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**UNIFIED INTERPRETATIONS OF THE PERFORMANCE STANDARD FOR
PROTECTIVE COATINGS FOR DEDICATED SEAWATER BALLAST
TANKS IN ALL TYPES OF SHIPS AND DOUBLE-SIDE SKIN SPACES
OF BULK CARRIERS (RESOLUTION MSC.215(82))**

1 The Maritime Safety Committee, at its ninety-second session (12 to 21 June 2013), with a view to ensuring a uniform approach towards the application of the provisions of the *Performance standard for protective coatings for dedicated seawater ballast tanks in all types of ships and double-side skin spaces of bulk carriers* (resolution MSC.215(82)); and following the recommendation made by the Sub-Committee on Ship Design and Equipment, at its fifty-seventh session, approved unified interpretations for the above Performance standard, as set out in the annex. The unified interpretations in the annex revise and supersede the unified interpretations of the Performance standard approved by the Committee as MSC.1/Circ.1378.

2 Member Governments are invited to use the annexed unified interpretations when applying the relevant provisions of the Performance standard and to bring them to the attention of all parties concerned.

ANNEX

UNIFIED INTERPRETATIONS OF THE PERFORMANCE STANDARD FOR PROTECTIVE COATINGS FOR DEDICATED SEAWATER BALLAST TANKS IN ALL TYPES OF SHIPS AND DOUBLE-SIDE SKIN SPACES OF BULK CARRIERS (RESOLUTION MSC.215(82))

PSPC 2 – DEFINITIONS

"2.6 "GOOD" condition is the condition with minor spot rusting as defined in resolution A.744(18)."

Interpretation

1 GOOD: Condition with spot rusting on less than 3 per cent of the area under consideration without visible failure of the coating. Rusting at edges or welds should be on less than 20 per cent of edges or weld lines in the area under consideration.

2 Coating Technical File: A term used for the collection of documents describing issues related to the coating system and its application from the point in time when the first document is provided and for the entire life of the ship including the inspection agreement and all elements of PSPC 3.4.

PSPC 3 – GENERAL PRINCIPLES

"3.2 Inspection of surface preparation and coating processes shall be agreed upon between the shipowner, the shipyard and the coating manufacturer and presented to the Administration for review. The Administration may, if it so requires, participate in the agreement process. Clear evidence of these inspections shall be reported and be included in the Coating Technical File (CTF) (see 3.4)."

Interpretation

1 Inspection of surface preparation and coating processes agreement should be signed by shipyard, shipowner and coating manufacturer and should be presented by the shipyard to the Administration for review prior to commencement of any coating work on any stage of a new building and as a minimum should comply with the PSPC.

2 To facilitate the review, the following from the CTF should be available:

- .1 Coating specification including selection of areas (spaces) to be coated, selection of coating system, surface preparation and coating process.
- .2 Statement of Compliance or Type Approval of the coating system.

3 The agreement should be included in the CTF and should at least cover:

- .1 inspection process, including scope of inspection, who carries out the inspection, the qualifications of the coating inspector(s) and appointment of a qualified coating inspector (responsible for verifying that the coating is applied in accordance with the PSPC). Where more than one coating inspector will be used then their areas of responsibility should be identified (for example, multiple construction sites); and
- .2 language to be used for documentation.

4 Any deviations in the procedure relative to the PSPC noted during the review should be raised with the shipyard, which is responsible for identifying and implementing the corrective actions.

5 A Passenger Ship Safety Certificate or Cargo Ship Safety Certificate or Cargo Ship Safety Construction Certificate, as appropriate, should not be issued until all required corrective actions have been closed to the satisfaction of the Administration.

"3.4 **Coating Technical File**

3.4.1 *Specification of the coating system applied to the dedicated seawater ballast tanks and double-side skin spaces, record of the shipyard's and shipowner's coating work, detailed criteria for coating selection, job specifications, inspection, maintenance and repair shall be documented in the Coating Technical File (CTF), and the Coating Technical File shall be reviewed by the Administration.*

3.4.2 *New construction stage*

...

