WÄRTSILÄ

# VMW628-1E-01

## Wärtsilä Propulsion Machinery

## *Certificates*

*American Bureau of Shipping*

### Main Engines:

1. 4 x WÄRTSILÄ® 6L26
   Nos. PAAE250719, PAAE250720, PAAE250721, PAAE250722
2. Spare Parts
3. 9A03 - Generators (4)
4. 7C01 - Flexible Coupling (Flywheel) (4)
5. 7C04 - Flexible Coupling (Engine PTO) (2)
6. Flexible Hoses

### Auxiliary Equipment:

7. 1E04 - Cooler (MDF) (4)
8. 3T01 - Starting Air Vessel, 1000 L (2)
9. 4N01 - Preheating Unit (4)

# 1.

4 x WÄRTSILÄ® 6L26
Nos. PAAE250719, PAAE250720, PAAE250721,
PAAE250722

# AMERICAN BUREAU OF SHIPPING

| | | | |
|---|---|---|---|
| Customer Name | **WARTSILA FINLAND OY** | Purchase Order No. | **PAAE250719** |
| Attending Office | **Trieste** | Report Number | **TR2212350** |
| First Visit Date | **10-Mar-2014** | Last Visit Date | **18-Apr-2014** |

**Certification Of:** Diesel Engine — Quantity: One (1)
Manufacturer: WARTSILA FINLAND OY FOR DELIVERY CENTRE-TRIESTE

**Survey Location :** S. Dorligo della Valle, Trieste (Italy)

**Equipment Data**

| | |
|---|---|
| Item Name | Diesel Engine |
| Manufacturer Number(S. No.) | PAAE250719 |
| Model Number | W6L26 |
| Destination Vessel (Class Number) | YY251689 |
| Builder/Shipyard | FUJIAN MAWEI SHIPBUILDING LTD. |
| Builder I.D./Hull No. | MW628-1 |

**Design Details**

| | |
|---|---|
| Design State | Type Approved |
| ABS Reviewing Organization | London Ship Engineering |

**Additional Data**

| | |
|---|---|
| ABS Stamping | ⊛ TR2212350 |
| Number of Cylinders | 6 |
| Cylinder Bore | 260 mm |
| Engine Cycle | 4 Stroke |
| Maximum Continuous Rating | 1950 kW |
| Revolutions at MCR | 900 rpm |
| Piston Stroke | 320 mm |
| Cylinder Configuration | In-line |
| Pressure Charging System | Turbo Charged |

**This is to Certify** that the undersigned surveyor(s) to this Bureau did, at the request of the customer, carry out the following survey and report as follows:

Manufacturer's production processes were generally examined and material flow, control and identification technique found satisfactory.
Manufacturer's quality system and workmanship standards reviewed and considered satisfactory or requested to be modified to suit the particular project requirements.
Principal data verified in accordance with the applicable specification and approved plans, and confirmed to be within acceptable tolerances.
Inspection and testing of machinery/equipment parts and assembly satisfactorily carried out in accordance with the applicable specification.
Functional testing satisfactorily performed in accordance with the applicable specification.
Traceability of materials used on this project has been verified.
Examination during manufacturer assembly has been carried out to verify all critical phases of welding, fitting, machining, and non-destructive examination as required by the applicable Rules and/or requirements.
Subject to satisfactory installation, testing and trials after installation onboard the vessel.
Final markings for identification confirmed.

