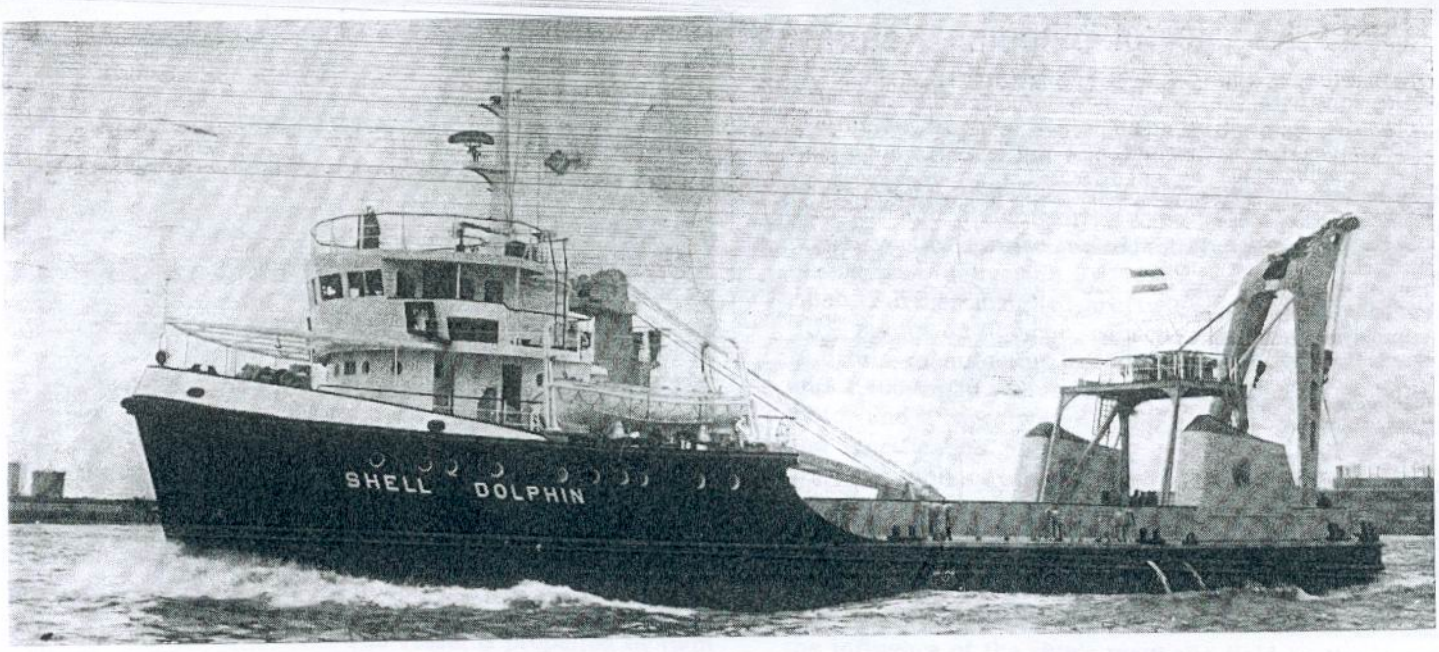


SUPPLY-VESSEL

SHELL DOLPHIN

The twin-screw supply vessel *Shell Dolphin* has been built by the Arnhemsche Scheepsbouw Maatschappij, Arnhem, for the Royal/Dutch Shell Group. The ship is intended for service in the Arabian Gulf and can cover a distance of 2,723 miles, corresponding with 236 hours steaming, without re-fuelling. During the period lying between the delivery of the ship and her departure for the Arabian Gulf the *Shell Dolphin* has been employed in the off-shore oil drilling operation with the oil drilling platform "Triton" on the location "Kijkduin Zee A" (see our September 1961 issue, page 46).