3.4.3 *In-service maintenance, repair and partial recoating*

In-service maintenance, repair and partial recoating activities shall be recorded in the Coating Technical File in accordance with the relevant section of the Guidelines for coating maintenance and repair.

3.4.4 *Recoating*

If a full recoating is carried out, the items specified in 3.4.2 shall be recorded in the Coating Technical File.

3.4.5 *The Coating Technical File shall be kept on board and maintained throughout the life of the ship."*

Interpretation

Procedure for Coating Technical File Review

1 The shipyard is responsible for compiling the Coating Technical File (CTF) either in paper or electronic format, or a combination of the two.

2 The CTF should contain all the information required by the PSPC 3.4 and the inspection of surface preparation and the coating processes agreement (see PSPC 3.2).

3 The CTF should be reviewed for content in accordance with the PSPC 3.4.2.

4 Any deviations found under paragraph 3 should be raised with the shipyard, which is responsible for identifying and implementing the corrective actions.

5 A Passenger Ship Safety Certificate or Cargo Ship Safety Certificate or Cargo Ship Safety Construction Certificate, as appropriate, should not be issued until all required corrective actions have been closed to the satisfaction of the Administration.

"3.5 Health and safety

The shipyard is responsible for implementation of national regulations to ensure the health and safety of individuals and to minimize the risk of fire and explosion."

Interpretation

In order to document compliance with PSPC 3.5, relevant documentation from the coating manufacturer concerning health and safety aspects such as Material Safety Data Sheet is recommended to be included in the CTF for information.

PSPC 4 – COATING STANDARD

"4.3 Special application

4.3.1 This Standard covers protective coating requirements for the ship's steel structure. It is noted that other independent items are fitted within the tanks to which coatings are applied to provide protection against corrosion.

4.3.2 It is recommended that this Standard is applied, to the extent possible, to those portions of permanent means of access provided for inspection not integral to the ship's structure, such as rails, independent platforms, ladders, etc. Other equivalent methods of providing corrosion protection for the non-integral items may also be used, provided they do not impair the performance of the coatings of the surrounding structure. Access arrangements that are integral to the ship structure, such as increased stiffener depths for walkways, stringers, etc. are to fully comply with this Standard.

4.3.3 It is also recommended that supports for piping, measuring devices, etc. be coated in accordance with the non-integral items indicated in 4.3.2."

Interpretation

Reference is made to MSC/Circ.1279, *Guidelines for corrosion protection of permanent means of access arrangements*, approved by MSC 84 in May 2008.

PSPC 4 – TABLE 1: FOOTNOTES OF STANDARDS

"Footnotes:

- 5 Type of gauge and calibration in accordance with SSPC-PA2:2004. Paint Application Specification No.2.*
- 6 Reference standard: ISO 8501-1:1988/Suppl:1994. Preparation of steel substrate before application of paints and related products – Visual assessment of surface cleanliness.*
- 7 Reference standard: ISO 8503-1/2:1988. Preparation of steel substrate before application of paints and related products – Surface roughness characteristics of blast-cleaned steel substrates.*
- 8 Conductivity measured in accordance with ISO 8502-9:1998. Preparation of steel substrate before application of paints and related products – Test for the assessment of surface cleanliness.*

- 9 *Reference standard: ISO 8501-3:2001 (grade P2). Preparation of steel substrate before application of paints and related products – Visual assessment of surface cleanliness (referred to in 3.1).*
- 10 *Reference standard: ISO 8502-3:1993. Preparation of steel substrate before application of paints and related products – Test for the assessment of surface cleanliness (referred to in 3.5)."*

Interpretation

Only the footnoted standards referred to in PSPC table 1 are to be applied.

