

Maritime Holland



Rotra Vente
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Special

Fast Forward
& Rewind
2016/2017

Roel de Graaf
The new managing
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Maritime Awards Gala



Movable deckhouses provide shelter for sensitive wind turbine nacelles

The short sea shipping and container shipping markets are in a crisis. While in the Netherlands several ship owners have filed for bankruptcy recently, elsewhere in the world a record was broken with the sale for scrap of a container vessel, which was only ten years old. At the same time, the overcapacity of ships in this segment creates opportunities. While versatility was the trend only a few years ago, the tendency has now shifted to very specialised vessels, tailored to do a specific task in the most efficient way.

In this article Maritime Holland looks at two coasters, which are specifically converted for efficient roll-on-roll-off transport of large components for the windfarm industry

Offshore wind

The project comes from the drawing boards of Concordia Group, a shipbuilder and shipbroker based in Werkendam, the Netherlands.

Traditionally the Concordia Group was mainly involved in inland waterway vessels - built in China and outfitted in the Netherlands - but it has diversified into seagoing vessels in recent years. At the request of Siemens, one of the major players in the offshore wind industry, Concordia developed two vessels for transporting wind turbine components between production and installation facilities in Europe.

Conversions

Chris Kornet, CEO of Concordia Group: "As a basis we used two existing vessels: *Rotra Vente* was converted from the vessel formerly named *Flinter Coral*. *Rotra Mare*

Two conversions for efficient roro transport of wind turbines

was a sister vessel formerly named *Flinter Crown*." *Rotra Vente* will be mainly be used to transport the nacelles and blades of windmills, while *Rotra Mare* will mainly transport the towers and the blades.

To carry out the modification works, Concordia contracted their neighbor across the Merwede river, Holland Shipyards. For each of the vessels, the cargo hatch covers were removed and instead a very solid, completely flush 2,000 square metres main deck was created, with a maximum payload of 17.5 tons per square meter. The space below - the former cargo holds - became support structures, ballast tanks and void spaces.

Lifting forecastle

The most visible modification to the vessels was done at the bow. The loading and unloading of the heavy components will be done on wheels with self-propelled modular transporters, as this creates independency

of crane infrastructure at both the loading and offloading site, to be more cost-effective and independent of wind conditions. The multi-wheeled vehicles will roll onto the main deck over a bow ramp, which extends towards the quay with a hydraulic system. Since the accident with the *Herald of Free Enterprise* (Zeebrugge, 1983), roll-on-roll-off (roro) vessels are required to have a watertight compartment at the bow, which usually consists of the bow door and a second watertight door a few metres behind. On *Rotra Vente* and *Rotra Mare*, a very innovative solution was created for this. Rather than using two watertight doors, the entire forecastle is an air-tight void space of 500 cubic metres, weighing 85 tonnes, which can be lifted with two hydraulic cranes. When this bow compartment is lowered, it is locked in place with hydraulic locking pins and it forms the required watertight compartment, while rubber seals avoid ingress of water through the gaps. To avoid having to move the weight of anchors, chains and windlasses, the anchor pockets were moved further back and outboard from their original position.

Bow ramp

Under the movable bow, a sliding ramp is located. Using a system with a hydraulic cylinder and pulling wires, the ramp - weighing

INNOVATIVE LIFTING FORECASTLE



A unique RoRo bowloading system was developed

70 tonnes - can be pushed over the bow and onto the quay. The ramp runs over a 'nose wheel', which looks somewhat like an upside-down version of the nose wheel of an aircraft. This hydraulically adjustable nose wheel allows for the height adjustment of the ramp. The ramp has a length of 16.5 metres and can be extended up to 6.8 metres beyond the bulbous bow. The vertical adjustment of the nose wheel, together with the ballasting capacity, allows for a variation of quay height of 5.6 metres. The system for the bow compartment and the sliding ramp was designed and engineered by TMS, based in Werkendam, and built by MDConstructions in Rotterdam.

To cope with the hydraulic needs of the bow lifting system, the sliding ramp, its nose wheel and the locking cylinders, an additional powerpack was installed in the bow of the vessel.

A completely flush cargo deck was created



REPURPOSING INTO TAILOR-MADE LOGISTICAL SOLUTION

Roof

To protect the high-tech nacelles from the weather conditions during transport, Rotra Vente's main deck is covered by a removable roof, which consists of four movable sections. These can be rolled forward or aft powered by electric motors. Rotra Mare will mainly transport towers and blades, which can be loaded on deck without protection. Movable support racks will be built to store the lighter turbine blades above the heavy towers. It is expected that Rotra Mare will be delivered in the spring of 2017.