With a deadweight capacity of 545 tons, the ship has the following leading particulars:—

Length o.a.	156 ft. 2 in. (47.60 m.)
Length b.p.	145 ft. 4 in. (44.29 m.)
Breadth moulded	36 ft. (10.79 m.)
Moulded depth	13 ft. (3.96 m.)
Loaded draught	9 ft. 9 5/16 in. (2.98 m.)
Draught (scantlings)	10 ft. 3 in. (3.12 m.)
Gross tonnage	611.97 R.T.

The ship is constructed to the requirements of Lloyd's Register of Shipping class ✠ 100 A I with the notation "service in Arabian Gulf".
The vessel will be operating in the Arabian Gulf area between shore-based storage spaces and the off-shore drilling stations. The latter will be supplied with the necessary equipment such as piping, cement and spares for the drilling operations and fuel oil for the driving machinery together with water and stores for the crew.

Constructional features:— The vessel is fitted with a reinforced cargo deck having an unobstructed loading area of 2,411 sq.ft. The deck beams are arranged longitudinally and extra pillars have been placed in the engine room. The engine room is situated in the aft ship and exhaust gasses escape through twin uptakes. This twin funnel design enables the utilisation of the largest possible deck area and these funnels have been placed in the extreme sides of the deck. Incorporated in each of the funnels is an entrance to the engine room.
Two holds have been arranged athwardships for the carriage of dry cargo and four deeptanks for the carriage of liquid cargo. Two tanks are situated on the port side and two on the starboard side and so arranged that there is one tank on each side of the dry cargo hold. These six cargo compartments are arranged between the forward accommodation and the engine room aft. A passageway leads from the accommodation to the engine room and is arranged below decks and on the vessel's centre line. The dry cargo holds are separated from this passageway by means of a removable wooden partition. The access to the engine room is closed by a watertight door which can be operated from the main deck. Between the aftermost liquid-cargo tanks and the ship's sides two heeling tanks have been arranged each having a capacity of 495 cu.ft. The vessel is not fitted with a double bottom. Bottom tanks have been arranged under part of the engine room and the dry cargo holds. The ship is of all-welded construction and model tests have been carried out in Wageningen.

Cargo spaces:— The large deck area has been arranged for the carriage of deck cargo which can be handled by the 10-ton crane and two capstans on the aftermost part of the deck. The capacity of the reinforced deck is 4 tons/sq.m. Number 1 tank on port side has a capacity of 4,448 cu.ft. and no. 2 starboard tank 2,892 cu.ft. Both tanks are arranged for the carriage of oil fuel. Number one tank on starboard side has a capacity of 4,096 cu.ft. and no. 2 tank on p.s. 2,893 cu.ft. These latter two tanks have been arranged for the carriage of fresh water. The hatchopenings of the dry cargo holds have been fitted

with MacGregor steel hatch covers of the flush deck type, and have a length of 15 ft. and a width of 8 ft. The total bale capacity of these cargo holds is 7,055 cu.ft.

