



## M/V Pacific Duchess

- ▶ **Bollard Pull** 220-238 tonnes
- ▶ **Brake Horsepower** 17,614 BHP
- ▶ **Clear Deck Space** 650 m<sup>2</sup>
- ▶ **Winch Line Pull** 500 tonnes

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## General Information

Built:	ST Marine, Singapore, March 2014
Flag:	Singapore
Call Sign:	9V9515
IMO No.:	9631424
Classification:	DNV-GL +1A Fire fighter(I) Offshore service vessel(Anchor handling, Towing) Clean DPS(2) E0 Ice(C) SPS

## Dimensions

Length, overall:	92 metres
Length, BP:	79.8 metres
Breadth, moulded:	22 metres
Depth, main deck:	9 metres
Design draft:	5.5 metres
Maximum draft midship:	7.5 metres
GT:	6641
NT:	1992

## Capacities

Deadweight (maximum):	4542.841 t
Clear Deck Area:	36 m x 18 m = 650 m <sup>2</sup>
Deck Strength:	10 t/m <sup>2</sup>
Deck Cargo:	1500 t (C.G. at 0.9 m above deck)
Fuel:	1172 m <sup>3</sup> (dedicated) 1940 m <sup>3</sup> (including combination BO, Mud tanks)
Potable Water:	1350 m <sup>3</sup>
Ballast Water / Drill Water:	2965 m <sup>3</sup>
Brine / DMA / Glycol / Liquid Mud:	860 m <sup>3</sup> - s.g. of 2.5 t/m <sup>3</sup>
Dry Bulk:	236 m <sup>3</sup> (8334 cubic feet) (in 4 tanks)
Ship's Stores:	Freezer (-25 degrees Celsius) - 25 m <sup>3</sup> Cold Room (+4 degrees Celsius) - 25 m <sup>3</sup> Provisions store - 90 m <sup>3</sup>

## Machinery

Main Engines:	4 x 3,285 kW = 13,140 kW (17,614 BHP), MAN 9L 27/38 Engines, Tier II Compliant
Propulsion:	2 x MAN Acpha CPP propellers in KORT nozzles, with Hi-Lift Flap Rudders
Azimuth Thruster:	1 x 880 kW (1,180 BHP) Azimuth drop-down thruster, 15.0 t thrust
Bow Thrusters:	2 x 880 kW (2,360 BHP) Brunvoll tunnel thruster, 13.0 t thrust
Stern Thrusters:	2 x 880 kW (2,360 BHP) Brunvoll tunnel thruster, 13.0 t thrust
Shaft Generators:	2 x AEM, 2800 kW, 3500 kVA each, 440V, 60 Hz
Auxiliary Generators:	1 x Caterpillar diesel generator, 1425 kW, 440V, 60 Hz capable of driving FiFi pump, Azimuth drop-down thruster, TIER II compliant

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Emergency Generators: 1 x Caterpillar diesel generator, 350 kW, 440V, 60 Hz (Emergency / Harbour Generator), TIER II compliant

