

Østensjø Rederi AS

EDDA TBN / NB 432

- Main Features

1. General

Østensjø Rederi AS has developed a new advanced and prospective PSV design together with the ship design consultants Skipsteknisk AS. The design is carrying forward the successful concept of high sides and multi access safe havens which first was introduced to the market in early 1980 by the Company's series of SK 60/09 type Edda vessels.

The new design named ST 216 will have diesel electric propulsion and will have a special low resistance hull form which has already been undertaking extensive model testing at Marintek, Trondheim and Vienna Model Basin, Ltd., Vienna.

The vessel is the first offshore vessel being fitted with Voith Schneider propulsion. The concept is developed together with Voith Turbo Marine GmbH and provide a range of operational benefits.

Østensjø Rederi AS has for many years worked on a development project for carrying large volume of drill cutting in bulk in integrated tanks. The vessel is fitted with 8 integrated DC / special purpose tanks which can be utilized for a variety of different cargoes.

2. Vessel Particulars

Length o.a.	85,80 m
Length b.p.p	77,40 m
Beam	19,20 m
Depth to Main deck	8,00 m
Depth to A-Deck	10,60 m
Draft max, abt.	6,50 m

Class:

DnV +1A1, Supply Vessel, SF, EO, Dynpos AUTR, HL(2,8), dk+, LFL*, ICE-C, CLEAN, COMF – C(3)-V(3), NAUT OSV

3. Capacities

Deadweight	4200 t
Deck cargo	2500 t
Deck area - wooden sheathed	915 m ²
Diesel oil	1212 m ³
Potable water	825-1252 m ³
Water ballast / drill water	1107 m ³
Mud / brine - dedicated systems	951 m ³
Methanol - stainless steel tanks	163 m ³
Special products / drill cutting	427 m ³
Dry bulk tanks	353 m ³
Recovered oil capacity (ORO)	1036 m ³

The cargo systems are remote operated from the vessels IAS (Integrated Automation System) and are designed for high efficiency and flexibility.

4. Drill Cutting - Special Purpose Tanks and System

Østensjø Rederi AS launched a development project aiming to radically improve on the safety, capacity and costs involved in transportation and handling of drill cutting. This project was initially initiated as a cooperation project between Shell UK and the Company.

Reference is made to separate Drill Cutting Transport Concept Description.

Total of 8 circular tanks are arranged and connected to different systems with chemical type separation flanges. The tanks may be used for a variety of cargoes and slops including low flash point liquids.

Tank suction and pumps are placed underneath the tanks allowing for best possible suction and draining of the tanks.

5. Power and propulsion

The vessel is designed with a diesel electric power and propulsion arrangement with Voith Schneider propulsion.

The design concept comprises high redundancy and safety and particular low fuel oil consumption especially during manoeuvring and operation at the offshore installations.

The main components are as follows:

- | | |
|---|-------------|
| - 4 main generators, approx. | 4 x 1950 KW |
| - 1 aux. /harbour generator, approx. | 400 KW |
| - 2 Voith thrusters aft as main propulsion, | 2 x 2500 KW |
| - 2 x tunnel thrusters forward | 2 x 1400 KW |

The diesel-electric system is based on 690V being of Aker Kværner new Low Loss Concept (LLC) which has been purpose designed for the vessel.

The LLC concept principally consist of four (4) switchboards instead of normally 2 connected via a bus-tie breaker, a bus-link and two (2) LLC transformers into a ring system.

The LLC concept provide for an increased power and thruster availability in case of any failure on the switchboard especially in DP mode. In case of a short circuit failure on one of the switchboards, the available power will be reduced by 14,6 - 33% and available thruster capacity by 25%. A traditional system with a split switchboard will similar have a reduction of 50% of both available power and thruster capacity.

5.1 Voith Schneider Propulsion

Østensjø Rederi AS has carried out a joint investigation program together with Voith Turbo Marine GmbH for many years for optimizing the performance of the VSP thruster especially for use in escort tugs, but also for offshore vessels. Lately this included also an active roll reduction functionality specially attractive for offshore vessels.

