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SIGNIFICANT SMALL CRAFT OF 1998

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Front cover: New design pilot vessel, Portunus; marine disaster prevention ship Neuwerk; trophy winning trimaran Cable & Wireless Adventurer.





Afai 08: fast ferry first for China

With a fully laden trial speed of 48.2 knots, *Afai 08* is the first high-speed passenger/car ferry to be constructed in China and certainly rates amongst the fastest Asian-built commercial craft. Built at Afai Southern Shipyard (Panyu), the vessel is the first in the K50 Class, developed as a joint venture by Australian yard Incat Tasmania, Afai Ships of Hong Kong and Advanced Multi-Hull Designs (AMD), also of Australia.

Designed to carry 450 passengers and 89 cars, the K50 exceeds the quality standards established by international classification societies and strong claims are made for its economy. Use of four medium speed Ruston 16RK 270 diesel engines, of around 5,500kW each, keep running costs low and reliability high. Two K series vessels operating worldwide, built by Incat Australia, have reportedly proven extremely reliable since operation started in 1995.

Afai 08 has two slender 5m alloy hulls, measuring 72.3m on the waterline, supporting an alloy superstructure on anti-vibration mounts. Each has eight vented, watertight sub-divisions comprising fore peak, two voids, pump compartment, engine room and waterjet space. All compartments are divided by transverse bulkheads.

Each hull is fitted with two Kamewa 80 SII waterjet units. All jets are configured for steering and reversing and have a separate hydraulic system in each hull, together with two electric motors driving separate pumps.

The K50 is designed for the stern loading of cars on the main deck and has space on the aft deck for carrying larger heavy loads such as buses or freight. Duty-free shopping and passenger amenities are centrally located on the main deck, with the second deck devoted to seating for up to 450 passengers. A lift is installed for disabled passengers.

The wheelhouse, on the upper deck just aft of amidships, is accessed by stairs from the passenger area or externally via a rear door. Offering 360-degree visibility to enhance safety of manoeuvring operations, all-round windows have demisters and independently operated and controlled Wynn straight line and pantograph wipers.

The three forward central windows have solar blinds. Forward facing seats are fitted around a centreline navigation console but the main helmsman sits at the forward end of the wheelhouse, just off centreline to starboard.

Navigation equipment is extensive and includes: Magnavox MX DGPS, Kelvin Hughes radars, Skipper DGS101 echo sounder, Walker speed/distance log and wind speed/direction finder, C-Plath autopilot, gyro compass and magnetic compass. Onboard communications systems for machinery, mooring and passenger spaces are controlled from the wheelhouse.

A comfortable ride is ensured by the installation of a Maritime Dynamics active ride control system with hydraulically operated trim tabs hinged at the after end of each hull. Each hull also has a special

abutment to take optional, forward bolt-on T-foils and is fitted with an emergency trim tab lifting device, which is activated in the event of complete hydraulic failure.

Main Particulars

Builder

Afai Southern Shipyard, China

Designer

AMD, Australia

Length oa	80.10m
Length waterline	72.30m
Beam oa	19.00m
Beam (hull)	5.00m
Draft (loaded)	2.20m
Deadweight	167t
Passengers	400-450
Cars	89
Speed (full load)	47.8 knots
Speed (light load)	50.1 knots
Range	440nm

Main Power

4 x Ruston 16V RK270 diesels,
5,500kW each

Auxiliary Power

2 x Volvo Penta TAMD/240 kW
415V, 50Hz

Propulsion

4 x Kamewa 80 SII waterjets

Classification

DNV +1A1 HSLC R2 Car Ferry
'B' EO



AMBULU: first of five for Asia

Ambulu, the first-of-class FPF 62-010 from German megayacht builder Lurssen Werft, is the first of five such ferries ordered by Indonesian operator ASDP.

Constructed in lightweight aluminium, shaped for minimal air resistance and propelled by four giant waterjets, the design owes much to the aircraft industry. Similarities also exist internally with 'class' based passenger categories and forward facing seats.

The ship's lines owe much to extensive and systematic research, model and seakeeping tank tests which were carried out in the Hamburg ship model basin (HSVA). The lines were optimised with various test models of different sizes, resulting in course stability with excellent seakeeping and low resistance.

The selected hull type is a deep-vee monohull with a parallel wedge shaped stern and sprayrail. At a Froude number of 0.79, the semi-displacement ship can maintain its high speed and stability up to moderate wave heights and at reduced speed, good behaviour is reported owing to a Vosper Thornycroft active stabiliser system.

To meet the new IMO Code for High Speed Craft, *Ambulu* has two separate engine compartments each serving one steerable water jet and one booster jet. Power for the Kamewa jets is supplied by four MTU type 16V595 TE 70L diesel engines, developing 3805kW at 1,825 rev/min.

Improved docking, easy maintenance and collision avoidance measures have been given special consideration. A bow thruster has been incorporated to aid manoeuvrability and engine and ventilation casings arranged to enable unit replacement within a 24-hour time span. As the FPF's area of operation is frequented by fleets of fishing vessels, collision avoidance by means of a short stopping distance has been ensured - distance from jet reverse to stop is just 150m.

Other features include a continuously running separator system for efficient cleaning of polluted fuels and shaft systems of fibre-reinforced plastics. To reduce overall noise levels in passenger compartments, much of the adjacent machinery is elastically mounted where necessary.

Main Particulars

Owner

ASDP, Indonesia

Builder

Lurssen Werft, Germany

Length oa 69.8m

Length 62.0m

Breadth 10.4m

Draft 2.0m

Main engines

4 x MTU 16V595 TE70L diesels,
3,805kW each

Auxiliary engines

2 x MTU 12V 185 TE52 (524kVA)

Emergency diesel

1 x MTU 6R 099 TA51V

Cruising range 650nm

Propulsion units

4 x Kamewa 900 waterjets (2
steerable jets, 2 booster jets)

Classification

BKI +A100 1 HSC-B OC2 GL +
100 A5 HSC-B OC2 Passenger
Craft

Passengers

925 total (1st Class 118, 2nd
Class 221, 3rd Class 586)

Deadweight 150t



ARCTICABORG & ANTARCTICABORG: fighting the freeze

New ice-breaking principles have been adopted for sister ships *Arcticaborg* and *Antarcticaborg*, 65.1m long supply vessels built at Kvaerner Masa's Helsinki New Shipyard for Dutch shipowning group company, Wagenborg Kazakhstan BV.

Designed to meet the heavy ice conditions in the northern Caspian Sea, where they are now on long term charter servicing drilling platforms, the vessels have a shallow draft of just 2.9m and are fitted with twin 1,620kW Azipod units. They are the first newbuildings to entirely follow the 'double-acting' operating principle developed by the yard.

In hard ice conditions the vessels will proceed stern-first but will adopt a conventional bow-first attitude in open water, for which it is claimed the hull form has good seakeeping characteristics. An ice level of up to 1m can be tackled, as can the more treacherous ice ridges to be found in the area, which can extend to the sea bed.

The icegoing characteristics of the ships were developed at the yard's Arctic

Technology Centre using models tested in the ice basin.

In addition to cargo carrying capacity (dry cargo on the open stern cargo deck, silos for pulverised goods forward and tanks for liquid cargo), the vessels are equipped with Ten Horn towing equipment to enable them to function as assistant icebreakers. They can also act in fire-fighting and pollution control operations as each is fitted with two Kvaerner Eureka fire-fighting pumps of 1500 m³/hr and 1,200 m³/hr monitors to meet FiFi 1 standard, a dispersant spraying system and portable and retractable spray booms. The ships are also provided with equipment to transport waste and sewage from the drilling rigs.

Diesel-electric propulsion systems have been selected, with a pair of Wärtsilä NSD 6L26 diesels, each developing 1,950kW, connected to two 2,250kVA/690V van Kaick generators. The two ABB electric Azipod units are each of 1,620kW and were chosen for their excellent icebreaking performance in relation to installed power. A 150kW bow thruster is also fitted.

Main Particulars

Owner

Wagenborg Kazakhstan BV

Builder

Kvaerner Masa Yards Helsinki New Shipyard, Finland

Length oa 65.1m

Breadth 16.4m

Draft, loaded 2.9m

Main engines

2 x Wärtsilä 6L26 diesels,
1,950kW each

Main generators

2 x van Kaick DGS, 2,250kVA at
690V

Propulsion

2 x Azipod, type 11, 1,620kW

Icebreaking performance

0.6m ice level (ahead)

1m ice level (astern)

Bollard pull 32t

Speed 13 knots plus

Deadweight 675t



CB 1 & CB 2: sister cats on standby airport rescue

After a nine-month build period, two catamaran rescue command vessels *CB 1* and *CB 2* were handed over to the Hong Kong Airport Authority in April '98 by builder, Greenbay Marine of Singapore. Each is ready for deployment from special rescue berths at either end of the new Chek Lap Kok Airport.

The vessels are based on an Incat hull with major modifications above the waterline made by Vancouver-based naval architect, Robert Allan to suit their fire-fighting, search and rescue roles. Measuring 35.30m x 12.00m, the catamarans have a maximum speed of 28 knots and are designed to withstand 60-knot winds and five-metre waves and to operate in shallow water.

The extensive array of rescue and fire-fighting systems aboard each vessel necessitated an intensive familiarisation programme for crews, each of nine men, who will man the craft. Equipment includes two RIBs, life rafts with a carrying capacity of 300 persons, four inflatable rescue ramps, hydraulic cranes and lift platforms, four Jason's Cradles, specialist detection items such as sonar, thermal imaging and underwater cameras and two Skum FJM fire-fighting monitors. Capable of discharging 4,000 litres/min, the monitors are mounted on diametrically opposite corners of the main deck. Floodlights to illuminate the rescue zone are carried at the head of a telescopic mast.