PSPC 4 – TABLE 1: 1 DESIGN OF COATING SYSTEM

"1.3 Coating pre-qualification test

Epoxy-based systems tested prior to the date of entry into force of this Standard in a laboratory by a method corresponding to the test procedure in annex 1 or equivalent, which as a minimum meets the requirements for rusting and blistering; or which have documented field exposure for five years with a final coating condition of not less than "GOOD" may be accepted.

For all other systems, testing according to the procedure in annex 1, or equivalent, is required."

Interpretation

Procedure for Coating System Approval

1 A Type Approval Certificate showing compliance with the PSPC 5 should be issued if the results of either method A+D, or B+D, or C+D are found satisfactory by the Administration.

2 The Type Approval Certificate should indicate the product and the shop primer tested. The certificate should also indicate other type approved shop primers with which the product may be used which have undergone the crossover test in a laboratory meeting the requirements in Method A, 1.1 of this UI.

3 The documents required to be submitted are identified in the following sections, in addition for all type approvals the following documentation is required: Technical Data Sheet showing all the information required by PSPC 3.4.2.2.

4 Winter type epoxy requires separate pre-qualification tests, including a shop primer compatibility test according to PSPC annex 1. Winter and summer type coating are considered different unless Infrared (IR) identification and Specific Gravity (SG) demonstrate that they are the same.

Method A: Laboratory test

1 A coating pre-qualification test should be carried out by a test laboratory recognized by the Administration and the test laboratory should meet the requirements set out in IACS UR Z17.

2 For the coating pre-qualification test, the measured average dry film thickness (DFT) on each prepared test panels should not exceed a nominal DFT (NDFT) of 320 microns plus 20 per cent unless a paint manufacturer specifies a NDFT greater than 320 microns. In the latter case, the average DFT should not exceed the specified NDFT plus 20 per cent and the coating system should be certified to the specified NDFT if the system passes the tests according to annex 1 of resolution MSC.215(82). The measured DFT should meet the "90/10" rule and the maximum DFT should always be below the maximum DFT value specified by the manufacturer.

3 Results from satisfactory pre-qualification tests (PSPC table 1: 1.3) of the coating system should be documented and submitted to the Administration.

4 Type Approval tests should be carried out for the epoxy-based system with the stated shop primer in accordance with PSPC, annex 1. If the tests are satisfactory, a Type Approval Certificate should be issued to include both the epoxy and the shop primer. The Type Approval Certificate will allow the use of the epoxy either with the named shop primer or on bare prepared steel.

5 An epoxy-based system may be used with shop primers other than the one with which it was originally tested provided that the other shop primers are approved as part of a system (PSPC table 1: 2.3 and table 1: 3.2) and have been tested according to PSPC annex 1, appendix 1, 1.7, which is known as the "crossover test". If the test or tests are satisfactory, a Type Approval Certificate should be issued. In this instance, the Type Approval Certificate should include the details of the epoxy and a list of all shop primers with which it has been tested that have passed these requirements. The Type Approval Certificate will allow the use of the epoxy with all the named shop primers or on bare prepared steel.

6 Alternatively, the epoxy can be tested without shop primer on bare prepared steel to the requirements of the PSPC, annex 1. If the test or tests are satisfactory, a Type Approval Certificate should be issued. The Type Approval Certificate should just record the epoxy. The certificate will allow the use of the epoxy on bare prepared steel only. If, in addition, crossover tests are satisfactorily carried out with shop primers which are approved as part of a system, the Type Approval Certificate should include the details of shop primers which have satisfactorily passed the crossover test. In this instance, the Type Approval Certificate will allow the use of the epoxy-based system with all the named shop primers or on bare prepared steel.

7 The Type Approval Certificate is invalid if the formulation of either the epoxy or the shop primer is changed. It is the responsibility of the coating manufacturer to inform the Administration immediately of any changes to the formulation.

Method B: five years' field exposure

1 Coating manufacturer's records, which should at least include the information indicated in paragraph 2, should be examined to confirm that the coating system had five years' field exposure and that the current product is the same as that being assessed.