The investigation program comprise extensive model testing at Voith Heidenheim, Maritek, Trondheim and Vienna Model Basin, Vienna. The suitability of the Voith Schneider propulsion for offshore vessels has been demonstrated documenting a high propulsion efficiency with potential fuel savings compared to contra rotating azimuth thrusters. A potential saving in fuel consumption of 5-20% is expected depending on operational conditions and speed.

The Voith Schneider propulsion due to the special construction, have a very quick thrust response time from port to starboard of max. abt. 2 sec. This feature allow for the thruster forces actively to counteract for the roll movement of the vessel.

The roll of the vessel will in many cases be reduced by up to 90%.



3-D image showing the Voith Schneider propulsion

Reference is made to separate presentation from Voith Turbo Marine GmbH.

6. Hull lines and Model Testing

The hull lines has specially been made and refined for an operational speed of 15-16 knots. The slender form of the hull lines has been extended all the way up to the forecastle deck to achieve high speed capabilities for all load conditions and for sailing in a sea state. The design has been made with a relatively small block coefficient to obtain the operational speed and low fuel consumption requirements for all operational conditions.

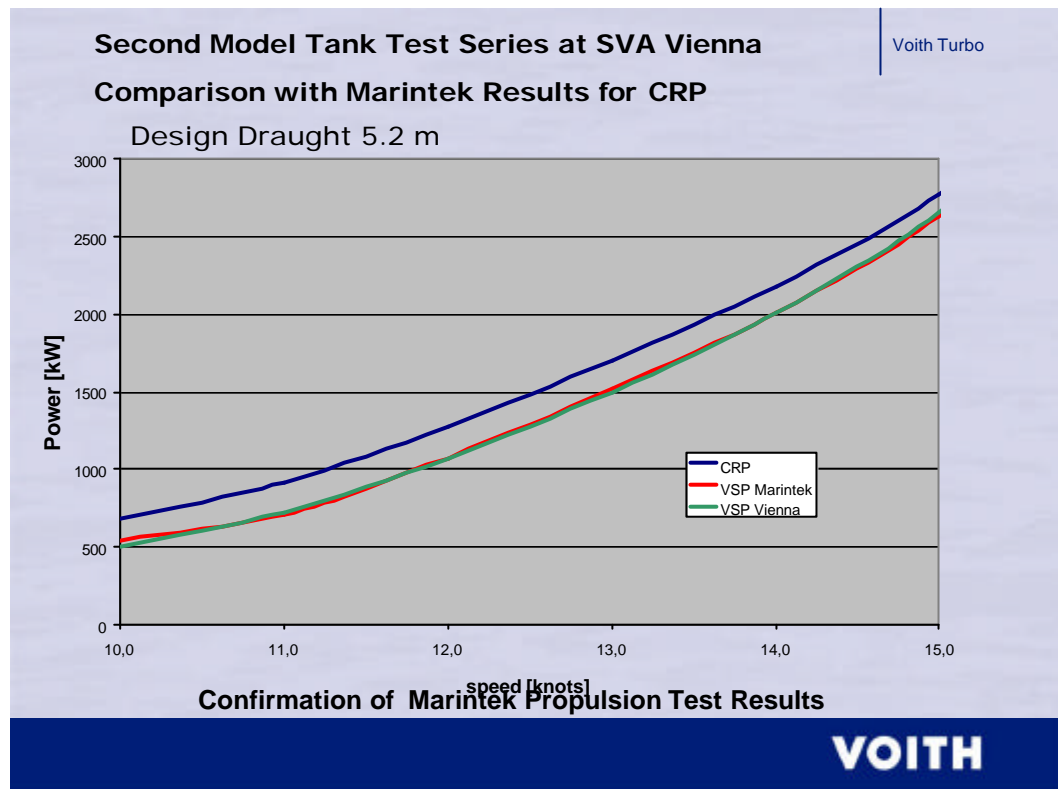
Extensive model testing have been carried out as follows:

- * Marintek, Trondheim
Tests and comparison for propulsion with both Voith Sneider and contra rotating azimuth thrusters.

