

Delta Admiral



Expected arrival of the PSV causes great excitement in Trinidad

In October 2013 Delta Logistics Ltd signed a contract with Shipyard De Hoop for the construction of a Platform Supply Vessel (PSV). Coming as a further development of the previous smaller De Hoop's KISS designs, the blueprint of this vessel was to herald the next generation of De Hoop PSVs. The vessel, with its deep water capabilities, is intended to operate in the offshore fields near Trinidad and Tobago in the Caribbean Sea.

The vessel, named *Delta Admiral* and carrying the shipyard De Hoop hull number 460, was launched on 18 July 2014, at their facilities in Lobith in the Netherlands. After removing the wheelhouse from the superstructure, the vessel was at the correct air draught to travel down river to Rotterdam. Once in Rotterdam the wheelhouse was reinstated and the PSV commenced its sea trials on a Saturday, the first day of Novem-

ber 2014. Following an intensive test programme, trials were successfully completed on 4 November 2014. After a few weeks of completing the final details, the vessel was handed over to her owners, Delta Logistics of Trinidad, at the beginning of December 2014. Redwise of Bunschoten Spakenburg in the Netherlands performed the transportation of the *Delta Admiral* on her own keel to Trinidad. It was the company's fourth die-

sel-electric ship in 2014 year to be brought to her owners under her own power.

This latest PSV evolution has been lengthened to 70 metres and further widened to 15.77 metres, resulting in a deadweight of over 2,350 tons. In close consultation with the yard, Delta opted for a diesel-electric propulsion concept, to achieve enhanced flexibility and economical superiority. Built for worldwide service plus according the additional (relatively high) standards required by Delta themselves, the vessel is of Germanischer Lloyd Classification with DP2 and Fi-Fi 1 notation, it had to become a unique offshore service vessel.

The general concept

The *Delta Admiral* is a PSV dedicated to the provisioning of oil and gas platforms of local contractors in the Caribbean Sea. The design is based on a proven De Hoop concept and their 'KISS' methodology, but evolved to the

next generation PSV, with a higher level of comfort and luxury. This vessel is further optimised and developed by combining the technical/design knowledge of De Hoop with the local nautical experience of this area from Delta Logistics.

The hull form is enhanced for fuel efficient operations, during both transit and DP modes. Although the multi-chined hull is wider than previous generations of De Hoop PSVs, by fairing the hull shape considera-

ble reduction in wave resistance is obtained. To further improve the resistance during transit, it is fitted with a specially developed bulbous bow, designed to maintain a service speed of 13 knots. The overall result is a higher transit speed than on previous generations and a reduction in fuel consumption.

Furthermore, the vessel's propulsion configuration is primarily optimised for excellent DP capabilities, enabling a speed of eleven knots astern and more than three knots sideways. In addition, the Kongsberg DP2 system of the *Delta Admiral* is designed to minimise fuel consumption and wear and tear on the propulsion equipment. The DP components are tuned to two tunnel bow and two azimuthing stern thrusters to

achieve high-accuracy station-keeping counteracting wind, waves and current forces in most weather conditions.

The generators, for the diesel-electric propulsion and other consumers, are located on the main deck, in the first superstructure layer. This is similar to the earlier KISS-designs and not only allows much larger cargo volumes, but also easier access for maintenance. The resulting enormous tank capacities make this vessel stand out in its

size range.

