Pacific Merchant Shipping Association, the Port of Los Angeles and the Port of Long Beach. This was an initial exploratory meeting and the OPC is continuing to consult with stakeholders.

IV. SUMMARY OF PUBLIC COMMENTS AND AGENCY RESPONSES – NOTICE OF MODIFIED TEXT

Five written responses were received in response to the 30-day Notice of modifications to the proposed regulation. Many of the comments received did not specifically address the proposed modifications. ARB decided it would nonetheless respond to these comments. A summary of all the comments received during the supplemental comment period, and ARB's responses, are provided below.

Comments Received during the 30-day Comment Period

Abbreviation	Reference Number	Commenter
COSBC	COSBC	Captain Stephen Brown President Chamber of Shipping of British Columbia Written Testimony: March 11, 2009
INTERTANKO	INTERTANKO	Joseph Angelo Deputy Managing Director International Association of Independent Tanker Operators Written Testimony: March 23, 2009
ISAC	ISAC	Kaity Arsoniadis-Stein LLB, LLM President and Secretary-General International Ship-Owners Alliance of Canada Written Testimony: March 23, 2009
NAVY	NAVY	C.L. Stathos Department of the Navy Commander Navy Region Southwest Written Testimony: March 19, 2009
PMSA	PMSA	John McLaurin President Pacific Merchant Shipping Association Written Testimony: March 23, 2009
MAERSK	MAERSK	B. Lee Kindberg Director, Environment Maersk Incorporated Written Testimony: March 23, 2009

1. **Comment:** There are operational and safety concerns related to the requirement to burn marine diesel oil or marine gas oil in auxiliary boilers effective July 1, 2009. The question of auxiliary boiler essential modifications is rather more complex in large tankers. Our members are in communication with auxiliary boiler specialists. However, as yet no engineering specification of modifications has been concluded. Marine diesel and gas oil operations for auxiliary boilers represent a significant safety issue, especially with respect to the potential for furnace explosions. Even while using fuel oil, a number of instances of ignition and boiler explosions have been recorded, the risk of same increasing if this category of vessel is legislated to use marine diesel oil or gas oil ahead of technical design solutions and essential modifications. We are appreciative that an exemption from the regulation is possible under subsection (g) for vessel operators based on the need for "essential modifications" as defined in the regulation. It is understood that this would apply only to the auxiliary boiler requiring modifications and that an "Essential Modification Report" would need to be submitted to ARB at least 45 days prior to a vessel's first reliance on this subsection. We further understand that there may be rule changes to provide flexibility in the notification requirements under subsection (g)(2) for cases where a vessel will be visiting California less than 45 days after the effective date of the regulation. Unfortunately, practical operating conditions will render a lead time of 45 days prior to a California port call difficult, if not impossible to predict. We would therefore suggest that a more reasonable notice period of 15 days could be regulated for first and subsequent calls to allow submission of the "Essential Modification Report" without compromising the objectives of this provision. (COSBC)

Agency Response: The comments related to safety and operational concerns associated with the use of the distillate fuels in auxiliary boilers do not directly relate to the proposed regulatory modifications provided with the 30-day Notice, but ARB will briefly respond. As discussed in the Staff Report (pgs. VI-12 to VI-14), most vessel operators will be able to use the specified distillate fuels in their auxiliary boilers without any significant issues. We also recognize that some of the larger boilers on older tankers may require modifications to regularly use distillate fuels. As the commenter pointed out, for situations where the need for modifications is substantiated, we provide an "essential modifications" exemption in the proposed regulation. This exemption would allow a ship operator to continue to use heavy fuel oil in the subject boiler, if the operator demonstrates the need for the exemption through an "Essential Modification Report," and provides the necessary notification to ARB prior to a visit.

With regard to the requirement that the ship operator must provide an "Essential Modification Report" at least 45 days prior to entry to Regulated California Waters, the commenter is correct that we have provided additional flexibility for cases where a vessel will visit less than 45 days after the effective date of the regulation. Specifically, for these situations, we allow submittal of the report *at the earliest practicable date prior to entry into Regulated California Waters*. For situations where the vessel is visiting more than 45 days after the effective date of the regulation, the 45 day requirement will

apply. We believe 45 days are necessary under normal circumstances to allow time for ARB staff to thoroughly review the technical information provided in the reports to ensure that there is adequate documentation to substantiate the exemption. Past experience with the implementation of similar programs indicates that follow-up information is often necessary to fully evaluate such claims. Vessel operators planning to use the exemption to comply when visiting California ports at some point in the future can submit their reports as soon as the regulation becomes legally effective or well in advance of their expected port visit. This way, after the vessel operator receives approval for its report, the operator will simply need to notify the ARB prior to entry into Regulated California Waters (not 45 days prior to the visit). The regulation also provides the option for some vessels operators to comply with the regulation via the noncompliance fee provision in subsection (h). Under this subsection, the ship operator can pay a noncompliance fee in lieu of direct compliance is certain situations. For example, under this subsection, there is a provision for infrequent visitors to California ports that would require ship modifications to use the cleaner fuel. These ship operators could pay a noncompliance fee and avoid the 45 day review process under subsection (g).