2 Manufacturer's records:

- original application records;
- original coating specification;
- original technical data sheet;

- current formulation's unique identification (code or number);
- if the mixing ratio of base and curing agent has changed, a statement from the coating manufacturer confirming that the composition mixed product is the same as the original composition. This should be accompanied by an explanation of the modifications made;
- current technical data sheet for the current production site;
- SG and IR identification of original product;
- SG and IR identification of the current product; and
- if original SG and IR cannot be provided, then a statement from the coating manufacturer confirming the readings for the current product are the same as those of the original.

3 Either class survey records from an Administration or a joint (coating manufacturer and Administration) survey of all ballast tanks of a selected ship should be carried out for the purpose of verification of compliance with the requirements of paragraphs 1 and 7. The reporting of the coating condition in both cases should be in accordance with IACS Recommendation 87, section 2.

4 The selected ship should have ballast tanks in regular use, of which:

- at least one tank is approximately 2,000 m³ or more in capacity;
- at least one tank should be adjacent to a heated tank; and
- at least one tank contains an under-deck exposed to the sun.

5 In the case that the selected ship does not meet the requirements in 4, then the limitations should be clearly stated on the Type Approval Certificate. For example, the coating cannot be used in tanks adjacent to heated tanks or under-deck or tanks with a volume greater than the size surveyed.

6 In all cases of approval by Method B, the shop primer should be removed prior to application of the approved epoxy-based system coating, unless it can be confirmed that the shop primer applied during construction is identical in formulation to that applied in the selected ship used as a basis for the approval.

7 All ballast tanks should be in "GOOD" condition excluding mechanical damages, without touch up or repair in the prior five years.

8 "Good" is defined as: *Condition with spot rusting on less than 3 per cent of the area under consideration without visible failure of the coating. Rusting at edges or welds, must be on less than 20 per cent of edges or welds in the area under consideration.*

9 Examples of how to report coating conditions with respect to areas under consideration should be as those given in IACS Recommendation 87.

10 If the applied NDFT is greater than required by the PSPC, the applied NDFT will be the minimum to be applied during construction. This should be reported prominently on the Type Approval Certificate.

11 If the results of the inspection are satisfactory, a Type Approval Certificate should be issued to include both the epoxy-based system and the shop primer. The Type Approval Certificate should allow the use of the epoxy-based system either with the named shop primer or on bare prepared steel. The Type Approval Certificate should reference the inspection report which should also form part of the Coating Technical File.

12 The Type Approval Certificate is invalid if the formulation of either the epoxy-based system or the shop primer is changed. It is the responsibility of the coating manufacturer to inform the Administration immediately of any changes to the formulation.

Method C: Existing Marintek B1 approvals

1 Epoxy-based system coatings systems with existing satisfactory Marintek test reports minimum level B1 including relevant IR identification and SG, issued before 8 December 2006 can be accepted. If original SG and IR documentation cannot be provided, then a statement should be provided by the coating manufacturer, confirming that the readings for the current product are the same as those of the original.

2 The Marintek test report with IR and SG information should be reviewed and, if satisfactory, a Type Approval Certificate should be issued. The certificate should record the report reference and the shop primer used. The Type Approval Certificate should allow the use of the epoxy-based system either with the named shop primer, unless there is evidence to indicate that it is unsuitable, or on bare prepared steel.

3 The epoxy-based system approved by this method may be used with other shop primers if satisfactory crossover tests are carried out with shop primers which are approved as part of a system, see Method A, 4. In this instance, the Type Approval Certificate should include the details of the epoxy-based system and a list of all shop primers which have passed these requirements. The Type Approval Certificate will allow the use of the epoxy-based system with all the named shop primers or on bare prepared steel.

4 Such coatings should be applied in accordance with PSPC table 1, rather than the application conditions used during the approval test which may differ from the PSPC, unless these are more stringent than PSPC, annex 1, for example, if the NDFT is higher or high-pressure water washing and/or sweep blasting of the shop primer is used. In such cases these limiting conditions should be added to the Type Approval Certificate and should be followed during coating application in the shipyard.

