ASTROSPRINTER & ASTRORUNNER

IHDA GROUP COMPLETES TWO 800 TEU CONTAINER VESSELS

Builders: IHDA Shipbuilding Service BV, Krimpen a/d Lek, the Netherlands
Owners: Reederei Wilfried Jens & Reederei Nagel

Recently, IHDA Shipbuilding Service, a member of the IHDA Group, completed the 800 TEU container feeders 'Astrosprinter' and 'Astrorunner' for account of German owners. The charter names will be "TransAnund" and "TransJorund".

IHDA

IHDA based in Krimpen aan de Lek is a Dutch shipyard specializing in the building of several types of vessels. The company has built and has under construction vessels in Ukraine and China. The current delivery programme includes a wide range of vessels, including:

– container feeder vessels ranging from 800 to 1200 TEU;
– multi-purpose coasters ranging from 3,900 to 12000 dwt;
– self-propelling inland navigation barges, oil tankers and push barges.

IHDA carefully selects and contracts a shipyard for production of the hull, designs the vessel, prepares all classification drawings, inspects and surveys each vessel during (hull) construction. Outfitting of the vessel takes place in the Rotterdam area under strict supervision of IHDA. The complete project, from signing of the contract up to delivery and technical trials is IHDA's responsibility. The company employs a well trained and experienced staff with a vast amount of theoretical and practical experience in shipbuilding. IHDA's aim is to deliver its customers a high quality vessel against a competitive price, which is the best starting point for a shipowner and a capital investment to operate with commercial success. Recent deliveries are the container feeders 'Astrosprinter' and 'Astrorunner'.

The hulls were built at a shipyard in China and outfitting of the vessel took place in the Netherlands by IHDA Shipbuilding Service BV at premises of G. Olthof Machinefabriek NV at Capelle aan den IJssel. Both vessels feature three cargo holds, each fully equipped with cell guides which are movable in Hold 2 and 3 for optimum stowage of 40' and 45' containers. Additionally the vessels have been opti-

Alphatron Marine Netherlands supplied and installed the navcom installation

mized for the carriage of 20/30/40/45/48 and 49 ft containers. These versatile vessels are suited for worldwide shipping and have been designed and built in compliance with the rules and regulations of GL, carrying the following notation: 100 A5 E3, Container Ship, SOLAS 11-2, reg. 19, MC E3 AUT.

Main Characteristics

The single deck container vessel has a transom stern, a covered forecastle deck, a raked stem and a bulbous bow. From stem to stern she features the following compartments:

– forepeak (ballast water);
– cargo hold sections;
– a watertight compartment;
– deckhouse;
– engine room section and
– aft peak.

The tanks in the cargo hold sections, wing and double bottom tanks, as well as the fore and aft peak tanks are suitable for the carriage of ballast water or fuel oil. The double bottom tanks in the engine room section serve as storage tanks. The "Astrorunner" and "Astrosprinter" feature the following main characteristics.

Principal particulars

Length o.a.	141.60 m
Length b.p.	132.20 m
Breadth mld.	20.60 m
Depth to main deck	9.50 m
Draught	7.30 m

Tonnage

Gross tonnage	7,700 t

Container capacity

Total number of TEU	510
In the holds	230
On the hatches	570
Reefers	150
Speed	18 knots

Performance

Installed power	7,999 kW
Speed	18 knots

Tank capacities

Heavy fuel oil	1,250 cu.m
Gas oil	175 cu.m
Ballast water	3,800 cu.m
Freshwater	110 cu.m

Arrangement

The superstructure consists of a five-tier deckhouse with a wheelhouse which has closed bridge wings on top. All decks are of steel, except in the area of the compass where stainless steel has been applied.

The vessel has a hull of mild steel with all casting and forgings in compliance with class. Special AH quality steel has been applied in the coamings and deck sections. The hull is constructed of transverse and longitudinal framing and features a raked stem of rounded steel plate. In order to avoid disturbing vibrations the stern frame is completely welded and of a rigid construction.

The forecastle accommodates two self-stowing chain lockers. In the bottom section longitudinal framing has been used, except the forward and aft part where transverse framing has been adapted. The double bottom accommodates an integrated pipe duct at centreline. All the bulkheads are of flush construction and the main transverse bulkheads run from shell to shell. MacGregor designed cell guides are used in the cargo hold section with entry guides on the upper end and bottom plates with cones on the lower end cell guide rails.

Accommodation

The accommodation fully complies with all safety requirements. Panelling for wall, linings and ceilings are of approved materials and has been delivered by Hoogendoorn. Special attention has been paid to suppress noise levels from entering from the engine room. The maximum noise levels are in accordance with the international requirements of IMO.