2. **Comment**: The main engines of commercial ships have been designed to utilize marine residual fuel oil with a kinematic viscosity up to 700 centistokes (cSt) at 50 Celsius degrees, and marine diesel oil meeting the specifications of ISO 8217, DMB grade. The DMB grade marine diesel oil is defined as distillate fuel with a maximum viscosity of 11.5 cSt and without minimum limit. Those marine diesel oils can be used, at least theoretically, without problem to the engine and relevant procedures have been identified by engine makers. However, the supply of MDO with a sulfur content less than 0.5% is a serious impediment to ensuring compliance for this fuel type. The alternative given in the CARB regulation is to use MGO (ISO 8217, DMA grade) of less than 1.5% sulfur content. The specification of the marine gas oil indicates that the maximum viscosity is 6.0 cSt and the minimum is1.5 cSt at 40 degrees Celsius. However, direct experience indicates that most of the MGO bunkered by ships worldwide is between 2.5 to 3.5 cSt at 40 Celsius, or even less. An increase in temperature reduces MGO viscosity which, in turn, lowers the lubricating properties of the oil. This is detrimental to the fuel pumps, which rely on the oil as their source of lubrication for the gear scrolls and is compounded by the fact that the lower sulfur content of the MGO also reduces the lubricating properties of the fuel. The fuel pumps of the main engine have been designed to run when the marine fuel in use is not less than 2 cSt in order to avoid any seizure between plunger and barrel and further failure of the pumps. However, the kinematic viscosity will obviously be lower as the ambient temperature of the environment on which they are supplied to the main engine is higher (around 80 Celsius). The use of MGO/DMA grade fuel would require consideration of alternative measures, such as: (1) segregating the fuel piping system (dual fuel); (2) extra insulating of the piping; (3) cooling the MGO down to appropriate temperature to maintain at least 2 cSt; and (4) change to suitable pumping and transferring MGO system. All these issues have feasible technical solutions but require significant

modifications in the engine room. They are time consuming activities and raise the question on whether the new equipment which might be required would be available and installed by July 1st, 2009. (INTERTANKO)

Agency Response: The comment does not directly relate to the proposed regulatory modifications provided with the 30-day Notice, but ARB will briefly respond. In addition, we addressed similar comments submitted during the 45-day comment period (see responses to comments C-1 and C-2 under "Technical and Safety Issues"). As discussed in the Staff Report (Chapter VI), both marine gas oil and marine diesel oil (DMA and DMB grade fuels) can be used in ocean-going vessel main engines, despite the lower viscosity of these fuels. This is demonstrated by the many vessels that routinely switch from heavy fuel oil to distillate fuels in their main engines during California port visits. A.P. Moller-Maersk Group, a major container ship operator, has a Pilot Fuel Switch West Coast Initiative (Maersk Pilot Program) where they are voluntarily using low (0.2% maximum) sulfur marine gas oil in their main engines within 24 nm of port. The Maersk Pilot Program began in March 31, 2006 and as of April 2008, included 577 fuel switches. The participating vessels have a variety of main engines manufactured by both MAN Diesel and Wärtsilä/Sulzer. In 2006, Maersk reported an average MGO fuel sulfur level of 0.17% for all participating visits in both the main and auxiliary engines. In 2007, the average MGO fuel sulfur level was 0.09%. Other operators are also now switching fuels under the Port of Los Angeles and Port of Long Beach's Clean Marine Fuel Incentive Program, which reimburses ship operators with the difference between the prices of standard heavy fuel oil and 0.2% or lower sulfur distillate fuel for use within a region as far as 40 nautical miles from the ports. We also note that the recent amendments to IMO Annex VI provide for the creation of Emission Control Areas that could restrict marine vessels to 0.1% sulfur fuel, the same as the Phase II fuel specified in the proposed regulation for mandatory use beginning in 2012. The parties that negotiated the amendments to this international treaty reached the same conclusion as ARB staff -- that the use of this fuel is feasible in marine engines.

Regarding the commenter's suggestion that significant modifications would be needed to use the lower sulfur distillate fuel, this has not been the case for almost all vessel operators currently using these fuels. However, for the limited situations where the need for modifications can be substantiated, we provide an "essential modifications" exemption in the proposed regulation. This exemption would allow a ship operator to continue to use heavy fuel oil in their main engine if the operator demonstrates the need for the exemption through an "Essential Modification Report," and provides the necessary notification to ARB prior to its first visit.

3. **Comment**: Regarding auxiliary boilers, the most serious safety concern associated with the requirement to switch from HFO to MGO fuel is the increased risk of furnace explosions in the event of flame failure. The increased risk results from two factors: 1) the temperatures created in the furnace during operation; and 2) the properties of MGO. Ships do use MGO for cold flashing of the boilers, which is an acceptable practice as the furnace temperatures are much lower and

therefore the risks associated with generating fuel vapors and igniting them is much less. After the initial flashing with MGO, the boilers are fed with HFO. Although, given time, HFO will also vaporize, the heavier fractions within it mean that the process will take much longer. In addition, the auto ignition temperature of HFO is higher than that of MGO, meaning that the risk of explosion is much reduced. Approaching the 24 nautical mile limit from the California Baseline, ships will be required to comply with this regulation by switching from HFO back to a much more volatile MGO. The combination of MGO atomization through the burner nozzle and the heat energy residing within the furnace tubes and refractory materials would cause the fuel to vaporize. This vaporization can lead to a highly explosive vapor being present in the furnace. This can then be ignited from hot spots within the furnace, tubes and refractory material, by small smoldering ash on the furnace floor or through incorrect operation of the boiler. That any of these may produce an explosion has long been recognized. (The UK MCA "M" notice M.1083, reprinted in part of the MCA's Marine Information Note accompanying the introduction of this Directive, MIN 258, states that "When using distillate fuels in burners designed for use mainly with heavier fuels these dangers are increased and in those conditions steam atomization should not be used.") Manufacturers recommend a number of modifications needed to minimize the risk when complying with requirements to switch from HFO to MGO in boilers. Modifications are required beyond the fuel system (e.g. pumps, steam atomizing systems, purging sequence, flame supervision, software adjustments, etc.). All these modifications require time. Many ships calling at California may not be ready to have all these modifications in place by July 1, 2009. (INTERTANKO)

Agency Response: The comment does not directly relate to the proposed regulatory modifications provided with the 30-day Notice, but ARB will briefly respond. As discussed in the Staff Report (see ISOR pgs. VI-12 to VI-14), most vessel operators will be able to use the specified distillate fuels in their auxiliary boilers without any modifications. This is based on discussions with boiler manufacturers and ship operators. In fact, the largest manufacturer of marine auxiliary boilers noted that their boilers manufactured after 1994 automatically adjust their burners for maximum efficiency without manual inputs when the fuel is switched to distillate. For the limited situations where the need for modifications is substantiated, we provide an "essential modifications" exemption in the proposed regulation. This exemption would allow a ship operator to continue to use heavy fuel oil in a boiler needing physical modifications to safely burn distillate fuel, if the operator demonstrates the need for the exemption through an "Essential Modification Report," and provides the necessary notification to ARB prior to a visit.