5 The Type Approval Certificate is invalid if the formulation of either the epoxy-based system or the shop primer is changed. It is the responsibility of the coating manufacturer to inform the Administration immediately of any changes to the formulation.

Method D: Coating manufacturer

1 The coating/shop primer manufacturer should meet the requirements set out in IACS UR Z17, paragraphs 4, 5, 6 and 7 (except for 4.6) and paragraphs 2 to 7 below, which should be verified by the Administration.

2 Coating manufacturers:

- .1 Extent of engagement – Production of coating systems in accordance with PSPC and this UI.

- .2 These requirements apply to both the main coating manufacturer and the shop primer manufacturer where both coatings form part of the total system.
- .3 The coating manufacturer should provide to the Administration the following information:
 - A detailed list of the production facilities.
 - Names and location of raw material suppliers will be clearly stated.
 - A detailed list of the test standards and equipment to be used (Scope of approval).
 - Details of quality control procedures employed.
 - Details of any subcontracting agreements.
 - List of quality manuals, test procedures and instructions, records, etc.
 - Copy of any relevant certificates with their issue number and/or date, e.g. Quality Management System certification.
- .4 Inspection and audit of the manufacturer's facilities should be based on the requirements of the PSPC.
- .5 With the exception of early "scale up" from laboratory to full production, adjustment outside the limitations listed in the QC instruction referred to below is not acceptable, unless justified by trials during the coating system's development programme, or subsequent testing. Any such adjustments must be agreed by the formulating technical centre.
- .6 If formulation adjustment is envisaged during the production process, the maximum allowable limits should be approved by the formulating technical centre and clearly stated in the QC working procedures.
- .7 The manufacturer's quality control system should ensure that all current production is the same formulation as that supplied for the Type Approval Certificate. Formulation change should not be permissible without testing in accordance with the test procedures in the PSPC and the issue of a Type Approval Certificate by the Administration.
- .8 Batch records including all QC test results such as viscosity, specific gravity and airless spray characteristics should be accurately recorded. Details of any additions should also be included.
- .9 Whenever possible, raw material supply and lot details for each coating batch should be traceable. Exceptions may be where bulk supply such as solvents and pre-dissolved solid epoxies are stored in tanks, in which case it may only be possible to record the supplier's blend.
- .10 Dates, batch numbers and quantities supplied to each coating contract should be clearly recorded.

3 All raw material supply should be accompanied by the supplier's "Certificate of Conformance". The certificate should include all requirements listed in the coating manufacturer's QC system.

4 In the absence of a raw material supplier's certificate of conformance, the coating manufacturer should verify conformance to all requirements listed in the coating manufacturer's QC system.⁵ Drums should be clearly marked with the details as described on the Type Approval Certificate.

5 Product Technical Data Sheets should comply with all the PSPC requirements. The QC system will ensure that all Product Technical Data Sheets are current.

6 QC procedures of the originating technical centre should verify that all production units comply with the above stipulations and that all raw material supply is approved by the technical centre.

7 In the case that a coating manufacturer wishes to have products which are manufactured in different locations under the same name, then IR identification and SG should be used to demonstrate that they are the same coating, or individual approval tests will be required for the paint manufactured in each location.

8 The Type Approval Certificate is invalid if the formulation of either the epoxy-based system or the shop primer is changed. It is the responsibility of the coating manufacturer to inform class immediately of any changes to the formulation. Failure to inform class of an alteration to the formulation should lead to cancellation of the certificates for that manufacturer's products.

"1.4 *Job specification*

...

1.5 *NDFT (nominal total dry film thickness)*⁵

..."

Interpretation

1 Wet film thickness should be regularly checked during application for quality control by the builder. The PSPC does not state who should check WFT, it is accepted for this to be the builder. Measurement of DFT should be done as part of the inspection required in PSPC 6.