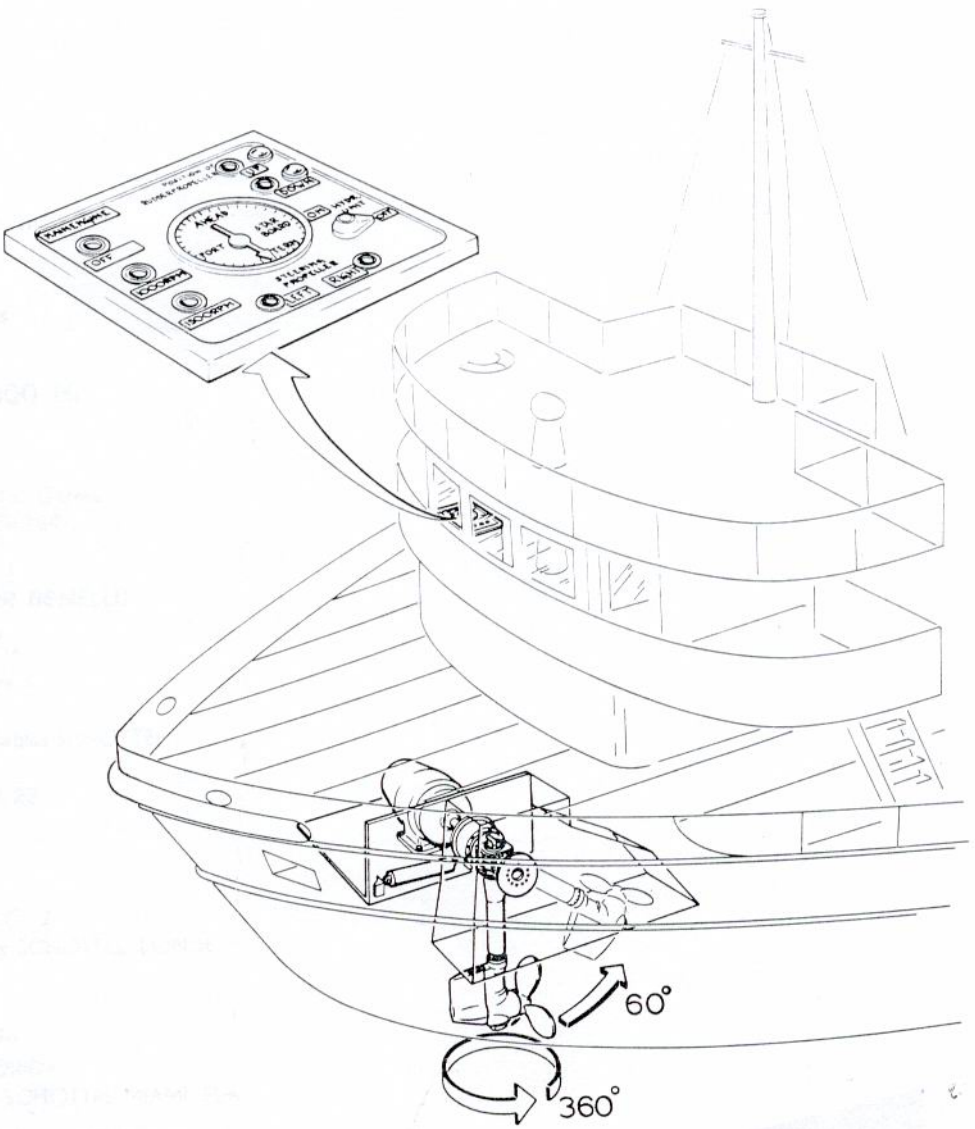
Deck Machinery:— The ship is fitted with a 10-ton electric deck crane of Figee manufacture. The heeling tanks are used to facilitate the operation of this crane in turbulent water. Two Vickers-Armstrong hydraulic capstans of SC40 type have been installed in the after-part of the cargo deck. The windlass is also of Vickers-Armstrong manufacture type WB6. Also installed on the extreme after part of the vessel is a sheerlegs for buoy maintenance work in the Arabian Gulf. The main tackle has a lifting capacity of 30 tons and two 10-ton secondary tackles have also been incorporated. This buoy lifting equipment can completely be dismantled and removed, which was actually done for the sake of the "Triton-operation". The sheerlegs can be adjusted in different operating positions by means of twin steel stays which can travel along steel bars with several securing positions. The sheerlegs is served by a three-drum winch installed above the loading deck on a platform. The winch is of H. J. Vos manufacture and driven by Smit Slikkerveer electric motors. The sheerlegs has been constructed by Bouw- en Montagebedrijf N.V., Zwijndrecht. The steering gear is of electric-hydraulic type and of Vickers-Armstrong type 2TT150 construction, and fitted with an emergency hand operating gear.