4. **Comment**: During normal operation of the boiler outside of the CARB area, the boiler burner will be adjusted to burn HFO. Changing the boiler to operate on MGO will affect the flame length by making it shorter as the MGO will burn faster unless the burner is adjusted at each changeover. The effect of reducing the flame length is to reduce the surface area of the flame and therefore its radiant

heat. For boilers operating towards their maximum firing rate such as would be the case for vessels which discharge cargo by steam turbine driven pumps, this will limit their ability to operate cargo oil pumps at the maximum rate and therefore slowdown the discharge. The required adjustment of the burner is not a simple procedure as it is an iterative process and can take some time to achieve good combustion of the new fuel. (INTERTANKO)

Agency Response: The comment does not directly relate to the proposed regulatory modifications provided with the 30-day Notice, but ARB will briefly respond. Based on discussions with boiler manufacturers, we agree that boiler burners will need to be adjusted to achieve maximum efficiency when switching from heavy fuel oil to distillate fuel. As reported in the Staff Report (see ISOR p. VI-13), older models may require manual adjustment, while new models can automatically adjust without manual inputs. A leading boiler manufacturer, Aalborg Industries, reported that 1994 and newer models automatically adjust the flame for the fuel type. The substantial emissions reductions achieved by using distillate fuel justify the effort in making the necessary burner adjustments.

5. **Comment:** We are concerned with the current approach of the proposed rule on the availability of marine distillates in the market. It is hard to understand the logic of imposing by rule significant noncompliance fees on ships which have to demonstrate that they genuinely did not manage to find compliant fuel on the market. But more worrying is that the proposed rule does not even guarantee supply of compliant fuel on California ports. The lack of such a provision may lead to unacceptable situations on which ships will be considered "noncompliant" because they cannot find the compliant fuel in California. As an example, a ship may arrive at California with compliant fuel but she would not have sufficient MGO to leave. In case there is no supply of MGO or low sulfur MDO in the Californian port, the rule would still consider the ship "noncompliant" and it will impose a financial penalty. Our concern is not without substance. A ship had recently called to California and the crew has investigated the possibility of bunkering MGO and MDO from a local supplier. The supplier replied that he will be able to supply MGO only (not MDO) after four days. It is our view that California should have shown leadership and, through regulatory provisions should be prepared to support the proposed regulation in practical terms. We hope that our comments are seriously considered by CARB and modifications are made to mandate compliant fuel supply at any time. Supply of proper fuel is the key element that would provide ships the ability to meet the proposed regulations. The consequences of poor and uncertain supply of compliant fuel worldwide would mean that ships, particularly tramp shipping such as tankers would need to seek supply in different ports and keep MGO onboard in case they would be required to arrive to California. This may require modifications for a larger and diversified fuel storage system. These modifications also take time. (INTERTANKO)

Agency Response: The comment does not directly relate to the proposed regulatory modifications provided with the 30-day Notice, but ARB will briefly respond. We addressed similar comments submitted during the 45-day comment period (see responses to the 45-day comments under section B above, "Fuel Requirements"). ARB conducted an extensive analysis of the availability of fuels worldwide to ensure that compliant fuel was available in ports where ocean-going vessel typically fuel prior to coming to California. As discussed in detail the Staff Report (see ISOR Appendix F), there is a sufficient worldwide supply of low sulfur marine distillate fuel meeting the Phase I fuel specifications and this fuel is available at key fueling ports servicing California-bound vessels. In California ports (Los Angeles and San Francisco), it was found that Phase I and Phase II low sulfur distillate fuel availability is not an issue and is currently available in adequate supply (see ISOR, Appendix F).

We also note that this same fuel was required under the ARB's ship auxiliary engine regulation, and there were not significant supply issues. Specifically, there were only three vessel operators that met the regulatory requirements over the 14 months the regulation was in place by paying "noncompliance" fees because they were unable to find complying fuel (see ISOR, Chapter VI, Table VI-1). While the analysis concluded that there is not currently sufficient supply of the Phase II (0.1% sulfur) fuel at key Pacific ports, availability should improve by 2012, when this fuel would first be required, due to an on-going trend by refineries to produce additional supply of lower sulfur distillate fuels. Refineries will also be preparing for the revised IMO Annex VI amendments which will require 0.1% sulfur fuel as early as 2015 in ECAs worldwide. For the rare cases where a ship operator is unable to source the complying fuel, the proposed regulation contains provisions to allow the ship operator to comply with the regulation by alternative means. Specifically, the "noncompliance fee provision" allows ship operators to pay a fee in lieu of using the cleaner fuel under certain circumstances. This fee is appropriate to ensure that the ship operator will not receive an unfair competitive advantage over other ship operators that incur the added costs of purchasing the lower sulfur distillate fuels. We also note that there is a provision that waives the fee once per vessel during each calendar year for the Phase II fuel requirement that begins in 2012.

6. **Comment**: We wish to highlight our concern regarding safety and the fact that there is a lack of operational expertise for operating auxiliary boilers on MDO/MGO for long periods of time. (ISAC)

Agency Response: The comment does not directly relate to the proposed regulatory modifications provided with the 30-day Notice, but ARB will briefly respond. As discussed in the Staff Report (see ISOR, Chapter VI, pgs. VI-12 to VI-14), most auxiliary boilers can be safely operated on distillate fuel without any modifications, or time limitations. Some shipping lines reported using distillate fuels at all times in some of their boilers to reduce maintenance associated with fouling caused by heavy fuel oil. For the limited situations where the need for modifications is substantiated, we provide an "essential modifications" exemption in the proposed regulation.