| | | | |
|---|---|---|---|
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Subject Diesel Engine has been verified to be in accordance with ABS Rules Part 4-2-1.
In particular the following has been verified:
- Verification of ABS design approval.
- Certificates and reports relevant to engine's components were available to the attending surveyor for review.
- Test of safety devices (FO leakage, Emergency Stops, Oil Mist Detector, LO low pressure, Over speed 1 and 2, Turning gear engaged).
- Crankcase explosion relief valves were provided as requested by 4-2-1, 7.1.
- Warning notices were fitted as per 4-2-1, 7.13.
- An operating governor conforming to the requirements of 4-2-1, 7.3 and 7.5 was fitted.
- Shielding of High Pressure Fuel Lines as per 4-6-5, 3.3.7 was fitted.
- Insulation of Hot Surfaces (over 220 deg C) as per 4-2-1, 11.9 was fitted.
- Review of explosion relief valve type approval certificate.
- The engine's testing parameters were verified (through manufacturer's documentation or actual testing) in accordance with 4-2-1.
- Factory Acceptance Test records/reports were reviewed by the attending surveyor for compliance with the Rules.
- Requirements and outcome of the tests were in accordance with Manufacturer's recommendations (i.e. temperatures, pressures, etc.).
- After shop test, the engine has been opened at Surveyor's satisfaction to verify that the unit is free of defects and deterioration and that the unit has been constructed and equipped in accordance with good engine manufacturing practice.

NOTES:
- Fuel oil and lube oil strainers are to be capable of being cleaned while the engine is operating, as per 4-6-5.
- Full power trial after installation on board is to be witnessed by the Surveyor and a selective opening for examination to be carried out in accordance with 4-2-1, 15.

**Survey Closed Findings**

**VR_1059616_96 Diesel Engine** **PAAE068783**

| | | | |
|---|---|---|---|
| **Opened In Report** | TR1059616_A - Certification - Diesel Engine | 26-Sep-2008 | Trieste |
| **Closed In Report** | TR2212350-ACertification - Diesel Engine | 18-Apr-2014 | Trieste |
| **Status** | Closed | | |
| **Found** | Type Approval for engine type W26B2 not available. | | |
| **Recommendation** | Type Approval certificate to be rendered available to attending Surveyor prior final acceptance of the engine. | | |
| **Rectification (Full )** | Engine type W6L26B2 has been verified to be made in accordance with Type Approved Design. See Type Approval Certificate issued by ABS London Ship Engineering N 14-LD469568-2-PDA-DUP2 on 17/04/2014. | | |

**VR_1633852_126 Diesel Engine** **PAAE102133**

| | | | |
|---|---|---|---|
| **Opened In Report** | TR1633852_A - Certification - Diesel Engine | 02-Mar-2009 | Trieste |
| **Closed In Report** | TR2212350-ACertification - Diesel Engine | 18-Apr-2014 | Trieste |
| **Status** | Closed | | |
| **Found** | Type Approval of Engine Type W26B2 not completed. | | |
| **Recommendation** | Type approval of engine type W26B2 to be completed by submitting the requested information to an ABS Office. | | |
| **Rectification (Full )** | Engine type W6L26B2 has been verified to be made in accordance with Type Approved Design. See Type Approval Certificate issued by ABS London Ship Engineering N 14-LD469568-2-PDA-DUP2 on 17/04/2014. | | |

| | | | |
|---|---|---|---|
| Customer Name | **WARTSILA FINLAND OY** | Purchase Order No. | **PAAE250719** |
| Attending Office | **Trieste** | Report Number | **TR2212350** |
| First Visit Date | **10-Mar-2014** | Last Visit Date | **18-Apr-2014** |

**VR_1633855_128 Diesel Engine** **PAAE102136**

| | | | |
|---|---|---|---|
| **Opened In Report** | TR1633855_A - Certification - Diesel Engine | 02-Mar-2009 | Trieste |
| **Closed In Report** | TR2212350-ACertification - Diesel Engine | 18-Apr-2014 | Trieste |
| **Status** | Closed | | |
| **Found** | Type Approval not completed. | | |
| **Recommendation** | Type approval of engine type W26B2 to be completed by submitting the requested information to an ABS Office. | | |
| **Rectification (Full )** | Engine type W6L26B2 has been verified to be made in accordance with Type Approved Design. See Type Approval Certificate issued by ABS London Ship Engineering N 14-LD469568-2-PDA-DUP2 on 17/04/2014. | | |