2 Stripe coats should be applied as a coherent film showing good film formation and no visible defects. The application method employed should ensure that all areas that require stripe coating are properly coated by brush or roller. A roller may be used for scallops, ratholes, etc., but not for edges and welds.

PSPC 4 – TABLE 1: 2 PSP (PRIMARY SURFACE PREPARATION)

"2. *PSP (Primary Surface Preparation)*

2.1 *Blasting and profile*^{6, 7}

Sa 2^{1/2}; with profiles between 30-75 µm

Blasting shall not be carried out when:

.1 *the relative humidity is above 85 per cent; or*

.2 *the surface temperature of steel is less than 3°C above the dew point."*

Interpretation

Checking of the steel surface cleanliness and roughness profile should be carried out at the end of the surface preparation and before the application of the primer, in accordance with the manufacturer's recommendations.

"2.2 *Water soluble salt limit equivalent to NaCl⁸*
≤ 50 mg/m² of sodium chloride."

Interpretation

The conductivity of soluble salts should be measured in accordance with ISO 8502-6 and ISO 8502-9, and compared with the conductivity of 50 mg/m² NaCl. If the measured conductivity is less than or equal to, then it is acceptable. Minimum readings to be taken should be one (1) per plate in the case of manually applied shop primer. In cases where an automatic process for application of shop primer is used, there should be means to demonstrate compliance with PSPC through a Quality Control System, which should include a monthly test.

"2.3 *Shop primer*

Zinc containing inhibitor-free zinc silicate based or equivalent. Compatibility with main coating system shall be confirmed by the coating manufacturer."

Interpretation

Shop primers not containing zinc or not silicate based should be considered to be "alternative systems" and therefore equivalency should be established in accordance with section 8 of the PSPC with test acceptance criteria for "alternative systems" given in section 3.1 (right columns) of appendices 1 and 2 to annex 1 of resolution MSC.215(82).

Procedure for review of quality control of automated shop primer plants

1 It is recognized that the inspection requirements of PSPC 6.2 may be difficult to apply to an automated shop primer plant and a quality control approach would be a more practical way of enabling compliance with the requirements of PSPC.

2 As required in PSPC, it is the responsibility of the coating inspector to confirm that the quality control procedures are ensuring compliance with PSPC.

3 When reviewing the quality control for automated shop primer plants the following procedures should be included:

- .1 Procedures for management of the blasting grit including measurement of salt and contamination.
- .2 Procedures recording the following: steel surface temperature, relative humidity, dewpoint.
- .3 Procedures for controlling or monitoring surface cleanliness, surface profile, oil, grease, dust and other contamination.

- .4 Procedures for recording/measuring soluble salts.
- .5 Procedures for verifying thickness and curing of the shop primer conforms to the values specified in the Technical Specification.

PSPC 4 – TABLE 1: 3 SSP (SECONDARY SURFACE PREPARATION)

"3.2 *Sa 2 1/2 on damaged shop primers and welds*

Sa 2 removing at least 70 per cent of intact shop primer, which has not passed a pre-qualification certified by test procedures in 1.3.

3.3 *Surface treatment after erection⁶*

Butts St 3 or better or Sa 2¹/₂ where practicable. Small damages up to 2 per cent of total area: St 3. Contiguous damages over 25 m² or over 2 per cent of the total area of the tank, Sa 2¹/₂ shall be applied.

Coating in overlap shall be feathered.

3.4 *In case of full or partial blasting 30-75 µm, otherwise as recommended by the coating manufacturer."*

Interpretation

Usually, the fillet welding on tank boundary watertight bulkhead is left without coating on block stage (because not yet been leakage tested), in which case it can be categorized as erection joint ("butt") to be power tooled to St 3.

"3.6 *Water soluble salts limit equivalent to NaCl after blasting/grinding⁸*
≤ 50 mg/m² of sodium chloride."

Interpretation

1 The conductivity of soluble salts is measured in accordance with ISO 8502-6 and ISO 8502-9, and compared with the conductivity of 50 mg/m² NaCl. If the measured conductivity is less than or equal to, then it is acceptable.