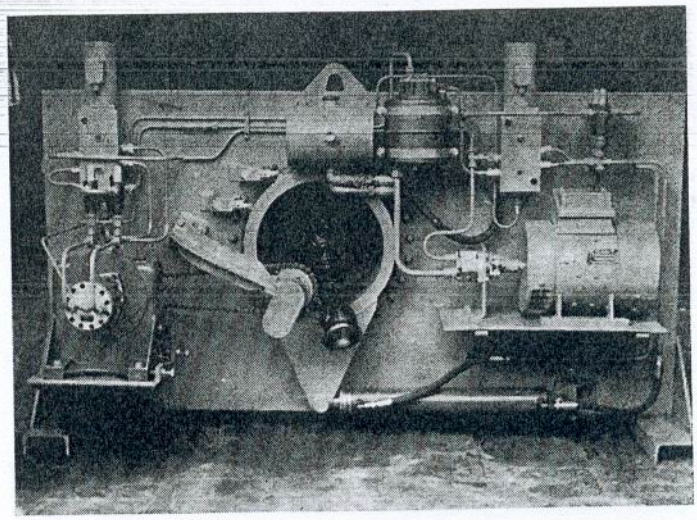
A special feature of the Shell Dolphin is the *Schottel Rudderpropeller* installed for use as a retractable bow propeller unit. This unit can be hydraulically retracted in a pocket constructed in the vessel's bow. The unit is lowered through an arc of 60° into vertical position and is fully operated from the wheelhouse. The rudder propeller can rotate 360° around its axis and thus enables the vessel to be turned around within its own length. The propeller is electrically driven and controlled from the wheelhouse. When the supply vessel is delivering cargo to an oil drilling platform in turbulent waters, the Schottel rudder propeller can prevent the vessel's bow from being damaged through coming into contact with the platform during loading or discharging operations. The Schottel rudder propeller is of the SRP75 type; the propeller has a diameter of 800 mm. and is driven through a 1 : 2.74 reduction gear by a 100-h.p. electric motor at 1,500 r.p.m. giving the propeller 550 r.p.m. and a pull of 1,000 kg. (see our January 1959 issue, page 27).

The safety equipment includes two Pyrene geared type monitors installed on the top deck. The monitors are fitted with foam induction system and so arranged that each monitor can be used independently on either foam or water. The capacity of each monitor is 500 gallons per minute when operating on water. The engine room is fitted with a Saval CO_2 installation having a capacity of eight 45-kg. cylinders. The installation is remote-controlled from the fore ship on main deck level. Two 20-person aluminium lifeboats with a transom stern have been installed and one 10-h.p. Johnson outboard engine has been supplied. The ship is also equipped with two 8-person RFD inflatable liferafts.

The accommodation for the ship's complement of 16 has been arranged in the fore ship. The officers are housed in single berth cabins and four three-berth cabins have been arranged for the crew. The accommodation is fully air conditioned by a Bronswerk low pressure installation operating on the direct expansion principle. The coolant being R-12 and a Worthington piston compressor operates in conjunction with a standard Bronswerk unit. This installation maintains an inside temperature of 24 °C. at extreme outside conditions of 44 °C. (= 111 °F.) and operates fully automatically. Bronswerk also installed the mechanical ventilation of the engine room, dry cargo holds and the sanitary spaces.

Communications equipment and navigational aids, partly installed by Radio Holland, comprise:— a lifeboat emergency transmitter/receiver "Salvita III"; the Marconi VHF radiotelephone "Argonaut"; the Kelvin Hughes echo sounder type MS 26 B; a Kelvin Hughes liquid standard and steering compass; a Decca navigator; Decca radar type 303 and a PYE Swordfish radio set.





Driving gear for S.R.P.

Machinery installation:— The vessel is propelled by twin diesel engines of the English Electric Company Ltd., manufacture of the 6SRKM type. The units are 6-cylinder 4-stroke pressure charged unidirectional diesel engines with a continuous output of 490 b.h.p. at 600 r.p.m. each.

