

Izar Gijon delivers two 4,400m³ dredgers to Jan De Nul

As part of a dredger building programme, that has seen eight dredgers delivered over the past two years, Izar's Gijon Shipyard has now delivered two 4,400m³ units, the *Taccola* and the *Francesco di Giorgio* to Belgium's Jan De Nul. The Gijon Shipyard, located on Spain's Atlantic coast, has also recently delivered two other dredgers for France's "Dragages Ports" – 5,000m³ and 8,500m³ capacity.

Over the last two years, Izar has built dredgers of several sizes at its shipyards in Gijón and Sestao. The biggest ones, the *Kaishuu* and the *Juan Sebastian Elcano*, with a capacity of 16,000m³ each were built at Sestao Shipyard, which also built the *Filippo de Brunelleschi*, and the *Francis Beaufort*, each with a capacity of 11,500m³. Six of the ships were for Jan De Nul.

Taccola and Francesco di Giorgio

Technical details

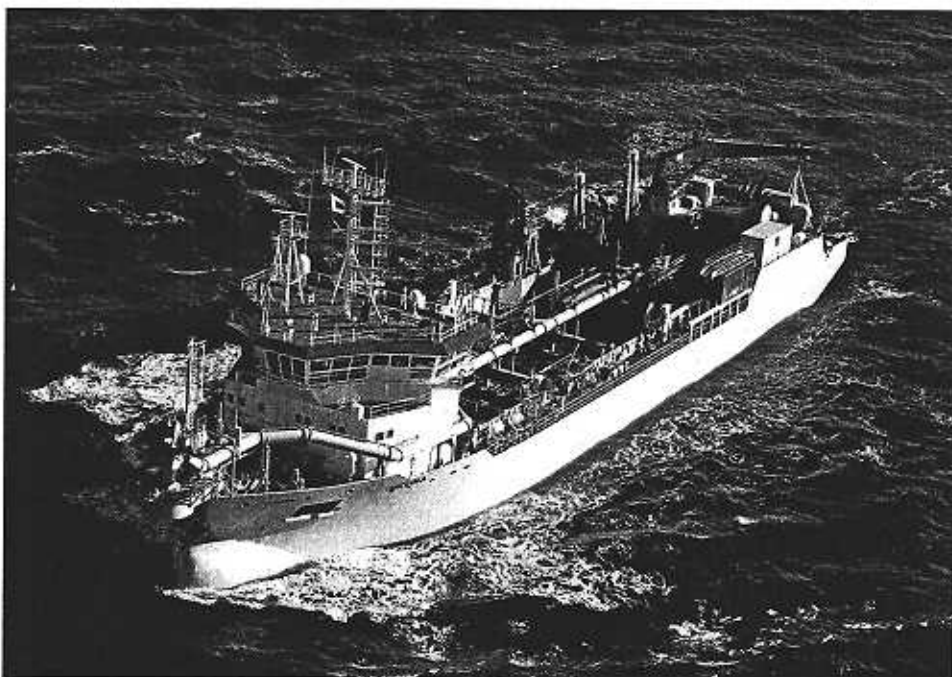
Hopper capacity	4,400m ³
Length, o.a.	95.40m
Length, b.p.	84.70m
Width	21.00m
Depth	8.50m
Dredging draught	7.20m
Deadweight at 6.5 draught	6,955 t
Suction Pipe diameter	900mm
Dredging Depth	21.00/24.30m
Speed	12.3kn
Power Main Generator Diesels 2x2,700kW	
Propulsion Power	2x2,150kW
Pump power trailing	Abt 1,250kW
Pump power shore discharging	3,000kW
Jet pump power	1,200kW
Bow thrusters power	550kW

wing desks, the DCM will facilitate monitoring of suction pipe position as well as draught and load, automatic cutter control, reporting and logging, trend curves and diagnostics for all machinery equipment. All relevant data are available for instant display to the dredge master via dedicated keyboards and a series of control levers.

Key system components include the PC-based Automatic Cutter Control (ACC) facility for acquisition and processing of

Sand Falcon lengthened

Damen Shiprepair Rotterdam (Niehuis Yard) (together with Merwede Shipyards) lengthened the aggregate hopper dredger *Sand Falcon* by 20.4m. Cargo capacity increased from 4,100m³ to 5,100m³. The 1,100 t bow section and the 400 t new section were floated precisely into position after the ship had been cut at Niehuis Yard.



The *Taccola*, one of two dredgers from Gijon for Jan De Nul.

dredging processes with data being relayed from dredge drives via serial interfaces. Profile data, feed values and alarm limits are entered via a control keyboard which also allows selection of four modes.

Similar DCM assemblies are typically operational aboard Jan De Nul's trailer suction hopper dredgers, *Vasco da Gama* and *Alexander von Humboldt* as part of earlier joint SAM Electronics-Vosta LMG projects carried out under a collaborative agreement signed in 2002. The two companies are also currently supplying components for a new trailing suction hopper dredger for Shanghai Waterway Bureau involving Vosta LMG-supervised conversion of a former 20,000dwt Korean bulk carrier for which SAM Electronics is

supplying a submersible pump drive system. Re-designed for sand dredging, the vessel is scheduled to begin operations this summer.

Light Tender launched at Damen Shipyards, Galatz

The new Light Tender *Relume*, under construction for the Middle East Navigation Aids Company (MENAS), was successfully launched in Galatz on 17 November

2003. This highly sophisticated buoy-handling vessel was towed at the beginning of January 2004 to the Netherlands for final outfitting and commissioning at Royal Schelde, for delivery to MENAS in August 2004. ■

SAM DCM System for new MHI trailer

The Suez Canal Authority's new 10,000m³ trailer suction hopper dredger built at Japan's Mitsubishi Heavy Industries' (MHI) yard in Kobe is being equipped with an automated Dredge Control & Monitoring System (DCM) developed by Hamburg-based SAM Electronics in association with its partner, Vosta LMG. The vessel, the largest dredger so far built in Japan, is due for commissioning this March.

Designed for control of the entire dredging process from a central and two

ranten eine Dichtungsvariante gefunden, die den hartnäckigsten der synthetischen Öle erfolgreich standhalten, uns somit für einen wartungsfreien Einsatz hinsichtlich der Pumpe in den marktführenden Filtersystemen sorgen. foerder-pumpen@kracht-hydraulik.de

Neue Winkelsensorik für drehelastische Kupplungen

Torsionsweiche Kupplungen werden eingesetzt, um Antriebselemente von Drehmomentstößen zu entkoppeln und Ausrichtfehler oder Verlagerungen auszugleichen, beispielsweise an Schiffs- oder Bahnantrieben. Aus sicherheits- und instandhaltungstechnischen Gründen werden die drehelastischen Kupplungen in zunehmendem Maße überwacht. Eine zustandsorientierte Instandhaltung wird dadurch ermöglicht. Überlastungs- oder ermüdungsbedingte Spontanfälle können vermieden werden.

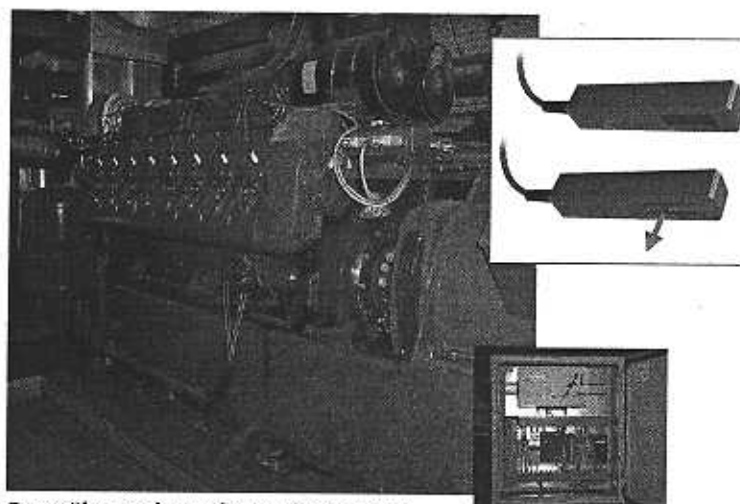
Die ACIDA-TorqControl GmbH, Spezialist für Antriebssensorik und Maschinenüberwachung, hat kürzlich ein System zur Dauerüberwachung des Verdrehwinkels an drehelastischen Antriebselementen vorgestellt (s. Abbildung). Es zeichnet

sich durch eine neuartige, industrietaugliche Sensortechnologie, die a-Sensorik, und eine moderne, automatische Signaldiagnose aus.