The heating and ventilating system has the capacity to maintain a comfortable indoor temperature at an outside temperature of -30°C and a seawater temperature of 0°C. The central heating plant consists of a hot water heating plant with forced circulation, by means of direct driven electrical circulation pumps. The heat for the central heating system is delivered by a heat exchanger fitted in the thermal oil system. When sailing in tropical waters an air conditioning system takes care of maintaining a comfortable indoor climate.

The air conditioning system, delivered by Heinen & Hopman, is of sufficient cooling capacity to maintain an indoor temperature of 29°C at 50 percent relative humidity. The system has been designed for a maximum of 50 percent air which is in balance with the supply and exhaust of the accommodation during the most extreme conditions.

The control panel for alarm- and monitoring systems

The steering is handled by a electro-hydraulic steering gear

The Flender reduction gearbox with secondary PTO

Accommodation quarters served by the air conditioning and ventilation system include the cabins/bedrooms, mess room, galley, provision store, laundry, deck office, and the wheelhouse. In the central unit of the AC system the outside air and the recirculation air are mixed, filtered, preheated or cooled, reheated and discharged by a centrifugal fan to the single air duct system.

Wheelhouse

The wheelhouse is situated on top of the superstructure. Alphatron Marine Netherlands supplied and installed the radio communications installation, nautical equipment including the wheelhouse consoles. The systems, complying with the requirements for A3 zone, include the following main components. JRC supplied:

- One X-band Radar JMA 5310-6;
- One S-band Radar JMA 5330-12;
- One DGPS JLR 7700;
- One AIS JHS 182;
- One SSB set JSB 196;
- Two Satcom-C JUE 750;
- One Fleet 77;
- One Weather chart recorder JAX 9A;
- One Doppler Speed log JLN 205;
- One Navigator Echosounder JFE 582;
- One Navtex receiver NCR 333.

Other equipment installed:

- One Anshutz Gyrocompass sytem STD22;
- One Anshutz Autopilot Pilotstar D;
- One GPS Saab R4;
- Two VHF units Sailor RT4822 with full wing control;
- Three McMurdo GMDSS portable radio's R2;
- Eight hand held VHF units HX370;
- Two McMurdo Sarts S4;
- One McMurdo Epirb E3;
- One Magnetic compass installation Cassens & Plath with Alphacourse TMC;
- One Anemometer system Alphawind;
- One Electronic chart system Alphachart;
- One GSM set;
- One Voyage Data Recorder Alphadata kit;
- One Alphatron Alphacon conning display;
- One Ships Speed Info System Alphaspeed;
- One Satellite television receive system KVH;
- One Inmarsat F system.

Cargo Hold Section

The cargo hold section consists of three holds. These three holds feature a width of 17.90and 13.40 m of which hold 2 and 3 have a length of 27 m and hold 1 a length of 26.35 m. The three cargo holds are covered by hydraulic folding-type steel weather deck hatch covers with top plates and partially closed bottom sides of the MacGregor design.

The steel hatch covers are designed to allow full block stowage of containers and are folded by means of hydraulic cylinders, located under hinged arms at the transversal coamings. Locking the hatch covers is done with heavy duty quick acting cleats. In stowed position the hatch covers are secured by automatically engaging and manually opened locking devices. The maximum permissible stack loads in the cargo hold 1 are 90 tons for 20 ft containers and 120 tons for 30 ft containers. In the cargo hold 2 and 3 the maximum permissible stack loads are 75 tons for 20 ft containers and 105 tons for 30 ft containers, while on the forecastle deck this is 60 t for 20 ft units. Throughout the vessel 150 Reefer plugs are installed.

Deck Machineries

The design of mooring arrangements is as per requirements of Suez and Panama Canal. The forecastle carries two electro-hydraulic combined windlass/mooring winches suitable for the handling of Q3 quality anchor chain cable. These combined windlass/mooring winches handle two stockless high-holding-power (HHP) bow anchors. On the aft ship two electric hydraulic mooring winches are installed each with one split mooring drum and one cast steel warping head.

Manoeuvring

Course control and steering is handled by a compact electro-hydraulic rotary vane steering gear which controls the rudder and a tiller. The system, delivered by Rolls Royce, features a maximum rudder angle of 45 degrees at a rudder travelling time of 28 seconds with one pump running and 14 seconds with two pumps running. Manoeuvring capacity is optimized by the installation of a controllable pitch electric bow thruster with a power output of 750 kW, driven by an electric motor. The bow thruster can run on 50% power without the use of the shaft generator, is made by HRP, and features a 1,750 mm diameter NiAl four-blade cp-propeller. The thruster's pod with right angle drive is of a streamline type with built-in-right-angle gear transmission. The hydraulic system of the tunnel thruster includes a hydraulic power pack with tank, pump sets and solenoid operated valves for pitch control.