7. **Comment**: We have been advised that for main and auxiliary engines, low sulfur distillate fuel will most certainly cause problems with pump failures, seizures and other wear related issues, thus creating serious navigational and safety issues if vessels lose power or propulsion in confined waters near the port. The comments submitted by INTERTANKO clearly set out the technical challenges. (ISAC)

Agency Response: The comment does not directly relate to the proposed regulatory modifications provided with the 30-day Notice, but ARB will briefly respond. As discussed in the response to comment #2 above, and in detail in the Staff Report (ISOR, Chapter VI), low sulfur distillate fuels can be used in main and auxiliary engines subject to certain precautions. In addition, during the implementation of the ARB's Ship Auxiliary Engine Fuel Rule (which as in place for about 14 months), these fuels were used successfully by the shipping lines.

8. **Comment:** The request to use MGO/DMA grade fuel is possible, but there are significant engine modifications required making it challenging to have all vessels compliant by July 1st, 2009. (ISAC)

Agency Response: The comment does not directly relate to the proposed regulatory modifications provided with the 30-day Notice, but ARB will briefly respond. As discussed in the Staff Report (ISOR, Chapter VI), most engines can be safely operated on distillate fuel without any modifications. For the limited situations where the need for modifications is substantiated, we provide an "essential modifications" exemption in the proposed regulation. Vessel operators granted this exemption will not have to use the distillate fuel.

9. **Comment**: We are aware that suppliers are unable to provide MDO in a timely manner. (ISAC)

Agency Response: The comment does not directly relate to the proposed regulatory modifications provided with the 30-day Notice, but ARB will respond. Ship operators can use either MGO or MDO fuels. For the initial Phase I standards, MDO up to 0.5% sulfur, or MGO up to 1.5% sulfur can be used. For cases where MDO is above the 0.5% sulfur limit, MGO can be used. As discussed in detail the Staff Report (see ISOR Appendix F), there is a sufficient worldwide supply of low sulfur marine distillate fuel meeting the Phase I fuel specifications and this fuel is available at key fueling ports servicing California-bound vessels. See also the response to comment #5 above.

10. **Comment**: We conclude that these regulations contain most of the same fundamental problems concerning the state's authority to regulate the activities of vessels, both U.S.-flagged and foreign-flagged, in and outside of California's territorial waters. Specifically, the current proposed regulation should not be adopted as it is inconsistent with, and contradictory to, existing statues, court decisions and other provisions of law, it exceeds the rulemaking authority of the Board, and in light of the totality of the record, it demonstrates that the current

record is inadequate in terms of technical, safety, and legal issues and has not taken into account supporting evidence that would fairly detract from the agency's current conclusions. These concerns were the basis of our previous challenge to the "Ocean-Going Vessel Auxiliary Diesel Engine Regulation" that was approved by the CARB Board in December 2005. (PMSA)

Agency Response: The comment does not directly relate to the proposed regulatory modifications provided with the 30-day Notice, but ARB will briefly respond. ARB has already responded to the commenter's assertions that the State lacks authority for the regulation, that the regulation conflicts with federal law and court decisions, that the regulation is unconstitutional and that there are unresolved technical, safety, and legal issues with the regulation. See the preceding responses, especially comments G-1 through G-7 for our response to the commenter's legal objections and PMSA comments in sections A, B, C, D, E and F for our response to the commenter's technical, safety, procedural and other concerns. As explained in response to comment A-1, ARB has endeavored to work cooperatively with the shipping industry in developing these regulations and is appreciative for the considerable cooperation it has received in the form of survey responses, other information, and suggested changes. We have given comments from PMSA careful consideration and response, but in the end ARB does not agree with the commenter's interpretation of the law or its view that ARB can achieve the regulation's purpose through non-regulatory programs and by waiting for possible international fuel use requirements

11. **Comment:** On August 30, 2007, the United States District Court for the Eastern District of California (see *PMSA v. Goldstene*, Case NO. 206-cv-0279) ruled that the regulation was preempted by the Federal Clean Air Act (CAA§ 209(e)(2)(A)) and permanently enjoined CARB from enforcing the regulation until they received a waiver from U.S. EPA for the implementation of the standard. That decision was subsequently upheld by the United States Court of Appeals for the Ninth Circuit on February 27, 2008. To our knowledge, staff has yet to apply for the waiver from U.S. EPA. (PMSA)

Agency Response: The comment does not directly relate to the proposed regulatory modifications provided with the 30-day Notice, but ARB will briefly respond. ARB has not applied for U.S. EPA authorization for the auxiliary engine ship rule because ARB has not enforced that rule since the Appellate Court affirmed the District Court's opinion in 2008. As explained in the ISOR, the new regulation establishes low-sulfur fuel use requirements for auxiliary engines in ocean-going vessels (in addition to similar requirement for the vessels' main engines and boilers), and is consequently intended to replace the auxiliary engine ship rule that was the subject of the court opinions cited by the commenter. The new regulation is not preempted by the Clean Air Act and is not subject to the authorization requirement in section 209(e)(2).

12. **Comment:** Another cause of action that was briefed, but not adjudicated in the *Goldstene* case, was the authority of CARB to regulate beyond three miles from the California baseline. This proposed regulation attempts to regulate

extraterritorially, just as the Auxiliary Diesel Engine regulation did and PMSA continues to believe that CARB is preempted under the Submerged Lands Act from such action. While the ISOR for this proposed regulation notes that "the Court did not reach the Submerged Lands Act issue" (ES-25), the question of under what authority the state is allowed to regulate vessels beyond its territorial waters are also at issue in the current proposed regulations. We feel that it is important for the Board to consider that, while the District Court did not make a ruling on the merits of the Submerged Lands Act cause of action, it did make the following comments on the attempt of the Board to regulate international and foreign maritime commerce generally: *More importantly, the challenged regulations affect the field of international maritime commerce, which has historically been within the purview of the federal rather than the state government. United States V. Locke, 529 U.S. 89, 108 (2000). In Locke, the Supreme Court observed that maritime commerce is "an area where the federal interest has been manifest since the beginning of our Republic and is now well established." 529 U.S. at 99. Indeed, during the debates on the ratification of the Constitution, the Federalist Papers touted the authority of Congress to regulate interstate navigation without intervention from separate states that would result in difficulties conducting foreign affairs, as a primary reason for adopting the Constitution. See Federalist Nos. 4, 6, and 22. (*PMSA)

Agency Response: The comment does not directly relate to the proposed regulatory modifications provided with the 30-day Notice, but ARB will briefly respond. See response to comment G-6, part of which responds to the commenter's earlier comment regarding the Submerged Lands Act and the quoted language from the District Court opinion.