Das Messprinzip basiert auf der Laufzeitmessung zwischen den Impulsgebern auf der An- und Abtriebsseite der drehelastischen Antriebskomponente. Der Laufzeitunterschied ist proportional zum Torsionswinkel. Als Impulsgeber können vorhandene Flanschverschraubungen genutzt werden oder es werden, um eine höhere Messgenauigkeit zu erreichen, nachträglich installierte Magnete verwendet. Der Verdrehwinkel der Kupplung und die Drehzahl sind die analogen Nutzsignale des Sensorsystems.

Die Vorteile der a-Sensorik sind:

- Die neu entwickelte a-Technologie mit Triple-Hall Sensorelement misst die Impulsmitte aus.



Dauerüberwachung des Verdrehwinkels

Dadurch ist das Messergebnis unabhängig von räumlichen Verlagerungen des Kupplungselements.

- Verdrehwinkel, die größer als der Teilungswinkel der Impulsgeber sind, werden erfasst.

Das Messprinzip bietet eine echte laufzeitbasierte Winkelmessung. Es handelt sich also nicht um eine (ungenau) Differenzdrehzählerfassung. Die Überwachung der Signale erfolgt mit Hilfe des μ OMM-a Signalwächters. Es werden die Grenzwerte der Drehzahl, des Winkels, des Signalgradienten und des extrapolierten Signals überwacht. Die Torsionsschwingspiele werden im Antriebslastkollektiv klassiert. Als wesentliches Merkmal für den Alterungszustand von Elastomerkupplungen, wird die bleibende Leerlaufverdrehung der Kupplung als Langzeitrend gespeichert. Die Torsionsschwingungen können selektiv im Frequenzbereich überwacht werden, z.B. zum Überwachen von Antriebsordnungen. Die μ OMM-a Geräte werden stand-alone betrieben und können per Remote-access (Modem oder LAN) konfiguriert und die gespeicherte Daten ausgelesen werden.

Die erste Geräteserie hat sich bereits an den Antrieben von Kreuzfahrtschiffen, Kraftwerksaggregaten (s. Abbildung), Hafenkränen und Fischkutterantrieben im weltweiten Dauereinsatz bewährt. www.acida-torqcontrol.de

IZAR Gijón delivers two 4.400M3 capacity dredgers

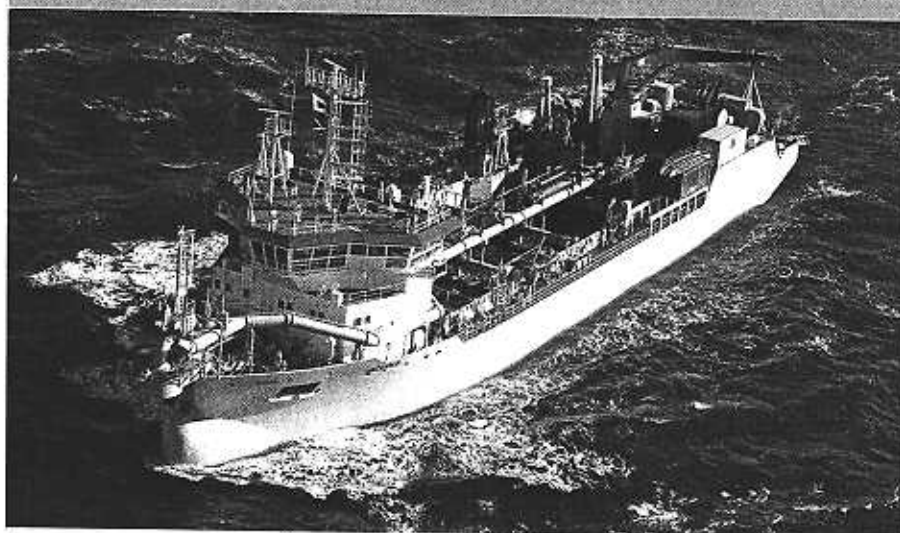
Last December Izar Gijón Shipyard delivered to Jan De Nul the suction dredgers named »Taccola« and »Francesco di Giorgio« with 4.400m³ capacity each. With a total of eight dredgers delivered in two years, Izar consolidates its position in the construction of these technologically sophisticated ships. Gijón has recently delivered two other dredges for the French company »Dragages Ports«, with 5.000m³ and 8.500m³ of capacity.

Over the last two years, Izar has built dredgers of several sizes at its shipyards in Gijón and Sestao. The biggest ones, the »Kaishuu« and the »Juan Sebastian Elcano«, with a capacity of 16.000m³ each were built at Sestao Shipyard which also built the »Filippo de Brunelleschi«, and the »Francis Beaufort« with a capacity of

11.500 m³. Six of the ships were for the Belgian owner Jan de Nul.

Main data of the twin »Taccola« and »Francesco di Giorgio«

Hoppercapacity:	4.400 m ³
Length:	95.4 m
Lpp:	84.7 m
Width:	21 m
Depth:	8.5 m
Dredging draught:	7.2 m
Deadweight at 6.5 draught:	6.955 t
Suction Pipe diameter:	900 mm
Dredging Depth:	21.0/24.3 m
Speed:	12.3 kn
Power Main Generator Diesels:	2 x 2700 kW
Propulsion Power:	2 x 2150 kW
Pump power trailing:	about 1.250 kW
Pump power shoredischarging:	3000 kW
Jetpump power:	1.200 kW
Bowthruster power:	550 kW



Patrick Stevedores: unbemannter Betrieb mit Kalmar ESC Portalhubwagen in Brisbane

Aufgrund der ausgezeichneten Ergebnisse des voll automatisierten Betriebes am Patrick's Fisherman Island Anlegeplatz 7 in Brisbane, Australien, hat Patrick Stevedores nun für seine drei neuen im Bau befindlichen Anlegeplätze 14 Kalmar ESC Portalhubwagen in Auftrag gegeben, die für den unbemannten Betrieb ausgerüstet sind. Die Expansion des voll automatisierten Betriebes zeigt das Vertrauen von Patrick Stevedores in das Konzept der Vollautomatisierung, dass während der letzten 12 Monate mit fünf umgerüsteten Kalmar CSC Portalhubwagen erfolgreich getestet wurde. Howard Wren, Chefberater Patrick Stevedores,

Poor Dredger!

Jan De Nul's 11,300m³ TSHD **FILIPPO BRUNELLESCHI** had to put in at Durban for repairs after running over its own dredging gear

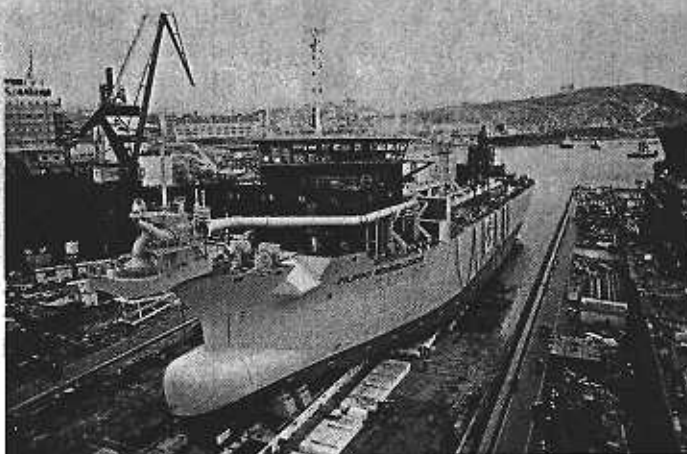
It's the third time the brand new ship has run into trouble while working in South Africa:

◆ At Walvis Bay pockets of hydrogen sulphide gas in dredged spoil hospitalised several of the crew (see the last DPC for the full story)

◆ When she then moved to Durban to dredge sand for a new dock project, she collided with the quay, damaging her hull, after the computerised positioning system malfunctioned

◆ And now this while she was dredging 3m cubic metres of material to deepen approaches to the new port of Ngqura.

"It really wasn't too bad and she'll be back at work soon," a



▲ A drydocked **Filippo Brunelleschi**, though this was before her launch

JDN spokesperson told DPC.

Meanwhile, on a happier note, the firm's mighty new cutter suction dredger *J.F.J. De Nul* has been undergoing trials and so far the news has been nothing but good...

More info at www.jandenul.com



▲ The **JFJ De Nul** on trial in Dutch waters

Back In Business

IMMINGHAM OIL TERMINAL – one of the UK's most important – is fully operational again after repairs

One of the terminal's River Humber berthing dolphins was damaged by a small bulk coal carrier that lost steerage whilst en route to a nearby berth – **Humber Oil Terminals Trustee (HOTT)** called in engineering consultants **High-Point Rendel** to oversee the repairs.

These included dismantling the dolphin's steel superstructure, removal of a damaged pile (one of five in the dolphin), driving a new, 1.8m wide x 45m long pile and reconstructing the superstructure.

Herbosch-Kiere won the contract – at a tender price of under £1m – and mobilised its multipurpose crane ship, *Atlantis* to complete the task safely, with no recordable accidents or incidents.