Power is provided by two MTU 12V 396 TE74L diesels, each developing 1,455kW at 2,000 rev/min, driving Kamewa 71SII waterjets via ZF BW465 gearboxes. A pair of 155kW Caterpillar 3306B driven generator sets supplies the electrical power.

Each boat has a rescue capacity of 600 people with onboard accommodation for up to 300 and sufficient inflatable rafts to hold 300 more. In excess of 240 survivors and a minimum of 40 stretchers can be housed in the cabin on main deck and five patients tended in the separate hospital aft. It is not the intention to station doctors on the vessel but the crews have been trained in first aid and, if necessary, the helicopter winching platform could be used to bring medical teams aboard.

At the commissioning ceremony The Airport Authority (AA) chairman, Wong Pu-yan, commented: "The airport is designed and built to operate to the highest standards of safety. With these boats we are now much better equipped to conduct rescue and fire-fighting operations on the sea surrounding the airport island. Our safety, of course, is guaranteed also by placing these well-designed vessels in the capable hands of the highly professional crew from the Airport Fire Services."

Raymond Toh, managing director of Greenbay Marine, which won an

international tender from the Hong Kong Marine Department to build the vessels, said modern communications played a key role in the shipbuilding project. "In view of the time constraints and crucial performance requirements, without modern information and communications, success would not have been possible. Extensive and precise cross-country project management was needed to achieve optimal design."

Main Particulars

Owner

Hong Kong International Airport Authority

Builder

Greenbay Marine, Singapore

Length oa 35.30m

Length waterline 32.38m

Beam oa 12.00m

Draft (design) 1.79m

Power

2 x MTU 12V 396 TE74L diesels, 1,455kW each

Propulsion

2 x Kamewa 71 S11 waterjets

Maximum speed 28 knots

Service speed 25 knots



CABLE & WIRELESS ADVENTURER: trophy-winning trimaran

A new entrant in the record books for '98 was the dramatically styled 35m x 14.10m trimaran, *Cable & Wireless Adventurer*. Designed by UK based naval architect Nigel Irens, the vessel circumnavigated the globe in 74 days, 20 hours and 58 minutes, stealing the record from the nuclear submarine *USS Triton*, which finished its journey on the 84th day back in 1960.

Adventurer's 26,000 mile voyage began and ended in Gibraltar and was the first attempt to claim a new trophy funded by Cable & Wireless and awarded by the UIM (the governing body of power boating) for the fastest time around the world. The trimaran took a mainly equatorial route, with stopovers at Monte Carlo, Port Said, Singapore, Hong Kong, Yokohama, San Diego, Kingston, Miami and New York.

Constructed in lightweight wood epoxy and FRP composite, the record-breaking design has a slender central hull and small outer hulls for transverse stability. Important aspects of the design included displacement/length ratio of the main hulls and the position, dimensions and geometry of the other hulls. A high level of redundancy for systems and machinery was included to ensure that the vessel could

continue in operation in all but the most severe systems' failures.

Power is supplied by twin Cummins 6CTA8.3M diesel engines, each developing 261kW at 2,500 rev/min. These drive Teignbridge 26-inch four-bladed propellers via Twin Disc MG-5111SC gearboxes for a maximum speed of 22 knots. Fuel capacity is 15,700 litres, giving the vessel a range of 2,300nm. To protect the stern gear, propellers are positioned under the central hull and fitted with full skegs. Seawater-cooled charge air coolers, manufactured by Serck Heat Transfer, in marine-compatible materials, were incorporated to reduce the temperature of the charge air as it enters the engine's induction system. This increased the mass and density of the air, improving combustion and thereby raising power output and reducing emission levels.

Accommodation for a crew of 16 is situated on the main deck with eight two-berth cabins, captain's cabin, VIP cabin and mess. A central stairway gives access to the horseshoe shaped low-profile bridge and the flybridge. Onboard navigational equipment has been supplied largely by Raytheon and includes two radars, Inmarsat M and C and gyro compass. A

McLennan Vistar night vision system is also fitted.

Adventurer, now designated as the first in the iLan 35 series, was built over a ten-month period, June '97-March '98, with hull and superstructure ready by January '98. Vosper Thornycroft, UK, constructed the vessel with structural engineering assistance from High Modulus (Europe) Ltd. The concept at 35m is considered ideal for passenger-carrying in exposed waters. A 25m design is being developed for patrol duties and a 50m version is under consideration as a fast cargo carrier.

Main Particulars

Owner

Transoceanic Adventures Ltd, UK

Builder

Vosper Thornycroft, UK

Designer

Nigel Irens Design, UK

Length oa 35.00m

Length waterline 34.80m

Beam 16.00m

Draft 1.61m

Displacement 45t

Range 2,300nm

Speed 22 knots

Main engines

2 x Cummins 6CTA8.3M diesels, 261kW each



CATLINK V: trans-Atlantic record breaker

In July 1998 *Catlink V*, the second of two 91m wave piercing catamarans built by Incat Australia, entered the record books as the current holder of the Blue Riband and Hales Trophy for the fastest trans-Atlantic crossing.

Catlink V broke the two world records set just a month earlier by another Incat ship *Catalonia* and clocked an average voyage speed of 40.28 knots, marginally lower than its proven 43-knot service speed.

Along with sister ferry *Catlink IV*, the record-holder was ordered by Scandlines Cat-Link A/S of Denmark to replace three fast ferries previously servicing the route between Arhus and Kalundborg. Carrying up to 800 passengers and 220 cars, each vessel completes the 42nm crossing in around 75 minutes and, to further save time, has been fitted with a special loading arrangement. This comprises the traditional stern access, together with a forward door on the port side allowing all 220 cars to be unloaded in around eight minutes.

Although larger in size, the vessel design has evolved from a number of successful Incat car ferries, especially those in the 74m to 86m range. Both Cat-Link vessels were built at the Incat shipyard in Hobart, Tasmania to the requirements of DNV High Speed Light Craft Rules (classed

+1A1 HSLC R1 Car Ferry "A" EO) and the IMO High Speed Craft Code.

Attention has been paid not only to enhanced loading systems but also to extensive fire prevention and extinguishing systems, enhanced ride characteristics and fuel economy.

Catlink V is conventionally powered by four Ruston 20 RK270 medium speed diesels, each developing 7,080kW (9,500hp), driving Lips waterjets through

Renk reduction gearboxes. A custom designed Lipstronic jet control system provides, apart from steering and reversing, the option of thrust vectoring and autopilot control. According to Incat, at full displacement with speeds of about 35 knots, fuel savings of 25 per cent can be achieved.

Two 230kW Caterpillar generators in each hull feed associated independent main switchboards, which are capable





of disconnection in an emergency. Built-in redundancy provides a high level of security for operation of safety services. In the event of the loss of one machinery space or switchboard a bus tie can be tripped to provide complete isolation of the main switchboard or to ensure the machinery space on the opposite side is unaffected.

Comfort has been addressed by installation of a Maritime Dynamics ride control system, now installed on a total of 24 Incat car ferries. Comprising an active trim tab mounted at the transom of each

hull to provide trim and motion dampening, it can be used to adjust the gain on pitch, roll and heave motions to optimise vessel performance to suit sea conditions, wave direction and speed.

Ride has also been improved by increasing the waterline length of the ferry by approximately 34 per cent over the Incat 74m vessels of the early 1990s, thus ensuring a more comfortable ride.

Advanced lightweight fire protection fittings, developed by Colbeck & Gunton of Tasmania, have been used throughout. These include single-leaved hinged fire doors, single and double sliding fire doors, guillotine fire dampers, engine room fire dampers, fire hatches and smoke baffles. A Thorn Solid State Fire Detection system which monitors a combination of smoke, break glass and heat detectors has also been installed.

Evacuation systems, supplied by Liferaft Systems Australia, cater for 900 people and comprise four slides and a series of liferafts.

Catlink V has one further notable feature; an uncluttered wheelhouse. Despite central and wing control positions to aid docking manoeuvres, space is maximised as many electronic devices are separately housed in an air-conditioned electronics room, which is



accessed via a private stairwell leading from the bridge or vehicle deck.

Main Particulars

Owner Scandlines

Cat-Link A/S, Denmark

Builder

Incatt Australia Pty Ltd

Length oa 91.30m
Beam oa (excl. fenders) 26.00m
Draft 3.73m

Main engines

4 x Ruston 20 RK270 diesels,
7,080kW each
Service speed 43 knots
Fuel capacity 66,780l
Passengers 800
Crew 23
Vehicles 220 cars
Deadweight 500t



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CHRISTIAN Í GRÓTINUM: breaking new ground for export

Delivery of the 74.5m seiner/trawler *Christian í Grótinum* to the Faroese operator of the same name represented a major export coup for Chilean yard Asenav as the first vessel it has ever built for a European country.

Ordered to fish for pelagic species in the North Sea and North Atlantic, the vessel is almost identical to *El Cazador* built by Asenav in September '97 for a Chilean company, but has increased power and hold capacity.

Norwegian designer Vik Sandvik has created a round bilge hull form with a U-type transom and bulbous bow. The ship has Hp profile frames, a double bottom and an aluminium wheelhouse.

With accommodation for 20, the trawler has two continuous decks as well as forecastle, bridge and boat decks. Noise insulated cabins are located aft of amidships.

The engine room, located aft, houses a single Caterpillar 3616 series A turbocharged main engine, developing 5,420kW at 1,000 rev/min. This drives a four-bladed 3,800mm diameter, nickel-bronze Volda CP propeller through Volda reduction gear via a Van de Giessen nozzle. The main engine is equipped

with automatic stand-by, synchronising and load sharing. Brunvoll bow and stern thrusters of 900hp and 1,000hp respectively are installed along with a flap rudder.

