



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

July 1, 2010

OFFICE OF
WATER

MEMORANDUM

SUBJECT: Science Advisory Board Review of the Availability and Efficacy of Ballast Water Treatment Technology for EPA's Office of Water and the United States Coast Guard

FROM: Linda Boornazian, Director
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TO: Vanessa Vu, Director
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This memorandum provides an introduction, background information, and specific charge questions to the Science Advisory Board (SAB) for their review of the status of ballast water treatment technology. To assist the SAB in their efforts, a member of my staff, in collaboration with other EPA and Coast Guard colleagues, has prepared a white paper titled "Availability and Efficacy of Ballast Water Treatment Technology: Background and Issue Paper" (hereinafter the "White Paper"). This paper provides additional background information and introduces the numerous documents we have provided to the SAB to assist in your analyses.

Background

Ballast water is typically drawn in from surrounding ambient water and used to assist with vessel draft, buoyancy, and stability. Almost all large vessels have ballast tanks dedicated to this purpose; some vessels may also ballast empty cargo holds. The ballast water discharge rate and constituent concentrations of ballast water from vessels will vary by vessel type, ballast tank capacity, and type of deballasting equipment. Under current U.S. regulation and permitting requirements (discussed in greater detail in the White Paper), there are existing best management practices to reduce the potential impacts of ballast water discharges. These include ballast water exchange and salt water flushing (collectively referred to as BWE).

While useful in reducing the presence of potentially invasive organisms in ballast water, BWE can have variable effectiveness and may not always be feasible due to vessel safety concerns. In order to make progress beyond use of BWE, establishing a standard for the concentration of living organisms in ballast water that can be discharged is necessary. The

United States Environmental Protection Agency (EPA) and the United States Coast Guard (USCG) both desire a stronger federal ballast water management program.

To help develop the next Clean Water Act Vessel General Permit (VGP), EPA needs an objective evaluation of the status and efficacy of ballast water treatment technologies and systems that are in existence or in the development process. A second major scientific question for regulatory agencies is to better understand and relate the concentration of living organisms in ballast water discharges to the probability of introduced organisms successfully establishing populations in U.S. waters. Given the complexity of the issues, EPA's Office of Water is seeking advice from the Science Advisory Board (SAB) on the first issue and the National Academy of Sciences' National Research Council (NRC) on the second issue. In Particular, EPA is seeking advice from the SAB regarding the availability and efficacy of ballast water treatment systems in neutralizing (killing) living organisms that might be discharged from ballast water tanks. For the other NRC study, EPA has requested that the NRC broadly assess and make recommendations about various approaches for assessing the risk of establishment of new aquatic non-indigenous species from ballast water discharges (see attachment 2 of the White Paper for the NRC charge).

Specific Charge in Evaluating the Efficacy of Ballast Water Treatment Technology

OW is seeking SAB advice in the following four general categories:

1. Performance of shipboard systems with available effluent testing data¹

1a. For the shipboard systems with available test data, which have been evaluated with sufficient rigor to permit a credible assessment of performance capabilities in terms of effluent concentrations achieved (living organisms/unit of ballast water discharged or other metric)?

1b. For those systems identified in (1a), what are the discharge standards that the available data credibly demonstrate can be reliably achieved (e.g., any or all of the standards shown in Table 1 of the White Paper? Furthermore, do data indicate that certain systems (as tested) will not be able to reliably reach any or all of the discharge standards shown in that table?

1c. For those systems identified in (1a), if any of the system tests detected "no living organisms" in any or all of their replicates, is it reasonable to assume the systems are able to reliably meet or closely approach a "no living organism" standard or other standards identified in Table 1 of the White Paper, based on their engineering design and treatment processes?

¹ EPA and the US Coast Guard have provided data they currently have to the panel on the attached CD. Where feasible, the panel is encouraged to find additional data if they have appropriate avenues to obtain those data.

2. Potential performance of shipboard systems without reliable testing data

2. Based on engineering design and treatment processes used, and shipboard conditions/constraints, what types of ballast water treatment systems (which may include any or all of the systems listed in Table 4 of the White Paper) can reasonably be expected to reliably achieve any of the standards shown in Table 1 of the White Paper, and if so, by what dates? Based on engineering design and treatment processes used, are there systems which conceptually would have difficulty meeting any or all of the discharge standards in Table 1 of the White Paper?

3. System Development

3a. For those systems identified in questions 1a and 2, are there reasonable changes or additions to their treatment processes which can be made to the systems to improve performance?

3b. What are the principal technological constraints or other impediments to the development of ballast water treatment technologies for use onboard vessels to reliably meet any or all of the discharge standards presented in Table 1 of the White Paper and what recommendations does the SAB have for addressing these impediments/constraints? Are these impediments more significant for certain size classes or types of organisms (e.g., zooplankton versus viruses)? Can currently available treatment processes reliably achieve sterilization (no living organisms or viable viruses) of ballast water onboard vessels or, at a minimum, achieve zero or near zero discharge for certain organism size classes or types?

4. Development of Reliable Information

4. What are the principal limitations of the available studies and reports on the status of ballast water treatment technologies and system performance and how can these limitations be overcome or corrected in future assessments of the availability of technology for treating ballast water onboard vessels?

Background Reading Materials

A more in depth introduction to these issues can be found in the attached White Paper, for which we have included both a hard copy and an electronic copy on the attached CD. In addition to the white paper and a copy of this memo, the CD contains three sets of documents. The first set of documents on that CD are summary reports produced by parties evaluating the availability of existing ballast water treatment systems or reports evaluating their potential efficacy. The second set of documents contains additional available test data and engineering information for specific ballast water treatment systems. The third set of documents primarily consist of International Maritime Organization papers and submissions, and were provided to serve as a reference library for the committee should the committee therein useful. Most of those documents have been prepared as reports for IMO as part of the "G9" review process (discussed in greater detail in White Paper). There is also an index file on the CD, which lists all of the document names and contains hyperlinks to the location of each file on the CD. Additionally, we have created an on-line docket which will contain all of the documents found on this CD: it is docket number EPA-HQ-OW-2010-0582 and can be accessed at www.regulations.gov.

Thank you for considering these important issues in your review. Your work will prove valuable as we move forward with federal ballast water regulation.

Attachments:

1. June, 2010 White Paper: Albert, R., Everett, R., Lishman, J., and Smith, D. (2010) Availability and Efficacy of Ballast Water Treatment Technology: Background and Issue Paper. Paper prepared to assist the Science Advisory Board Review of the availability and efficacy of Ballast Water Treatment Technology.
2. Compact Disc containing all documents referenced in Appendix IV of the above White Paper.