# C/P oil tanker shipbuilding according to PSPC

广船国际 广州广船国际股份有限公司
GUANGZHOU SHIPYARD INTERNATIONAL COMPANY LIMITED

2010 November

Luo Yun

GSI, China

# Foreword

**Background of vessel**

Ship name: 50500t Chemical/Product Oil Tanker

Ship-Owner: From Denmark

Construction period:

Steel cutting date: 12th, March 2009
Erection date: 23rd, October 2009
Launching date: 5th, March 2010
Delivery date: 19th, July 2010


TORM ASLAUG
TORM

# Certificate from Det Norske Veritas

# DET NORSKE VERITAS

## CERTIFICATE OF INTERIM CLASS

Issued under the provisions of the Rules of Det Norske Veritas

**Particulars of Ship**

| | |
|---|---|
| Name of Ship: | "TORM ASLAUG" |
| Builder: | GUANGZHOU SHIPYARD INTERNATIONAL CO., LTD. |
| Yard No: | 06131034 |
| Owner: | TORM A/S |
| DNV Ship Id No.: | 27962 |
| IMO number: | 9465978 |

THIS IS TO CERTIFY
that the above-mentioned ship has been surveyed by the undersigned according to the Rules of Det Norske Veritas and that, upon completion of the survey on the **2010-07-19** the undersigned is of the opinion that the ship's hull, machinery and equipment are in compliance with the applicable Rule requirements for the following class notation:

**✠ 1A1 CSR Tanker for Chemicals and Oil ESP SPM E0 VCS-2 COAT-PSPC(B) BIS TMON**

By authority, the above interim class is assigned in accordance with my reports[1] and I will forward my recommendation to the Society accordingly

Provided the requirements for the retention of class in the Rules will be complied with, and unless the class has been suspended or withdrawn, this Certificate is valid until the administration of the Society has decided on the assignment of class or until the expiry date stated below.

**2011-10-19**

Det Norske Veritas AS, **Guangzhou, P. R. China** Date: **2010-07-19**

DET NORSKE VERITAS 1864 Guangzhou

**Jung Hun Cho**
**Surveyor**

**IMPORTANT!**
The ship's class will be automatically suspended if the renewal survey is not completed or under completion before the expiry date of the Classification Certificate, unless the survey has been accepted postponed prior to the Certificate's expiry date. Furthermore, the ship's class will also be automatically suspended if the annual/intermediate surveys, required for retention of this Certificate, are not carried out within 3 months after the anniversary date of the Classification Certificate.

[1] Conditions of Class issued, see page 2





Name of ship: **"TORM ASLAUG"** DNV Id No: **27962**
Date of issue: **2010-07-19**

| | CONDITIONS OF CLASS ISSUED: | DUE DATE: | POSTPONED UNTIL: |
|---|---|---|---|
| CC1 | Within due date, the loading computer is to be installed with final lightweight data. The master should make a printout of the test conditions that verifies that the correction has taken place and submit this to the approval centre(DNV Shanghai) | 2010-10-19 | |
| | | | |
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Issued at **Guangzhou, P. R. China** on **2010-10-19**

for **Det Norske Veritas AS**

DET NORSKE VERITAS 1864 Guangzhou

**Jung Hun Cho**
**Surveyor**

# I. Preparation work

1、GSI established PSPC specific **team** to carry out new standard sufficiently. week regular meeting for PSPC

2、**Training** on inspectors, managers and workers involved in application, some of them got NACE I and NACE II certificates.