**VR_1633853_133 Diesel Engine** **PAAE102134**

| | | | |
|---|---|---|---|
| **Opened In Report** | TR1633853_A - Certification - Diesel Engine | 23-Mar-2009 | Trieste |
| **Closed In Report** | TR2212350-ACertification - Diesel Engine | 18-Apr-2014 | Trieste |
| **Status** | Closed | | |
| **Found** | Type Approval of engine type 6L26B2 not completed. | | |
| **Recommendation** | Type Approval of engine type 6L26B2 to be completed by submitting the requested information to an ABS office. | | |
| **Rectification (Full )** | Engine type W6L26B2 has been verified to be made in accordance with Type Approved Design. See Type Approval Certificate issued by ABS London Ship Engineering N 14-LD469568-2-PDA-DUP2 on 17/04/2014. | | |

**VR_1633854_156 Diesel Engine** **PAAE102135**

| | | | |
|---|---|---|---|
| **Opened In Report** | TR1633854_A - Certification - Diesel Engine | 31-Mar-2009 | Trieste |
| **Closed In Report** | TR2212350-ACertification - Diesel Engine | 18-Apr-2014 | Trieste |
| **Status** | Closed | | |
| **Found** | Approval process of Diesel Engine type W6L26B2 not completed. | | |
| **Recommendation** | Design approval of engine type W26B2 to be completed by submitting the requested information to ABS London Engineering. | | |
| **Rectification (Full )** | Engine type W6L26B2 has been verified to be made in accordance with Type Approved Design. See Type Approval Certificate issued by ABS London Ship Engineering N 14-LD469568-2-PDA-DUP2 on 17/04/2014. | | |

**Surveyor(s) to The American Bureau of Shipping**
**Attending Surveyors**

Morgantl Antonio — Electronically Signed on 22-Apr-2014

**Reviewed By**
Monaco, Marco — Electronically Signed on 22-Apr-2014, Milano Port

RECORD BOOK

# Record Book of Engine Parameters

| | |
|---|---|
| Document ID | DBAD132448- |
| Date of issue | 28.07.2014 |
| Installation | VMW628-1E-01 |
| Engine type | W6L26 |
| Engine number | PAAE250719 |
| Project | VMW628-1E-01 |

# 1. Forewords

This file fulfils the requirements for engine accompanying documents stated in Annex VI of the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the protocols of 1978 and 1997 (herein after referred to as "the Convention").

This file includes all parameter changes, including components and engine settings, which may influence NOx emission of the engine.

This file shall accompany the engine throughout its life in an installation that possesses an EIAPP–certification.

The owner of the engine is responsible for up keeping information in this file.

# 2. Statement of Compliance EIAPP–Technical File

This chapter contains original documents that are signed by EIAPP Authority.

The chapter shall contain at least the Certificate of Compliance for Engine Air Pollution Prevention and the engine's Technical File as stated in the Convention, see the Foreword of this file (chapter 1).

Certificate No.: TR2638698-1

# ENGINE INTERNATIONAL AIR POLLUTION PREVENTION CERTIFICATE

(Note: This Certificate shall be supplemented by a Record of Construction, Technical File and Means of Verification)

Issued under the provisions of the Protocol of 1997, as amended by resolution MEPC.177(58) in 2008, to amend the International Convention for the Prevention of Pollution from Ships, 1973,as modified by the Protocol of 1978 related thereto (hereinafter referred to as "the Convention") under the authority of the Government of:

Malaysia

*(full designation of the country)*

by the **American Bureau of Shipping**

| Engine Manufacturer | Model Number | Serial Number |
|---|---|---|
| Wartsila Italia S.p.A.<br>Trieste<br>Italy | W6L26D2 | PAAE250719 |
| Test Cycle(s) | Rated Power (kW)<br>And Speed (RPM) | Engine Approval Number |
| E2 | 1950kW @ 900rpm | ABSLD-NTC-1561-0000-00007 |

## THIS IS TO CERTIFY:

1. That the above-mentioned marine diesel engine has been surveyed for pre-certification in accordance with the requirements of the Revised Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines (2008) made mandatory by Annex VI of the Convention; and

2. That the pre-certification survey shows that the engine, its components, adjustable features, and Technical File, prior to the engine's installation and/or service on board a ship, fully comply with the applicable regulation 13 of Annex VI of the Convention.