13. Comment: The current record is deficient in failing to address the benefits of pending international and U.S. regulations. The Initial Statement of Reasons (ISOR) that was the basis of the CARB Board approval on July 24, 2008 noted that "there was much uncertainty with respect to the possibility of implementing an ECA in the U.S." Fortunately, most of that uncertainty has been resolved. On July 21, 2008, the Maritime Pollution Protection Act of 2008 was signed into law by the President. That federal law enabled the United States to deposit the U.S. Instrument of Ratification for the International Convention for the Prevention of Pollution from Ships (MARPOL) to the International Maritime Organization (IMO) on October 6, 2008. As a result the United States is now a signatory to the treaty that includes Annex VI to reduce emission from vessels. On October 9, 2008, the Marine Environmental Protection Committee adopted the sweeping amendments that empower the United States to designate an Emission Control Area (ECA). The U.S. EPA, in coordination with Environment Canada, is preparing an application to the IMO for the creation of an ECA, under the provisions of MARPOL Annex VI. The ECA will include the east, west, and gulf coasts, and the Great Lakes for the U.S. and Canada. It is expected that the application will be submitted in time for consideration by the Marine Pollution Protection Committee (MEPC) in July of this year. The final piece will be for U.S.

EPA to complete the regulation of "Control of Emissions from New Marine Compression-Ignition Engines at or Above 30 Liters per Cylinder," that will incorporate the enforceable requirements of the ECA by the end of this year. The ECA is expected to be approved and be fully in force by August of 2012. Clearly, there is little, if any, uncertainty that there will be an ECA in place for California. The Air Resources Board has expressed their support for Annex VI and ECA establishment in the ISOR as long as it is at least as protective of public health as the proposed regulation. PMSA agrees with that position. The need for uniform and consistent regulation is also why PMSA joined with the World Shipping Council (WSC), the American Association of Port Authorities (AAPA), the West Coast Diesel Collaborative (WCDC) and others in endorsing the amendments to Annex VI that were approved in October 2008. These amendments, when fully implemented, exceed the emission reductions of this proposed regulation. This is because the Annex VI amendments also includes emission standards for engines, world wide limits on marine fuel sulfur, and extended jurisdictional boundaries, that are not included in the proposed regulation. Even without consideration of these additional benefits, the second phase of the Annex VI will trigger the sunset provision of the proposed regulation when it is implemented in 2015. With the reduced number of vessel calls and the greater geographical extent and scope of the ECA, combined with voluntary measures of the maritime industry, PMSA continues to believe that the emission reduction goals of the proposed regulation can be achieved without the proposed regulation and without placing the maritime industry in California at a competitive disadvantage with other ports in the U.S., Canada, and Mexico. (PMSA)

Agency Response: The comment does not directly relate to the proposed regulatory modifications provided with the 30-day Notice, but ARB will briefly respond. Similar comments were addressed in our responses to the 45-day comments above (Section A, "Regulatory Approach").

We strongly disagree with the commenter's statement that the record is deficient because it failed to address the benefits of pending international and U.S. regulations. Although the pending regulations mentioned by the commenter were not yet adopted when the Staff Report was released, ARB nevertheless discussed in detail these proposed amendments to IMO Annex VI (ISOR, Chapter V). ARB staff also compared the PM emissions and associated health effects under both the Annex VI amendments and the proposed ARB regulation (see ISOR, Table V-2, Figure V-1, and Figure V-2). These comparisons show that the proposed ARB regulation would achieve dramatically greater emission reductions compared to the IMO Annex VI amendments, until 2015 (at the earliest), when an Emission Control Area in California could potentially limit marine fuel sulfur content to 0.1%. The gap in emission reductions achieved by these rules cannot realistically be filled by the factors mentioned by the commenter, including the recent decline in vessel visits due to the economic downturn, voluntary measures, and the potentially greater offshore boundary of an ECA.

As mentioned by the commenter, ARB staff has supported the now approved amendments to IMO Annex VI, and agree that they could potentially provide benefits that meet or exceed the proposed ARB regulation by January 1, 2015. In fact, to help California transition to national or international controls, we included a provision in the proposed regulation to sunset the requirements in the ARB rule if the U.S. EPA adopts and enforces regulations that will achieve equivalent benefits from ocean-going vessels in California. However, we cannot forego needed emission reductions in the 2009-2015 timeframe. These reductions are critical to our ability to fulfill federal State Implementation Plan obligations and to protect the public health of California citizens. In addition, for the IMO regulation to achieve equivalent benefits, an "Emission Control Area" must be established and implemented on an ambitious schedule. There is no guarantee that this will occur as expected.

14. **Comment**: The baseline conditions have fundamentally changed due to the economic downturn. Appendix D of the ISOR used estimated growth rates for container vessels of 4.4% at the Port of Oakland to 8.3%, at the Port of Huememe, and 6.8% for the Southern California Ports of Los Angeles, Long Beach and San Diego. However, the reality is that due to the current economic recession the actual growth at these ports were negative for 2008 and will likely be even worse for 2009. Lloyds recently reported that worldwide, 9.1% of container vessel capacity has been taken out of service. Los Angeles and Long Beach just reported that the February throughput is down 40% from a year ago. Some of this decline is attributed to the diversion of cargo to ports outside of California and it is not clear what percentage, if any, of that diverted cargo will return to California when the economy improves. A contributing factor to that diversion is the increased costs and uncertainty of doing business in California like those imposed by the proposed regulation. While everyone anticipates that there will be an economic recovery, it is not known when that recovery will occur or at what rate growth will be when it does. The reduced throughput is resulting in decreased emissions resulting in environmental and public health benefits but at significant social costs of increased unemployment and decreased tax revenue. In response to the economic downturn and the unintended environmental and public health benefits PMSA strongly urges that the proposed regulation be set aside and reevaluated in light of the economic down turn and the approved international regulations. We believe it likely that a reevaluation will lead to the conclusion that, when combined with MARPOL Annex VI requirements, California could reach the same emission levels outlined in the ISOR without creating the competitive disadvantages of this California only approach that will likely continue to drive cargo away from California and delay the recovery of California's economy. (PMSA)