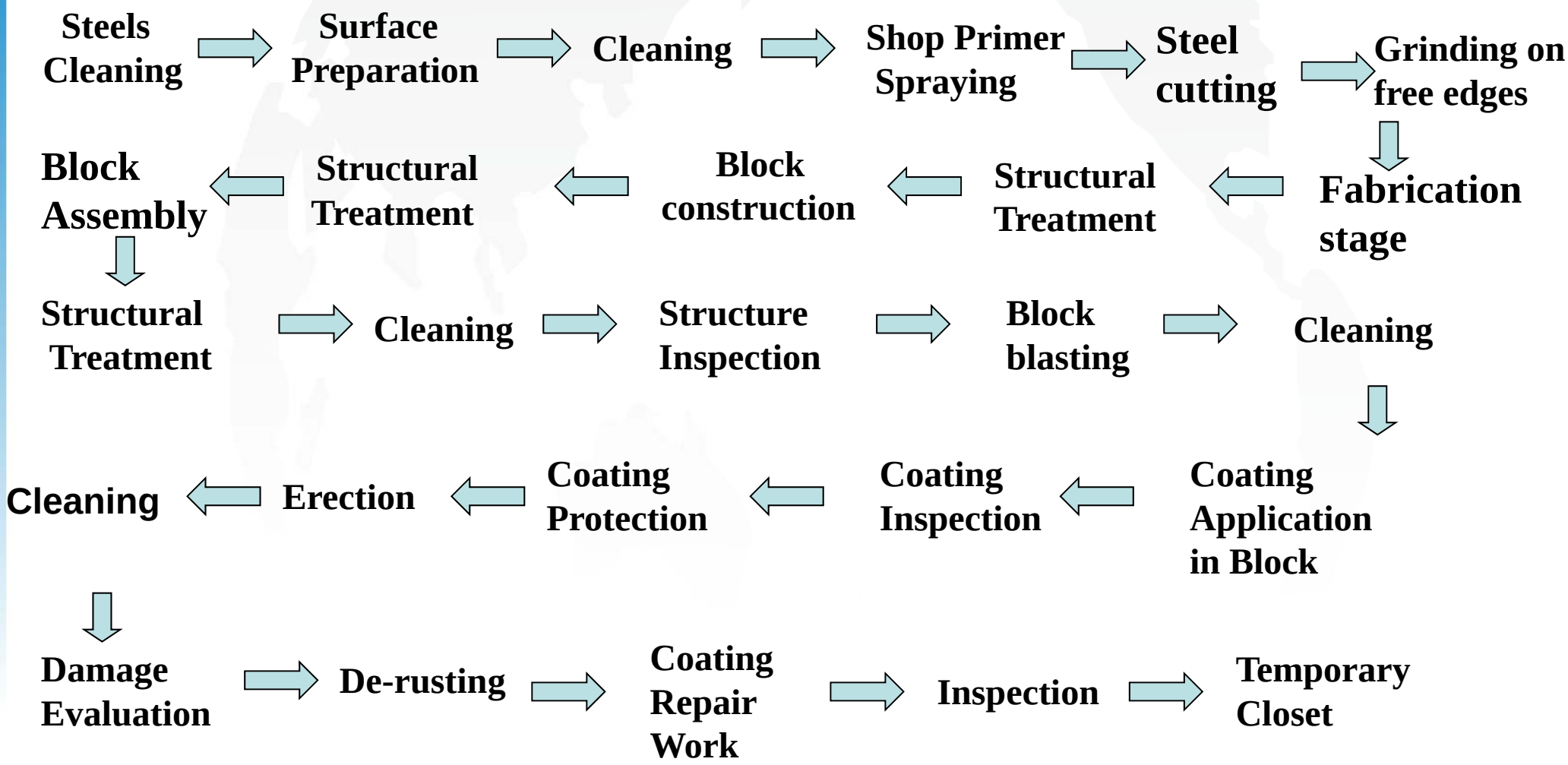
3、**Purchase implements** for PSPC specific inspection or professional test.

4、Three parties inspection **agreement.**

5、Four parties **pre-job conference** includes DNV, ship-owner, paint manufactures and shipyard.

# II. Coating Procedure for W.B.Tk

## Procedure of Coating Application



# II. Coating Procedure for W.B.Tk

## Coating Inspection Procedure

**Preparation treatment on steel surface and Coating application** → **De-rusting grade, surface profiles, water soluble salts, surface cleanliness and dry film thickness**

**Climate control**

↓

**Structural treatment on steel surface** → **Welding undercut, splatter and grinding free edge**

↓

**Secondary Surface preparation and coating application** → **De-rusting grade, surface profiles, water soluble salts, surface cleanliness, stripe and coating quality**

**Climate control**

↓

**Surface treatment and coating application after erection** → **Damaged area evaluation, de-rusting grade and coating quality**

