

Comments on

“Shore Based Ballast Water Treatment System in California” – Literature Review

Prepared for Delta Stewardship Council
Sacramento, California

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Comments submitted are prepared by Mo Husain of MH Systems, Inc. of San Diego, California

M H Systems is pleased to submit following comments on the ‘Literature Review’ report of the “Shore-based Ballast Water Treatment in California” prepared by Glosten of Seattle, Washington. The Literature Review of a relatively new subject i.e. shore based ballast water treatment system is inherently a difficult one. Preparers of the report have done an outstanding effort, given the relatively ‘newness’ of the subject matter, and the premise itself. The fact that the subject matter itself is ‘subjectively’ a bit contentious adds to the difficulty in preparation of such a report.

‘California Ballast Water Management ‘interim’ Standard’: It is obvious, and has been for a long time, that California ballast water discharge standard is for more stricter than either IMO or US Coast Guard ballast water discharge standards and this report (Executive Summary- page iii) states the obvious – “However, there is a lack of data to determine if the treatment systems that are being installed on board marine vessels are capable of meeting California’s interim standard. *Shore-based ballast water reception and treatment is under consideration as an approach to meet the California interim standard.*”

Actually, California’s ‘ballast’ water discharge standard has nothing to do with treating ‘ballast water’ of ships. The idea of treating or converting ballast water to the state of purification that the California standard strives is admirable one, however that is not the purpose of treating ballast water to a standard as envisioned by IMO or USCG rules. Therefore, a shore based ballast water ‘reception and treatment’ facility is not going to solve the problem. Re-branding of California ‘ballast’ water discharge rules may be necessary for a shore based treatment system.

The ‘Report’ refers six studies of feasibility study of shore based treatment system. All these studies are in general port specific and mostly attempting to conform and comply with the IMO or USCG ballast water discharge standards. Specifically, the Port of Baltimore (King 2013) discusses the necessity, but impracticality and costliness of an universal coupling for transfer of ballast water from visiting vessels. Vessel modifications to accommodate or connect with the California shore based facility may be equally costly.

Treatment Systems:

Several ballast water treatment systems has been mentioned including:

(i) UV Disinfection (ii) Ozonation (iii) Membrane Filtration (iv) Hydrodynamic cavitation.

Although UV Systems are the most pre-dominant and best sellers, majority of them are failing to pass USCG directed tests. Although on certain level UV Systems passed legally IMO tests, but in reality the sea water is not sufficiently transparent for UV to be effective. Although high energy input (i.e. bigger doses of UV) may cure the problem, but high cost of energy will be a factor. In many instances and in plain language DNA of the organism are altered by the application of UV, such that they appeared to be dead in the tank, but after the ballast water is discharged in the bay, the organisms are sort of revived !!! I am attaching several literature on UV effectivity (and others) at the end of this section:

Ozonation: Theoretically, it appeared to be a good system, but it has its corrosive problems resulting in a very few actual installations.

Membrane Filtration: By itself, not an acceptable solution for ballast water treatment system.

Hydrodynamic cavitation: Very few stand alone application for ballast water treatment systems.

References (primarily) related to UV system:

<https://www.usc.edu/CSSF/History/2004/Projects/J1303.pdf> experiments on exposure times.

<http://www.vtt.fi/inf/pdf/tiedotteet/2005/T2313.pdf> experiments with exposure times.

http://www.aquaticinvasions.net/2012/AI_2012_1_Liebich_etal.pdf Re-growth of potential invasive phytoplankton following UV-based ballast water treatment

<http://www.sciencedirect.com/science/article/pii/S0025326X07002731> exposure lengths are prohibitively long.

http://aquaticinvasions.net/2009/AI_2009_4_3_Gregg_etal.pdf survey of many systems, cavitation, discussion of issues with high flow rates.

<http://onlinelibrary.wiley.com/doi/10.1111/j.1462-2920.2010.02335.x/abstract;jsessionid=BF203A47B79673A8C481543CEE9E4D68.f04t03?userIsAuthenticated=false&deniedAccessCustomisedMessage=> Regrowth

<http://www.sciencedirect.com/science/article/pii/S0025326X12005577> regrowth after UV disinfection

<http://link.springer.com/article/10.1007/s10811-013-0049-9> **Life after treatment: detecting living microorganisms following exposure to UV light and chlorine dioxide**

Treatment Approach:

Conspicuously absent is a modified small used tanker to handle large quantity of ballast, preferably with an in-tank system for processing very large quantity of ballast water very rapidly.

Sincerely Yours,



Mo Husain
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