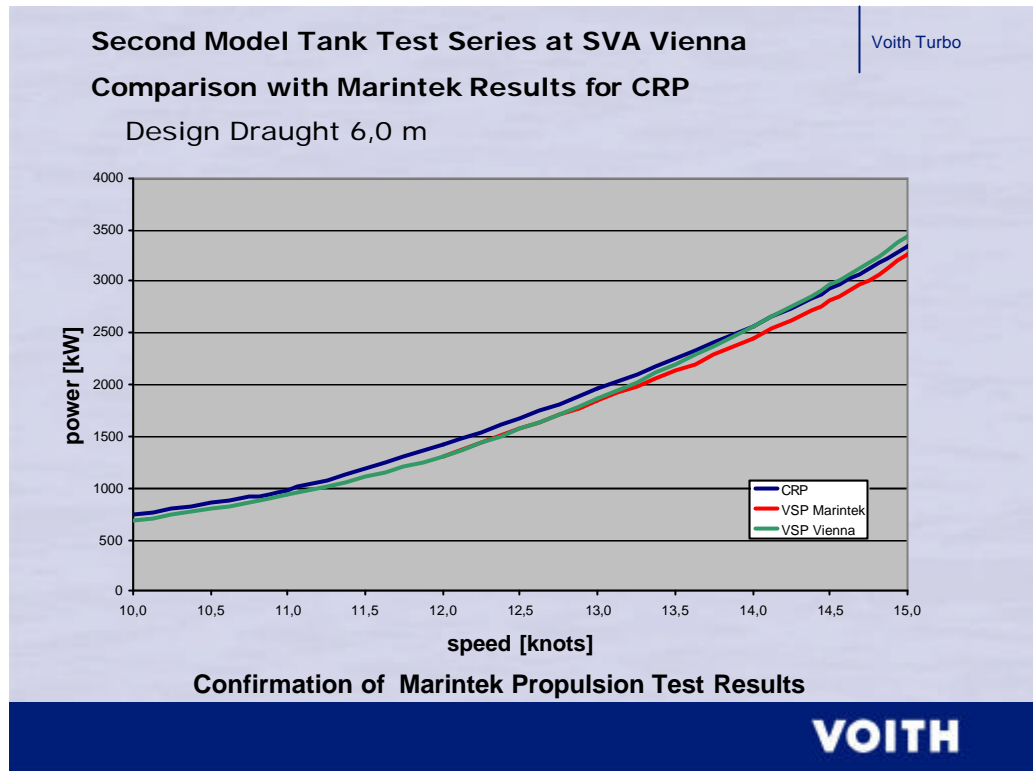
- * Vienna Model Basin Ltd, Vienna
- Verification of Marintek results with VSP
- Optimizing study
- Slamming tests

The model tests show a fuel saving of 5-20% for normal operational conditions depending on load condition and speed.

The results are shown in the following graphs for both azimuth contra rotating propulsion and Voith Schneider propulsion for 5,20m and 6.0m typical drafts.



Speed / power curve for draft 5,20m



Speed / power curve for draft 6,0m

7. Environmental Conditions

The vessel will be constructed in compliance with DnV CLEAN class notation.

The vessel will be equipped with the Company's special arrangement with bilge wells under all loading/discharge connections on open deck as for the Company's other platform supply vessels.

Waste incinerator and garbage compactor are fitted in a separate Incinerator/Garbage compartment.

8. Noise and Comfort class notation

The vessel will comply with noise and vibration requirements in accordance with vessel Comfort class notation with minimum rating 3.

In order to comply with the noise requirement with all thrusters running, following measures are included.

- Elastic support of diesel generators
- Elastic support of tunnel thrusters forward

- Required noise insulation of casings
- Floating floors and elastic supports of linings etc. in accommodation

9. Accommodation and Crew Facilities

Crew comfort is specially emphasised by the Company and considered to be of major importance for the safety and quality of the vessel operation.

The accommodation is of high quality and include following:

- High quality single cabins with TV and entertaining equipment
- Satellite TV antenna
- Spacious lounge and mess room
- Separate lounge for smokers
- Gymnasium / recreation room with sauna
- Office facilities