This certificate is valid for the life of the engine, subject to surveys in accordance with regulation 5 of Annex VI of the Convention, installed in ships under the authority of this Government.

Issued at: Trieste, Italy on 09 June 2014

ABS

Antonio Morganti

*Surveyor, American Bureau of Shipping*

Certificate No.: TR2638698-1

# SUPPLEMENT TO ENGINE INTERNATIONAL AIR POLLUTION PREVENTION CERTIFICATE (EIAPP CERTIFICATE)

## RECORD OF CONSTRUCTION, TECHNICAL FILE AND MEANS OF VERIFICATION

Notes:

1. This Record and its attachments shall be permanently attached to the EIAPP Certificate. The EIAPP Certificate shall accompany the engine throughout its life and shall be available on board the ship at all times.
2. The Record shall be at least in English, French or Spanish. If an official language of the issuing country is also used, this shall prevail in case of a dispute or discrepancy.
3. Unless otherwise stated, regulations mentioned in this Record refer to regulations of Annex VI of the Convention and the requirements for an engine's Technical File and means of verifications refer to mandatory requirements from the Revised $NO_x$ Technical Code (2008).

**1 Particulars of the Engine**

1.1 Name and address of manufacturer
Wartsila Italia S.p.A.
Trieste
Italy

1.2 Place of engine build
Wartsila Italia S.p.A., Trieste, Italy

1.3 Date of engine build: March 2014

1.4 Place of pre-certification survey: Wartsila Italia S.p.A., Trieste, Italy

1.5 Date of pre-certification survey: 11 March 2014

1.6 Engine type and model number: W6L26D2

1.7 Engine serial number: PAAE250719

1.8 If applicable, the engine is a Parent Engine ☐ or a Member Engine ☒ of the following Engine Family ☐ or Engine Group ☒: Wartsila 26D2-ER2 P_PAAE219765

1.9 Individual Engine or Engine Family / Engine Group details:

1.9.1 Approval reference: ABSLD-NTC-1561-0000-00001

1.9.2 Rated Power (kW) and Speed (RPM) values or ranges: 325 kW/cyl. @ 900 rpm

1.9.3 Test cycle(s): E2 & D2

1.9.4 Parent Engine(s) test fuel oil specification: ISO 8217 DMA

1.9.5 Applicable $NO_x$ Emission Limit (g/kWh), regulation 13.3, 13.4, or 13.5.1 (delete as appropriate)
9.2 g/kWh (900 rpm) -13.4

1.9.6 Parent Engine(s) Emission Value (g/kWh): E2: 7.44 g/kWh, D2: 7.48 g/kWh @ 900 rpm

**2 Particulars of the Technical File**

The Technical File, as required by chapter 2 of the $NO_x$ Technical Code, is an essential part of the EIAPP Certificate and must always accompany an engine throughout its life and always be available on board a ship.

2.1 Technical File identification/approval number ABSLD-NTC-1561-0000-00007

2.2 Technical File approval date 29 May 2014

**3 Specifications for the On-board $NO_x$ Verification Procedures**

The specifications for the on-board $NO_x$ verification procedures, as required by chapter 6 of the $NO_x$ Technical Code, are an essential part of the EIAPP Certificate and must always accompany an engine through its life and always be available on board a ship.

3.1 Engine Parameter Check method:

3.1.1 Identification/approval number ABSLD-NTC-1561-0000-00007

3.1.2 Approval date 29 May 2014

3.2 Direct Measurement and Monitoring method:

3.2.1 Identification/approval number N/A

3.2.2 Approval date N/A

Alternatively the Simplified Measurement method in accordance with 6.3 of the $NO_x$ Technical Code may be utilized.

**N/A**

Issued at: Trieste, Italy on 09 June 2014

ABS

Antonio Morganti

*Surveyor, American Bureau of Shipping*