Introduction to IMO Performance Standard for Protective Coating of seawater ballast tanks

MiD Training – Moerdijk
12 March 2012

Jan de Waart
1 Introduction
1 Class vs PSPC

- Scope of application of these regulations:
  - According to MSC.216 (82) (statutory)
- Main requirements
- How to Review the documentation
- How to monitor the coating inspection

RESOLUTION MSC.215(82)
(adopted on 8 December 2006)

PERFORMANCE STANDARD FOR PROTECTIVE COATINGS
FOR DEDICATED SEAWATER BALLAST TANKS IN ALL TYPES OF SHIPS
AND DOUBLE-SIDE SKIN SPACES OF BULK CARRIERS
1 Application of PSPC

• SOLAS (regulation II-1, 3-2)
  -> 500 GT and above
  -> self propelled
  -> dedicated seawater ballast tanks

So, not applicable to smaller ships, stationary units or ships with tanks with ‘technical freshwater’.
1 Application of PSPC

• SOLAS (regulation II-1, 3-2)
  - building contract > 1/7/2008 or
  - keellaying > 1/1/2009 or
  - delivery > 1/7/12
1 PSPC General Principles

- Verification of compliance to PSPC
  - Is responsible to check step by step the compliance of Coatings to PSPC
  - Are responsible to produce a Coating complying to PSPC

- Administration / Class
- Coating Inspector
- Shipyard / Coating Manufacturer
Seven main steps to be considered:

• Scope or description of the work
• Materials (Product selection)
• Surface preparation
• Coating Application
• Inspection
• Repairs
• Documentation
For a new construction

These 7 main steps are to be considered at three main phases:

**Phase 1:** Planning and specification of coating works

- Tripartite agreement and basic technical documents

**Phase 2:** Performance of coating works

- Coating work records by the qualified Coating Inspector (CI)

**Phase 3:** Verification of records after the completion of construction works

- The Coating Technical File (CTF)
1 Coating works - IMO PSPC

**BV Surveyor’ activities**: three main phases identified

**Phase 1**: Prior to the commencement of coating works

- Review of the tripartite Agreement and referred technical documents

**Phase 2**: During the performance of coating works

- Check at random the inspection works by the CI

**Phase 3**: After the completion of coating works

- Check the CTF (at random basis)
2 The phases
Phase 1: Review of the Inspection Agreement

- Review of the Inspection Agreement
- Steel preparation and Coating application
  - Shop primer
  - Block construction
  - Erection
- Coating work records
- Inspection
  - Inspection logs of CI checked for proper equipment, techniques, and methodology

Phase 2: Verification of PSPC implementation

- New Construction
- Steel preparation and Coating application
  - Shop primer
  - Block construction
  - Erection
- Coating work records
- Inspection
  - Inspection logs of CI checked for proper equipment, techniques, and methodology

Phase 3: CTF Review

- Coating Technical File (maintained onboard)
  - Agreement between parties
  - Statement of compliance or TAC of coating system
  - Coating technical data sheets
  - Shipyard work records
  - Inspection procedures
  - Coating inspection logs of CI
  - Shipyard inspection report verified by CI

- In-service procedures and records
2a Phase 1: Review of the Inspection Agreement
### Tasks and Action/Unit Verification Table

<table>
<thead>
<tr>
<th>Items</th>
<th>Tasks</th>
<th>Action / Unit Verification</th>
</tr>
</thead>
<tbody>
<tr>
<td>N°1</td>
<td>Coating System <strong>Type Approval by Bureau Veritas</strong></td>
<td>Local office and HO</td>
</tr>
<tr>
<td>2</td>
<td>Review of the <strong>Inspection Agreement</strong> on surface preparation and coating process</td>
<td>The Inspection Agreement on surface preparation and coating process agreed between Shipyard, Shipowner and Coating Manufacturer is to be reviewed by <strong>qualified BV Surveyor</strong></td>
</tr>
</tbody>
</table>

Reviewed as per IMO MSC.215 (82)
06 June 2008
X. Durand
2a Phase 1: Review of Inspection Agreement

► Is to cover at least the following:

- The **scope of inspection**,  
- **Who** carries out the inspection,  
- The **qualifications** of the coating inspector(s) and **appointment**,  
- The **areas of responsibility** of each coating inspector.