Propulsion Plant

The main propulsion plant includes a MAK 8M43C marine medium speed diesel engine developing 7,999 kW at 500 rpm. The main engine is fitted with a reduction gearbox with PTO shaft generator. The Flender reduction gearbox type Navilus GUCP 950 with secondary PTO for generator drive, features a built-in thrust bearing and is connected to the main engine through a flexible coupling, supplied by Vulkan.

The five-blade controllable pitch propeller, make Wärtsilä Propulsion, is moderately skewed and features a diameter of 4,600 mm. The main engine is flexible mounted and the reduction gearbox is mounted on epoxy resin chocks, while the shaft generator is mounted on vibracons.

The freshwater box cooling system for main and auxiliary engines consists of:

- a separate HT and LT cooling circuit for the main engine;
- a fresh water cooling circuit for the gearbox, integrated in the LT fresh water cooling circuit of the main engine and separate circuits for the auxiliary engines.

The fresh water circuit for the main engine is fitted with fresh water circulation pumps,

The RWO bilgewater separator

The Visco booster unit

The Hatenboer-Water fresh water treatment

On the aft ship two electric hydraulic mooring winches are installed

pumps for the HT fresh water cooling circuit, and pumps for the LT fresh water cooling circuit. HT and LT circuits are cooled by means of serial placed box coolers.

Engine Room Auxiliaries

The 30 bar compressed starting air system includes two air compressors; make Atlas Copco, which supply compressed air to two 750 litres air vessels. The service air system is working at 7 bars. The two electric main starting air compressors are of the vertical single-acting two-stage two-crank type and provided with inter and after cooler, relief valves suction strainer and pressure gauges.
The heavy fuel oil system and treatment plant is suitable for the use of IFO 380 heavy fuel oil. Equipment includes self-cleaning purifiers, HFO transfer pumps, a booster unit, and thermal oil heaters. The gas oil system consists of gas oil transfer pumps. A thermal oil system has been provided for heating purposes and consists of a thermal oil tank, a oil fired 1000 kW boiler, an economizer, thermal oil circulation pumps, and a thermal oil expansion tank. The thermal oil system supplies heated thermal oil to bunker tanks, day and settling tank, sludge tank, overflow tank, leak oil tank, dirty oil tank, heaters for the purifiers and heat exchangers for central heating.
Engine room ancillaries further include a hydrophore set, an evaporator, an emergency fire-fighting pump, a bilge water separator, a general service/bilge/fire-fighting pump, a sludge pump, a ballast system with remote controlled valves and served by two ballast pumps. A separate bilge pump is fitted for emptying the cargo hold bilges. Schiedam based Hatenboer-Water supplied the fresh water hydrophore and treatment unit. This skid mounted unit contains two self-priming hydrophore pumps, a hydrophore tank, fresh water filter, UV water disinfection system, hot water calorifier and hot water circulation pump. Delivery included interconnecting piping and electrical wiring. This modular approach saved the yard considerable engineering and installation time and costs.
Air refreshment of the engine room is handled by two two-speed axial flow fans providing an air refreshing rate of 2 x 55,000/28,500 cu.m/h. One fan can function in reverse direction for extraction of CO_2 from the engine room.

Electrical Power

The electric power plant has been designed to ensure economical, safe, reliable operation and service under normal conditions. The two Caterpillar/LeRoySomer main generators, delivered by Pon Power, have a capacity of 760 kVA and the emergency/harbour generator set has a capacity of 370 kVA. At sea, electric power is derived from a 1250 kVA Leroy Somer shaft generator.
The main switchboard is equipped with a Deif Protection and Paralleling Unit (PPU) for each generator. A Power Management System will arrange the total electrical power supply depending on the power consumption.
The electrical installation has been laid out for the following voltages:

- 440 V, 3-phase, 60 Hz; generators, shore connection, power consumers such as motors, reefers, heaters and galley equipment.
- 230 V, 3-phase, 60 Hz; lighting, including emergency lights, small galley equipment and small heaters, as well as socket outlets and nautical equipment.
- 230 V, 3-phase, 60 Hz emergency supply and 24 VDC; nautical equipment and automatic/security systems.

Under normal circumstances, the main switchboard will supply the emergency switchboard. In case of a failure with a main generator, the standby generator will start-up automatically. During a total blackout of the main switchboard and the main generators not starting up, the emergency generator starts automatically and supplies the essential consumers.

Life-Saving Appliances

Life-saving appliances fitted on board include two automatic inflatable 16-person rafts, each including cradle and hydrostatic release gear, one 10-person raft on the foreship and one 6-person MOB boat with outboard motor. The 18-person free-fall lifeboat is carried by a combined sliding ramp/hydraulic system, design

Hatecke, allowing a free fall launch at 20 degrees list and 10 degrees trim. Safety systems fitted on board are delivered by Datema and based on 16 persons, and further include fire-fighting systems such as:

– portable extinguishers;
– hoses with spray nozzles;
– fire men suits with air breathing apparatus;
– a line-throwing apparatus;
– rockets;
– life-saving jackets;
– survival suits.