Agency Response: The comment does not directly relate to the proposed regulatory modifications provided with the 30-day Notice, but ARB will briefly respond. ARB strongly disagree that the regulation has contributed to the downturn in containerized throughput or port calls for California ports during 2007 and 2008. The downturn in port visits began in 2007 due to a global economic downturn, two years prior to the

implementation date of this regulation. While the regulation will result in additional fuel costs for the shippers due to the higher cost of the cleaner distillate compared to the dirtier heavy fuel oil, the added cost of the regulation represents less than one percent of the total costs of a typical trans-Pacific voyage, as noted on page ES-20 of the ISOR.

As noted in the comment, the decrease in port calls may result in a corresponding decrease in ship emissions. However, PMSA "anticipates that there will be an economic recovery" projecting that port calls will increase during the recovery, resulting in a corresponding increase in emissions. ARB also anticipates that any emissions reductions resulting from lower annual port calls will be temporary. The ARB regulation achieves an estimated 74 percent reduction in PM and 81 percent reduction in SOx, immediately upon implementation. In 2012, when the second phase implements with 0.1% distillate, we estimate an 83% reduction in PM and 90% reduction in SOx. We believe that the economic downturn will be temporary and even at its worst, in terms of loss in growth of port calls or container traffic, the reduction in emissions due to the economic downturn will not provide significant reductions compared to the large and significant reductions gained by this regulation.

15. **Comment:** The baseline scenario presented in the supplemental environmental analysis does not take into account any emission reductions from the OGV regulation (fuel or speed reduction) within the 24 nm zone including the Santa Barbara Channel. An alternative scenario showing full compliance with the fuel regulation is not included and omitting this information results in understating the true impact of moving the shipping channel out of the Santa Barbara Channel, into the Sea Range. This full compliance scenario is required to enable the Board to compare the avoidance scenarios with actual compliance and that the supplemental environmental analysis is incomplete without an understanding of the environmental and human health benefit from full compliance with the regulation. The approach taken by the ARB does not provide a basis for an apples-to-apples comparison and hides the true impacts of the increased use of the Sea Range through avoidance of the ARB proposed regulation. In addition, since there is no full compliance scenario included for emissions estimates or in the modeling analysis, the potential impacts of the proposed action have not been adequately studied. The cumulative analysis is also flawed because it does not include an additional scenario showing full compliance with the fuel regulation and a vessel speed reduction (VSR) measure. Since a full compliance and VSR scenario has not been included in the cumulative impacts section, the full impact of avoidance on greenhouse gas emissions and other pollutants is not provided. (NAVY)

Agency Response: The U.S. Navy comment relates to the definition of "environmental setting" or "baseline" for conducting an analysis under the California Environmental Quality Act (CEQA). The comment indicates that to fully understand the impacts of avoidance, the avoidance scenarios should be compared to a scenario that reflects the best case scenario, i.e. full compliance with the proposed regulation without any regulation-induced changes in ship travel routes. In the case of the cumulative impacts

section, the U.S. Navy states that the avoidance scenarios should be compared to a scenario that reflects the best case scenario with full compliance with the fuel regulation and a vessel speed reduction measure, again without any change in the routes vessels use.

ARB's analysis of the environmental impacts of the regulation is governed by CEQA. CEQA Guidelines' section 15125 (section 15125, title 14, California Code of Regulations) requires that in assessing whether a project will have significant effects on the environment, the project's effects be compared to baseline conditions that are:

> ... the physical environmental conditions in the vicinity of the project, as they exist at the time the notice of preparation is published, or, if no notice of preparation is published, at the time environmental analysis is commenced…

ARB believes it used the appropriate baseline under CEQA, and those are the conditions that existed when ARB began development of the ship fuel-use regulation. As described in the supplemental environmental report on page 6:

> ... [T]he physical environmental conditions that existed at the beginning of ARB's informal rulemaking process and work on the ISOR constitute the environmental setting or "baseline" for purposes of analyzing whether the proposed regulation will result in significant adverse environmental effects. ARB staff's work on the proposed regulation began in 2005 so the environmental baseline for purposes of ARB's analysis are conditions as they existed in 2005.

ARB's cumulative effects analysis in the supplemental report then compared the combined potential effects of the regulation with the potential effects of a future vessel speed reduction measure and analyzed whether these combined effects were significant and, for those that were judged to be significant, whether the regulation's contribution to those effects were cumulatively considerable. This analysis was consistent with CEQA requirements as well.

ARB does agree with the commenter that ARB's supplemental environmental analysis would have shown a larger difference in emissions if it compared emissions associated with widespread use of avoidance strategies to the best case (regulated) scenario reflecting full compliance without use of avoidance strategies. The CEQA analysis, however, requires that the impacts are compared against a pre-project baseline. The comparison urged by the commenter would have identified impacts associated with the use of wide-spread avoidance strategies rather than identify the possible environmental impacts of the regulation, as required by CEQA.

ARB disagrees with the comment that the emission estimates for the full compliance scenario have been omitted. Emission estimates for full compliance were thoroughly analyzed and presented in ISOR. The supplemental analysis is an additional component to the original environmental analysis presented in the ISOR. Emissions by year, inventory zone (24 or 100 nm), and equipment type are listed in detail in

Appendix D, Tables III-2 to III-18. Furthermore, emissions reductions resulting from full compliance are presented in the ISOR in Tables ES-2, ES-4, in the text on ES-17 and more fully, in Chapter VII.

