



DET NORSKE VERITAS

DESIGN VERIFICATION REPORT

(Independent Review Certificate)

MANUFACTURER : Transcon Engineering AS
 LOCATION : Nøtterøy, Norway
 INSTALLATION : AKER SMART 1
 ID NO. : 27934
 ARCHIVE NO. : 72436266 ACTIVITY 0

This is to certify that the design of:

Nautilock Sea Chest Sealing Plugs – Dimensions: 4", 20", 48"

have been reviewed and found to comply with:

- [1] DNV's Offshore Standard DNV-OS-C301 "Stability and Watertight Integrity", January 2001.
- [2] DNV's Offshore Standard DNV-OS-D101 "Marine and Machinery Systems and Equipment", October 2005.

If any person suffers loss or damage which is proved to have been caused by any negligent act or omission of Det Norske Veritas, then Det Norske Veritas shall pay compensation to such person for his proved direct loss or damage. However, the compensation shall not exceed an amount equal to ten times the fee charged for the service in question, provided that the maximum compensation shall never exceed USD 2 million. In this provision "Det Norske Veritas" shall mean the Foundation Det Norske Veritas as well as all its subsidiaries, directors, officers, employees, agents and any other acting on behalf of Det Norske Veritas.

The verification is based on the following.**A. Design codes/standards used as references**

DNV's Offshore Standard DNV-OS-C101 "Design of Offshore Steel Structures, General (LRFD method)", April 2004

B. Design limitations

<u>Design Parameter</u>	<u>Value</u>
Design draught	20 m
Design pressure	0.302 MPa
Test pressure	0.453 MPa

C. Design Specifications

<u>Drwg./Doc. No.</u>	<u>Rev.</u>	<u>Date</u>	<u>Title</u>
P543-NE-DR-100	0	19.11.2007	48" Nautilock, General Arrangement
P543-NE-DR-101	0	19.11.2007	48" Nautilock, Assembly
P543-NE-DR-102	0	19.11.2007	48" Nautilock, Front Buoyancy Tank, Welding and Machining
P543-NE-DR-103	0	19.11.2007	48" Nautilock, Rear Buoyancy Tank, Welding and Machining
P543-NE-DR-104	0	19.11.2007	48" Nautilock, ROV Grabber Bar, Welding and Machining
P543-NE-DR-105	0	19.11.2007	48" Nautilock, Flange Machining
P543-NE-DR-106	0	19.11.2007	48" Nautilock, Front and Rear Plate Machining
P543-NE-DR-107	0	19.11.2007	48" Nautilock, Threaded Boss and Shaft Machining
P543-NE-DR-108	0	19.11.2007	48" Nautilock, Shaft with COG Wheel, Welding and Machining
P543-NE-DR-109	0	19.11.2007	48" Nautilock, Washers Machining
P543-NE-DR-200	0	19.11.2007	20" Nautilock, General Arrangement
P543-NE-DR-201	0	19.11.2007	20" Nautilock, Assembly
P543-NE-DR-202	0	19.11.2007	20" Nautilock, Front Buoyancy Tank, Welding and Machining
P543-NE-DR-203	0	19.11.2007	20" Nautilock, Rear Buoyancy Tank, Welding and Machining
P543-NE-DR-204	0	19.11.2007	20" Nautilock, ROV Grabber Bar, Welding and Machining
P543-NE-DR-205	0	19.11.2007	20" Nautilock, Flange Machining
P543-NE-DR-206	0	19.11.2007	20" Nautilock, Front and Rear Plate Machining
P543-NE-DR-207	0	19.11.2007	20" Nautilock, Threaded Boss and Shaft Machining
P543-NE-DR-208	0	19.11.2007	20" Nautilock, Shaft with COG Wheel, Welding and Machining
P543-NE-DR-209	0	19.11.2007	20" Nautilock, Washers Machining

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<u>Drwg./Doc. No.</u>	<u>Rev.</u>	<u>Date</u>	<u>Title</u>
P543-NE-DR-300	0	19.11.2007	4" Nautilock, General Arrangement
P543-NE-DR-301	0	19.11.2007	4" Nautilock, Assembly
P543-NE-DR-302	0	19.11.2007	4" Nautilock, Expansion Cone
P543-NE-DR-303	0	19.11.2007	4" Nautilock, Expansion Shaft, Welding and Machining
P543-NE-DR-304	0	19.11.2007	4" Nautilock, Teflon Disc and Washer Machining
P543-NE-DR-305	0*	19.11.2007	4" Nautilock, Front Flange Machining
P543-NE-DR-306	0	19.11.2007	4" Nautilock, Rear Plate Machining
P543-NE-DR-307	0	19.11.2007	4" Nautilock, Rear Flange Machining
P543-NE-DR-308	0	19.11.2007	4" Nautilock, ROV Grabber Rail, Welding and Machining

D. Calculations

<u>Doc. No.</u>	<u>Rev.</u>	<u>Date</u>	<u>Title</u>
P543-NE-DR-103-01.ipt		14.11.2007	Analysis of P543-NE-DR-103-01.ipt
P543-NE-DR-203-01.ipt		15.11.2007	Analysis of P543-NE-DR-203-01.ipt
P543-NE-DR-305-01		14.11.2007	Analysis of P543-NE-DR-305-01_Analysis Derived.ipt
		14.11.2007	Analysis of 20inch fwd Tank Analysis.ipt
		14.11.2007	Analysis of Aft Tank Analysis 20 inch.ipt
		15.11.2007	Analysis of 48inch FWD Tank Analysis.ipt
		15.11.2007	Analysis of Rear Tank Analysis.ipt
P543-NE-RE-001	0	19.11.2007	48" Nautilock Padeye Calculation

E. Comments

1. Fatigue life has not been considered.
2. Hydrostatic pressure testing to be conducted at 1.5 maximum times the allowable working pressure for duration of 15 minutes on pressure vessel and flanged fittings according to the DNV-OS-D101 Ch.2 Sec.6.

Høvik, 2008-01-21

for DET NORSKE VERITAS AS

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