More info at www.total.gb.com

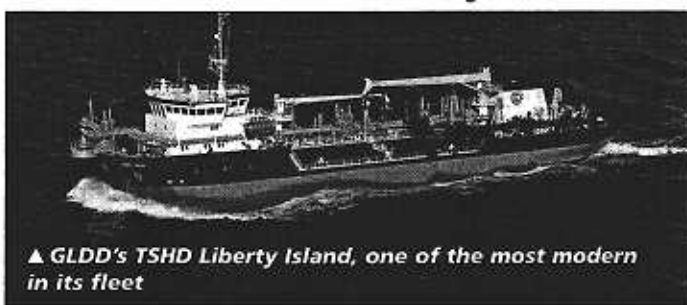


▲ **Olympic Legacy**, the largest crude carrier ever to visit **Immingham**, with the dolphin in question adjacent to the ship's stern quarter

GLDD Sold

GREAT LAKES DREDGE & DOCK Co. (GLDD), the largest dredging contractor in the US, has been bought by investment group **Madison Dearborn Partners** for **US\$340m**

GLDD has averaged a 40%+ US market share over the past three years and generates about 15% of its revenues from international operations – including the Port Hidd and Umm Qasr contracts featured in past issues of DPC. More info at www.mdcp.com or www.gldd.com



▲ **GLDD's TSHD Liberty Island**, one of the most modern in its fleet

On Guard

SEA-SENTINEL, a web-based risk assessment tool that provides the very latest information on global security events, has been launched by DPC's new publisher, **Lloyd's Register – Fairplay**

Combining the resources of **Lloyd's Register** and **Jane's Information Group** with **Maritime & Underwater Security Consultants**, the **Sea-Sentinel** service is aimed at shipping company security officers (CSOs) – who'll need to comply with the **ISPS** code when it comes into force on July 1.

Sea-Sentinel gives CSOs vital information to enable them to undertake a risk assessment for any port where their ships will call. Additionally, when security organisations and flag state officers look for evidence that potential threats and their possible impact have been investigated, Sea-Sentinel can provide that evidence.

The service, which is updated every working day, is accessible via a secure internet link – www.sea-sentinel.com – and is available on an annual subscription basis.

More info from **Lloyd's Register-Fairplay** on +44-(0)1-737-379-700 or e-mail sales@lrfairplay.com.

Mon€y

NOT BAD...

Given current market conditions, **Imtech's** chairman **René van der Bruggen** is 'not dissatisfied' with his firm's performance.

The order portfolio at year-end remained at around €2bn and the dividend proposal is similar to the previous year – €1.07 per share.

More info at www.imtech.nl

PAID OFF

Two major investments made by **Bristol Port Company** in the past year are showing dramatic returns.

◆ **The Avonmouth Fresh Produce Terminal** did £8.5m worth of business – and another extension is already being considered

◆ **Bristol Aviation Fuel Terminal** at **Royal Portbury Docks**, which came onstream in March 2003 costing £10m, is expected to handle 1m tonnes.

Overall, the privately owned port, which handled over 11m tonnes in 2002, is reporting an 11% increase in cargo volumes.

More info at www.bristolport.co.uk



▲ **Bristol's Royal Portbury Dock** currently has more deepwater berths (14.5m) than all the other major UK ports combined...

GETTING THERE...

Kitakyushu Hibiki, Japan's first privately invested container terminal, came a step forward recently when ten investors and a total of 16 partners signed a highly complicated financial deal.

The aim is to develop a distribution hub on the Pan-Asian Sea, offering 15m-deep berths for vessels of 5,000 to 6,000 teu. And when it comes on stream – planned for this year – the terminal aims to handle up to 600,000 teu annually.

More info at www.kitayport.or.jp/kowan_e/hibiki/

▼ How the terminal should look when it's open



IZAR Sestao

Two suction dredgers for Jan de Nul

Sestao shipyard of the Spanish IZAR shipbuilding group recently launched two suction dredgers with a capacity of 11,300 cubic metres for Jan de Nul (newbuilding numbers 324 and 325). According to IZAR delivery of the first dredger "Filippo Brunelleschi" will take place in September and of the second one "Francis Beaufort" in November. Both are planned to be operated in Southeast Asia for gaining land to the sea. These, as well as the previous ships "Juan Sebastián de Elcano" and "Kaishuu", of 16,000 cubic meters, will be operated by the same Belgian shipowner, Jan de Nul, and will execute similar activities. The "Filippo Brunelleschi" and its twin ship are smaller than their predecessors, but are able to dredge to a major depth and are better manageable.

The type of suction hopper dredger is designed and built to perform the following functions:

- Dredging by means of one trailing suction pipe, provided with an electrically driven submerged dredge pump
- Delivering the spoil either into the hopper or directly overboard when the dredged spoil is too light (low sand concentration)
- Dumping the spoil on the seabed through one row of hinged doors on the bottom of the ship or by means of two shallow water dumping doors which can be opened without exceeding the baseline.
- Emptying of excess water from the hopper by means of two overflows, before the dredge pump goes into operation
- Pumping of dredged material from the hopper ashore, by means of a shore discharge dredge pump and a selfemptying system.
- A bow connection arrangement is fitted suitable for coupling to a flexible floating pipeline, as well as a bow jetting installation.

Main characteristics

Length overall:	138.94 m
Breadth:	27.5 m
Design draught:	9 m
Tons deadweight:	18,590
Propulsion:	2X MAN B&W of 5 760 kW each

The dredging system

The main elements of the dredging system installed aboard this ship are the following:

- Shore discharge dredge pump
- One trailing suction pipe with an electrically driven submerged dredge pump
- Hopper with pipelines and loading and unloading systems
- Auxiliary dredging systems
- Jetwater system for diluting the hopper load to facilitate unloading
- Instrumentation for dredge control.

Dredge pumps

Dredge pumping set consists on two pumps, manufactured by IHC:

- One shore discharge dredge pump double walled type driven by an electric motor via gearbox; max. power rating: 7500 kW.
- One submerged dredge pump single walled type driven by an electric motor; max. power rating 3400 kW at a nominal speed of 280 rpm.

Suction pipe

The dredger is equipped with one suction pipe of a 1200 mm internal diameter, dimensioned for dredging at a depth of 32.5 m (adjustable to 52 and 71 m) under the waterline with the hopper empty, and with a 50° or

55° respectively maximum angles between the suction pipe and the baseline.

A draghead of a 1200 mm bore, with an adjustable visor and a swell compensator, is fitted to the end of the suction arm. This swell compensator allows a movement of the draghead of 6 m with respect to the vessel. The suction pipe is hoisted by three gantries placed at the draghead, at the intermediate cardan joint and at the trunnion connection of the arm to the hull. Each gantry is provided with a hydraulically-driven winch with the following nominal pulls: 1005 kN in the draghead, 960 kN in the intermediate for a nominal hauling speed of the suction pipe of 8 m/min. Draghead winch is arranged for single part hoisting, trunnion and intermediate winches for double part hoisting.

Kraftvoller Rohrbearbeiter sucht...



...Rohre bis 80 mm für präzise Umformungen

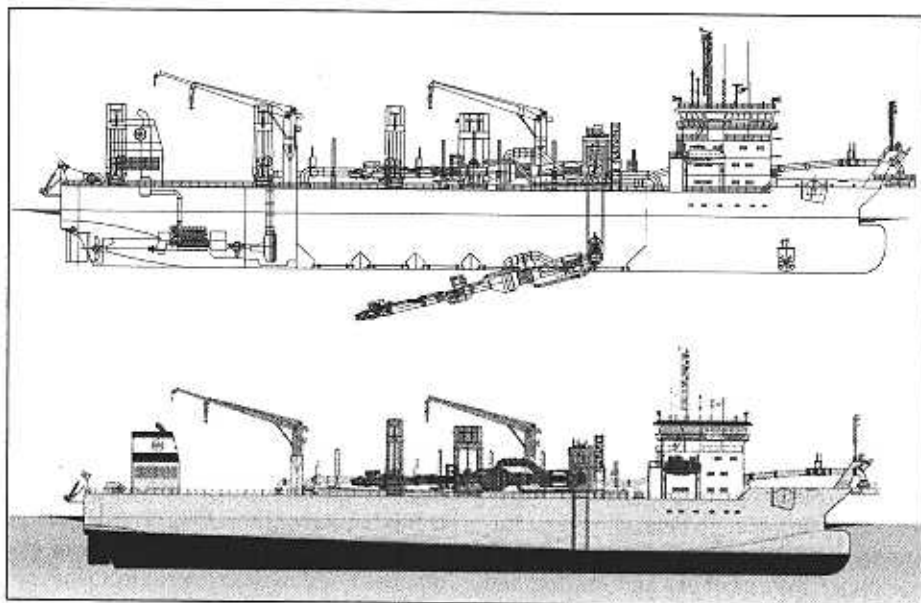
Rohrleitungen bis 6000 mm Länge und 76,1 mm Ø, z. B. für den Anlagen- und Schiffsbau, lassen sich mit dem **TUBOBEND 80** mühelos biegen. Ausgestattet mit freistehendem Biegekopf für enge Bögen und Bogenfolgen, Soll- / Istanzeige für 8 vorprogrammierbare Biegewinkel, abnehmbarem Bedienteil sowie mitlaufendem Gleitstück und variablem Klemmdruck bietet der **TUBOBEND 80** alles für eine erstklassige Biegequalität - für nahezu alle Rohrarten.