16. **Comment:** The supplemental environmental analysis does not consider or state the potential national security impacts and socioeconomic impacts due if the ships in the test range results in continual cancelling tests or exercises. The U.S. Navy indicates that the supplemental analysis is based on a premise that ocean going vessels will not seek to avoid the fuel regulations by transiting the Sea Range. In addition, the U.S. Navy has been contacted on numerous occasions for information on commercial ships transiting the Sea Range. (NAVY)

Agency Response: ARB believes that there will not be a wide scale use of an avoidance route through the Sea Range, as stated on page 15 of the supplemental environmental impact report and in the response to comment H-2, and that this regulation will not negatively impact the operation of the Sea Range. ARB is only aware of one shipping company, A.P. Moller - Maersk, that has approached the U.S. Navy to discuss the possibility of transiting through the Sea Range. ARB understands that Maersk has worked in a cooperative manner and abided by the U.S. Navy's recommendations. Furthermore, as stated previously in the responses to comments H-2 and H-3, ARB does not believe that there will be any disruption to the Point Mugu Sea Range as a result of this regulation. However, ARB is committed to working with the Maritime Industry, U.S. Navy, Ocean Protection Council and others to monitor traffic patterns and to take other actions, if necessary, to help ensure that the implementation of this regulation does not interfere with U.S. Navy operations at the Point Mugu Sea Range.

Additionally, ARB agrees that the supplemental environmental analysis did not include a discussion about the potential impacts of avoidance routing on military activities and the economics of the region. Those impacts are not addressed in the supplemental environmental analysis because they are not impacts on the natural environment that must be analyzed under the California Environmental Quality Act (CEQA) or ARB's certified regulatory program for CEQA compliance.

17. **Comment:** There is a statement in the report that needs to be changed. At the bottom of page 11 and top of page 12, the report says, "The U.S. Navy argues that an increase in traffic in the Point Mugu Sea Range would potentially interrupt naval exercises, even if vessels abide by posed advisories. Ship traffic in the Point Mugu Sea Range Could Result in a temporary halt in exercises, and in the worst case, would create an accident risk that could potentially close the Point Mugu Sea Range." Under no circumstances would we proceed with a test if there were non-participating vessels in the hazard pattern, period. The real impact is that the tests would be interrupted, delayed or cancelled. This reinforces the need for consideration of these socioeconomic impacts. (NAVY)

Agency Response: The language in the supplemental environmental report does not

conflict with the U.S. Navy's position that tests would not proceed if there were non-participating vessels in the hazard pattern. Furthermore, the statement in the supplemental environmental report acknowledges the potential for interruption. The U.S. Navy's comments concerning the need for a socioeconomic analysis if the Sea Range activities are impacted by increased commercial vessel traffic are addressed in comment H-2.

18. Comment: The analysis is fundamentally flawed under California Environmental Quality Act, Public Resources Code section 21000 *et. seq.* The Supplemental Environmental Analysis (SEA) does not consider all feasible alternatives for rerouting vessels. The SEA analysis is based on two potential routes provided by the U.S. Navy as shown on Figure 4. These routes assume that all vessels will transit to and from a common point north of Point Conception and would diverge from that point when transiting to and from the southern California ports. Nowhere in the SEA was any consideration given to the routes that OGV operators would take if they were rerouting vessels to and from the Southern California Ports. Trans-pacific vessels would take the most direct route through the Sea Range that would be a straight line extension of the "orange route". In other words, it is unlikely that trans-pacific vessels that are avoiding the Santa Barbara Channel would add distance and time to their transit traveling to or from a common point when crossing the Pacific. PMSA believes that this alternative must be assessed since it is likely to show that rerouting would reduce fuel consumed and greenhouse gas emissions, and would change the on-shore ozone impacts when compared with the alternatives presented and with the baseline conditions assumed for the regulation in the ISOR. PMSA believes this analysis must be completed to comply with a fundamental CEQA requirement to assess feasible alternatives that may lessen the impacts of the proposed regulation. (PMSA)

Agency Response: The commenter confuses impacts analysis with alternatives analysis under CEQA. CEQA "alternatives" are alternatives to the proposed project that must be analyzed to determine whether a feasible alternative to the project would avoid or substantially lessen the significant environmental impacts of the project while attaining most of the basic objectives of the project. (see CEQA Guidelines section 15126.6(a)) In the context of environmental analysis of this regulation, project alternatives involve variations of the regulation, or entirely different regulatory or non-regulatory approaches, that would accomplish equivalent emissions reductions. Avoidance routes through the Sea Range are not alternatives to the project, and even if they were, CEQA does not require consideration of all feasible alternatives, as the commenter suggests, but only a reasonable range of alternatives. (see CEQA Guidelines section 15126.6(a) and (f)) The remainder of this response will therefore focus on the substance of the comment, which is adequacy of the supplemental environmental document's impacts analysis.

The commenter argues that ARB's extensive work modeling the effect of emissions from vessels traversing the Sea Range on ambient air quality in the Southern California Air Basin is unreliable and the analysis is deficient because ships on trans-pacific

voyages may use a different route when entering and leaving the Port of Los Angeles and the Port of Long Beach, a straight-line route that at its eastern terminus matches the orange route in Figure 4 on page 13 of the supplemental environmental analysis (SEA). The commenter also claims that in the ARB analysis the "…routes assume that all vessels will transit to and from a common point north of Point Conception and would diverge from that point when transiting to and from southern California ports. Nowhere in the SEA was any consideration given to the routes that OGV operators would take if they were rerouting vessels to and from the Southern California Ports."

The avoidance route that ARB used to analyze the regulation's potential environmental impacts represents the best information available as to a potential regulation-induced shift in vessel routing that would, if it materializes, create additional project-related environmental impacts. The commenter is incorrect in the assumption that in the analysis, all vessels transit from a common point and that no consideration was given to ships using other routes. In the ARB avoidance route impact analysis, only the route of the vessels that were transiting the Santa Barbara Channel, based on actual traffic patterns discussed below, were relocated outside the channel. Many other vessel routes were included in the analysis that did not transit through the Santa Barbara Channel, as shown in the SEA Figures 1 and 2, and were not modified when analyzing the impacts of avoidance. Furthermore, it is worth noting that many of the vessels using the Santa Barbara Channel are not on a trans-pacific voyage, but transiting between northern and southern California ports.