Caterpillar engines were also selected for main auxiliary power. Units of 1,360kW (a Caterpillar 3512 series A) and 500kW (Caterpillar 3412) are equipped for automatic stand-by, synchronising and load sharing.

Deck gear includes an articulated 2.5 ton, 9m reach fish pump crane amidships to handle the remote controlled 18 inch fish pump, a 5 ton/12m crane and 15.5 ton pull anchor winch but is naturally dominated by fishing gear, much of which was supplied by Karmoy.

For purse-seining *Christian í Grótinum* has two 43-ton maximum pull purse seine winches; one 23-ton maximum pull end-wire winch; Tristar three-roller net winch; and four-ton net stacker. Equipment is remotely controlled from a distance command control cabin with a separate remote unit handling the Tristar winch and netstacker.

Karmoy also supplied the trawling gear, which includes a Karm 3001 autotrawl system.

Main Particulars

Owner

P/F *Christian í Grótinum*,
Faroe Islands

Builder

Asenav, Chile

Length oa 74.50m
Beam 12.60m

Fish hold capacity 1,900m³
Crew 20

Main engine

1 x Caterpillar 3616 diesel,
developing 5,420kW

Propulsion

4-bladed Volda CP propeller

Bow thruster

Brunvoll CP FU-63-LTC-1550,
900hp

Stern thruster

Brunvoll CP FU-63-LTC-1750,
1,000hp
Speed 19.2 knots



FAR SENIOR: refined and powerful

All four Ulstein UT 722 vessels bought by Norwegian operator Farstad Shipping over the past five years have progressively benefited from extra refinements and modifications. The fifth to join the fleet, *Far Senior*, proves to be no exception.

Constructed by Langsten Slip & Batbyggeri, the anchor-handling tug supply vessel has an impressive array of towing and anchor-handling equipment and a 189-tonne continuous bollard pull. Most intriguing amongst its machinery, however, is a retractable hydraulic crane, which folds into the deck on the starboard side aft. The purpose of the crane, which has a horizontal pull of six tonnes, is to handle the increasingly heavy connections and shackles in the Karm Fork area. It is probably the first time a crane of this type has been used aboard an AHTS. Capable of full remote control by the deck crew, the crane is expected to offer a greater level of safety and ease of working.

Traditional equipment is less innovative but nonetheless formidable. Main anchor-handling and towing winches have a maximum brake holding capacity of 550 tonnes, with a line pull of 400 tonnes at 9m/min. The capacity of each winch drum is 6,300m of 76mm diameter SWR or 4,600m of 90mm diameter SWR. The main tow wire - 1,300m of 83mm SWR - can be

readily removed and stowed on a powered reel to enable the full capacity of both winch drums to be used. Two tugger winches each have a 20-tonne line pull and house 600m of 76mm SWR.

Four Karm towing pins, with a safe working load of 240 tonnes, are installed forward of the stern roller, with two Karm forks rated at 650 tonnes.

Far Senior is powered by four Ulstein Bergen diesels producing a total of 16,800hp. These drive two controllable pitch propellers, rotating in fixed nozzles. Two shaft generators of 2,800kVA each are coupled to the main propulsion twin input/single output gearboxes and a pair of Ulstein high lift rudders and a 1,200hp transverse stern thruster are installed. A similar transverse thruster is fitted in the bow in addition to a retractable fully azimuthing thruster powered by a separate 1,200bhp engine.

Whilst the maximum bollard pull is, as stated, 189 tonnes, a pull of around 165 tonnes is achievable with all thrusters operating at 80 per cent capacity. The vessel has a maximum speed of 17 knots and an economical cruising speed of 12 knots.

In addition to its powerful machinery, *Far Senior* has a deck cargo area of 585m² with a maximum load of 900 tonnes, internal tanks for liquid storage and a dry

bulk cargo area of 10,000ft³. High capacity discharge systems are provided for all dry bulk and liquid cargoes. Four integral chain lockers, located amidships, have a total capacity of 546m³ of rig mooring chain.

The wheelhouse features an array of navigational and communications equipment including an Anschutz Pilotstar D autopilot, two Furuno radars, Furuno FE680 echosounder, Seatex/Furuno DGPS and an ECDIS chart system.

Main Particulars

Owner

Farstad Shipping ASA, Norway

Builder

Langsten Slip, Norway

Length oa	80.00m
Length bp	69.30m
Breadth mld	18.00m
Draft design	6.00m
Deadweight (6.0m)	2200t
Crew	12
Bollard pull	189t
Maximum speed	17 knots

Classification

DNV +1A1 Supply Vessel SF
Tug, EO, ICE-C



IRIS 6.1: fast cat with modular benefits

Now operating as a shuttle vessel in the Caribbean, *Iris 6.1* is as unusual in appearance as it is versatile in concept. Built in GRP by the French company Iris Catamarans and acquired by TMCA, a Caribbean maritime transport company, the vessel can carry passengers and/or freight in removable, easily dismantled modules.

Measuring 42.77m x 13.5m, the vessel has narrow hulls which are linked forward by a bulbous 'command head'. The passenger compartments, also of GRP sandwich construction, are located in-line astern and can easily be replaced by containers of freight. The modules are mounted on vibration absorbing supports behind the futuristic bridge/bow section and can accommodate 240 passengers.

Principal criteria behind the development of the new style catamaran were seaworthiness, low wake and high performance and a variety of configurations were tested by the builder back in 1995 at the Marin facility in Holland to ascertain the optimum solutions. Tank testing was carried out in '96 on 1/10th scale models and the first-of-class launched in November 1997.

The result has striking lines and a higher than average built-in safety factor, according to the company. The concept of 'containerising' the passenger spaces away from machinery and fuel storage areas is a big safety bonus, further augmented by the extensive use of non-combustible coatings and flame-proof partitions, panelling and floor coverings.

Power is provided by a pair of MTU 12V 400 M70 diesels with an output of 1,740kW, driving model LJ 76 DL Lips waterjets. With seven tonnes of fuel and a full complement of passengers this gives the vessel a cruising speed of 29.9 tonnes, range of ten hours and maximum speed of 34.2 knots.

As an alternative to the 6.1, Iris Catamarans offers the 6.2, an enhanced version able to carry 398 passengers on the same basic size and hull configuration by the simple expedient of a double layer of passenger modules. Using the 16V version of the MTU engines, a slightly increased service speed is forecast and the maximum speed is expected to be improved by a little over four knots. The bigger version has a larger bow pod to allow rearward visibility from the bridge.

Main Particulars

Owner

TMCA, Caribbean

Builder

Iris Catamarans, France

Length oa 42.77m

Length waterline 39.75m

Beam oa 13.5m

Draft (approx) 1.6m

Deadweight (with modules) ... 51t

Passengers 240

Service speed 29.9 knots

Maximum speed 34.2 knots

Range 10 hours

Power

2 x MTU 12V 4000 M 70 diesels,
1,740kW each

Propulsion

2 x Lips LJ 76 DL waterjets

Classification

DNV +1A1 HSLC R3 Passenger
EO



JADE EXPRESS: testing the Caribbean market

With a speed of 40 knots and capacity for ten cars and 330 passengers, Austal's first mid size fast ferry in the proven Auto Express range of vehicle-passenger catamarans, entered service in the French Caribbean in April/May '98.

Delivered to L'Express des Iles - the fast ferry operation of French Maritime Group, Compagnie Chambon, the 48m ship was seen as an economical means to test market demand for car carrying, with minimal sacrifice to passenger capacity. In addition, as it is built to HSC Code, the vehicle deck can also be utilised for cargo carrying.

As a 30-minute turnaround in port was specified, the car deck has been specially designed for swift loading and unloading. Cars enter and exit the vessel via a hydraulically operated 3m port side ramp located aft on the main deck. This system allows the vessels to berth at existing facilities on the island of Martinique with only simple shore based ramps required to reach the height of the car deck. Vehicle deck height is 2.1m and structural fire protection and drencher systems feature throughout. Forward of the ten parking bays is an 18m² area designated for baggage and cargo space.

Jade Express is fitted with four MTU 16V 396TE74L engines and the Austal Ocean Leveller ride control system, which features T-foils forward and interceptors aft on the transom of each hull. With a trial deadweight of 49

tonnes, the vessel achieved a maximum speed of 40 knots and a service speed (90 per cent MCR) of 38 knots.

Although operating with two bridge crew, four helm chairs are installed in the well-equipped wheelhouse. The bridge features external wing stations with Kamewa controls for precise manoeuvring and docking. Other equipment includes an MTU MCS5 monitoring system, Austal Ocean Leveller control station and NavMaster Electronic Chart Display. As well as providing navigation data for the crew, the NavMaster system is linked to the passenger accommodation television units thus acting as an information system.

Passenger saloons have been comfortably outfitted with an emphasis on the use of low maintenance materials. A combination of airline style seating and table/chair arrangements is used for the 330 passengers: 196 on the main deck, 54 in the upper deck saloon and 80 in the covered aft sundeck, which features acrylic-canvas covered 'deck-chairs'.

On board features include a bar/kiosk located aft of the main deck seating area, hostess station, television units throughout and overhead baggage racks along the main deck aisle seats and forward bulkhead on the upper deck. Quarters for the nine crew are located forward on the main deck and amenities include cooking facilities, shower and toilet, television and lounge area.

Safety equipment includes Viking 5m evacuation mini-slides situated in three stations: amidships, port; starboard on the main deck; and aft on the upper deck. In tests 128 passengers and five crew were evacuated in 13 minutes and 46 seconds, almost four minutes under the designated time set by the French flag authorities, FMM.

