"VLAANDEREN XXI"

new split-type suction hopper dredger built by Shipyard Beliard Oostende

Shipyard Beliard Oostende N.V. at Oostende, Belgium, has delivered the split-type trailing suction dredger "**Vlaanderen XXI**" to the owners the Belgium Dredging Company Decloedt & Zoon at Zeebrugge.

The launching ceremony, which took place in October 1982, was performed by Mrs. G. Simoen, wife of Mr. R. Simoen, Inspector General of the Ministry of Public Works in Belgium.

The split hopper dredger is of the longitudinal splitting type suitable for the trailing suction dredging of sand, ooze, gravel and soft clay with the aid of one suction pipe with a diameter of 650 mm. The maximum dredging depth is 30 metres. The dredge pump is mounted in board and the hopper capacity is 1,751 m³.

The principal dimensions of the "Vlaanderen XXI" are:

length o.a.	76.00	m
length b.p.	72.50	m
breadth	14.50	m
depth	5.00	m
deadweight (d = 4.57 m)	2,650	tdw
hopper capacity	1,751	m³
output sandpump	866	hp
output main engines	2x1,198	hp
crew	14	
twin cabins	7	
fuel capacity	200	m³
freshwater	40	m³
lub oil	20	m³

The dredger is propelled by a fixed pitch twin-screw propulsion installation. The superstructure is hinge-mounted and remains horizontal during splitting.

The new dredger meets the classification requirements of Bureau Veritas Class + 1 3/3 E, "Drague-Porteur et Déblai (Haute Mer). The engine room received the notation AUT (M3). The dredger also complies with the regulations for an unmanned engine room of the Belgian Shipping Inspectorate.

Machinery installation

The machinery installation comprises the following diesel engines:

- two main propulsion engines
- a dredge pump engine
- a generator engine
- an emergency generator/fire extinguishing engine
- a bow thrust engine

All engines burn diesel oil and have been designed for unmanned operation.

The two main propulsion engines are of make Deutz, type SBA 8 M 528. They are of the marine 4-stroke type and develop each 1,198 hp at 900 rpm.

Through two Rhenania reduction gearboxes, type AWNG 45/45 i = 3.46 and two Stromag elastic couplings, type GEF 1200 N, these two main engines drive two Van Voorden fixed pitch bronze propellers, diameter 2,350 mm, speed 260 rpm.

This twin-screw propulsion arrangement is supplemented by a Schottel bow thruster, type 150/152 Z (tunnel diameter 1,000 mm). The bow thruster is powered by a Deutz diesel engine, type 12V71T, of 350 hp at 1,800 rpm which transmits its power through a Rhenania type AWNG 22/22 i = 1:1 reduction gearbox and Stromag elastic coupling, type GEF 200 N.

The two streamlined rudders, one abaft each propeller, are powered by two Brusselle, type HSE 100 M, hydro-electric steering engines, each with a maximum torque of 3.3 nm. The inboard dredge pump installed in the pumproom forward is powered by a Deutz diesel engine, type BA6M528, of 866 hp at 900 rpm. This engine drives the pump through a Rhenania reduction gearbox, type ALNps 40, with built-in clutch coupling, a Globoflex tooth coupling type ZN 100 and a Stromag elastic coupling. The Rhenania gearboxes and Stromag couplings were supplied by Boone B.V. Oud-Beijerland.

Electricity is supplied by a diesel driven main generator set consisting of a Deutz diesel engine, type SBA8M816LLK-U developing 438 hp at 1,500 rpm and an A. van Kaick main generator of 380 kVA, 3 x 440 V, 60 Hz.

For emergency purposes electricity is supplied by a generator set consisting of a Deutz type F8L413 diesel engine of 135 hp at 1,500 rpm and an A. van Kaick emergency generator of 105 kVA, 3 x 440 V, 60 Hz.

The electric system includes the main switchboard with incoming generator sections and 80 kVA shore connection, a 220-Volt lighting system with some 70 connections, a 24-Volt system with 3 batteries and an alarm installation for unmanned operation.
The auxiliary machineries include among others:
- 3 electrically driven bilge/ballast/fire fighting pumps of make Desmi type SA 80/200 x 14
- 2 electrically driven general service/hopper drainage pumps of make K&R, type Wavak 4.21
- an emergency fire fighting pump of make Desmi driven by the emergency diesel through a hand-operated coupling
- two hand pumps for draining the chain lockers
- two electrically driven fuel transfer pumps of make Speck
- a seawater and a freshwater hydrophore, capacity 200 l complete with pumps of 1.5 m^3/h at 30 m w.c.
- two sanitary boilers, capacity 120 l
- two electrically driven Desmi flush pumps for the dredging pump
- a Sarex bilge water separator, type OWS and
- two Ervor starting air compressors, capacity 15.5 m^3/h at 30 bar.