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Side view of the new 11,300 m² trailing hopper suction dredgers

Hopper, loading and unloading

The hopper form is designed for optimal settlement and discharge of the spoil both through the bottom doors and through the bow. Two vertically adjustable overflow pipes are installed, one forward and one aft. Unloading through the bottom into shallow water. Two doors are arranged on the bottom of the hopper to unload the dredged material when there is not enough depth to unload through the ship-bottom doors as described above. Fluidisation of dredged material. To speed up the unloading of dredged material, a piping system fitted with nozzels projects pressurised water from different positions on the hopper. Two TTS/IZAR Manises electro-hydraulic cranes are installed for repair and replacement of the dragheads and other elements that form part of the suction line, as well as repair work in general. One of the cranes has a 45 t hoisting capacity and a maximum reach of 16 m. The other has a 14 t hoisting capacity at a maximum reach of 22.

Propulsion and auxiliaries

The suction dredger type is powered by two MAN B&W diesel engines, type 12V32/40, of an 5760 kW power output at 750 rpm, burning heavy fuel of a max. viscosity of 390 cst at 50°C.

Starboard main engine, driving:

- a Wärtsilä controllible pitch propeller via a flexible coupling, a Jahnel Kestermann reduction gearbox with clutchcoupling
- a Nihhuis jetpumpset from the forward end of the engine via reduction gearbox with two outgoing speeds. Between engine and gearbox a flexible coupling, between gearbox and pumpset a tooth coupling are fitted
- a generator driven by means of a PTO on propulsion gearbox.

Portside main diesel engine, driving:

- a Wärtsilä controllible pitch propeller via flexible coupling, a Jahnel Kestermann reduction gearbox with clutch-coupling
- a generator driven by means of a PTO on propulsion gearbox.

The electric propulsion plant is formed by two main shaft alternators of a 6750 kVA output at 1800 rpm, 6,6 kV and 60 Hz. An auxiliary generator set formed by a Caterpillar engine of a rating of 1550 kW at 1800 rpm, drives an alternator rated at 1050kVA, 440 V, 60 Hz, and an emergency generation set.

Automation

Imtech Marine & Industry was awarded the contract for the dredging and platform automation of the trailing suction hopper dredger series. The automation concept for the vessel provides full integration of the navigation-DP/DT system, the alarm, monitoring and control system and the dredging control and automation system. The redundant high speed network has no single point of failure to ensure maximum reliability and safety. Multi-function workstations optimise crew efficiency and system operation.

Integration of radar, ECDIS, DP/DT survey, conning, AIS, VDR and autopilot functions allows efficient route planning and flexible operation. The fully automated dredging control system featuring touch-screen operation is also integrated in the ship's speed network. Furthermore, hardware commonality in the system reduces the spareparts investment and simplifies maintenance activities. In addition, decentralised input/output processing reduces the amount of electrical cable on the ships and contributes to minimising life-cycle costs. ✂

ICMES 2003

Interessante Tagung in Helsinki

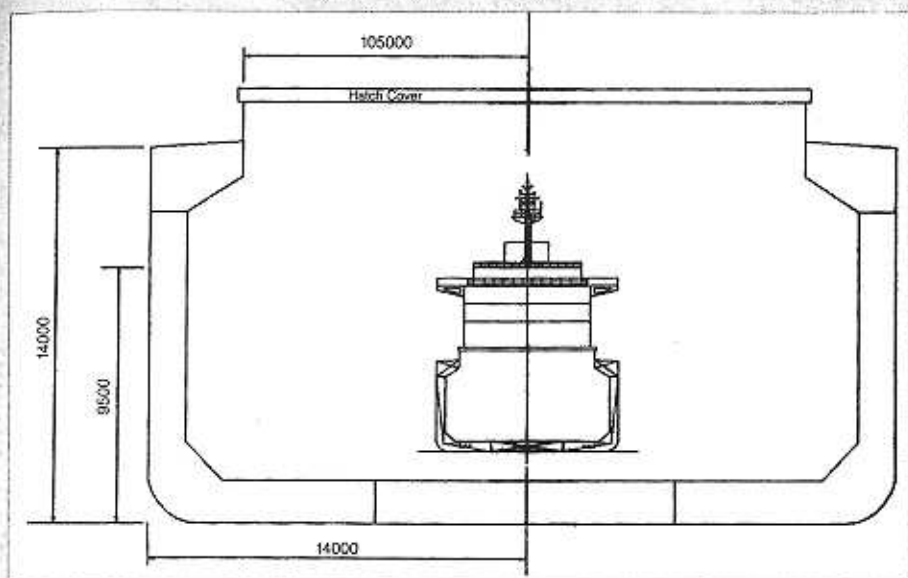
Vom 18. bis 20. Mai fand in der Technischen Universität Helsinki in Espoo die 9. Konferenz der „International Co-operation on Marine Engineering Systems“, die ICMES 2003 statt. Insgesamt 81 Teilnehmer aus den USA, Finnland, Japan, Norwegen, Schweden und Großbritannien, Ägypten, Kanada, Dänemark, Deutschland und Italien konnten der Vorsitzende des Organisationskomitees, Prof. Pentti Häkkinen und die Stadtpräsidentin von Espoo begrüßen.

Der fachliche Teil der Tagung begann mit zwei Vorträgen im Plenum, worauf weitere Vorträge zu aktuellen Themen des Schiffsmaschinenbaus und der Schiffsbetriebstechnik folgten. Johannes Tvedte, President Hoegh Fleet Services AS, gab mit seinem Plenarvortrag „Overview of the Norwegian Maritime Research in Norway“ einen informativen Einblick in das Kompetenznetzwerk aus Hochschulen, Forschungsinstituten, Reederverband, Norwegian Research Council und seiner Reederei und zeigte die strategischen und taktischen Ziele auf, die gemeinsam angegangen werden. Er stellte auch Beispiele unlängst abgeschlossener Forschungsarbeiten vor und berichtete über den Grad der Umsetzung auf den Schiffen der Leif Hoegh AS.

Mika Laurilehto aus dem Hause Wärtsilä Corporation beschrieb anschließend in dem zweiten Plenarvortrag den Hintergrund, der seine Firma dazu bewogen hat, dieses Thema anzugreifen. Schiffe mit Gas als Kraftstoff können in beachtlichem Umfang zur Verminderung der Umweltbelastung beitragen. Er stellte ausgeführte Beispielanwendungen vor: ein Fährschiff, einen kleinen Gastanker, der als Bunkerboot fungieren kann sowie mehrere andere kleinere Einheiten. Auch der erhebliche Ersatzbedarf an LNG-Tanker-Tonnage wurde angesprochen.

In den nachfolgenden sehr informativen Fachvorträgen wurden folgende Schwerpunkte angesprochen:

- schiffssicherheitsrelevante Themen
- IT-Lösungen zur Erhöhung der Sicherheit des Schiffsbetriebs
- fehlertolerante Regelungs- und Diagnosesysteme
- Entwicklungstendenzen bei langsam laufenden und mittelschnell laufenden Dieselmotoren
- Optimierung der Ausrichtung von Wellenleitungen
- Neuentwicklungen für wassergeschmierte Stevenrohrlager



Cross section with double skin (1.30 m wide)

discussions between the Chartering and operations department of Clipper and the technical department of their technical managers, Dockendale Shipping Co. Ltd., and drawing on GTRC's own experience in standard ship design and supervision for various owners, such as Unicorn, Navarone, Pyros, Egon Oldendorff, Aug. Bolten and Transmer.

The highly optimised »Trader« design incorporates high specification machinery and equipment with safe margins, high specification paint coating including Tar-free light coloured »survey friendly« paints for ballast tanks, tin-free anti-fouling paints with sixty months life, a 1,300 mm wide double hull giving ample access for surveys and inspections.

The characteristic Algoship wide hatches (75% of the beam) with minimum overhang, large cargo hold tank-top foot prints with small side-hoppers and square bulkhead stools as well as four sets of 30 t cranes fitted with radio controlled grabs enables the »Trader« design to handle cargoes without the assistance of secondary cargo handling equipment such as forklifts, pay-loaders etc. This reduces not only cargo damages but also substantially reduces the cargo handling time and costs.