► To facilitate the review, the following shall be available:

- **Coating Specification** including selection of areas (spaces) to be coated, selection of coating system, surface preparation and coating process,  
- **Statement of Compliance or Type Approval** of the coating system,
2b Phase 2: Verification of PSPC implementation
Coating process scheme new building – surface preparation

- **Primary Surface Preparation**
  - Shop Primer Application
  - Edge Preparation
  - Secondary Surface Preparation

- **Shipyards’ Verified Inspection Reports**
  - To be included in the CTF

- **Coating Logs**
  - Check at random by BV

- **Shipyard Work Records**

- **PSP**
  - Shop primer application

- **SSP**
  - Edges treatment
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– Coating Process

► Coating process of blocks

1st coat application

1st Coating

Coating Preparation

Dry-to recoat times (drying)

Striped coat / 2nd Coating

Shipyard Work Records

Coating Inspector

Shipyard’s Verified Inspection Reports

Coating Logs

Check at random by BV

To be included in the CTF
Coating process scheme during new building

- Erection joint treatment
- Erection
- Surface treatment
- Stripe Coat / Erection coating
- Damage touch up
- Coating Inspector
- Coating Logs
- Check at random by BV
- Shipyard’s Verified Inspection Reports
- Shipyard Work Records
- Stripe Coating
- To be included in the CTF
2b Phase 2: Verification of PSPC Implementation

Procedure for Verification of PSPC implementation

- **Checklists** may be used by the BV Surveyor.

- Shipyard name and address: .................................................................
- Ship Register Number: ........................................................................
- Date: .................................................................................................
- BV Office: ...........................................................................................
- Surveyor’s Name: ................................................................................

<table>
<thead>
<tr>
<th>N° in PSPC</th>
<th>Item N°</th>
<th>Check the TAC</th>
<th>S*</th>
<th>F*</th>
<th>Evidences / Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>§7.1</td>
<td>I.1.2</td>
<td>Check that the Statement of Compliance (SOC) or Type Approval Certificate (TAC) of the coating system(s) attests compliance with the PSPC.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

II - Check the coating identification representative containers

<table>
<thead>
<tr>
<th>N° in PSPC</th>
<th>Item N°</th>
<th>Check during the Patrol Survey</th>
<th>S*</th>
<th>F*</th>
<th>Evidences / Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>§7.2</td>
<td>II.1.1</td>
<td>Check that the Base component indicated on the container corresponds to the Base component given in the SOC or TAC.</td>
<td></td>
<td></td>
<td>Record batch number or container number, if any, of the container checked</td>
</tr>
<tr>
<td>§7.2</td>
<td>II.1.2</td>
<td>Check that the Curing Agent component indicated on the container corresponds to the Curing Agent component given in the SOC or TAC.</td>
<td></td>
<td></td>
<td>Record batch number or container number, if any, of the container checked</td>
</tr>
</tbody>
</table>
Phase 2: Verification of PSPC Implementation

► Check the coating inspector’s report (coating log) on sampling basis

At least one coating log(s) of each type shall be reviewed:

- Coating log Primary Surface Preparation

- Coating log Secondary Surface Preparation

- Coating log Coating Application

- Coating log Erection works

► Check the coating inspector’s equipment used on sampling basis, as laid down in the inspection agreement
Phase 2: Verification of PSPC Implementation
Phase 2: Verification of PSPC Implementation