**Climate control**

# III. Key Point Control

## 1.Structure treatment

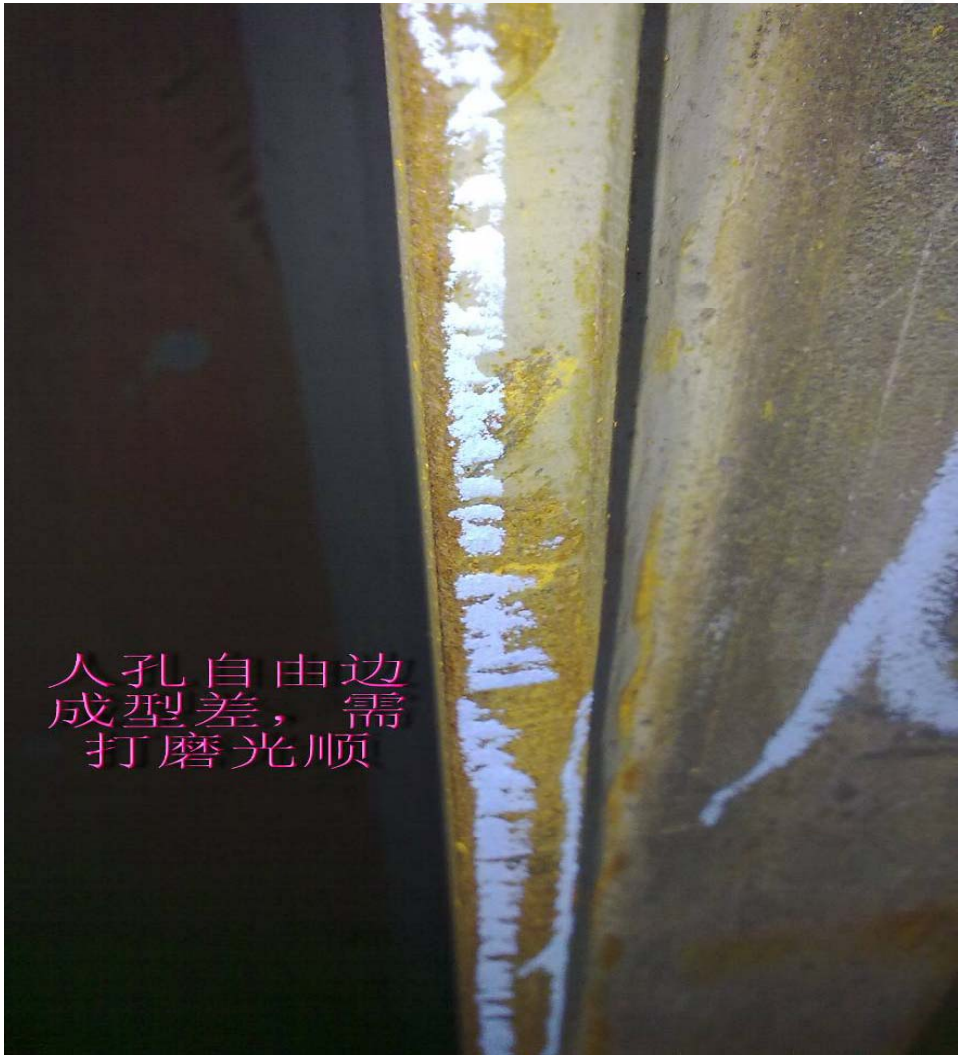
Free edges

# 1.Structure treatment

Free edges

# 1.Structure treatment

## Defects on steel surface

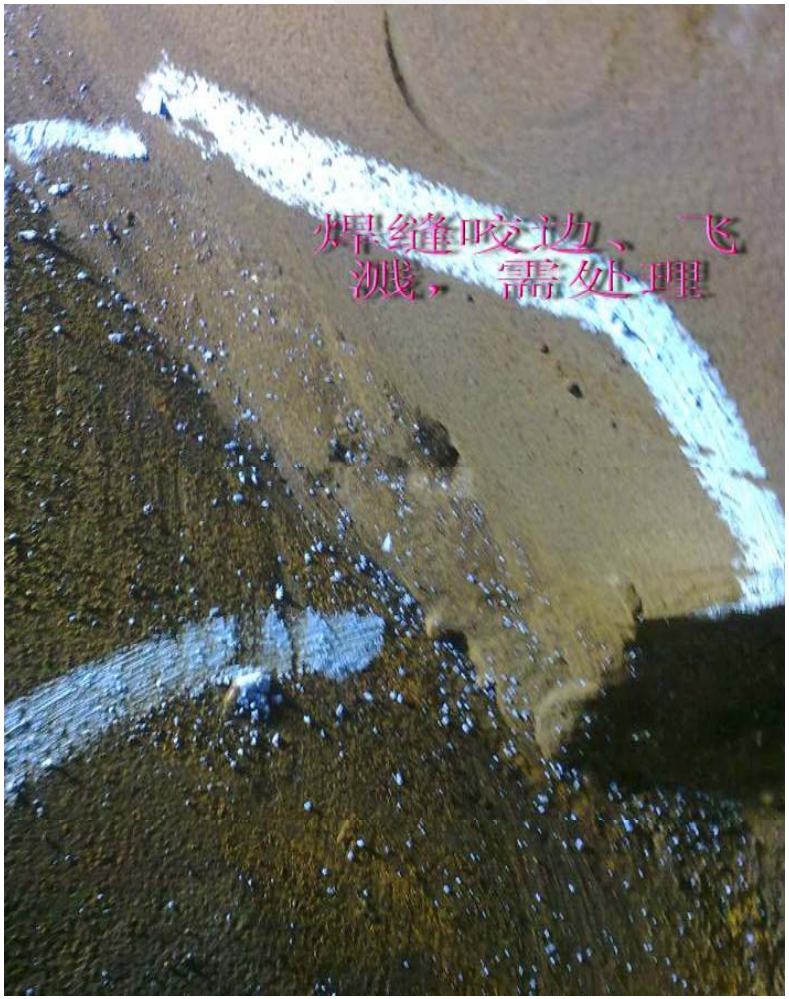



# 1.Structure treatment

## Defects on steel surface

# 1.Structure treatment

## Welding seams and splatter

# 1.Structure treatment

After blasting

# 1.Structure treatment

After blasting

# III. Key Point Control

## 2.Precision control

**Using Total Station to do**:

block measurement and analysis,

computer assembly,

pre-cutting before boarding,

**Purpose**：reduce the coating damage

# Total Station

# Pre-cutting before boarding

# III. Key Point Control

## 3.Welding distortion control

Improve application method

automatic welding instead of manual welding

**Purpose**： reduce the coating damage

# III. Key Point Control

## 4.Advance pre-fitting integrality

Optimal design, reduce mistakes

Outfitting before coating

Block overall assembly， enlarge pre-fitting area

**Purpose**： reduce the coating damage

# Block Assembly, pre-fitting

# Block Assembly, pre-fitting

# III. Key Point Control

## 5.Coating protection

**Purpose**: reduce coating damage

# 5.Coating protection

# 5.Coating protection

# IV. Relative test results of W.B.TK

## Water soluble salt test results

| No. of tanks | Date | Result (mg/m²) |