2 All soluble salts have a detrimental effect on coatings to a greater or lesser degree. ISO 8502-9:1998 does not provide the actual concentration of NaCl. The percentage NaCl in the total soluble salts will vary from site to site. Minimum readings to be taken should be one (1) reading per block/section/unit prior to applying.

PSPC 4 – TABLE 1: 4 MISCELLANEOUS

"4.3 *Testing of coating⁵*

Destructive testing shall be avoided. Dry film thickness shall be measured after each coat for quality control purpose and the total dry film thickness shall be confirmed after completion of final coat, using appropriate thickness gauges (see annex 3)."

Interpretation

All DFT measurements should be measured. Only the final DFT measurements need to be measured and reported for compliance with the PSPC by the qualified coating inspector. The Coating Technical File may contain a summary of the DFT measurements which typically will consist of minimum and maximum DFT measurements, number of measurements taken and percentage above and below required DFT. The final DFT compliance with the 90/10 practice should be calculated and confirmed, see PSPC 2.8.

PSPC 5 – COATING SYSTEM APPROVAL

"Results from pre-qualification tests (table 1, paragraph 1.3) of the coating system shall be documented and a Statement of Compliance or Type Approval Certificate shall be issued if found satisfactory by a third party, independent of the coating manufacturer."

Interpretation

See Interpretation of PSPC table 1: 1 Design of coating system, 1.3 Coating pre-qualification test.

PSPC 6 – COATING INSPECTION REQUIREMENTS

"6.1 General

6.1.1 To ensure compliance with this Standard, the following shall be carried out by qualified coating inspectors certified to NACE Coating Inspector Level 2, FROSIO Inspector Level III or equivalent as verified by the Administration.

6.1.2 Coating inspectors shall inspect surface preparation and coating application during the coating process by carrying out, as a minimum, those inspection items identified in section 6.2 to ensure compliance with this Standard. Emphasis shall be placed on initiation of each stage of surface preparation and coatings application as improper work is extremely difficult to correct later in the coating progress. Representative structural members shall be non-destructively examined for coating thickness. The inspector shall verify that appropriate collective measures have been carried out.

6.1.3 Results from the inspection shall be recorded by the inspector and shall be included in the CTF (refer to annex 2 (Example of daily log and non-conformity report))."

Interpretation

Procedure for assessment of coating inspectors' qualifications

1 Coating inspectors required to carry out inspections in accordance with the PSPC 6 should be qualified to NACE Coating Inspector Level 2, FROSIO Inspector Level III, or an equivalent qualification. Equivalent qualifications are described in paragraph 3 below.

2 However, only coating inspectors with at least 2 years' relevant coating inspector experience and qualified to NACE Coating Inspector Level 2 or FROSIO Inspector Level III, or with an equivalent qualification, can write and/or authorize procedures, or decide upon corrective actions to overcome non-compliances.

3 *Equivalent qualification*

3.1 Equivalent qualification is the successful completion, as determined by the course tutor, of an approved course.

3.2 The course tutors should be qualified with at least 2 years' relevant experience and qualified to NACE Coating Inspector Level 2 or FROSIO Inspector Level III, or with an equivalent qualification.

3.3 Approved course: A course that has a syllabus based on the issues associated with the PSPC including the following:

- Health environment and safety
- Corrosion
- Materials and design
- International standards referenced in PSPC
- Curing mechanisms
- Role of inspector
- Test instruments
- Inspection procedures
- Coating specification
- Application procedures
- Coating failures
- Pre-job conference
- MSDS and product data sheet review
- Coating technical file
- Surface preparation
- Dehumidification
- Waterjetting
- Coating types and inspection criteria
- Specialized application equipment
- Use of inspection procedures for destructive testing and non-destructive testing instruments
- Inspection instruments and test methods
- Coating inspection techniques
- Cathodic protection
- Practical exercises, case studies.