Following the recent substantial upgrade of the Lobith shipyard, which now boasts a complete range of 'state-of-the-art' facilities, the yard is now even better equipped to perform new building

of sophisticated vessels. The 'grade A' steel hull plating, with slightly increased thickness compared to the previous KISS-designs, was cut using De Hoop's latest plasma cutting machine. The robotic arm of this plasma machine cuts at an angle, thus 'breaking edges' and bevelling in preparation for welding is done in one process, providing finished parts at an extremely high tolerance. The high-quality welding machines reduce the input of excess heat and diminish the need for straightening of block sections afterwards. Any remaining minor uneven-

AMPLE HIGH-CAPACITY TANKS



The diesel generator sets are freshwater-cooled Caterpillar units



Two of the four dry bulk tanks and the sewage tank in the fore ship below the superstructure



The waterspray system is fed by the dedicated Fi-Fi pumps in the aft ship



The propulsion system consists of two Veth azimuthing Z-Drive thrusters

ness is eliminated by their new straightening machine, which uses induction instead of heat to flatten bumps. This complete package of tools results in a highly efficient building process with less deviations and reduced heat input.

To achieve a high comfort level in the accommodation, with low sound and vibration levels, De Hoop invested in 'floating' interior floors, ceilings and walls, whilst the doors are acoustically dampened with integrated ventilation grills.

Cargo arrangement

As a result of the propulsion configuration and lay-out, the entire below deck space is given over to a large number of high-capacity (cargo) tanks. The only exception being the main and bow thrusters which take up a very small volume of the available cubic metreage. From stern to bow in the centre cargo hold we find four dry bulk tanks, two brine tanks, two (cargo) fuel oil tanks, two drilling water tanks and four liquid mud tanks with agitators that keep the liquid slurry from separating. The double hull and

bottom further comprises of 14 drilling water tanks, three more fuel oil tanks and a bilge water tank. The remainder of the fresh water, dirty oil, sludge, bilge water tanks are to be found in the fore ship, below the superstructure.

In addition to the liquid cargo, *Delta Admiral* will transport deck cargo, such as pipe or drummed materials on pallets. The design of the large square open deck permits large quantities of various offshore requisites, such as casing segments, drill pipe, tubing and other miscellaneous deck cargo to be transported. In addition, the main deck is provided with container fittings and ample lashing points to accommodate a containerised cargo of 160 TEU in four tiers.

Deck lay-out

The vessel boasts a large 600 square metre

600
SQUARE METRE
MAIN DECK

main deck, a work-cum-cargo deck, which is designed to accommodate loading up to five tons per square metre. The four-level superstructure is located as far forward as possible, to enable an increased unobstructed 'deck length' and with the high comfort criteria of the accommodation in mind.

A full suite of anchoring and mooring equipment is provided as is appropriate for vessel of this type and size. The sheltered foredeck houses an electro-hydraulic anchor winch with two gypsy wheels and two warping heads: one of both on each side. The anchors are two stockless high holding power Pool-M items of 1,305 kilogrammes each with 470 metres stud link chain cables of 32 millimetres diameter. The anchor and mooring winches were delivered by Machine- & Lierenfabriek Kraaijeveld from Sliedrecht and the anchors and chains are provided by Wortelboer from Rotterdam. In addition, there are two bollards on either side of the foredeck. Tugger winches are provided behind the superstructure at the cargo deck to assist crew to operate heavy towing gear and for handling (dragging/tow-

ing) deck cargo. On either side on the main cargo deck are two more bollards: one of which is just after the superstructure for the mooring spring, whilst the other is aft near the stern and integrated in the bulwark.

To meet the safety requirements, six Viking inflatable life rafts are provided, three on port and three on starboard side, with a capacity of 20 persons each. The rafts are gravity launched and stored in racks on B-deck (second superstructure layer) against the aft side of the superstructure. Furthermore, complete with its dedicated davit installation, a Palfinger FRSQ600 rigid fast rescue craft (FRC) with a planing deep-V hull and an inboard diesel engine driving a water jet propulsion, is to be found on starboard side on B-deck. The FRC is equipped with an automatic offload release hook with which it is deployed and recovered by the hydraulic pivoting A-Frame davit, also delivered by Palfinger. This FRC replaces the solas/IMO required man-overboard boat (MOB).

For external fire-fighting purposes, two monitors and an external FiFi1 unit are installed on main deck aft. This installation includes a self-protection deluge (water spray) system, fed with water from the dedicated Fi-Fi pumps in the aft ship. The extinguishing water jet is created in the monitor outlet by pressing water through the monitor nozzle.