A CO_2 system, delivered by MX, protects engine room and cargo holds from fire hazards. The cargo hold spaces are continuously monitored by a CO_2 fire extinguishing and smoke detector installation, a so-called smoke sampling extraction smoke detection system. The sample extraction smoke detection system is based on permanent air suction via detection lines from the cargo holds. In case of smoke detection an audible alarm as well as an optical fire alarm is activated.

Subcontractors and suppliers of equipment fitted on board the 'Astrosprinter & Astrorunner'
(partial list)

Aalborg Industries NL, Spijkenisse : *Wiesloch* thermal fluid heating units
Alewijnse Marine, Nijmegen : electrical installation; alarm & monitoring system; navigation lights; e-motor bowthruster; shaft generator; *EASEACON* loading computer (hardware and software)
Alfa Laval Benelux, Breda : pumps; freshwater generator; heat exchangers
Alphatron Marine, Rotterdam : *Alphabridge* communications & navigation systems, wheelhouse consoles
Atlas Copco Ketting Marine Center, IJmuiden : air compressors
Berkefeld, Veenendaal : bilge water separator
Bosch Rexroth, Boxtel : remote operates valves system; tank measuring system
Choren, Gdansk, Poland : stability calculations; piping outside engine room
Chugoku Paints, Fijnaart : *CMP* marine paints
Corrosion & Water-Control, Moerkapelle : impressed current anti-fouling system; impressed current cathodic protection
Datema, Delfzijl : fire extinguishers; life-saving appliances; books and charts; life rafts; nautical equipment; lighting systems
Discom, Alblasserdam : silencers with flexible mountings
Doedijns Instrumentatie, Waddinxveen : magnetic level switches; level alarm switches
Econosto, Capelle a/d IJssel : valves & fittings
E+H, Raisdorf (Ger) : anti-heeling system
Flender Bruinhof Marine, Rotterdam : reduction gearbox
Germanischer Lloyd, Schiedam : classification
GN Piping, Krimpen a/d IJssel : engine room installation
Hatenboer-Water, Schiedam : freshwater treatment system
Hebu Techniek, Krimpen a/d IJssel : hydraulic pipes & fittings
Heinen & Hopman Engineering, Spakenburg : heating; ventilation; air conditioning
Hoogendoorn's Timmerbedrijf, Werkendam : accommodation outfitting & upholstery; galley equipment
HRP Thruster Systems, Krimpen a/d Lek : controllable pitch tunnel thrusters
IHDA, Krimpen a/d Lek : piping drawings engine room
Intersona, Heerde : noise and vibration calculations and consultancy
Kalkman, Krimpen a/d IJssel : inventories; engine room workshop tools
Kroon, Hoogezand : *TNF* accommodation system; *Alvedoor* fire doors; ship's hardware
MacGregor, Hamburg (Ger) : hydraulic folding hatchcovers design; power pack and cylinders and other parts; cell guide design fixed container fittings
MAK, Dordrecht : main engine
Mx Brandbeveiliging, Almere : fixed CO2 installation for engine room, boiler room, cargo holds (incl. fire detection system), separator room and exhaust duct for galley range; watermist system in engine room; sprinkler system for paint store
NRF, Mill : boxcoolers; ICCP
ODS, Barendrecht : *Helden* couplings
Olthof, Machinefabriek G., Capelle a/d IJssel : installation propulsion installation and gensets; outfittings
PCC Eurovalve, Losser : butterfly valves
Pon Power, Papendrecht : *Caterpillar* generator sets
Promac, Zaltbommel : *Promac-Hatecke* freefall lifeboat, rescue boat, freefall-lifeboat and store handling crane and rescueboat crane
Pronk Isolatie, Ridderkerk : insulation
Rolls-Royce Marine Benelux, Pernis RT : *Tenfjord* steering gear; *Hinze* flap rudder
Shell, Rotterdam : lubricants
STIG , China : hull; hydraulic folding hatch covers; paint application
Trinoxx, Rotterdam : watertight doors; windows & portholes
Tyco Integrated Systems, Woerden : fire detection
Vulkan Benelux, H.I.Ambacht : *Vulkan Rato* highly flexible couplings
Wader MEC, Hamburg (G) : loose container fittings
Wärtsilä Propulsion Netherlands, Drunen : *Lips* 5-bladed CP-propeller; stern tube seals and bearings
Westfalia Separator, Cuijk : separators for fuel and lube oils; boosterunit
Van Wijk, Werkendam : winches; anchors & anchor chains
Winteb, Winschoten : ventilation check valves

General Arrangement