The hydraulic aggregate is situated in the pumproom and incorporates 5 electrically driven pumpsets of make Poclain Hydromatik type Gury. The total installed E-output is 112 kW. The hydraulic installation powers the gantries, suction pipe winches, windlasses, overflow valves, spoil chute valves and splitting cylinders.
The complete installation excluding the windlasses is remote controlled from the bridge.
The hydraulic aggregate is of Hydraudyne/Rexroth construction.
The split operation is controlled by two hydraulic cylinders supplied by Hydraudyne, the hydraulic pipeline system was supplied and installed by Hydrocare.
The engine room are protected against fire by a fire detecting and an inert gas installation.

Dredging installation

The spoil in the hopper is discharged by splitting the starboard and port ship's halves longitudinally with two hydraulic cylinders, one forward and one aft.
The two ship's halves are connected with heavy hinges and the opening angle is 2 x 20°. The hopper sealing supplied by IHC can be dismantled with the ship in closed position in drydock.
The overflow system includes two overflows situated in the two sides of the hopper forward. The overflows are provided with two hydraulically operated valves to control the hopper level from the bridge.
The spoil filled hopper is drained by two longitudinal pipes over the full length of the hopper and connected to two drainage pumps. Excess water can also be removed by the sandpump. The hopper is provided with two platforms from which it is possible to monitor the density of the spoil.
The dredge pump is installed in the foreship on starboard side and is of IHC standard type 125-37.5 - 65 with 5-blade impeller. The suction and delivery diameter is 650 mm. The suction pipe, supplied by IHC, is suitable for trailing suction and is suitable for dredging to −30 metres at an angle of 55° with the bottom. The suction tube can be shortened by removing a section of 6 metres.
The suction pipe is suspended in 3 gantries of IHC standard construction. Lowering/hoisting of the pipe is by three hydraulic winches of IHC standard construction with remote control. These winches are powered by Staffa motors.
The dredge pump can either be connected to the hull connection for the suction pipe or to the hopper connection for water drainage. The pump can deliver the spoil to either a spoil chute placed on the port hopper coaming or an AMOB line or a peak tank pipeline.
The complete dredging process is remote controlled from the bridge and the dredge master's station includes all necessary controls and handles including an IHC suction tube position indicator and draught and load metres.

Deck equipment

The anchoring equipment includes two Brusselle windlasses with chain stoppers, two "Pool" type anchors of 1,050 kgs each and 220 metres of Q2 36 mm chain.
Ample bollards are provided on the main deck to enable safe mooring.
The "Vlaanderen XXI" has two masts, one forward and one on top of the superstructure for carrying the navigation lights. The applied paint system of the hull and accommodation is of make Hempel S.

Accommodation

The "Vlaanderen XXI" has accommodation for a crew of 14 persons in the superstructure aft. In all there are seven 2-berth cabins.
On the boatdeck are two 2-berth cabins for the chief engineers and masters - each with private bathroom suite - the crew's deck accommodates 5 two-berth cabins, a messroom, a galley and bathroom.
The accommodation and engine room are provided with a hot water central heating system.
The engine rooms and pumproom have forced draught ventilation of 20,000 m^3/hr, the bow thruster room has also forced draught ventilation, capacity 10,000 m^3/hr.
The messroom, cabins and wheelhouse have a central ventilation system with preheated air, the bathrooms have a central exhaust and the galley has a separate exhaust.

Navigation and communication

The navigation and communication equipment includes:
- an Observator magnetic compass
- a Simrad echosounder, type ED 162
- two Furuno radar sets, type FR1221 and type FR1011 (N)
- a Koden radio direction finder, type KS540K
- a Sailor radio telephone installation of 800W
- a Sailor watch receiver and a Sailor vhf set
- a Vingtor telephone system
- a sound power telephone system

Other equipment includes 2 straight line window wipers, electric whistle and 100 W search light.
Beliard Oostende N.V. at Oostende could realize the construction of this dredger by closely cooperating with IHC Smit B.V. at Kinderdijk, Holland, who also provided the design for this dredger.