Propulsion and machinery

The propulsion system of the vessel consists of two Azimuthing Z-drive thrusters in the stern and two bow thrusters. The stern thrusters are Veth units with fixed pitch propellers operating at variable speed within a nozzle. The propellers, driven by freshwater cooled electro-motors of 1,150 kW each, are capable of producing their maximum thrust throughout a full 360 degree steering range. The speed control of the thrusters is by means of a variable frequency converter. The thrusters are placed at an angle, thus significantly reducing the losses due to 'thruster-to-hull' and 'thruster-to-thruster' interaction.

In the bow of *Delta Admiral*, two transverse tunnel thrusters, also delivered by Veth and driven by air-cooled e-motors of 550 kW each, are fitted. These thrusters, also fixed pitch propellers, operating at variable speed and controlled by a variable frequency converter, are predominantly used in DP-mode.

Power generation comprises of four diesel alternators with an output of 905 kW/1130 kVA each, which can be used in any combination. This flexibility ensures fuel consumption is reduced to a minimum, while power for speed and manoeuvrability is guaranteed. All diesel generator sets are freshwater-cooled Caterpillar C32 units, delivered by PON Power, and are located in

the engine room on the main deck in the superstructure. The main alternators can be run in parallel and the power management system arranges the load sharing as such that each generator is equally loaded.

The actual electrical power distribution is split in two circuits to obtain the redundancy required for DP2 certification. The main distribution power is three phase 60Hz 480VAC, whilst all lighting and small consumers are on a 110 VAC circuit. For shore power use, cable connection facilities are provided. The emergency/harbour generator set, an air-cooled Caterpillar C4.4 of 99 kW, is located high on top of the wheelhouse deck in a dedicated compartment.

Droste Elektro is responsible for the complete electrical installation, including the design installation of all switchboards, drives, converters, the power management system and the alarm/detection systems.

Provided by MiniMax, the engine room is protected against fire by a fixed Novec extinguishing system. This system is unique because it employs the NovecTM 1230 chemical suppressor. This fire suppressor is neither corrosive nor electrically conductive and does not cause any damage to sensitive parts through short circuits or residues. The suppressor liquid comes from cylinders, stored in the engine room itself on A-deck,



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whilst the system is pneumatically activated from outside the engine room. Furthermore portable fire extinguishers are provided throughout the vessel. In addition, a water fire and wash line is arranged in the engine room and throughout the entire length of the PSV with branch lines to main deck, working spaces and the anchor/chain wash installations. The galley exhaust is protected from fire with a separate CO₂ system.

Wheelhouse and accommodation

The bridge is outfitted with ergonomically designed consoles for a good view of the instruments and ease of operation. The wheelhouse windows are specially designed to provide optimal 360 degree horizontal, deck and water level visibility around the vessel. These windows in combination with upwards directed and tilted windows in top deck sides, guarantee an extended view overhead when manoeuvring in the vicinity of high offshore structures. To facilitate night-time and poor visibility operations, four remote controlled search lights are provided on wheelhouse top.

The wheelhouse is separated into two effective bridges: the forward facing part, used solely for transit sailing and the aft facing area, where the DP (dynamic positioning) assisted operations can be controlled during loading or unloading. Between the two bridge parts there are the pantry facilities on portside, whilst the starboard side accommodates the radio console/chart table and the stairs to lower decks.

The *Delta Admiral* is equipped with a comprehensive navigation and communication package, supplied by Alphanon Marine. All (communication) equipment is in compliance with the SOLAS and GMDSS regulations for sea area A3.