Main Particulars

Owner

L'Express des Iles, France

Builder

Austal Ships, Australia

Length oa	47.6m
Length waterline	41.6m
Beam mld	13.0m
Hull draft (approx.)	1.4m
Deadweight (max)	54t
Passengers	330
Vehicles	10 cars
Crew	9
Service speed	40 knots

Main engines

4 x MTU 16V 396TE74L diesels,
1980kW each

Classification

BV +3 3/3 E HSC Cat. A Coastal
Waters - 50 miles from port of
refuge +MACH +AUT-MS, CSA, F



KOYO MARU: Japan invests in state-of-the-art salvage tug

Thirty years after delivering a salvage tug named *Koyo Maru* to the Nippon Salvage Co., of Japan, shipbuilder Mitsubishi Heavy Industries delivered a replacement, named for its predecessor and jointly owned by Nippon and the Japan Ocean Tug Company. The new *Koyo Maru*, launched in June '98, represents an investment of around Yen 2 million and is the first large purpose-built salvage tug to be built for worldwide use in over a decade.

Measuring 86.08m x 14.50m, the 2,475grt vessel features a long forecastle with a flat deck, vast working deck space and upper deck level accommodation. A double-bottom, double-hull construction engine room houses two 5,000hp Daihatsu 8DLM-40A eight-cylinder diesel engines. These drive a pair of 3,500mm diameter four-bladed Kamome CP propellers in fixed Kort nozzles with twin Schilling rudders. Manoeuvrability is aided further by an electric bowthruster of 10-ton thrust, coupled to joystick control. The set-up can achieve a free-running speed in excess of 18 knots, cruising speed of around 16 knots and bollard pull of 132.5 tons. Auxiliary power is provided by two Daihatsu 1,000kVA 440v AC generators.

An impressive array of machinery dominates the forecastle deck, where a cage holds four 4.2-ton high-holding Admiralty Class 14 type salvage anchors,

various anchor laying slips and a recovery roller. Machinery is handled by an adjacent hydraulic rotating crane with 10-ton lift capacity.

An eight-ton workboat and inflatable rescue craft are mounted on davits and fixed on the starboard side of the bridge deck, with provision on the forecastle for an additional eight-ton workboat if necessary. An electro-hydraulic waterfall-type winch from Uchida Marine Hydraulics is located in a compartment on the upper deck at the aft end of the

superstructure. Capable of a 200-ton holding and 45-ton heaving capacity, the winch has two drums, one of 68mm diameter 1200m main towing wire ready for connection and the other with 5 x 200m lengths of 48mm diameter beach anchor-wire.

Other towing arrangements include hydraulically raised towing pins located either side of the working deck amidships aft, as well as a pair aft on the centreline, which have the ability to rotate to form an enclosed fairlead. All the pins can





guns - two fixed and two portable - carries 500 litres of oil dispersant chemical in a fixed tank as well as chemical in loose drums and can hold 215m³ of recovered oil/water.

A T-shaped wheelhouse offers good all-round visibility and is equipped with an integrated navigation system featuring ECDIS, joystick control, Doplar sonar and DPS. There is a choice of four control positions -

forward centreline, aft centreline looking over the working deck aft and one either side of the wheelhouse forward. All operations on the working deck and in the winch room can be viewed on large CCTV monitors.

Crew accommodation on the main deck comprises certified cabins for nine officers and five crew. Fulfilling its role as a salvage vessel there are also dedicated cabins for a salvage master and assistant, as well as berths for 24 other salvage personnel. A saloon and spacious mess room have been incorporated, with these, like the wheelhouse and engine control room, fully air-conditioned. Unlike the previous *Koyo Maru*, which was operated by a crew of 22, the new version can be adequately manned by just twelve personnel.

accommodate the 68mm diameter towing wire. Large capacity salvage holds for the storage of extra equipment are situated fore and aft and an electric deckhead crane system is located in the aft hold for the transportation of heavy equipment such as compressors and generators.

To cover all emergencies *Koyo Maru* has fire-fighting and pollution control capabilities. A 1,920m³/h fire pump is driven by the main port engine and a hydraulically controlled water gun, electronic foam/water gun and electronically controlled powder gun located on the main mast. 10,800 litres of concentrated foam compound and 2,000kg of fire-fighting powder are carried aboard.

For anti-pollution tasks the vessel is equipped with four oil dispersant spraying

Left. The spacious engine control room is fully air-conditioned.

Main Particulars

Owners

Nippon Salvage Company & Japan Ocean Tug Company

Builder

Mitsubishi Heavy Industries, Japan

Length oa 86.08m

Beam 14.50m

Depth mld 6.70m

Main engines

2 x Daihatsu 8DLM-40A diesels, 5,000hp each

Main generators

2 x Daihatsu, 1,000kVA at 440v

Propulsion

2 x Kamome CP propellers, twin Schilling rudders

Speed free-running .. 18.34 knots

Speed cruising 16.20 knots

Endurance

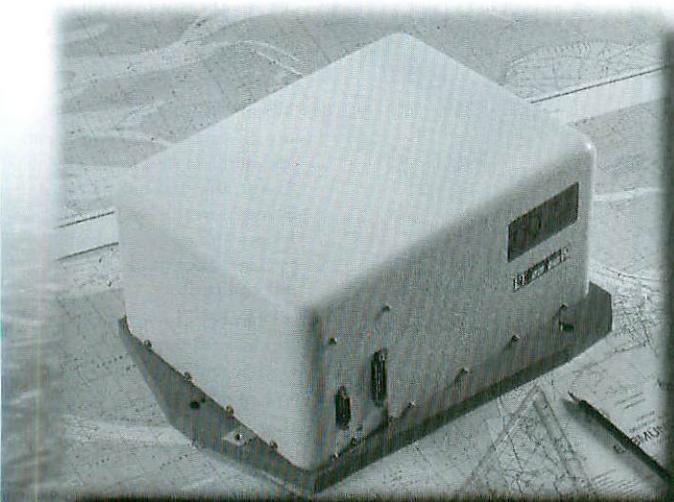
(two engines) 15,500 miles

(one engine) 23,000 miles

Bollard pull..... 132.5t

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MKL 2201: fast RIB fashioned for Finland

In the early 1980s UK boatbuilder Delta Marine Services introduced the first of an entirely new range of rigid inflatable boat. Featuring a high bow sheer, constant deep V hull and broad beam, the design found ready acceptance with rescue, police, patrol and diving authorities around the world. In 1984, approval was received from the UK Department of Transport (DTp) for fast rescue craft use in the North Sea oilfields, thus setting even stricter manufacturing standards.

A highlight for 1997/98 was completion of an 11.5m fast daughter craft RIB for the Finnish Southwestern Maritime District. Although based on the 115 or Super X Delta range, which is around 60cm wider than the 5.5m-6.5m Delta Dash range of rescue boats, *MKL 2201* was closely tailored to the authority's specific needs. Powered by a single 3406E 7000hp commercially rated Caterpillar diesel driving a Kamewa FF375S waterjet via a Twin Disc type MG5114A gearbox, the craft achieved a speed in excess of 45 knots.

High speed was a particular requirement

for the broad range of duties and extensive geographical operating area assigned to the vessel. Ordered in an administrative capacity for fast patrol and pilot duties in the provinces of Turku, Pori and Aland, its multi-role capabilities are put to the test in helping to promote good navigation and safeguard shipping in a particularly busy stretch of water. The district includes over 3,800km of marked fairways and approximately 5,000 aids to navigation with five pilot stations and an international radio station. Around 7,500 acts of pilotage occur annually covering 400,000km. The authority is also responsible for vessel surveys and inspections and the upkeep and development of regularly scheduled archipelago traffic.

Comfort was deemed as important as speed. A fully enclosed aluminium wheelhouse, derived from the

proven 95 daughter craft series in offshore operation but shortened to suit the authority's needs, is fitted with six KAB seats, galley and toilet. The interior has been laid out for best ergonomics with the latest electronic and navigation aids including radar, echo sounder, DGPS and





beacon receiver from the Furuno electronics range, C-Net compass system and Raytheon loudhailer/intercom. Large windows in the wheelhouse give excellent visibility and two opening top hatches have been incorporated for ventilation and upward visibility.

Delta designs offer seaworthiness and durability by means of a unique combination of CRP buoyant fendering and traditional pneumatic sponson. In essence,

this means that the high risk side areas have solid fendering whilst the shock absorbing inflated nose section is retained. Individual side sections can be swiftly replaced if they become damaged. The vessel's aft deck is dominated by an engine and jet housing, necessary to accommodate the large 3406E unit, which is the standard engine installed in all pilot and patrol craft in the authority's fleet.

As an administrative vessel, MKL 2201

has not been classified but was designed and constructed to meet the Nordic Boat Standard 1990 for commercial vessels under 15m (hull length), Finnish Maritime Administration requirements and the Marine Safety Agency Fast Rescue Standby Code of Practice.

Following delivery of the RIB to Finland, Delta completed a similar vessel for UK company Brown & Root. The fourth in a series, the craft commenced its operating life as a daughter craft for crew transfer and rescue on the Sangu Project in India.