In the past, Shanhaiguan, a CSIC-yard, has predominantly focused on ship-repair. This project will be an important step for them in their attempt to become a new-building yard. GTRC and CISIC have cooperated over eight years now, and dur-

ing this time GTRC was able to revive Xingang and Xinhe shipyards, which had gone bankrupt before GTRC had come into the picture. Both of these yards are very active and successful today.

Under the current CISC Vice-President Yu Shi Chun, who was by then President of Dalian Old Shipyard, GTRC was able to make record early deliveries of the »Fantasy« vessels. The New Century Shipyard has enjoyed phenomenal growth after GTRC launched the »Festiva« and »Galaxy« designs in this yard. Shanhaiguan and CSIC are relying on the knowledge, experience, expertise, and pro-active supervision of GTRC to achieve yet another milestone.

Algoship and Shanhaiguan Shipyard have retained MASTEK Heavy Industries of Pusan South-Korea to carry out the basic and detail design in order to achieve a better quality of detailed design and material control. MASTEK a closely associated partner of Algoship in their design development activities are also active in China. Their recent major project is the total design package supplied to New Century Shipyard for a series of Panamax Tankers built for Italian buyers. Algoship and MASTEK are now developing a double hull Super-Panamax bulk-carrier to be built in China for their international ship-owner clients.

The model tests for the »Trader« class vessels were carried out at KRISO model basin in South-Korea. ABS has been retained to class the vessels. Latest ABS rules including SAFEHULL Phase-B, IACS and IMO regulations applicable to bulk-carriers shall be applied to this design. □

Spanish IZAR managed to open a new niche market. They started to build two 4,500/8,500 cbm suction hopper dredgers and continued with three even bigger ones (2 x 16,500 cbm and one 11,300 cbm) until the end of 2002. Two similar ones are under construction now.

Dredgers built in Spain

The design and construction of floating dredgers of all kinds was traditionally the main business of companies in The Netherlands (IHC) and to a minor extent in Germany (O&K later Vosta/LMG). Within the last decade international yards came into picture using partly licences from the before mentioned companies which continued to deliver the main dredging components, such as pumps, suction pipes and drag heads. Within the last five years Spanish IZAR Group (former AESA) entered this special niche market.

In May 2000, IZAR's Gijon shipyard received the first order from French national dredging company Dragages-Ports in Rouen to build two floating trailing suction hopper dredgers (TSHD). In April 2002 »Daniel Laval« (4,500 cbm) and in October 2002 »Samuel de Champlain« (8,500 cbm) were delivered to their French owners (see HANSA 12/2002, page 37). Both vessels were constructed following a Vosta/LMG-design and also the dredging equipment came from them.

The next step for IZAR was to design and construct two larger TSHDs to be built

at their Sestao shipyard close to Bilbao. »Juan Sebastián Elcano« and »Kaishuu« measure some 16,500 cbm each and are employed by Singapore-based associates of Belgian Jan de Nul Group in land reclamation and civil engineering work in South-East-Asia. Both vessels in came into service by March and October 2002. Two further contracts were placed by the same owner, but these dredgers are designed slightly smaller - 11,300 cbm each. Sestao's hull no. 325 was named »Francis Beaufort« and launched middle of this May. Naming and launching of hull no. 326, »Fil-

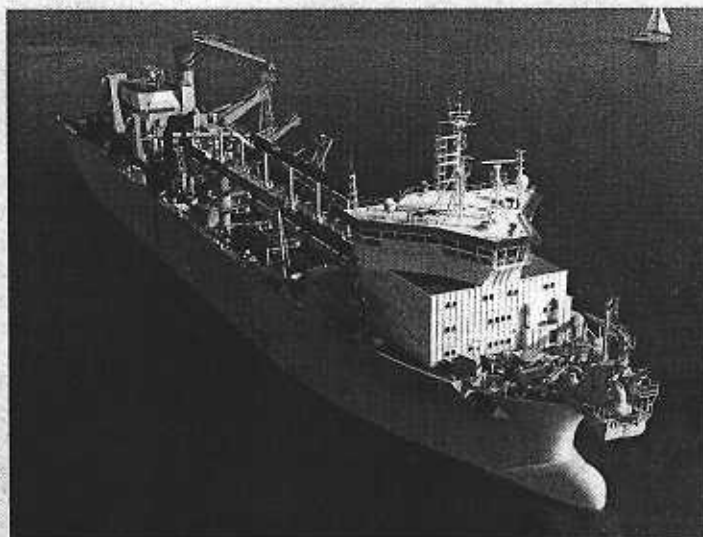
Dredgers

ippo Brunelleschi« followed two months later while the delivery of this twin is scheduled for this November.

Basically the design of all these dredgers is similar with main machinery aft, wheelhouse and accommodation forward. Hoppers are positioned centrally between these two more or less curved sections. To give enough strength and stability to the hull, hoppers are positioned between wide side spaces, arranged with sloping bottom and several drop-doors. Dredging uses port- or starboard suction pipes positioned aft of half length of the ship and dimensioned to dredge at a depth of at least 34 m below the keel, at an angle of 50°.

On both sides of the hulls, three davits with hydraulic winches handle the suction pipes with drag heads, which are fitted with an adjustable visor and wave compensator. Spoil is discharged by itself through the drop doors, or by pumping over the bow, either through a floating hose, or by rainbow nozzles. Dredging pumps are of double walled type. They are directly driven via gears by the main diesel engines. Portside pumps are variable over the speed (170/236/278 rpm) creating variable powers (3,500/6,000/6,000 kW) for changing depths. Starboard pumps are dimensioned for 3,500 kW only on 170 rpm. All jet-pumps are driven by electric motors.

The main machinery is based on two MAN B&W 8 L



Up to now the largest class of 16,500-cbm-TSHD built in Spain Photo: IZAR

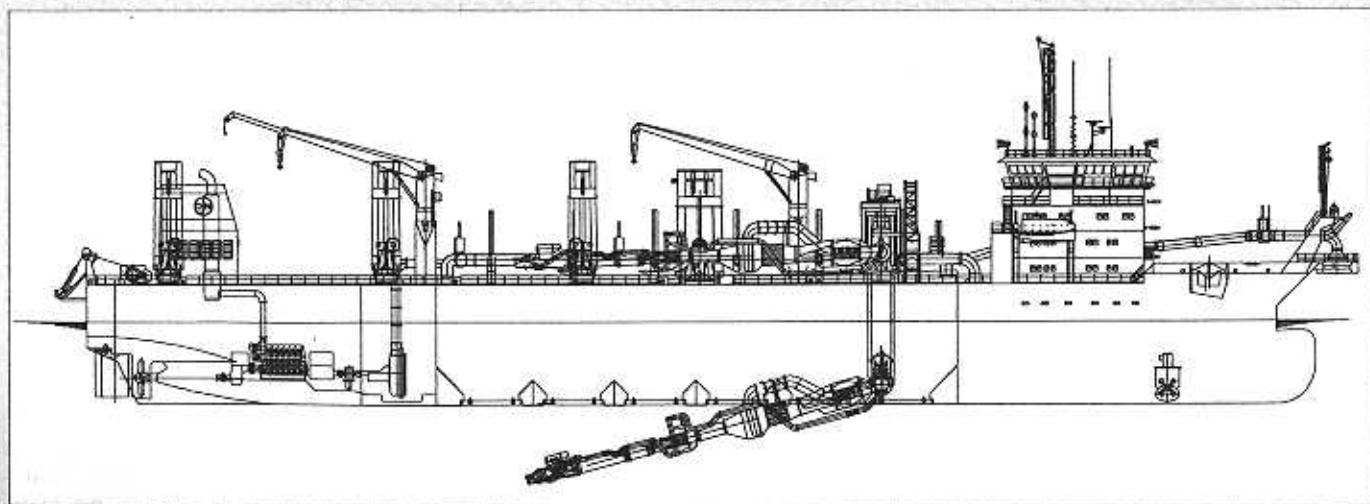
Main particulars	11,300 cbm	16,500 cbm
Length over all	139.00	149.00
Length b. pp.	127.00	140.00
Breadth mld.	27.50	27.80
Depth to main deck	13.00	15.50
Draught		9.70
Dredging draught	9.00	11.00
Deadweight	18,590	25,900
Hopper capacity	11,300	16,500
Speed	15.0	15.6
Main engines	2 x 5,760	2 x 8,400
Engine speed	600	600
Auxiliary engine		895
Generators	2 x ...	2 x 3,840
	1 x ...	1 x 850
Propellers	2 CP	2 CP
Double bottom doors	6	7
Shallow water doors	2	2
Self-emptying doors		14
Adjustable overflows	2	2
Shore discharge over	bow	bow
Suction pipe	1	2
Dredging depths under keel	32.5/51/71.5	34-48
Dredge pumps	2 x 3,500	2 x 3,500/6,000
High pressure jet-pumps	4 x ...	4 x 3,500
Low pressure jet-pump	1 x ...	1 x 6,000
Deck cranes	400/65	400/65
Thruster bow	2 x 850	2 x 850
stern	1 x 850	1 x 850
Classification	BV	BV

48/60 type engines, each connected by a shaft-line, flexible couplings and a reduction gear box to a variable pitch propeller. A power take-off (PTO) from each of these two gear boxes provides the drive, by way of multiplier gear boxes and flexible couplings, to port- and starboard dredging pumps. These are placed in the aft pump room and are rated at 25,200/21,600 cbm/h. Two more gear boxes power take-offs and drive two alternators, 4,000 kW each, which satisfy other electrical requirements on board.