|---|---|---|
| FPT | 2010-2-25 | 13.2 |
| NO.1 (P)W.B.T | 2010-2-24 | 22.4 |
| NO.1 (S)W.B.T | 2010-2-24 | |
| NO.2 (P)W.B.T | 2010-2-24 | |
| NO.2 (S)W.B.T | 2010-2-23 | |
| NO.4 (P)W.B.T | 2010-2-19 | ≤50 mg/m² (equivalent to NaCl) |
| NO.4 (S)W.B.T | 2010-2-22 | |
| NO.5 (P)W.B.T | 2010-2-18 | |
| NO.5 (S)W.B.T | 2010-2-19 | |
| NO.6 (P)W.B.T | 2010-2-11 | |
| NO.6 (S)W.B.T | 2010-2-11 | |
| NO.7 (P/S)W.B.T | 2010-2-21 | |

# Damage evaluation results

| No. of Each tanks | Area of each tank ($M^2$) | Coating damaged area and damaged rate | | | | | |
|---|---|---|---|---|---|---|---|
| | | QC results | | Paint manufacture's results | | Owner's results | |
| | | Damaged area ($m^2$) | Damaged rate (%) | Damaged area ($m^2$) | Damaged rate (%) | Damaged area ($m^2$) | Damaged rate (%) |
| FPT | 5721 | 17.09 | 0.31 | 24.46 | 0.43 | 34.05 | 0.60 |
| NO.1 (P) | 5123 | 54.62 | 1.07 | 67.50 | 1.32 | 67.05 | 1.32 |
| NO.1 (S) | 4543 | | | | | | |
| NO.2 (P) | 5754 | | | | | | |
| NO.2 (S) | 5055 | | | | | | |
| NO.3 (P) | 4925 | | | | | | |
| NO.3 (S) | 4265 | | | | | | |
| NO.4 (P) | 4789 | | ≤2% | | | | |
| NO.4 (S) | 4183 | | | | | | |
| NO.5 (P) | 4890 | | | | | | |
| NO.5 (S) | 4435 | | | | | | |
| NO.6 (P) | 4843 | | | | | | |
| NO.6 (S) | 4287 | | | | | | |
| NO.7 | 8266 | | | | | | |
| A.P.T(P) | 1636 | | | | | | |
| A.P.T(S) | 1500 | | | | | | |