The avoidance route analyzed by ARB was developed from the existing (baseline) traffic patterns and rerouting only the vessels that were transiting within the Santa Barbara Channel. The baseline route was based on actual traffic pattern data derived from the Army Corps of Engineers National Waterway Network, automated instrumentation system (AIS) telemetry data, and the Ship Traffic, Energy and Environment Model (STEEM), developed by Dr. James Corbett. In its comments to the Board, the U.S. Navy provided information on feasible routes that it believed ships would take through the Point Mugu Sea Range if shippers that would ordinarily use the channel were avoiding fuel and vessel speed reductions measures there. The U.S. Navy (whose comments in large part prompted the supplemental environmental analysis) agreed that the route shown in red in SEA Figure 4 would be the most likely route for shippers that chose to avoid the Santa Barbara Channel shipping lanes due to the regulation or the combined effects of the regulation and a future vessel speed reduction measure. The red route is considered the most likely avoidance route because it represents a shorter "detour" from the Santa Barbara Channel than other suggested avoidance routes, and therefore would be the fastest and most fuel efficient alternate route for vessels that would ordinarily chose to use the Santa Barbara Channel but are trying to stay outside Regulated California Waters for as long as possible. This route also corresponds to existing AIS traffic pattern data (SEA Figure 2). While the PMSA comment does identify another possible avoidance route, the commenter provides no data to substantiate the feasibility or likelihood that route being used, such as AIS data or existing traffic patterns that utilize the shortest trans-pacific great circle routes. Furthermore, the commenter does not provide any information to

substantiate that most vessels currently using the Santa Barbara Channel would use the route recommended in the comment.

In summary, the record supports ARB's decision to use the avoidance scenario it did for the supplemental environmental analysis. As noted elsewhere in these responses, ARB believes wide-spread use of avoidance strategies by vessels that currently use the Santa Barbara Channel is very unlikely as a result of the regulation, even if a vessel speed reduction measure were to be implemented in the future.

19. **Comment:** We urge ARB to continue to work with the Ocean Protection Council on overall strategies to protect the Sea Range with respect to national security interests, socioeconomic concerns and most importantly be more protective of public health. (NAVY)

Agency Response: ARB agrees with this comment. As noted in the response to comment H-5, ARB staff has met with the Ocean Protection Council to continue to fully address the U.S. Navy's concerns.

20. **Comment**: International vessels are best regulated internationally, by rules created through the IMO. This ensures clarity and consistency of rules throughout the globe. IMO has made significant progress in implementing such rules for a variety of vessel operational and environmental issues. We believe California can achieve the desired results, with less litigation and more cooperation, by encouraging progress on implementation of international standards such as the proposed North American ECA. (MAERSK)

Agency Response: The comment does not directly relate to the proposed regulatory modifications provided with the 30-day Notice, but ARB will briefly respond. We addressed essentially the same comments submitted during the 45-day comment period (see responses to comments A-1 and A-2 under "Regulatory Requirements").

21. **Comment**: The ARB should suspend activity on this rule until critical legal issues of pre-emption and jurisdiction have been resolved, or unless the proposed North American ECA is not implemented. As an interim measure, voluntary efforts have been shown to result in substantial air quality improvements, and can be particularly effective with incentive programs, reducing competitive cost pressures. Such approaches are already helping bridge the time until international regulations are in place, and should be considered seriously before implementing these Proposed Regulations. (MAERSK)

Agency Response: The comment does not directly relate to the proposed regulatory modifications provided with the 30-day Notice, but ARB will briefly respond. We addressed essentially the same comments submitted during the 45-day comment period (see responses to the comments A-1 through A-4 under, "Regulatory Requirements").

22. **Comment**: These rules rest on the same legal framework and rationales which CARB advanced to support the now enjoined "Ocean-Going Vessel Auxililiary Diesel Engine Regulation." (See PMSA v. Goldstene, Case No. 206-cv-02791). The federal Clean Air Act (CAA § 209(e)(2)(A)) preempts the Proposed Regulations. The July 23, 2008 comments on the Proposed Regulations of the Pacific Merchant Shipping Association provide substantial detail on precisely why and how the Clean Air Act preempts these rules. CARB has not advanced a different legal rationale or analysis which will survive preemption under the Clean Air Act. A waiver from the U.S. EPA is required for the Proposed Regulations to be adopted. To our knowledge U.S. EPA has not granted a waiver. (MAERSK)

Agency Response: The comment does not directly relate to the proposed regulatory modifications provided with the 30-day Notice, but ARB will briefly respond. We addressed essentially the same comments submitted during the 45-day comment period (see responses to comments in section G above, "Legal Authority"). See also the response to 30-day comment #11 above.

23. **Comment**: CARB may not regulate conduct beyond the 3 mile limits. The Submerged Lands Act preempts regulation of conduct on board vessels more than 3 miles from the California coastline, yet the Proposed Rules require material compliance actions and conduct well beyond the three mile jurisdiction limit. Congress has not granted authority to CARB to promulgate an independent regulatory scheme governing fuel use of vessels engaged in international or interstate commerce. Accordingly, the Proposed Regulations are not authorized and are preempted. (MARESK)

Agency Response: The comment does not directly relate to the proposed regulatory modifications provided with the 30-day Notice, but ARB will briefly respond. We addressed essentially the same comments submitted during the 45-day comment period (see responses to the 45-day comments under section G above, "Legal Authority"). See also the response to 30-day comment #12 above.

24. **Comment**: The regulations exceed state police powers. The Proposed Regulations mandate fuel switches at least 24 nm from the California coastline. In doing so they also mandate actions more distant from California, by requiring fuel purchases at distant facilities and requiring other equipment, operational or maintenance changes. The requirements apply to both foreign flagged and U.S. vessels, resulting in regulation of foreign vessels engaged in international trade. (MARESK)

Agency Response: The comment does not directly relate to the proposed regulatory modifications provided with the 30-day Notice, but ARB will briefly respond. We addressed essentially the same comments submitted during the 45-day comment

period (see responses to the 45-day comments under section G above, “Legal Authority”). See also the response to 30-day comment #12 above.