The pumps are supplied by Dutch IHC, and have double walls with an abrasive-resistant internal coating. To speed discharge, high-pressure water can be directed into the hopper through nozzles to assist fluidisation, and a de-gassing plant is fitted to the suction pipe in the aft pump room.

The automation and control system integrates the navigation DP/DT systems, alarm monitoring and dredging control. It is cent and operated from a large triangular-shaped bridge, designed to afford all around visibility for both navigating and dredging personnel.

Manoeuvring and positioning are enhanced by the two controllable pitch propellers with active rudders and two thrusters in the bow as well as one aft. Classification is for Bureau Veritas notation: I 3/3 E + Hopper dredger Deep Sea, AUT-MS. □



Side-view of 11,300-cbm-TSHD

Sketch: IZAR

will remain as Vice President and General Manager of LWT; Charles Albert will remain as Director of Operations of Baltimore Dredges, which will be changing its name to Ellicott Dredges, LLC. Peter Bowe, Chairman of LWT, will be joining the BDE board.

Gamal Elsaeed, the Chairman of Baltimore Dredges, and the newly elected Chairman of BDE, expressed enthusiasm for the new investment; "With the additional financial resources we will be hiring new staff at all of our locations, and adding dredges to our lease fleet. We clearly are the leading US player in the dredge manufacturing industry. An analogy for our strategy is the multi-brand car dealer – we will have a product and an organisation to suit all customers. We will be continuing to offer Ellicott™, Mud Cat™, LWT Pit Hog™, IMS, and United Marine International brand products, each backed by a separate sales and engineering organisation to serve their respective market niches."

Joe Killackey, a UGP partner and a new Director of BDE, said, "This is an ideal investment for our Fund – growth financing for a leading company in some unique and growing markets. We plan to work with BDE to build the company to the dominant player in its markets."

In industry news, Ellicott Dredges noted that it sold to customers in three countries in June and will shortly be shipping its first SandMiner dredge to a unit of Lehigh Cement Company, a subsidiary of Heidelberg Cement of Germany.

LWT has announced a substantial order for multiple fully automated dredges from International Paper (IP). IP will use the dredges for secondary waste water treatment at a Florida kraft pulp and paper mill operation. LWT also said that it has just shipped its first Innovative Material Systems Versi-Dredge™, equipped with the patented Starwheel™ self-propulsion system. This delivery marks

the first IMS dredge built by LWT since LWT acquired IMS's intellectual property in February of this year. Finally, the company has just commissioned a TrashCat™ from LWT's United Marine International Division.

Izar Gijon launched the second 4,400m³ dredger for Jan De Nul

Spain's Izar Gijón Shipyard has launched the *Francesco di Giorgio*, a suction dredger with a capacity of 4,400m³, for Jan De Nul. The ceremony, that took place last 13 June, was followed by the naming of the twin dredger, *Taccola*.

The delivery of the *Francesco di Giorgio*, whose godmother was *Isabelle de Sadeller*, will take place on November, while the delivery of her sistership, whose godmother was *Ghislaine de Jul*, is scheduled for December.

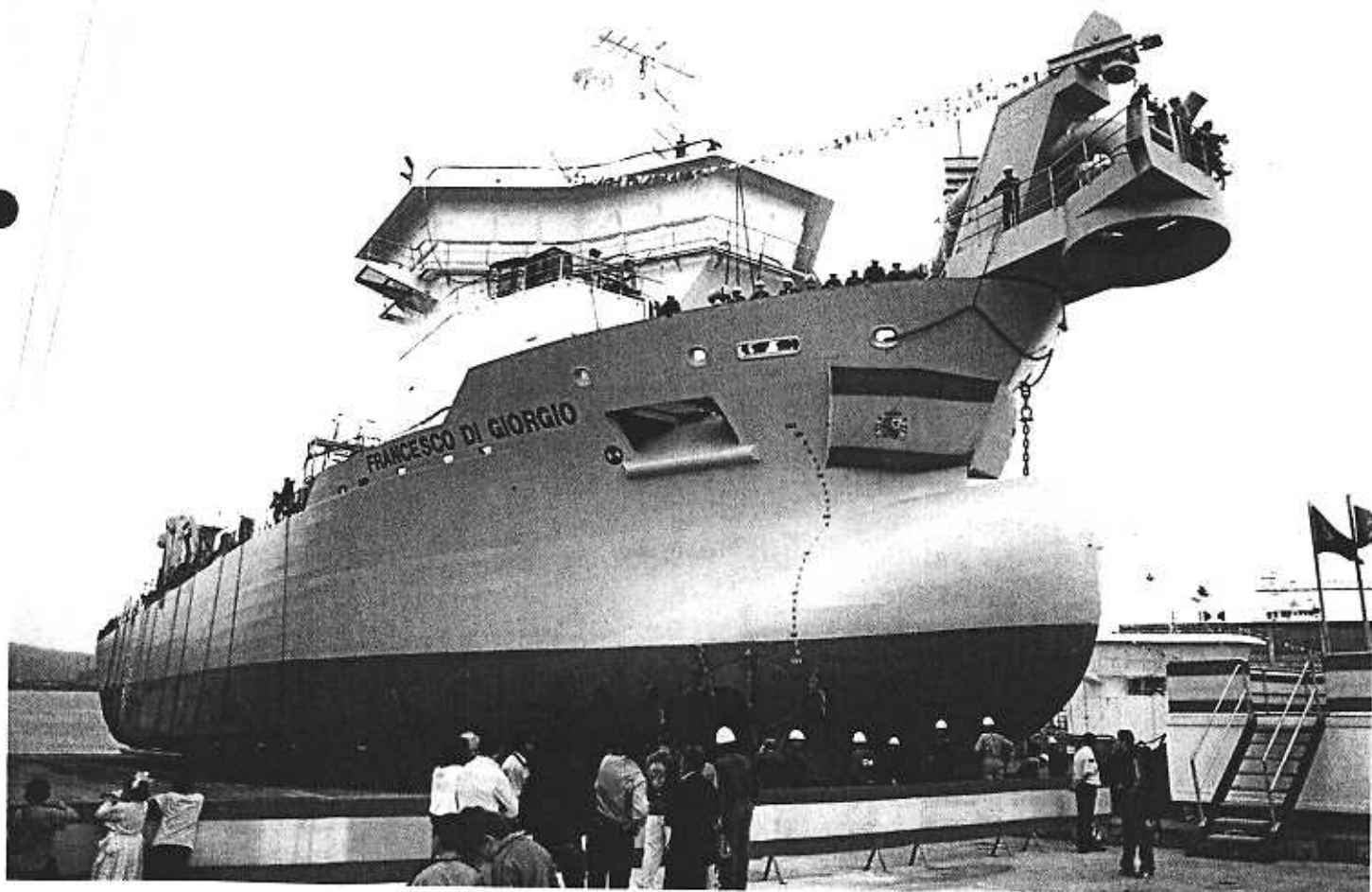
The vessel's propulsion system comprises two Indar diesel engines, each with an output of 2,150kW, and four auxiliary engines. Izar's Cartagena Diesel Engine Factory has provided the auxiliary equipment (Izar-Cat 3412 diesel engines of 525kW each, and an emergency Izar-Cat 3360 diesel with 170kW output).

Before these two dredgers, Gijón shipyard had already built and delivered two more dredgers for Dragages Ports (France) – the 5,000m³ *Daniel Laval*, and the 8,500m³ *Samuel de Champlain*.

Francesco di Giorgio

Technical details	
Length, o.a.	95.3m
Breadth	21.0m
Depth	8.5m
Design draught	6.5m

The *Francesco di Giorgio* on the slipway at Izar – Gijon.



Prins de Nederlanden launched

Boskalis' new trailing suction hopper dredger *Prins der Nederlanden* has been launched at Merwede Shipyard in Hardinxveld-Giessendam, under a contract signed with the British subsidiary – Royal Boskalis Westminster.