Loading of the nacelles will take about 45 to 60 minutes per nacelle. Each nacelle weighs about 430 tonnes. To avoid excessive heeling and trim variations during cargo operations, the ship is equipped with an automatic heeling tank system and a manual forward/aft trimming system with a capacity of 2,000 cubic metres per hour. The automation and electric powering of this system was supplied by Holland Ship Electric, including a touchscreen operated ballast system. They also took care of the complete electrical installation, such as switchboards, lighting, alarm systems and communications.



A completely flush cargo deck was created



Fast ballasting allows for trim control and anti-heeling



The main engine has reserve power for the ship's ice class notation



Holland Ship Electric did the complete automation and electrical installation

INNOVATIVE LIFTING FORECASTLE

Energy saving

The Rotra Vente was originally built for a maximum speed of 18.5 knots. Based on the requirements in the logistics chain, it was decided to optimise the propulsion installation for a lower trading speed of 15 knots. The vessel has a single controllable pitch propeller, but at an engine loading of only 70 per cent, there is more twist in the blades than needed. Together with Wärtsilä, a study was made to determine the costs and benefits of reblading the propeller for the lower speed. This resulted in a power demand reduced by 14 per cent at 15 knots and a payback period of less than one year. Obviously the order for new propeller blades followed.

Power

The main engine of the Rotra Vente needs to deliver 3,500 kW to achieve 15 knots, but it's rating was kept at 5,200 kW to comply with the ice class rating of the vessel (1A). To cope with the significant wind loads, a 750 kW bow thruster with controllable pitch propeller from ZF was installed. The vessel was originally built under Bureau Veritas class, but due to the extensive modifications (850 tonnes of weight was removed and 1,250 tonnes was added), it classifies as a newbuilding. The new certification was done by RINA Rotterdam, due to a previous successful collaboration.

The Rotra Vente will initially sail in the SECA area, as its first transport route is between Hull (United Kingdom) and Cuxhaven (Germany). Nevertheless, an HFO installation was retrofitted to allow the use of heavy fuel when working elsewhere worldwide.

Contemporary view on shipping

Concordia Group's core business is designing and building vessels with an innovative and economical profile. Their designs combines clients' wishes with high level technical knowledge and their down-to-earth-management allows them to build these vessels worldwide. They also provide turnkey shipping projects, through vessels completely built and managed by Concordia Group.



The ship can be loaded in eight hours, regardless of weather conditions

With the global sulfur cap coming into force in 2020, the question remains whether much HFO will be used at all.

The ship will be manned by a crew of eleven. A notable upgrade is the complete make over of the wheelhouse console. *Roetra Vente* is the first vessel to feature Alpha-tron's new 46-inch LCD displays, giving the Tesla-feel on a cargo ship.

chain of logistics with a clean slate, innovative solutions come up. Even when re-purposing existing ships, an ideal solution can be the result, at a lower cost, lower environmental footprint and shorter lead time than when building new ships from scratch. The whole conversion of *Roetra Vente* took only ten months. There are many more semi-finished hulls or laid up vessels, which are waiting to become true workhorses when adapted to a specific need. The Dutch shipbuilding industry certainly has a role to play in this.