Main Particulars

Owner

Finnish Southwestern Maritime District

Builder

Delta Marine Services, UK

Length oa 11.50m
Beam 3.28m

Main engine

Caterpillar 3406E diesel, developing 7000hp

Gearbox

Twin Disc MG5114A

Propulsion

Kamewa FF375S waterjet

Speed: 45 knots plus

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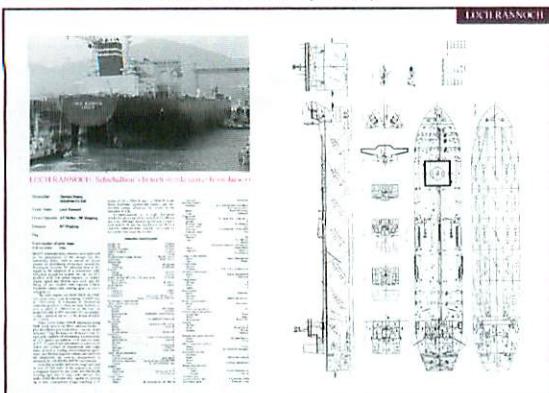


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NEUWERK: marine disaster prevention in the North sea

Equipped for a number of roles but with strong emphasis on that of marine pollution control, 78.91m x 18.63m *Neuwerk* is now in operation from its home port of Cuxhaven, servicing the North Sea.

Described as 'a marine disaster prevention ship', *Neuwerk* was planned, designed, specified and supervised in build by the Watercraft Department of Germany's Federal Waterways Engineering & Research Institute (BAW) and built by the German yard of Volkswerft Stralsund. The lines of the ship are based on conventional designs optimised by the Hamburg Ship Model Basin.

Reinforced to comply with GL Ice Class E3, the hull has a stem which tails off beneath the vessel into a box-shaped keel. This, together with two keel elements above the propellers, improves ice-breaking action and helps clear broken ice away from the propellers. The hull is divided into seven watertight compartments by vertical bulkheads and contains stainless steel cargo tanks, which are positioned lengthways and completely isolated from the sides and bottom by cofferdams. There are four in-hull decks and four superstructure decks plus a helicopter winch deck aft.

Power is provided by four main diesel generator units working in parallel. To allow the power generated to match demand and thus avoid the low-load

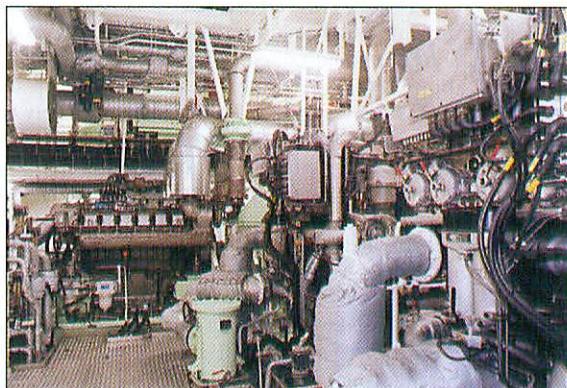
problems associated with diesel engines, three MTU 16V 595 TC50 units, each developing 3,000kW at 1,500 rev/min and one MTU 12V 396 TC54 developing 960kW, at the same speed, are installed side-by-side, just forward of amidships. A pair of 2,900kW Schottel Rudder-propellers with FP propellers, inside nozzles, is fitted at the stern and a 2,600kW Schottel pump-jet at the bow. On trials, the vessel achieved a bollard pull of 113.5 tonnes and speed of 14.9 knots. A fourth generator set of 300kW is provided for harbour use.

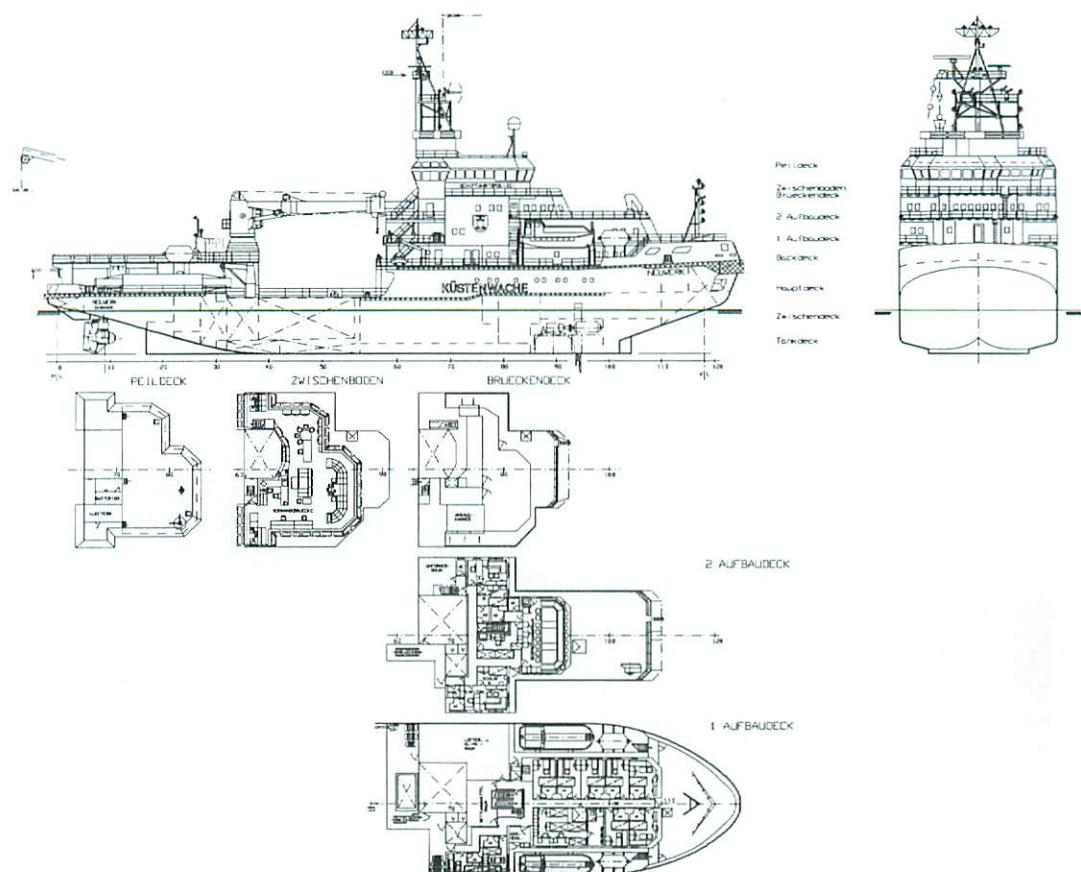
With built-in skimming devices and a citadel-type interior to protect against toxic or explosive external atmospheres, the main role of *Neuwerk* is undoubtedly marine pollution control.

The gas protection system extends to all interior living and working areas including bridge, crew quarters and engine rooms. Entrance and exit to and from 'the citadel' is via gas locks and the interior is supplied with decontaminated air, purified through modular filter stations, each fitted with sub-micron and activated carbon filters. Pressure is maintained

above outside atmospheric pressure to prevent the possibility of polluted air entering the citadel and constant monitoring and failsafe systems are in place. The engines are cooled by a closed circuit freshwater system to avoid the risk of contamination.

Neuwerk is equipped with a pair of built-in independent sweeping arm skimmers for oil spill duties. Developed by Jastram Forschung of Hamburg, each measures 15m in length and can be deployed at angles of 35 to 65 degrees to the ship's side whilst the vessel proceeds at under 2.5 knots. Floating substances are thus forced by the ship's forward movement towards an integrated suction pipe and pumped to gravity





separation systems. Recovered pollutants are held in five stainless steel cargo tanks with a total capacity of 1,000m³. The tanks can also be used for the transportation of dangerous substances.

Other roles for the vessel include emergency towing, buoy tending, fire-fighting, ice-breaking and policing. For ETV operations the ship is equipped with a Hatlapa towing winch of 2,000kN brake holding power with 1,000m of towrope. Two tugger winches and retractable towing pins are also fitted and a CCTV system enables all towing equipment to be bridge controlled although the NMF deck crane shields some of the view. The crane, with telescopic jib, is for buoy handling and salvaging cargo lost overboard by casualties. A retractable sonar, installed

at the base of the foreship, can be used to locate sunken objects.

For fire-fighting operations, two monitors are carried, each with a range of 120m and a throwing height of 45m. One monitor is mounted on a telescopic mast, which can be raised hydraulically to a point 35m above the waterline. In addition, two 370m³ water/foam monitors and a 1,480m³/h sprinkler system are installed. The latter system

can also be used for decontamination purposes during gas protected operation. Remotely controlled from within the bridge, the fire-fighting and fire protection systems comply with GL classification FiFi 1.

All accommodation is contained within the superstructure above main deck level and provides for a normal complement of 16 plus up to 34 additional personnel. Immediately below the bridge, adjacent to the captain's cabin, is a large conference room spanning the full width of the accommodation forward. The bridge itself is spacious with a main control console, supplied and equipped by STN Atlas, positioned right forward. Equipment includes ARPA, ECDIS, full GMDSS for areas A1, A2 and A3, two echo sounders (in addition to the sonar) and an automatic weather station.

Main Particulars

Owner/Operator

Waterways and Shipping Administration (WSV), Germany

Builder

Volkswerft Stralsund, Germany

Length oa 78.91m

Length bp 73.20m

Breadth oa 18.63m

Breadth mld 18.00m

Draft, design (buoy layer) .. 5.00m

Deadweight, max 2,011t

Speed 14.9 knots

Bollard pull 113.5t

Classification

Lloyd's +100 A5 E3 Oil Recovery Vessel, Chemical Recovery Vessel, Tug +MC E3 AUT, FF1 RP 50%

Main engines

3 x MTU 16V 595 TC50 diesels, 3,000kW each

1 x MTU 12V 396 TC54, 960kW

Propulsion

2 x Schottel Rudderpropeller, 2,900kW each, with FP propellers

1 x 2,600kW Schottel pump-jet



NEW RIVER: radical docking module

A radically different alternative to the traditional berthing tug started work early in '98 with owners Hvide Marine in Port Everglades, Florida. *New River*, a 90ft x 50ft Ship Docking Module (SDM), built at Halter's Lockport yard, has impressive manoeuvrability and the ability to generate a very high proportion of its power in any direction - forward, backwards or sideways.