The maximum output developed is 675 b.h.p. at 750 r.p.m. The engines are driving two outward rotating manganese bronze propellers each having a diameter of 1,900 mm. and a pitch of 1,900 mm. through twin M2WR size 4 gearboxes of Modern Wheel Drive Ltd. manufacture of a split torque type and have the input and output shaft co-axial. The port gearbox has been specially arranged to give an auxiliary drive incorporating a clutch for a fire pump. The gearboxes have been designed to receive 485 b.h.p. on the input shaft at 600 r.p.m., are extremely compact and have only 12 in. of sump depth below the seating flange. The casing has a main bottom part and a further top part cover, both of fabricated construction. The input shaft is carried in two bronze backed, whitemetal lined bearings and has upon it the ahead and astern pinion. These two pinions are in constant mesh with, in the case of the ahead pinion, the ahead clutches and in the case of the astern pinion the astern clutches through an idler. The clutches are of the Hindmarch/MWD type, the clutch shafts have the final pinions on their after end. The gearboxes have a 2½ : 1 reduction ratio between input and output shaft, the output shaft also carries a thrust collar for the Michell type thrust bearing, which has a capacity of 10 tons. The drive on the port gearbox for the pump is taken from the ahead input pinion and a speed increase arranged to give the correct speed required for the pump shaft. The pump is supported aft of the gearbox and requires 92 h.p. at 1,500 r.p.m. and is driven through an Anderton friction coupling. The fire fighting pump is a Pulsometer centrifugal pump delivering 500 gals./min. at 500 r.p.m. and 160 p.s.i.

The engineroom is insulated against heat and noise and the installation can be controlled from the wheelhouse by remote control. This remote control equipment has been designed and developed by A. Robinson & Co. Ltd., Liverpool, and works fully automatic. Forced draught ventilation for the engine room is provided.

A 220 volt d.c. electrical installation has been installed and electrical requirements are met by two Rolls Royce type C6-SFLM diesel engines developing 165 b.h.p. at 1,500 r.p.m. each coupled to a Metropolitan Vickers generator of 100 kW, 445 Amp. A harbour generator set has been provided comprising a Petter B4/Mk4, 4-stroke, 4-cylinder, vertical, water cooled, totally enclosed, diesel engine developing 40 b.h.p. at 1,500 r.p.m.; a Hugh J. Scott 24 kW generator rated to give an output of 220 volt d.c. and a Hamworthy type 2SM3 two stage single crank, vertical, water cooled, totally enclosed compressor of 350 p.s.i. delivering 9.6/16.0 c.f.m. FAD at 750/1,500 r.p.m. Further installed are two electric general service SIHI pumps of 30 c.m.h. capacity; one cargo oil pump of Houttuin manufacture of 60 m^3/hr. capacity at 60 p.s.i. and 1,400 r.p.m. driven by a Smit-Slikkerveer electric motor and a cargo water pump of the same manufacture and specification.

For the supply of cement cargo to the oil drilling stations, a bulk cement handling compressor has been installed in the engine room and this compressor is of Air Pump Ltd. make, type ARSM380, having a working pressure of 125 p.s.i.

The wheelhouse is of aluminium construction to reduce the influence of the ship's magnetic field on the steering compass.