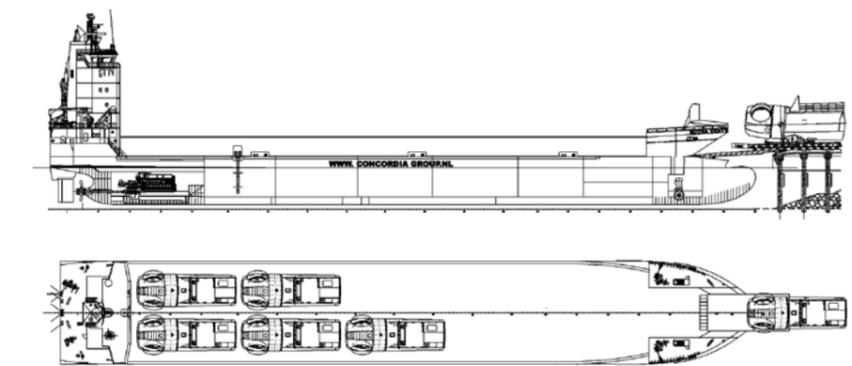
Bruno Bouckaert

Principal particulars

Shipyard	Holland Shipyards, Hardinxveld-Giessendam, the Netherlands
Owner	SP Vessel 1 and 2, subsidiary of Concordia Group
Ship Management	Amasus Shipping, Delfzijl, the Netherlands
Freighter	Deugro, Overgade, Denmark
Charterer	Siemens Wind Energy, Erlangen, Germany
Length o.a.	141.60 m
Length b.p.	132.30 m
Beam	20.60 m
Depth	9.50 m
Draught	7.05 m
Deadweight	9,100 t
Payload	5,200 t
Net tonnage	1,986 t
Gross tonnage	6,620 t
Main engine	1 x 5,200 kW
Max speed	15 knots
Crew	11
Fuel	591 m ³
Freshwater	111 m ³
Ballast water	7,208 m ³
Heeling tanks	602 m ³
Fixed ballast tanks	1,085 m ³
Sewage	75 m ³

Repurposing

Offshore wind is becoming more affordable by the year, and it's logistic solutions like these that do it. When shipyard, technical management company, freight forwarder and charterer come together, not just to discuss the specification of a ship, but to discuss the entire



Subcontractors and suppliers of equipment fitted on board the *Roetra Vente*, YN HS2015-146

Alfa Laval Benelux, Breda: separators; **All Pumps Holland**, Papendrecht: pumps; **Alphatron Marine**, Rotterdam: navigation and communication equipment, AlphaBridges consoles with 46" LCD displays; **Argos Engineering**, Groningen: engineering; **ASD Shipdesign**, Alblasserdam: engineering; **Bakker Vakkeuken**, Berlikum: cold room, freezer room; **Boll Engineering**, Giessen: production and painting of main deck canopy; **Caldic Technics**, Rotterdam: Stamford generators; **CCM3**, Werkendam: ballast system; **Cornet Service**, Werkendam: painting; **Datema Nautical Safety**, Rotterdam: engineering safetyplan, medical outfit, nautical inventory, (digital)charts and publications, fire fighting equipment, life saving equipment, safety signs, life rafts, gas detection equipment; **De Wiel Services**, Spijck: shaft alignment; **Destil**, Tilburg: bearings for bow ramp; **Econosto**, Capelle aan den IJssel: valves; **Hatecke GmbH**, Drochtersen, Germany: mob, freefall boat, cranes; **Heinen & Hopman**, Bunschoten: HVAC installation; **Hoko Installatiebedrijf**, Werkendam: sanitary pipework; **Holugt Sauer**, Tiel: starting and working air system; **Hoogendoorn MBI**, Werkendam: carpentry; **HSE (Holland Ship Electric)**, Rotterdam: electrical installation; **IMS Group**, Akland, Norway: watertight doors; **Intercad Holland**, Gouderak: engineering; **Intersona**, Heerde: noise and vibration measurements; **JP Isolatie**, Maasdijk: piping insulation; **Kontherm**, Nunspeet: complete thermal oil heating system; **Lenntech**, Delft: water makers; **Marine Service Noord (MSN)**, Hoogezand: booster unit; **MarteQ**, Rotterdam: gangways; **MDC Constructie**, Ridderkerk: construction sections; **Minimax**, Almere: watermist system engine room, engine room CO₂ system; **NRF Nederland**, Mill: boxcoolers and anodes; **Q-Plus**, Slidrecht: piping systems; **RINA**, Rotterdam: classification; **Schegro**, Zwijndrecht: helmsman's seats; **SIP Marine**, Drunen: engineering of propeller; **SKB Group**, Werkendam: piping; **Theunissen Technical Trading**, Malden: *Pesch/Seematz* searchlights, *Zenitel/Vingtor* communication system; **TMS Engineering**, Werkendam: engineering and manufacturing bow ramp system; **Trinox**, Hardinxveld-Giessendam: steel doors; **Van der Velden Marine Systems**, Krimpen aan de Lek: rudder and steering gear; **Van Wijk Werkendam**, Werkendam: winches; **Veth Propulsion**, Papendrecht: *Scania* engines, *Stamford* generatoren.; **Wärtsilä Nederland**, Drunen: propeller, engine type *Wärtsilä 8L38C*, gearbox, *Lipstronic/Unic* propulsion control; **Winteb**, Winschoten: air pipe heads; **ZF Marine**, Krimpen aan de Lek: electric bow thruster with CPP.