Coating Inspector equipment required by FROSIO

- Note book
- *Surface Preparation ISO standard* (ISO 8501-1, 8501-2)
- Torch
- Mirrors + Telescope pole
- *Surface profile comparator* (ISO 8503-1)
- Lens (G ×5, ×10, ×30)
- Adhesive tape for dust rating evaluation (ISO 8502-3)
- Bresle patch + syringe + Conduct meter (ISO 8502-6, ISO 8502-9)
- Plastic or glass beaker for abrasive contamination evaluation (ASTM D 4940)
- White paper or chiffon for compress air pollutant control
- pH paper
- Psychrometer or electronic Hygrometer
2b Phase 2: Verification of PSPC Implementation

- Coating Inspector equipment required by FROSIO
  - Contact thermometer
  - Dew Point and RH% calculator table \( (Ix\) diagram) \)
  - Chalk
  - Wheel gage
  - Calibrated thickness gage + calibrate shims and metallic support
  - PIG
  - Daily log
  - Proximity detector \( (High\) and low voltage) \)
  - Pull off tester
  - Viscosity cup
  - Filter paper + Potassium Hexacyanoferrate
  - Distilled water
### Phase 2: Verification of PSPC Implementation

<table>
<thead>
<tr>
<th>N° in PSPC and in PR 34</th>
<th>Item N°</th>
<th>Check during the monitoring of coating inspections</th>
<th>S°</th>
<th>F°</th>
<th>Evidences / Remarks</th>
</tr>
</thead>
</table>
| §7.5 and §4.1.1         | D.4 - Check the correct equipment for the extraction of water soluble salts | Check that the Coating inspector is equipped with:  
  - Standard Adhesive Patch (Bresle patch),  
  - Distilled or de-ionized water,  
  - Syringe and needle, |    |    |                                   |
| §7.5 and §4.1.1         | D.5 - Check the correct equipment for water soluble salts content control | Check that the Coating inspector is equipped with:  
  - Glass beaker of convenient size and shape for housing the electrode end of the conductometer,  
  - Calibrated conductometer, with temperature compensation and sufficient range, e.g. from 0 mS/m (0 μS/cm) to 200 mS/m (2000 μS/cm). |    |    |                                   |
| §7.5 and §4.1.1         | D.6 - Check the correct equipment for dust control | Check that the Coating inspector is equipped with:  
  - Adhesive tape, consisting of pressure sensitive tape of width 25 mm,  
  - Display board, of colour contrasting to that of the dust, for use as a background,  
  - Hand lens, capable of magnification x 10. |    |    |                                   |
2c Phase 3: Review of the Coating Technical File
2c IMO PSPC BV Tasks/ Action

- CTF content
  - TAC of coating systems used
  - Technical data sheets
  - Shipyard work records of coating application
    - Includes a large number of DFT measurements
  - Procedures for repairs during construction
  - Coating log of CI
  - Procedures for in-service maintenance and repairs of coating system
2c DFT measurements

- **CTF content**
  - DFT measurements (annex 3 of MSC 215)
  - -> 320 mu
  - -> 90/10 rule (90% of readings is > 320 mu AND none of the remaining 10% readings is below 0.9 X 320 mu)

  - 1 reading per 5 m² flat surface
  - 1 reading each 2 – 3 meter
  - 4 readings each 2 - 3 m on profiles
  - + more
### 2c IMO PSPC BV Tasks/ Action

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<tr>
<td>N° 4</td>
<td>CTF documentation review for content</td>
<td>Qualified BV Surveyor is to review for content the CTF documentation submitted by the Shipyard.</td>
</tr>
</tbody>
</table>

- **The BV stamp shall be affixed on the CTF final version.**

Reviewed as per IMO MSC.215 (82)
06 June 2008
X. Durand
3 In-service maintenance of CTF
3 CTF in-service

- PSPC fully applicable during repairs of those seawater ballast tanks built under PSPC during newbuilding!
Move Forward with Confidence*