The brainchild of Eric Hvide and designed in detail by Seattle based Elliott Bay Design Group, the vessel has two Ulstein model 1650H fixed pitch Z-Drives mounted forward and aft and diagonally offset some 2m from the centre-line of the hull. Caterpillar 3516BTA engines, developing 2,000hp at 1,600 rev/min, are positioned at each end of the vessel, leaving ample space in the engine room for two 75kW Detroit Diesel 4-71 generator sets.

Although later vessels in the series have internal ladder arrangements to the wheelhouse, *New River* - designed for operation in a warm climate by a two-man crew - has exterior bridge access with cabins opening directly onto the aft deck. Visibility from the bridge is excellent via half height windows forward and full height windows aft. Two island consoles, each with main engine and thruster control,

are positioned at the forward end.

As *New River* manoeuvres in all directions, the entire 'circumference' of its flat bottomed hull has been protected by Schuyler cut-tire fendering. It has also been equipped with a unique extra type of protection, although in this instance for ecological reasons - manatee guards have been fitted to the type 19a Kort nozzles which surround the 2,184mm four-bladed stainless steel, fixed pitch propellers. Designed by Ulstein Maritime in Vancouver to prevent propeller strikes on these endangered creatures, the guards incorporate hydrodynamically contoured foil shaped spokes spanning the inlet to the nozzles to ensure a smooth water flow.

Deck machinery comprises a Markey DYSF-39 hawser winch with capacity for 500ft of softline. This is fitted with a 30hp hydraulic power unit, hydraulic drum brake, an instrumentation system for monitoring tension and single station pilothouse controls. A remotely operated 3,000 gallons/min Skum fire monitor is mounted on top of the wheelhouse.

Although the SDM was ABS approved at 107,000lbs pull, peaks of around 114,000lbs were achieved when the

vessel entered service. Slight problems were, however, caused with the diagonally opposed and offset thrusters creating a slight lift as water flows across each adjacent skeg. This effect is doubled as the bow tends to go one way and the stern the other. In open water on a long warp, as required for the bollard pull test, this is sufficient to cause the vessel to turn off-line which the helmsman naturally corrects by adjusting the angle of the thrusters. This reduces the achievable test bollard pull.

Slots have been incorporated in the skegs of the subsequent deliveries *St Johns* and *Escambia* to solve the problem.

Main Particulars

Owner

Hvide Marine, USA

Builder

Halter Marine, USA

Length oa 27.43m

Breadth mld 15.24m

Draft (design) 4.93m

Power

2 x Caterpillar 3516BTA diesels,
2,000hp each

Propulsion

2 x Ulstein Z-Drives type 1650H

Speed 12.5 knots

Bollard pull 48.5t



PACIFICAT 1000: superferry for Canadian commuters

North America's newest and largest fast ferry, *Pacificat 1000*, was clocked by the Canadian Coast Guard at speeds exceeding 44 knots during builder sea trials off the coast of British Columbia in November '98. Such results for the twin-hulled wavepiercing ro-ro catamaran have, according to lead builder Catamaran Ferries International (CFI) exceeded the expectations of customer, British Columbia Ferries Corporation (BCFC).

Vancouver-based naval architect, Robert Allan, designed the mechanical outfitting of the giant ferry whilst Philip Hercus of Incat Designs in Sydney, Australia, produced the basic layout. A consortium of Vancouver shipbuilders, headed up by CFI - a subsidiary of BCFC - has been responsible for its construction.

Measuring 122.5m x 25.8m, the world's second largest ferry can carry up to 250 cars and 1,000 passengers on a journey between North Vancouver's Horseshoe Bay and Nanaimo on Vancouver Island. Travel time will be 65 minutes at a service speed of 37 knots, a reduction of 35 minutes on the current travel time.

To avoid changes to docking configurations and facilities, *Pacificat 1000* has a special drawbridge enclosing its lower car deck, which lowers in the shape of a monohull after docking. Two

car decks, both with eight lanes, are each designed for a straight drive-through, with two lanes on each deck discharging simultaneously.

Two accommodation levels offer a mix of airline and restaurant-style seating and a variety of entertainment and amenity spaces.

Power is provided by four MTU 20V 1163 diesel engines (two in each hull) with a total output of 33,500hp (26,000kW). These each drive a Kamewa type 112 S11 waterjet via a Renk ASL53 gearbox with integral clutch and carbon-fibre shafts. Facilities exist within the vessel's switchboard computer to automatically engage a power management system that will compensate power amongst three engines should one unit lag. In addition, the Kamewa computerised control systems allow the steering of each jet to be independent, operate in pairs or all together.

Such propulsion control is coupled with computerised navigation and vessel management systems positioned in the wheelhouse and custom designed by Prime Mover Controls and BC Ferries' electrical engineer, Glen Darling.

With 1,000 passengers plus crew to protect, safety is of prime importance and a Dunlop-Beaufort evacuation system,

comprising two sets of chutes, platforms and four 150-person liferafts are located on each side of the vessel. The ship is also equipped with two approved Zodiac H-742 rescue boats and passenger areas, car decks and machinery spaces protected by a Hi-Fog system.

Main Particulars

Owner

BC Ferries Corporation, Canada

Builder

Consortium led by CFI, Canada

Length oa 122.5m

Beam 25.8m

Draft loaded 3.9m

Deadweight 532t

Service speed 37 knots
(100% MCR) @ max DWT

Main engines

4 x MTU 20V-1163 TB73L
diesels, 6,500kW each

Propulsion

4 x Kamewa 112 S11 waterjets

Passengers 1000

Vehicles

Cars (European) 314

Coaches (Max) 6



PORTUNUS: first of three for ABP

A new type of pilot vessel, developed by naval architect David Cannell and built by Southampton-based yard Halmatic, entered service in the Associated British Port (ABP) fleet last year. Lead vessel *Portunus*, the first of three craft to be ordered as a modern alternative to ABP's traditional favourite - the Halmatic Nelson - offers higher speeds and a drier ride.

ABP's need to upgrade arose in part because of changes in pilot boat regulations, which had increased the displacement of the Nelsons leading to a 'wet' ride with excess spray on windscreen and deck. The new generation solution, based on an FRCV (Fast Round Chine Vessel) hull form offered an ideal alternative.

The FRCV incorporates a single chine of optimum angle for lift and dryness, well rounded topsides above the chine aft, warped bottom and reduced deadrise towards the transom. According to the designer, the hull offers seakeeping with even lower acceleration forces than a semi-displacement hull form of lower speed range.

"To achieve this, the hull shape has been developed with very fine entry for excellent head sea performance, maintaining the centre of lateral area of the hull well aft, to give superb down sea performance,"

says Cannell. To maintain a dry foredeck in heavier seas, a high reserve of buoyancy is incorporated into the forward sections above the chine.

The performance is further enhanced by highly developed tunnelling to the propellers, which results in lower draft, less keel depth and reduced power requirements.

Built in accordance with the MSA Code of Practice for Workboats & Pilot Boats, *Portunus* (named for the Roman god of

harbours) operates within ABP's Compulsory Pilotage Area - a 28-mile stretch of water from Southampton to the Nab Channel. Like the third in the series, *Portunus* has seating for coxswain, crewman and six pilots. The second vessel, *Prospect*, has been designed for a combined patrol/pilotage/VIP carrying role and seats six with a full size chart table.

A top speed of 26 knots - six knots faster than the Nelson average - is derived from two V-drive mounted Scania DSI 14 diesel engines, developing 520hp at 1800 rev/min. These drive two four-bladed propellers via a Twin Disc MG5114RV 1.45:1 reduction gearbox. Machinery was selected on the basis of a 2,500 to 3,000 hours per annum duty cycle with slow speed/cruising speed for 25-40 per cent of



PORTUNUS

the operating time and service speed (25 knots maximum) for 60-75 per cent of the time.

The wheelhouse is spacious with plenty of natural light filtering through three electrically heated toughened glass windscreens, ten side windows and five tinted glass roof lights, all supplied by Seaglaze. The windscreens are raked inwards and fitted with Wynn Type C heavy-duty parallel motion wipers. The instrument console is positioned to port with a Bostrom Viking 300K helmsman's seat. Seven further seats of the same specification are installed for crew and

pilots. A folding table is installed behind the helm position. Navigation equipment includes a Raytheon ST50 echo sounder and speed log, Furuno 7061 radar, Sestrel compass and Sailor RT 2048 radios. Forward accommodation, comprising a well-equipped galley, toilet and crew mess area, is accessed from the wheelhouse.

On deck safety is ensured by non-slip flooring, a continuous Hadrian Rail safety harness system and Halmatic Matesaver MOB recovery system. An electro-hydraulically operated stern rescue platform, constructed from stainless steel tubing and mesh, is fitted to the transom.