The interior is designed to the current standards in the 24/7 offshore industry and each cabin has access to internet, radio and television. All cabins have individually controlled air-conditioning. Accommodation for a crew compliment of 36 persons has been provided, divided over two single berth, five double berth and six quadruple

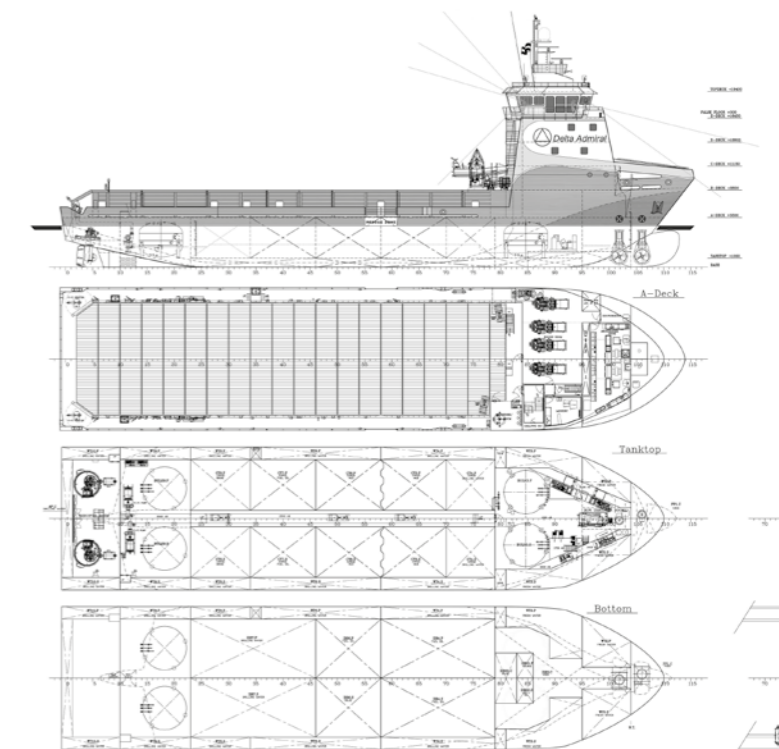
berth cabins. Furthermore, the superstructure features a changing room, fitness room, combined mess/dayrooms, galley, freeze/cold provisions stores and various offices. The portside aft features the funnel with the generator exhaust lines, whilst starboard side aft accommodates the interior central staircase. Aft on D-deck is the air-treatment room on centreline, while the engine room ventilation is integrated in the aft bulkhead on B-deck just above the engine room.

Justly proud

The synergy between De Hoop and Delta Logistics has led to a modern all-round, though cost efficient, workhorse. The expected arrival of *Delta Admiral* already causes great excitement in the Caribbean area around Trinidad. The vessel awaits a grand welcome with fireworks and the lot when arriving at its homeport.

With the acquisition of this next generation PSV from De Hoop, Delta Logistics is the first of the relatively larger local marine contractors to add an ultramodern vessel of such dimensions and exquisite luxury to their fleet. Delta can be justly proud of this expansion and has every cause for a celebration.

Tom Oomkens



Principal particulars	
Builder	Shipyards De Hoop, Lobith, the Netherlands
Owner	Delta Logistics, Carenage, Trinidad and Tobago
Length o.a.	70.00 m
Length b.p.p.	63.03 m
Beam mld.	15.77 m
Depth mld.	5.50 m
Draught summer	4.56 m
Speed max.	13 kn
Complement	36 persons
Cargo capacities	
Deadweight (T = 4.62m)	2,355 t
Deck area	600 m ²
Tank capacities	
Fuel oil, service	610 m ³
Fresh water, potable	230 m ³
Drill water	1,080 m ³
Liquid mud	675 m ³
Brine	310 m ³
Dry bulk	220 m ³

