

Meeting the IMO Ballast Tank Regulations

By Michael Sellars and John Fletcher

The International Maritime Organisation (IMO) regulation for the Performance Standard for Protective Coatings (PSPC) for Salt Water Ballast Tanks, Resolutions MSC.215(82) and MSC.215(84), comes into full effect from 1st July 2008 for new ship builds, bringing with it a number of challenges for the coatings inspector.

The following simplified illustration indicates the extent of the issues facing the inspector.

The typical dimensions of a Very Large Crude Carrier (VLCC) are[†]:

Length: 470m (1542ft)
Draft: 20m (66ft)
Beam: 60m (197ft)

The total ballast tank coating areas onboard a VLCC are approximately 300,000m² (greater than 3,000,000ft²)[†].



Commercial oil tanker AbQaiq, U.S. Navy photo by Photographer's Mate 1st Class Kevin H. Tierney.

Using the SSPC PA2 standard for coating thickness measurement, each flat area requires five spot readings - each the average of three readings per 10m² or 100ft².

Taking into account the typical dimensions of a VLCC, the outer surface area of the ship is approximately 58,000m² (~625,000 ft²). If we assume that there are two coating layers applied, inspecting the vessel's outer surfaces alone, under SSPC PA2, would require 174,600 individual coating thickness readings to be taken and recorded. This increases to 187,500 when using Imperial units within SSPC PA2. This does not take into account any complex areas or the superstructure itself.

According to the IMO regulations the following dry film thickness verification regime is to be adopted:

- one reading per 5m² (54ft²) on flat surface areas;
- one gauge reading at 2 or 3m (6.5 – 10 feet) intervals and as close as possible to tank boundaries, but not further than 15mm (0.6 inch) from edges of tank boundaries;
- around openings, one gauge reading from each side of the opening;
- additional spot checks are to be taken to verify coating thickness in any area considered necessary by the coating inspector.

Additional inspection requirements are listed for longitudinal and transverse stiffener members, primary support members and complex areas (primarily large brackets of primary support members).

Using the lowest possible estimate, this indicates that a minimum of 300,000 readings which must be taken and recorded to meet the obligation of the IMO PSPC for Salt Water Ballast Tanks regulation. This is a SOLAS (Safety Of Life At Sea) regulation, making this a legal requirement.

The requirements for coating thickness measurement are, therefore, in essence, similar to the number of readings you are required to take when using SSPC PA2 for the outer hull surfaces alone! This, of course, does not take into account any internal surfaces, cargo holds, fixtures and fitting or any complex areas.

The IMO regulation does not stop at coating thickness, it also requires the inspection of surface profile and cleanliness, together with the recording of temperature, relative humidity and dewpoint at

each appropriate stage of the build process.

So how does an approved inspector schedule the appropriate inspection, record the results *and* generate the legal Coating Technical File to meet the IMO PSPC regulation for salt water ballast tanks, on top of his or her already complex data gathering for the rest of the shipyard, for the various coating systems, at every stage of the construction, with numerous inspectors, across different ship types, in yards around the World, with different construction methods?

'Paperless QA', 'digital data management' and 'digital job files' are the buzzwords that have been flying around the protective coating's industry for the past two or three years.

The maximum number of readings you can realistically report on a sheet of paper is 650. This means that a minimum of 450 pages will be required for the IMO Coating Technical File to report the *coating thickness values* for the ballast tanks.

'Paperless QA' requires data to be collated electronically. Elcometer has a number of digital gauges in the marketplace that measure, record and transmit - via *Bluetooth®* or other transfer methods - surface profile, coating thickness, relative humidity, dewpoint and temperature measurements.



Elcometer 456 Coating Thickness gauge displays the 90/10 rule required for PSPC

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How can paperless QA be achieved for surface cleanliness and other visual or manual inspections which do not have an electronic method of measurement without the need for scanning?



Elcometer 224 Surface Profile Gauge allows electronic recording of blasted surfaces

In addition, with discussions regarding IMO regulations for void spaces and cargo holds already under way, how can all this data be recorded in a structured manner and reported?

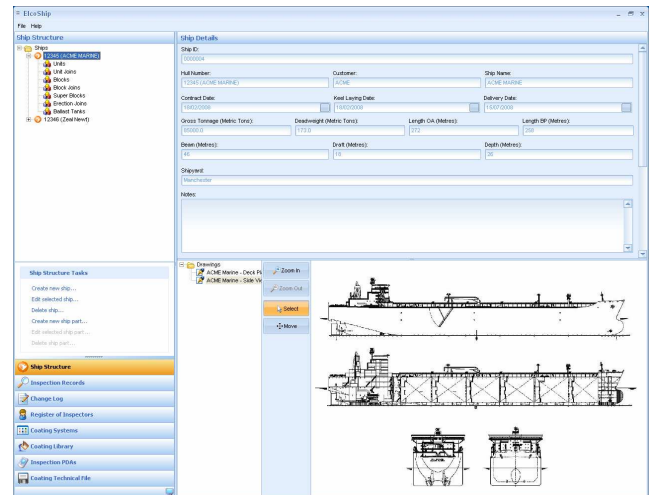
Elcometer has been working for sometime on the question of paperless QA and already provides comprehensive software, ElcoMaster™, free with all its gauges. This does not, however, answer all the questions raised by the shipping industry for coatings management for both the whole ship and specifically the IMO PSPC requirements.

For the particular issues surrounding paperless QA in shipbuilding, Elcometer, has been working with experts from the marine coating's industry to provide the answer.

ElcoShip® has been developed to provide a single point solution to Marine Coating Inspection Data Management. Integrating coating inspection planning with data collation and reporting for both IMO legal documentation and non-IMO inspections, ElcoShip® is a total inspection solution which provides:

- complete coating system management using manufacturer's technical data sheets and MSDS' in a coating's library, complete with change control
- inspection personnel management – recording those inspectors that are approved, together with their associated certification records
- coating inspection process planning, including reworks and pass/fail criteria
- a data management system, which records both digital and manual inspection tasks, digital data transferred directly; manual inspections recorded electronically using ElcoShip® Mobile on a PDA. Inspection tasks are identified by ship location, complete with a change log
- the inspection status for the build of the ship at a glance, using the vessel's block plan diagram with zone by zone identification
- the Coating Technical File (CTF) at a click of a button – electronically or in printed form – to meet your legal requirements.

Due for release in May 2008 for extensive field trials, ElcoShip® will be available for commercial use in July



Elcometer's ElcoShip® Marine Coating Inspection Data Management Software provides coating's inspectors with a paperless QA solution and generates PSPC documentation instantly

For more information contact the authors at Elcometer via elcoship@elcometer.com

About Elcometer

Elcometer is a leader in the manufacture and supply of inspection equipment for the coatings industry.

With facilities located in six countries and with over 150 stocking distributors around the World, Elcometer is able to provide a solution to your inspection requirements.

Acknowledgements:

[†] www.wikipedia.com; March 2008

[‡] J. Eliasson & D Rauta; *Journal for Protective Coatings & Linings*, May 2007

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