# V. Problems

1、Owners did inspections based on over high PSPC standard by their own understanding, they were in advantageous position and eventually it caused many works started over again.

**Examples：**

→Grinding on free edges, treatment on welding splatters and welding defects is always unable to meet the requirements of owners.

→Even if we have the judgment of 90/10 rule for DFT measurements, owners always hope to obtain a perfect coating.

2. Treatment on free edge of fittings inside the tank and welding surface

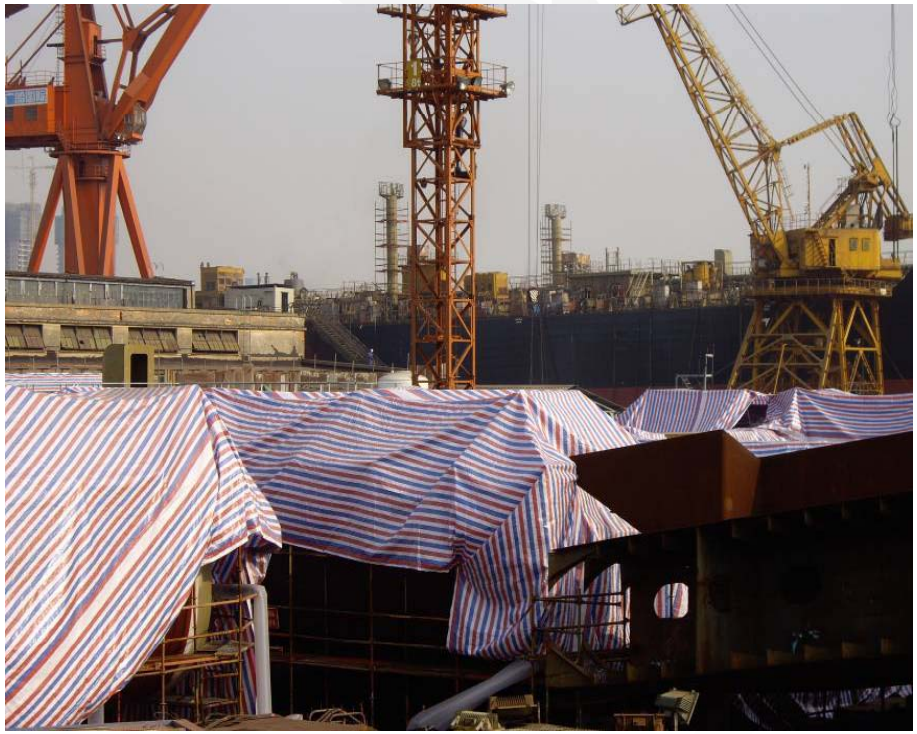
**IMO standard**：no specific requirement

**Owner requirements**：same standard as the hull structure

**Grinding on free edge of fittings**

# 3. Coating protection

The rise in **costs**



4. There are so many **documents** include over detailed items need to be recorded, it is a large amount of work for inspectors. Over one hundred documents for one ship.

→ Coating Technical File (CTF)

5. **Lack of capacity** on lifting, grounds and transport

→ from single block to combination block

# Vi. Conclusion

**Disadvantage： Big cost!**

On each stage includes block stage, assembly stage, coating stage and erection stage, work force of **grinding** has doubled and redoubled . It is 3 or 4 times larger than usual vessels.

# Vi. Conclusion

**Disadvantage ： Big cost!**

High Inspection standard made the **period longer** than before.

It influenced construction process of other vessel’s.

# Vi. Conclusion

**Advantage:**

**Coating damage** has been decreased for sake of improvement of construction technology.

**Coating quality and appearance** of water ballast tank is improved.

# Final Coating of W.B.TK

# Thank you !