Main Particulars

Owner

Associated British Ports, UK

Builder

Halmatic, UK

Length oa 14.77m

Length mld 14.52m

Length waterline 12.92m

Beam mld 4.27m

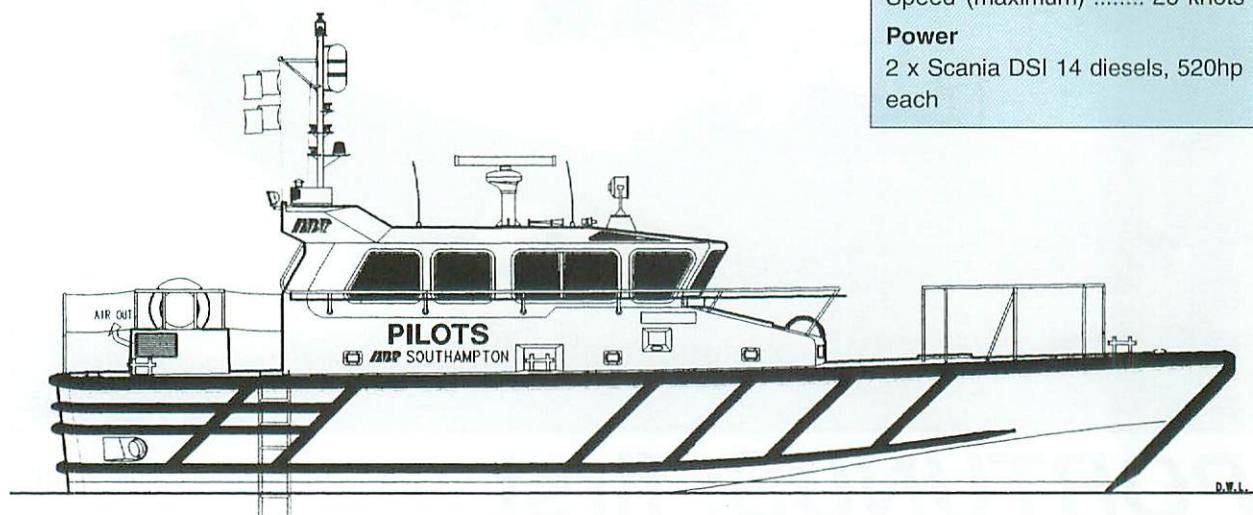
Draft 1.33m

Displacement 22.1t

Speed (maximum) 26 knots

Power

2 x Scania DSI 14 diesels, 520hp each



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Tom Harcus & crew with their new vessel
"Russa Taign"
from the designers Vik-Sandvik

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SHIP DESIGN CONSULTANTS



RPC 1150: pilot/patrol craft with competitive streak

Versatility and competitive pricing were key requirements set out by French yard Raidco Marine International when commissioning UK based naval architect Alastair Cameron to design a pilot/patrol vessel for its commercial craft portfolio. The first-of-class vessel, purchased by West African owners, boasts innovative features and was fully customised at minimal extra cost.

Developed from a range of proven Camarc multi-chine hull designs, the GRP boat has a deep V hull which enables it to maintain speed in adverse conditions whilst remaining stable at slower speeds. A major extra feature is an all-round reinforced PU/foam fender system, developed by Raidco for maximum protection. The system is modular, enabling damaged sections to be swiftly repaired when necessary and creates an easier, safer boarding platform for pilots and other personnel.

A simple internal layout can easily be amended to suit customer requirements and a number of superstructure options are also offered. For the first vessel a steeply

raked wheelhouse was selected with seating for six pilots or crew plus a helmsman and navigator. A small cabin, WC and galley is incorporated forward.

The lower deck level comprises a small forepeak area divided by a watertight bulkhead from the forward void space/store and fuel tank space aft.

The hull can accommodate twin propulsion units if required and outdrive or conventional propeller installations are available. The West African owners opted for a single Cummins 6CTA 400hp diesel engine driving a Hamilton 291 waterjet - a package which is reported to give a 28 knot cruising speed and exceptional fuel economy. With twin engine options the vessel should achieve speeds of up to 40 knots.

Raidco is marketing the design for international authorities seeking a capable and cost-effective craft for coastal and harbour operations. Delivery of the first vessel led to yet another contract from West Africa. Application this time, for a smaller 10m long version, is fisheries protection and three open console vessels were

selected. Each benefits from the special foam fender arrangement and has single diesels driving waterjets.

Main Particulars

Owner

West African Authority

Builder

Raidco Marine International,
France

Length oa 11.20m

Length hull 10.4m

Length waterline 8.85m

Beam 3.74m

Beam hull 3.1m

Draft hull 0.55m

Power

1 x Cummins 6CTA diesel, 400hp

Propulsion

1 x Hamilton 291 waterjet

Fuel 600l

Speed 28 knots

Crew 2-8



RAM 24: tough RIB on proven hull form

Aluminium boat builders, SeaArk Marine of Arkansas, USA, extended its portfolio in early '98 with the introduction of a rigid inflatable patrol boat. Designated the Ram Class, the new concept combines proven hulls from the Commander and Dauntless classes with a specially designed heavy-duty tube system which can be air or foam filled.

Deep 21 degree V hulls, developed five years ago by C Raymond Hunt & Associates, have been selected for their performance in rough seas. The following advantages are cited: smooth ride in choppy waters because of a sharp 45 degree bow entry; dry ride due to multiple lift strakes, wide chines and highly flared bows; and excellent stability, both at rest and underway, caused by wide chines aft and wide waterline beams. In following or quartering seas, Hunt hulls are said to have less tendency to yaw or become buried in steep sea conditions.

The Ram collar enhances performance in surf or whitewater conditions by providing considerable levels of extra buoyancy. In high banking turns, the collar

contacts the water, reducing roll, and stability is enhanced when large numbers of people are working over the side.

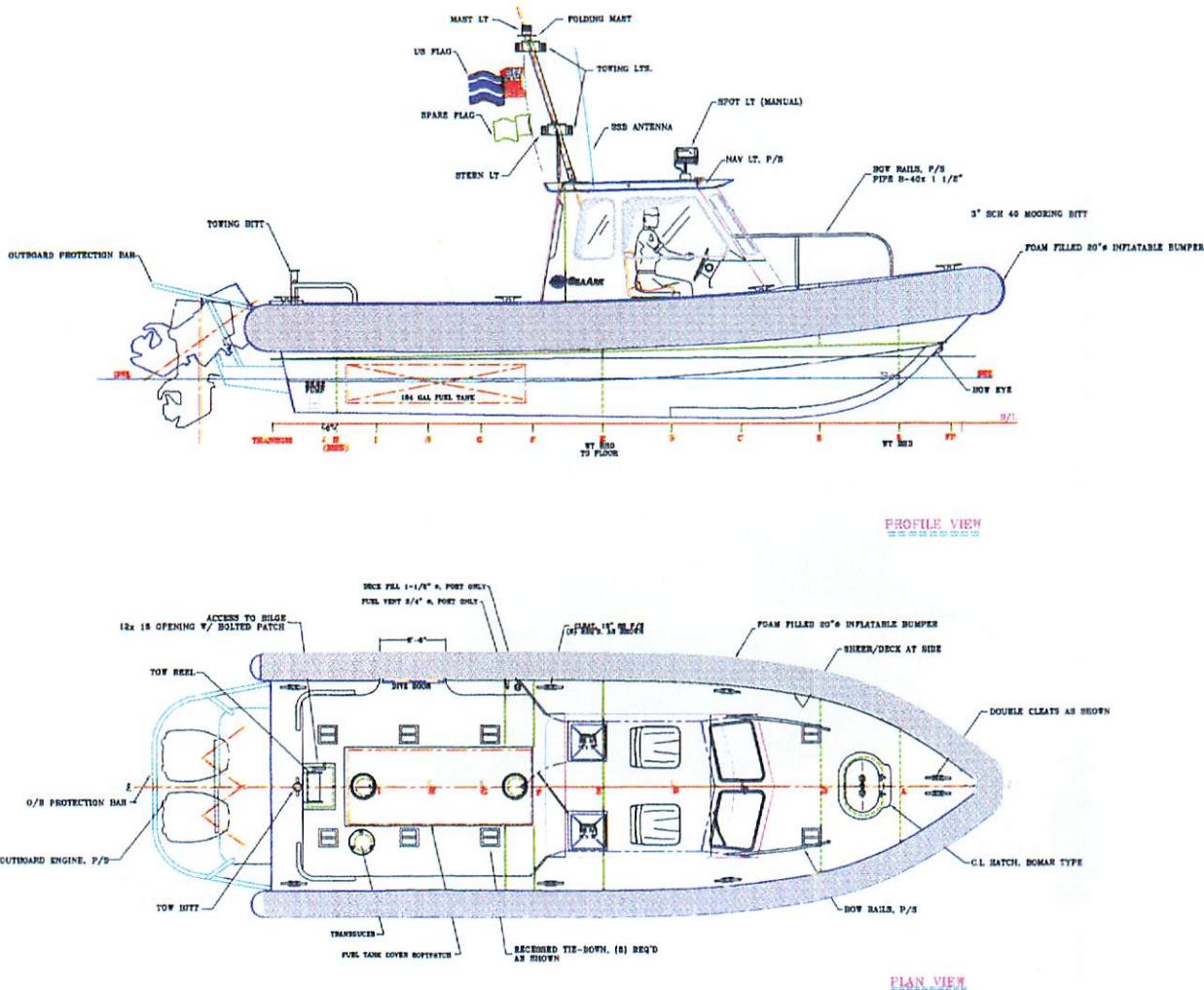
Attached to the hull by means of a bolt rope system on a continuously welded track, the collar is mounted approximately six inches above the load waterline. A number of advantages are claimed over conventional RIBs where tubes are frequently partially submerged: marine growth on the tube surfaces is eliminated; the hullform, with its wide chines, is more efficient at higher speeds because tubes are not dragged through the water; the collar is 'D' shaped, providing greater interior working room, working side decks, and foot holding tow room under the gunwales; and the tubes are less subject to damage from floating debris, ice or the caustic effect of oil and chemical spills.

Although introduced as a 24ft model, Ram boats range from 21 to 28 feet in length and can be powered by outboards, stern drives in both gas and diesel configuration and single outboards. The latter should have a 30 inch shaft length

as this will keep the motor's powerhead well above the waterline when the boat is operated at displacement speeds, such as during towing. When dual outboards are selected, 25 inch shaft lengths are recommended.