The *Prins der Nederlanden* is one of two new hopper dredgers currently being built for Boskalis. Both ships will be approximately 156m long, with a hopper capacity of approximately 16,000m³. The ships were specially designed for the dredging and transportation of sand and sludge. They will be used by Boskalis throughout the world on dredging projects such as land reclamation and harbour construction. The construction of the two ships is part of the long-term plans for the Boskalis fleet. Some of the plans for the fleet include increasing capacity in the light of market developments, others the replacement of older tonnage by highly efficient, state-of-the-art ships. For example, in November 2000, the mid-size hopper *Coastway* (4,900m³) was launched and 2002 saw the extension of the jumbohopper *WD Fairway* to a megahopper of 35,500m³. The *Prins der Nederlanden* and her sister ship will be the cost leaders in their class. The *Prins der Nederlanden* will go into service in February 2004. The second ship will follow later that year.

The *Prins der Nederlanden* has a very innovative and efficient design. The ship has a large carrying capacity and a relatively shallow draught and it can dredge down to large depths. Furthermore, gantries of the gravitation type have been installed for lifting the suction lines in and out of the water and the innovative design means that the ship needs fewer bottom doors than usual for discharging. Damage stability is higher than required by international standards and the ship has four 'control and

Ms Helene Helligsøe naming the *Mjolner R*.



monitoring' systems: a DP/DT (dynamic positioning and dynamic tracking) system, that makes it possible to keep the ship precisely in a set position, a dredge control system, a hopper monitoring system, and an alarm and monitoring system.

Rohde Nielsen A/S' new aquadigger dredger

Denmark's Rohde Nielsen A/S has taken delivery of a new aquadigger dredger, the *Mjolner R* from Western Shipyard, Klaipeda, Lithuania and various Danish sub-suppliers, as Niels Mosberg ApS and Hans Jacobsen. The *Mjolner R* consists of a PC3000A excavator, which was manufactured to Rohde Nielsen's special requirements by Komatsu Mining, a pontoon of 50.00m x 17.00m x 3.00m and accommodation for seven people. The *Mjolner R* is the largest of its kind in Denmark.

The *Mjolner R* was introduced into the existing Rohde Nielsen fleet by a naming ceremony on 4 June this year (2003) at the Rohde Nielsen Repair Yard in Grenaa, Denmark. The *Mjolner R* was named by Rohde Nielsen's Secretary, Ms. Helene Helligsøe, who has been with the company for 10 years. Rohde Nielsen A/S considers Ms. Helene Helligsøe a most loyal employee, which is why she was chosen for this honourable task.

All Rohde Nielsen's vessels have names from Nordic mythology and this vessel is no exception. To honour this, the *Mjolner R* was named using Mjød, which is beer brewed to an old viking prescription. The *Mjolner R* was the God Thor's very powerful hammer and the *Mjolner R* is, like Thor's hammer, a very powerful tool with which Rohde Nielsen A/S can serve their clients.

The *Mjolner R* has been designed as a strong and very efficient production unit working in an environmental friendly way taking the surroundings as well as the crew into consideration. Although the *Mjolner R* is not the biggest of its kind in the world, it belongs to the class of very large dipper dredgers. Without being too heavy, it can also cater for all the small to medium size jobs in Scandinavian waters and elsewhere in the world. The *Mjolner R* is equipped with a 11m³ bucket, but can be equipped with a 14m³ bucket for lighter materials. The *Mjolner R* is also equipped with a 12m long boom and a 7m long stick and with this attachment the *Mjolner R* can dredge down to -16m. With a longer attachment, a 15m boom and 12m stick, the *Mjolner R* can go down to -22m.

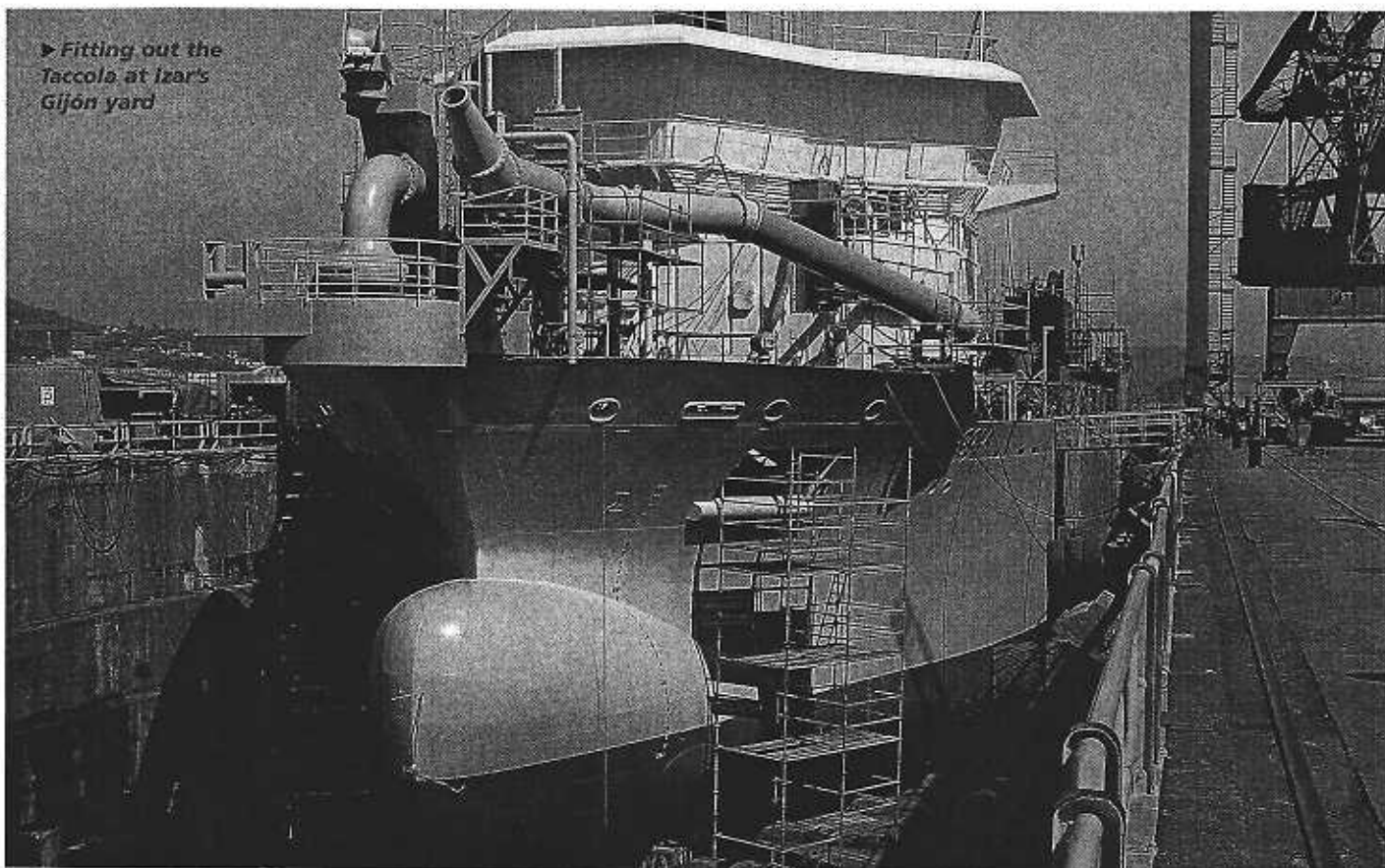
Rohde Nielsen A/S feel confident that the *Mjolner R* will be a powerful tool, which will provide valuable support to our existing dredging fleet that now consists of 24 units. ■

Above centre. The *Mjolner R* was christened in Mjød beer, brewed on an old viking prescription



Mr Jens Rohde Nielsen welcoming guests.

Coping With The Future



► Fitting out the Taccola at Izar's Gijón yard



Jan De Nul's new TSHDs Taccola and Francesco di Giorgio both have integrated, automated bridge, engine room and dredging process systems – FRITS VAN LOOSEN was the man behind it

Built at Izar Astillero's Gijón yard, the two ocean-going vessels are each 21m wide and thus ideal for dredging sand close to shore in shallow coastal waters – or for pumping sand ashore in order to nourish a beach or create new land.

Both ships have 900mm suction pipes, total installed power of 6,050kW, a maximum dredging depth of 24.3 metres and 4,400m³ hopper capacities and they've been designed to be reliable, functional, easy to maintain – yet state-of-the-art.

And that latter feature includes a single, comprehensive automation solution consisting of mostly standard components from my firm, Alewijnse Marine Systems.

It's a solution with the advantage that various functionality aspects don't have to be duplicated and it requires only a relatively modest investment in spare parts.

