Ballast Water Treatment - are you on course for compliance?

With ratification forecast to occur in the next six months, the deadline for meeting the International Maritime Organisation’s 2004 Ballast Water Management Convention is fast approaching. The new legislation, which will require tens of thousands of ships to be retrofitted with new systems for Ballast Water Treatment over the next few years, has caused much debate within the marine industry. To date, discussion has largely centred around which type of treatment technology is most suited to the task. However, this has overshadowed two very important aspects of the new regulations which must form part of the overall treatment regime in order to be effective in ensuring environmental compliance: point of discharge measurement and recording and reporting of treatment activities. A new joint development between PSM and Chelsea Technologies Group aims to address these important issues.

Point of Discharge Measurement

A key requirement for any treatment system installed is to provide analysis of the ballast water at the point of discharge to prove correct treatment. Using the inherent high sensitivity of the FastBallast Compliance Monitor has been specifically developed for working with phytoplankton within the aqueous phase at low optical density, exactly the conditions encountered in ballast water. FastBallast interrogates the photosynthesis process taking place within phytoplankton to distinguish between which cells are alive or dead. Using complex algorithms, FastBallast can rapidly determine if your ballast water discharge is compliant.

To ensure that all phytoplankton present within the 10 to 50um range are detected, FastBallast uses multiple LED excitation channels. A highly sensitive photon multiplier tube is used to detect the variable fluorescence of live phytoplankton. Each measurement takes only 200 µs, which means that data can be collected from fast moving water (up to two metres of linear flow per second), typically encountered within ballast tanks or water treatment system piping.

FastBallast is available as a portable or integrated system. Capable of operating in flow through and static sampling mode, the portable version of FastBallast is designed for carrying out spot check measurements, reassuring port state control and shipboard engineers that their BWTS is operating as it should. The touch screen displays a RAG (red-amber-green) system used to indicate whether the ballast water discharge is compliant with regards to current regulations. Data can be downloaded via USB or ethernet for a more detailed assessment of the treated ballast water.

The integrated variant of FastBallast is designed for permanent installation within a BWTS, where it will operate in flow through mode providing a continuous update on discharge compliance. This version of FastBallast can interface with PSM’s BallastView, a system for logging compliance data onboard a vessel which can also transmit data ashore, if required.

Using FastBallast will improve the ballast water management regime of vessels in time for ratification and will assure the end user whether that be a ship operator, BWTS manufacturer or port state control officer that a given Ballast Water Treatment System is discharging ballast water in compliance with the IMO D2 standard (10 to 50um category).

“The threshold for bringing the IMO Ballast Water Convention into force is getting very near. During the MEPC67 meeting several countries announced their ratification. Less than 3% of global tonnage is now needed to reach the tonnage threshold that will start a retrofitting process in all existing applicable ships over a 5 year period.”

October 18th 2014, MEPC
Recording and reporting of treatment activities

An equally critical stipulation of the new regulations is Requirement B-2, which calls for vessels to hold data in a ballast water record book. This can be in an electronic format, either standalone or integrated into another system. The recorded data must include the following key information to prove correct operation:

- When ballast is taken onboard, volume, date, time and geographical location
- Movement of ballast water for on board ballast water management purposes
- When ballast is discharged to sea, volume, date, time and geographical location
- When ballast is discharged to a reception facility, volume, date, time and location
- Accidental or other exceptional uptake or discharges of ballast water

Entries into the ballast water record book must be maintained onboard for a period of two years after the date of entry and thereafter kept in the company’s control for a further three years.

Marine systems specialists PSM undertake continuous research and development aimed at providing operators with improved control and visibility onboard vessels. The latest BallastView system from PMS, for example, is a modular solution comprising a suite of onboard and shoreside hardware and software elements, developed to ensure vessels are operated efficiently, safely and in an environmentally responsible manner. Integral to the system’s functionality are secure data recording capabilities which more than meet the stipulations set out for the new reporting requirements.

The system’s Ballast Water Treatment module allows shipping vessel operators and onshore personnel to monitor the operation of ballast water treatment equipment. An encrypted recording capability electronically captures all key data and provides secure archive storage onboard or onshore, offering proof of correct operation for the three year period required.

Modern solutions such as BallastView not only provide the answer for new vessels but offer an affordable, least cost solution for retrofitting existing vessels to meet the requirements of the new regulations. Designed for compatibility, BallastView is scalable and can be integrated with existing system elements as required, thus minimising the cost of upgrades. The technology has already been successfully employed across a number of fleets for similar monitoring, recording and data transmission applications in complying with MAR-POL regulations for Oily Water Treatment and Oil Record Book regulations. The automatic collection of data forming the Ballast Water Treatment Book, for example, then might also be transmitted in real-time to Port State Control prior to arrival to facilitate a swift clearance of this part of the vessel’s inspection well ahead of port entry.

While earlier products were only able to monitor and log signals from primary treatment equipment, the development of the new integrated systems means other areas - for example tank levels, pump operations and valve positions - can now also be monitored. This comprehensive surveillance approach enables potential issues to be flagged as system alerts where, for example, ballast levels are falling but the treatment plant is not running.

The need to upgrade to emerging new legislative requirements presents operators with the ideal opportunity to take positive measures to improve onboard control. The installation of a modern integrated system with the latest monitoring and measurement technology can prevent incidents which might otherwise lead to violations, incurring significant fines for fleet operators and the risk of prosecution for senior officers who could also be held legally responsible.

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<td></td>
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<td>3.2.4</td>
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Pictured: A ClearView onboard display of the real-time BWT activity, an example of the BWT Record Book printed for Port State inspection and historic BWT activity report transmitted onshore for management reporting.