Engine compartments, sized for the largest V-8 gas engine and the longest six-cylinder diesel, are sealed so that oily water cannot leak into the forward sections or into the foam flanking the engine compartment. A welded coaming surrounds the engine opening to prevent cockpit water from entering. With twin 150hp outboard engines, the Ram is able to attain speeds of over 45mph and can plane up to 30mph on a single engine.

A number of interior arrangements are available, with a standard centre console an ideal option that maximises working space, both fore and aft. Where additional weather protection is required, a pilot house version provides 360 degree gunwale access and year-round protection from wind blast. Features comprise a front windshield of safety glass that opens for



ventilation, an aluminium roof and lockable entry door.

Other features of the vessel include a unique bow boarding rail system for officer safety and convenience, non-slip walking surfaces and a watertight collision bulkhead. Rams are equipped with a heavy-duty towing eye and three heavy-duty bollards, one forward and two aft. These penetrate the deck and tie into the hull's structure below.

Operated by the Boston Police Harbor Unit, the Ram was chosen last summer to

escort *USS Constitution* on its historic sail into the harbour. The Ram served as an official rescue craft during the event as part of the inner security zone and responded to a small boat sinking and a medical emergency on board a nearby Coastguard cutter.

SeaArk has sold three further boats since the Boston prototype. The State of Connecticut has purchased 21ft and 23ft Rams with air filled collars and the USCG North District a 27ft boat with foam filled collar.

Main Particulars

Length oa tube inflated 24ft
 Beam tube inflated 10ft
 Draft (engine up) 1ft 4in
 Fuel capacity 100 US Gallons
 Weight capacity 4,000lbs/12 persons

Power

Outboards or sterndrives
 Speed 48mph plus



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REGAIN: modern lines for lighterage duties

With its low profile, shallow draft and rather squat appearance, *Regain* entered service on London's River Thames in the early months of '98 as a new-style addition to the Cory Environmental fleet.

Built at Delta Shipyard in Holland for £1.23m on a hull constructed by Scheepswerft Made BV, the vessel has replaced two elderly, single screw vessels in the task of towing barges of containerised refuse away from transfer stations in central London to sites on the lower reaches of the river.

Designed by Marine Data International with a low profile to ensure ease of passage under London's many bridges, and with minimal draft for work near shallow wharves, the vessel is nonetheless rugged with heavy scantlings and shell plating protected in vulnerable areas by heavy 'U' section, steel rubbing strakes. Substantial tubular rubber fendering is fitted at bow and stern.

Unlike a traditional single screw lighterage tug, *Regain* has twin propellers. Power is supplied by two Caterpillar 3508B DI-TA, eight cylinder, four-stroke turbocharged diesels, running at 1300 rev/min to give a total

of 1,610hp (1200kW). Reintjes type WAF 541 gearboxes transmit power to the 1.65m diameter four-bladed skewed propellers, supplied by Kort Propulsion.

Twin balanced rudders are operated by Wagner electro/hydraulic steering gear and controlled by a traditional wooden wheel. The engine and gearbox controls have also been kept as simple as possible, with a Kobelt manual system.

Electrical power is supplied by a pair of auxiliary generators served by twin Mermaid Melody II four-cylinder diesel engines coupled to Stamford 42kVA generators.

Deck layout follows traditional Thames practice with several refinements developed by Cory. The very wide stern is well rounded and incorporates steps in the angled after bulwarks and at deck level to afford safe personnel access to barges.

Towing gear comprises a quick release Mampaey tow hook, located on a short radius arm. Protection against girding and over running is provided by a 'goal post' structure, surrounding the hook area, developed by Cory for use in earlier, modernised tugs.

The entire superstructure and upperworks comply with a specified maximum air draft of 4.3m and a well glazed wheelhouse is located above a long, low profile deckhouse. A hydraulically operated folding mast enables the vessel to pass under bridges and a closed circuit television system is fitted for monitoring of barges in tow.

Main Particulars

Owner

Cory Environmental, UK

Builder

Delta Shipyard, Holland

Length oa	26.5m
Beam (excl. fenders)	8.87m
Draft	2.22m
Speed	12.6 knots
Bollard pull	17.5t

Main Engines

2 x Caterpillar 3508 DI-TA diesels, 600kW each

Propulsion

2 x Kort 4-bladed propellers



SCOTIA: multi-role fisheries research ship

In March 1998 the Agriculture, Environment and Fisheries Department of the Scottish Office accepted a new flagship fishery research vessel, the fourth of its type to bear the name *Scotia*. Built at a cost of £21 million, the vessel has multi-role capabilities suited to worldwide service and an impressive list of innovative features.

Built by Ferguson Shipbuilders of Port Glasgow and designed by Norwegian naval architects, Skipsteknisk A/S as a hydrographic research ship, *Scotia* is also well equipped as a fully operational pelagic and demersal trawler. Additional tasks such as plankton sampling, towed body operations, ROV deployment and acoustic research are well within its capabilities.

Notable features include a retractable keel unit housing an array of acoustic transducers for echosounding and measuring ocean currents, fibre-optic connections linking a broad range of sensors and a system of containerised laboratories which can be outfitted on shore before loading on board. Special attention has been paid to the reduction of noise and vibration to avoid disturbing scientific equipment.

Propulsion is by means of a diesel electric system comprising three Wärtsilä 9L20/Ansaldi alternator sets, arranged

midships. Each unit produce 1,485kW (1,750kVA) at 1,000 rev/min and feeds a 660V, three-phase, 50Hz AC air-breaker switchboard. Two 1,500kW DC propulsion motors, mounted in tandem on a common drive shaft, turn a Lips 360mm five-bladed FP NAB propeller which is designed for silent running at 11 knots and is capable of producing 30 tonnes at

five knots whilst trawling. An integrated, self-lubricated thrust bearing, turning gear and torsion meter are incorporated. For harbour and emergency use, generators of 258kW and 315kW output are housed in a separate compartment on the boat deck (three levels up).

With this configuration the vessel has a maximum speed of 15 knots and a service



speed of 13 knots, but for extra economy when travelling between survey positions, a speed of 11 knots can be maintained using just one out of the three Wärtsilä/Ansaldo generators.

Tenfjord electro-hydraulic spherical rotary vane steering gear turns an 8.90m² Ulstein high-lift rudder with active flap blade. To further enhance manoeuvrability, a 380kW, 1375mm diameter transverse thruster is installed below the propulsion shaft and a 700kW Elliot omni-directional thruster is fitted at the bow. A gyroscopically controlled Intereng twin-tank roll stabiliser, with resiliently mounted air ducts and pneumatic valves, is fitted amidships. Tanks are incorporated for 275 tonnes of fuel, 77 tonnes of potable water, 24 tonnes of lube oil and 480 tonnes of water ballast.

Considered to be amongst the most radical aspects of the ship is the principal containerised laboratory store in which four 20ft wet/dry laboratories are located. Positioned in the centre section of the main deck, the laboratories can be adapted and equipped on shore and loaded in a combination that is tailored to each voyage. Full services are provided to each laboratory when in position by an umbilical and the containers are handled within the vessel by a Buitendijk Technik ten-tonne overhead travelling crane.

A sonar laboratory, hospital and small mess room are located at the forward end of the main deck whilst the aft section has

a stern ramp with side gantries and recessed trawl doors, open working deck and wet fish laboratory. A 'scientific hangar', located immediately aft of the laboratory store, has access to the port side via a large roller shutter and is equipped with extending arm crane for sample recovery. A hydraulically-operated retractable platform deck can be extended out over the stern ramp for operations such as buoy handling.

Galley and communal accommodation areas make up the forward end of the boat deck whilst the aft end is dominated by machinery. A total of ten Brattvaag winches, a net drum, a series of Aukra electro-hydraulic cranes for container manipulation, plankton sampling and towed body/cod end handling and an Odim custom-built six-tonne gamma frame are positioned. The single funnel is offset to port abaft of which are located a 5.3m, 25-knot Norsafe waterjet propelled workboat and a 3.8m 25hp outboard powered Avon RIB. Five 15-person life rafts are carried immediately forward of the wheelhouse with launching davits on both sides.

The large, irregularly shaped wheelhouse is well glazed and equipped with Wynn wipers. Four consoles, installed for control of propulsion equipment and manoeuvring, feature a GPS linked joystick-controlled Simrad dynamic positioning system interfacing with rudder, propeller and both thrusters.

A separate navigation console features Furuno X and S band radars, Decca Navigator and Loran C receiver systems, two differential GPSs, two video radar plotters, a Simrad Robertson gyro and Lillie & Gilley magnetic compass. Communications equipment also merits its own console, supplied and fitted by UK company Ships Electronics Services. This includes a full GMDSS area A3 installation comprising Inmarsat B and C terminals, MF/HF 250 transmitter/receiver, MF/HF Sailor R502 watchkeeper and NBDP radio telex.

Main Particulars

Owner

Agriculture, Environment & Fisheries Dept, Scottish Office

Builder

Ferguson Shipbuilders, UK

Length oa	68.6m
Length bp	61.2m
Breadth mld	15.0m
Draft laden	5.65m
Gross tonnage	2619t
Nett tonnage	785t
Deadweight	850t
Service speed	13 knots

Classification

Lloyd's +100A1 ice class 1D

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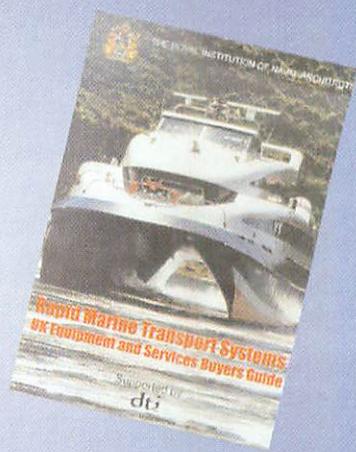
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