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Photo by Flying Focus

We wish the crew of Delta Admiral a safe voyage

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VETH PROPULSION

Quality - Service - Innovation - Sustainability

Subcontractors and suppliers of equipment fitted on board the *Delta Admiral*, YN 460
Alfa Laval Benelux, Breda: fresh water coolers; **Alphanon Marine**, Rotterdam: navigation and communication equipment; **Anchor Insurance**, Rotterdam: building insurance
Axces, Tholen: silencers and spark arrestors; **Boer Staal, De**, Uitgeest: steel plates and profiles; ship building kit; **MacGregor Cargotec**, Rotterdam: twist locks; **Carlsen Group**, Krimpen aan den IJssel: drybulk system; **Chemetal**, Oss: anodes; **Gevier Dales**, Doetinchem: sanitary equipment; **Datema Nautical Safety**, Delfzijl: Lifesaving rescue and firefighting equipment; nautical publications; **Delade**, Doetinchem: furniture; interior carpentry; **Deno Compressors**, Krimpen aan den IJssel: compressors; **Distrimex**, Doetinchem: hydrophor system; **DNV GL**, Rotterdam: classification; **Droste Elektro**, Tolkamer: electrical installation; **Econosto Nederland**, Rotterdam: fittings; **Electrolux Professional**, Alphen aan den Rijn: laundry equipment; **EMCÉ Lieren**, Voorhout: tugger winches; **Facet International**, Almere: bilge water separator; **Famos**, Gdansk, Poland: panel doors; **FIS**, Moss, Norway: external firefighting system; **GEA Westfalia Separator Nederland**, Cuijk: separator; **Georg Fischer**, Ede: piping / fittings; **Global Marine Decking**, Hardinxveld-Giessendam: flooring; **Heinen & Hopman**, Bunschoten: HVAC installation; design, supply and installation; **Intersona**, Heerde: noise level measuring; **Jac de Vries Gesta**, Middenbeemster: hotwater boiler; **Kieboom-Werkendam**, Werkendam: wheelhouse chairs; **Kongsberg Maritime Holland**, Spijkenisse: DP system; **Kraaijeveld C, Machine & Lierenfabriek**, Slidrecht: anchor winches; **Kroezje Maritiem**, Delfgauw: mud boxes; **Kroon**, Hoogeveen: fittings; **Luttjeboer**, Veendam: stainless steel frame top light; **Marine Service Noord (MSN)**, Hoogeveen: engineering; **Minimax**, Almere: internal firefighting system; **National Oilwell Varco**, Groot Ammers: pumps/mud; Brine; **NethShip**, Papendrecht: engineering; **Nicoverken**, Schiedam: piping and fittings; **Noxon Stainless**, Helmond: couplings; **ODS**, Barendrecht: piping; **Palfinger Ned-Deck**, Barneveld: fast rescue boat and frame davit; **Pon Power**, Papendrecht: *Caterpillar* generator set; **Reikon**, Spijkenisse: *Azcue* pumps; **Redwise Maritime Services**, Bunschoten: transportation of *Delta Admiral*; **Rook en Zn**, Krimpen aan den IJssel: testliner piping; **Rubber Design**, Heerjansdam: flexible support exhaust liners; **Schröder, Schiffdorf-Wehden**, Germany: mooring equipment; **Schutte Metaal**, Stadskanaal: manholes; **Skid Piping**, Ten Boer: prefab piping; **Span**, Beek: application paint; **Uittenbogaart, Technisch Bureau**, Ridderkerk: sewage plant; **The Green Machine Industrial**, Maarssen: trash compactor; **Trinox**, Hardinxveld-Giessendam: windows; portholes; watertight doors; **VAF Instruments**, Dordrecht: flow meters; **Verhagen IT Group**, Lobith: internal communication; internet; entertainment equipment; **Veth Propulsion**, Papendrecht: *Azimuth* tunnel thrusters and controls; **Viking Life-Saving Equipment**, Zwijndrecht: liferafts; **Wetcab Sp. Z.o.o.**, Gdansk, Poland: sanitary components; **Winel**, Rotterdam: ventilation heads; **Winteb**, Winschoten: air pipe heads; **Wortelboer**, Rotterdam: anchor and anchor chain.