IN OUTLINE

The automated system can be roughly divided into two facets:

- 1). *Dredging* – the full process, from extraction to unloading, and
- 2). *Bridge And Engine Room Control*.
Opting for a single automation system

means the operator can control and manage the processes from the bridge. Thus, for dredging purposes, three joysticks for manual control and a computer for fully automatic operation are installed. Using the latter, the computer will bring the draghead to a pre-set value for any given depth, whilst incorporating the position of the swell compensator before the gantries swing the suction pipe over the side. Further, the position of the lower part of the pipe is also automatically adjusted to prevent the draghead from trailing along the seabed at the wrong angle.

MIXTURE COMPOSITION

An 'automatic light mixture overboard' system (ALMO) functions during dredging, measuring the mixture flow and concentration. If the mixture doesn't have the desired consistency – eg: because the draghead has temporarily lost contact with the seabed – then the ALMO function helps prevent the mixture from ending up in the hopper.

Additionally, both dredgers are equipped with a bridge-operated degassing system that removes gas from

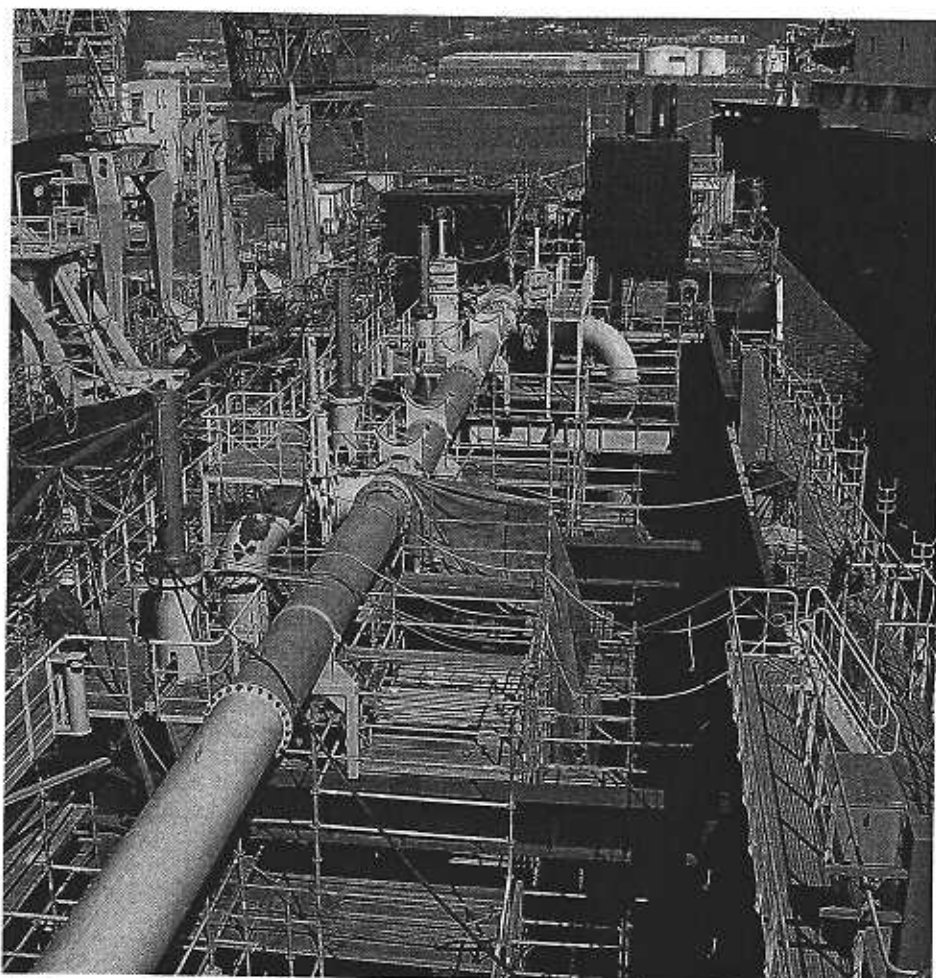
Alewijnse Marine Systems?

The Dutch electro-technical group's been around for over 100 years...

The firm, which employs over 800 people, 'designs, creates and integrates complex electrical systems for around 70 ships every year.'

Alewijnse focuses on integrated bridge systems, switchboard and console solutions, diesel-electric applications, along with navigation & communication equipment and has a service division available 24/7, plus branches in Romania and the Ukraine.

More info at www.alewijnse.nl



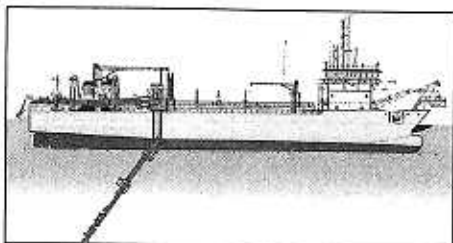
▲ Francesco di Giorgio's hopper – both dredgers have an 'automatic light mixture overboard' system

the dredged mixture prior to it going through the dredge pump. The dredge pump speed is also automatically controlled via the built-in flowmeter, which compares a previously entered set point to the mixture's speed and concentration.

Finally, both ships have automated draught control – as soon as a preset value is exceeded, this mechanism adjusts the height of the overflow duct, allowing excess water to flow back into the sea.

UNLOADING

A dredger's draught plays a crucial role when it comes to unloading the hopper and in order to prevent uncontrolled dumping a 'shallow water unload mode' is built in as standard. This subsystem links the opening of the hopper doors to the vessel's draught: as draught diminishes, so the doors can be opened to their full extent.



▲ State-of-the-art design for the Taccola and Francesco di Giorgio

As with most modern TSHDs, the hopper content may also be pumped to shore through a floating pipeline linked to a bow coupling, or be rainbowed. We've utilised the same pump for both transferring the mixture ashore and for dredging, but we installed separate controls as a backup too.

Both ships are also equipped with such features as automatic ballast mode for trim adjustment; a system to open or close jet and dredging valves; a start / stop

function for jet, dredging and gland pumps, plus a load management system. The latter's a module that 'balances' the ships' energy usage – eg: sufficient propulsion power must always be available onboard for the vessel to maintain its position regardless of what other processes are in operation.

TECHNICALLY SPEAKING...

The functional integration of both process control and engine room operations is designed specifically to Jan De Nul's requirements and in conformity with the IEC 61131-3 standard. Thus, four I/O stations, divided between the bridge, the fore and the engine room via a fibre optic network with built-in redundancy, are linked to the various components that control the dredging process. The Ethernet-based network uses a TCP/IP protocol and operates at 1mb per second.

The main and backup servers are connected via a CAN bus ring system to which nine LCD control panels are connected. These are positioned in the cabins, bar, mess and the engine room and, among other things, are used to report any alarms that may occur within the system. If one of the crew confirms an alarm on any control panel, then he *must* take action.

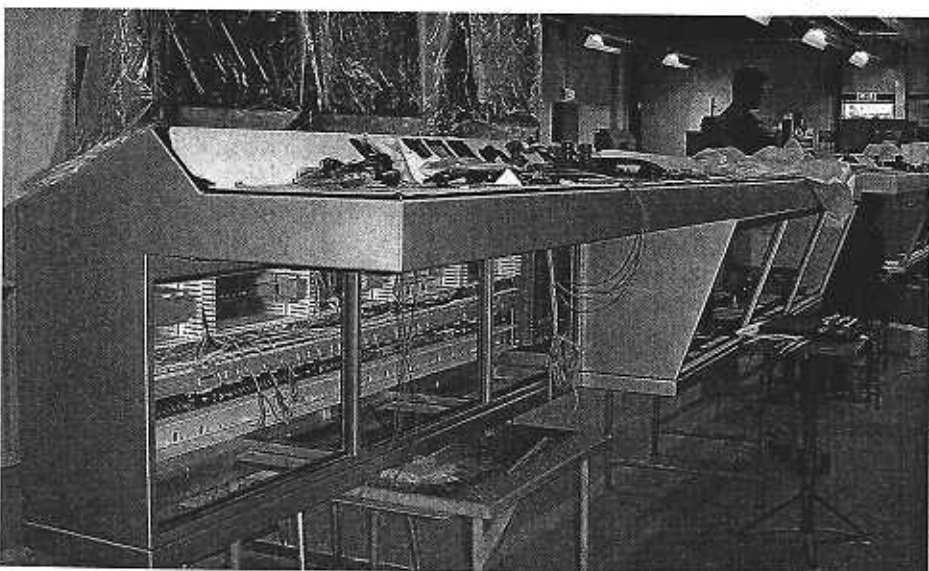
In total, there're eight workstations on each ship, all of which can access the automation system's full functionality. They're strategically installed in the engine room (three) and the bridge / dredging desk.

FINALLY...

Although we've been actively involved in the field of comprehensive automation for years, these two dredgers were a new challenge for our people.

The objective was to use the latest technology – but only technology able to guarantee as close to 100% future operational reliability as possible.

And with the Taccola and Francesco di Giorgio, we believe we've done just that. ▲



▲ Navigation desk under test at Alewijnse's lab.