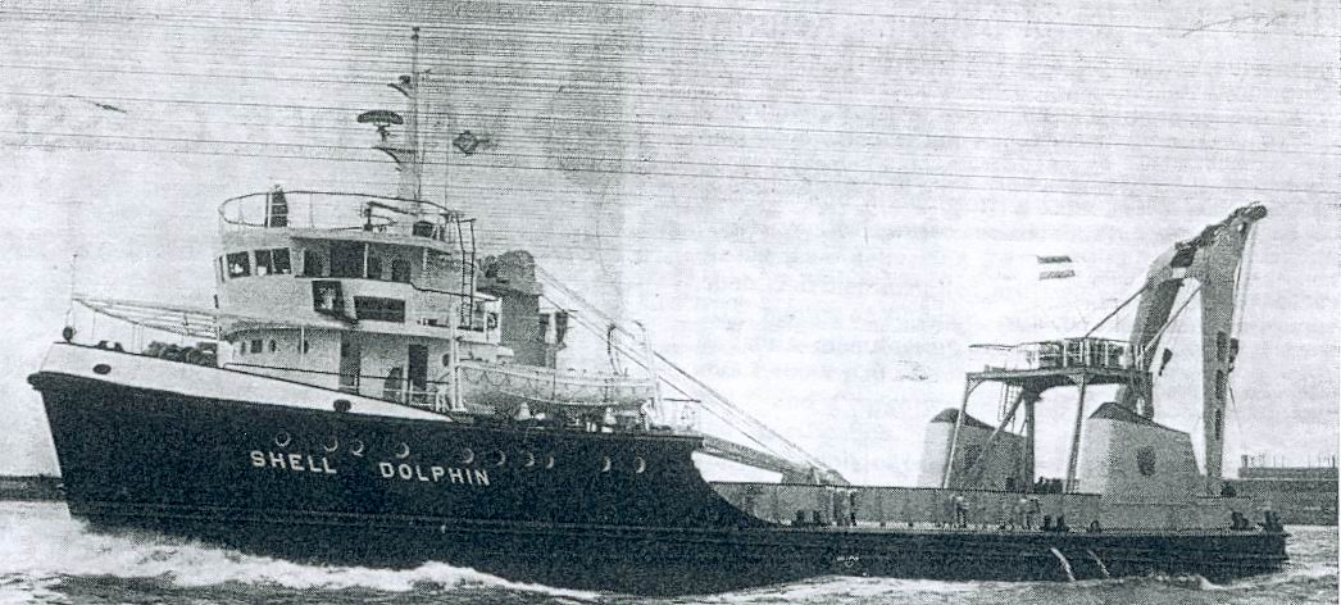
The *Shell Dolphin* is, as far as known the largest vessel of its kind so far constructed, and her design stems from the prototype supply vessel operating off the coast of Louisiana since 1957.

EQUIPMENT ON BOARD THE "SHELL DOLPHIN"
(partial list)

Almetaal N.V., Amsterdam: "Grillo" cathodic protection on aft-ship.
Bouw- en Montagebedrijf N.V., Zwijndrecht: Sheerlegs.
N.V. Bronswerk, Amersfoort: Air conditioning.
Davit-Company N.V., Utrecht: 2 sets of mechanical davits type "Normal Deck Pivot" (N.D.P.) with boatwinches type "Hand Power".
N.V. Econosto, Rotterdam: fittings.
Goodwill schuimrubber N.V., Rotterdam: foam rubber.
Hawker Siddeley Brush N.V., Rotterdam: Petter Auxiliary set.
P. de Hoop, Krimpen: Lifeboats.
Houttuin-Pompen N.V., Utrecht: Pumps.
N.V. Industriewolf, Amsterdam-C.: M.W.D. reverse reduction gearboxes.
N.V. Ingenieursbureau Fr. Eriksson, The Hague: Vickers-Armstrong machinery.
Internationale Navigatie Apparaten N.V., Rotterdam: Decca navigator.
Maters, Beverwijk: pumps.
N.V. Observator, Rotterdam: Kelvin & Hughes compasses and navigation lights.
Radio Holland N.V., Rotterdam: Navigation and communication equipment.
N.V. Redwijs, Baarn: trials.
Rietschoten & Houwens, Rotterdam: Electrical installation.
J. de Ruiter, Hardinxveld: Upholstery.
Saval, Breda: Remote controlled CO_2 installation.
Schottel-Nederland N.V., The Hague: Schottel bow propulsion unit.
Smit, Slikkerveer: Electric winch drive.
H. J. Vos, Dordrecht: Winch for sheerlegs.
P. v. d. Wegen, Tilburg: Hydraulics.
Zaltbommelsche Stuwschroevenfabriek N.V., Zaltbommel: Four manganese bronze four-bladed propellers.

The Society of Naval Architects and Marine Engineers, New York

has annouced the publication of two design monographs sponsored by the Society's Hull Structure Committee. Monograph no. 1 is entitled:— Design of a typical tanker oiltight transverse bulkhead, by D. F. MacNaught. Monograph no. 2 is entitled: "Design of a typical platform deck", by Merville Willis. The price per copy is respectively $2.00 and $ 3.00 and they are available at the Society's headquarters, 74 Trinity Place, New York. The society intends to publish other design monographs.


SHELL DOLPHIN