Examples of approved courses may be internal courses run by the coating manufacturers or shipyards, etc.

3.4 Such a course should have an acceptable measurement of performance, such as an examination with both theoretical and practical elements. The course and examination should be approved by the Administration.

3.5 Equivalent qualification arising from practical experience: An individual may be qualified without attending a course where it can be shown that the individual:

- has a minimum of five years' practical work experience as a coating inspector of ballast tanks during new construction within the last 10 years; and
- has successfully completed the examination given in paragraph 3.4.

4 *Assistant to the coating inspectors*

4.1 If the coating inspectors require assistance from other persons to perform part of the inspections, those persons should perform the inspections under the coating inspector's supervision and should be trained to the coating inspector's satisfaction.

4.2 Such training should be recorded and endorsed either by the inspector, the yard's training organization or inspection equipment manufacturer to confirm competence in using the measuring equipment and confirm knowledge of the measurements required by the PSPC.

4.3 Training records should be available for verification.

PSPC 7 – VERIFICATION REQUIREMENTS

"The following shall be carried out by the Administration prior to reviewing the Coating Technical File for the ship subject to this Standard:

- .1 check that the Technical Data Sheet and Statement of Compliance or Type Approval Certificate comply with this Standard;*
- .2 check that the coating identification on representative containers is consistent with the coating identified in the Technical Data Sheet and Statement of Compliance or Type Approval Certificate;*
- .3 check that the inspector is qualified in accordance with the qualification standards in paragraph 6.1.1;*
- .4 check that the inspector's reports of surface preparation and the coating's application indicate compliance with the manufacturer's Technical Data Sheet and Statement of Compliance or Type Approval Certificate; and*
- .5 monitor implementation of the coating inspection requirements."*

Interpretation

Procedure for verification of application of the PSPC

1 The verification requirements of PSPC 7 should be carried out by the Administration.

2 Monitoring implementation of the coating inspection requirements, as called for in PSPC 7.5 means checking, on a sampling basis, that the inspectors are using the correct equipment, techniques and reporting methods as described in the inspection procedures reviewed by the Administration.

3 Any deviations found under paragraph 2 should be raised initially with the coating inspector, who is responsible for identifying and implementing the corrective actions.

4 In the event that corrective actions are not acceptable to the Administration or in the event that corrective actions are not carried out, then the shipyard should be informed.

5 A Passenger Ship Safety Certificate or Cargo Ship Safety Certificate or Cargo Ship Safety Construction Certificate, as appropriate, should not be issued until all required corrective actions have been carried out to the satisfaction of the Administration.

PSPC ANNEX 1: TEST PROCEDURES FOR COATING QUALIFICATION FOR DEDICATED SEAWATER BALLAST TANK OF ALL TYPES OF SHIPS AND DOUBLE-SIDE SKIN SPACES OF BULK CARRIERS

Annex 1 – Footnotes of standards

"Footnotes:

- 10 *Reference standard: ISO 2811-1/4:1997. Paints and varnishes. Determination of density.*
- 11 *Reference standards: ISO 4628/2:2003. Paints and varnishes – Evaluation of degradation of coatings – Designation of quantity and size of defects, and of intensity of uniform changes in appearance – Part 2. ISO 4628:2003. Paints and varnishes – Evaluation of degradation of coatings – Designation of quantity and size of common types of defect – Part 3: Designation of degree of rusting.*
- 12 *Nine equally distributed measuring points are used on panel's size 150 mm x 150 mm or 15 equally distributed measuring points on panel's size 200 mm x 400 mm.*
- 13 *Reference standard: ISO 4624:2002. Pull-off test for adhesion.*
- 14 *Reference standards: ASTM D4145:1983. Standard Test Method for Coating Flexibility of Prepainted Sheet.*
- 15 *Reference standard: ISO 6270-1:1998. Paints and varnishes – Determination of resistance to humidity – Part 1: Continuous condensation."*

Interpretation

Only the footnoted standards referred to in PSPC annex 1 should be applied.