## Towing and Anchor Handling

Bollard Pull:	225.93 MT at 100% MCR 238 MT with independent driven azimuth thruster
Main Winch:	Rolls Royce Brattvaag waterfall type winch, 3 drums (1 x SL500WX and 2 x BSL400WX), all drums provided with remote controlled spooling gears
Load Capacity:	1 x 500 t and 2 x 400 t
Brake Capacity:	600 t on drum's 1st layer
Tow Drum Dimension:	2800 x 5000 mm diameter / 5500 mm length Socket comp 2800 x 5000 mm diameter / 900 mm length with 700 mm split opening
Tow Drum Wire Capacity:	13,600 m of 76 mm wire / 9800 m of 87 mm wire / 1900m of 8" rope Load capacity - 1st layer 500 t @ 15 mtr/min
AH Drum Dimension:	AH Drum SB 1500 x 3750 mm diameter / 2500 mm length Load capacity - 1st layer 400 t @ 20.1 mtr/min AH Drum PS 1500 x 3750 mm diameter / 2000 mm length with socket compartment 1500 x 3750 mm diameter / 900 mm length Load capacity - 1st layer 400 t @ 20.1 mtr/min
AH Drum Wire Capacity:	A/H Drum SB (Designated tow drum) 4,100 m L x 76 mm dia 3,100 m L x 87 mm dia 2,800 m L x 90 mm dia A/H Drum PS 3,200 m L x 76 mm dia 2,450 m L x 87 mm dia 2,200 m L x 90 mm dia
Secondary Winch Dimension:	1500 x 4500 mm diameter / 4500 mm length plus 1100 mm length socket comp.
Secondary Winch Capacity:	1600 mtr of 8" rope
Chain Gypsy Cable Lifter:	2 x 84 mm, 2 x 76 mm
Rig Chain Locker:	624 m <sup>3</sup> chain capacity (in 4 lockers of 156 m <sup>3</sup> each)
Stern Roller:	Rolls Royce double stern roller, 2 x 3 m length x 4.5 m diameter, SWL 750 t (Environmental friendly grease lubricated). Anchor Recovery Frame: Odium, Max. Dynamic Forces: Wire Tension 300 t Transversal Load 75 t Deployment Speed 80 seconds
Tow Pins / Guide Pins:	Karmoy 2 sets of combined Towing Pin and Karm Forks, each unit comprises one pair of tow pins and one fork, SWL 650 t. Stop Pins (Norman Pins) with wire stopper, roller: SWL @ bottom 230 t, SWL @ top 100 t
Wire Chain Stopper:	2 x 650 t
Popup Pins:	2 x hydraulic SWL top 100 t, SWL bottom 230 t

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Spare Reel Capacity: 1500 mtr of 76 mm wire

## Deck Machinery

Tuggers:	RRM, 2 x 24 t, capacity 600 m of 26 mm wire each; Locally, remote, portable-wireless control. RRM, 1 x 17t, capacity 200 m of 25 mm wire each; Locally, remote, portable-wireless control.
Capstans:	RRM, 2 x 15 t with warping head and drum; Drum capacity 45 m x 20 mm wire; Locally, remote, portable-wireless control.
Windlass:	RRM combined windlass / mooring winch Duty on warping ends, 13 t @ 0-15 m/min, light line 0-48 m/min. Duty on cable lifters, nom pull 13.6 t @ 0-12.2 m/min, max pull 20.4 t @ 0-11.3 m/min. Duty on mooring drums, two de-clutchable mooring drums, diameter drum 640 x 1200 x 1000 length, stowing capacity 230 m of 60 mm rope Duty on mooring drums 19 t @ 0-12 m/min, 2 t @ 0-41 m/min, lowering 0-43 m/min.
Bow Mooring:	See Windlass
Smit Towing Bracket:	1 x 300 t
Crane Capacity:	RRM 2 x cargo rail double jib crane max. working radius 14.3 m, min. working radius 3.2 m SWL of 3 t @ 10 - 14.3 m SWL of 5 t @ 3.2 - 10 m 1 x provisions crane, knuckle type, capacity 5 t @ 15 m radius. Winch hook travel of up to 1000 m

## Electronics

Main Radar:	Furuno FAR 2137 S Band 10 cm ARPA, 21"
Auxiliary Radar:	Furuno FAR 2117 X Band 3 cm ARPA, 21"
Auto Pilot:	Tokimec PR 6000
Gyro Compass:	Tokimec TG 8000
Magnetic Compass:	Tokimec Reflector Magnetic Compass
Echo Sounder:	Skipper GDS 102, dual frequency 50 kHz and 200 kHz
DGPS :	Furuno GP-150 Furuno GP-170
Anemometer :	Gill Windobserver, ultra sonic
Speed Log:	Furuno DS-80 Doppler Speed log
Communications:	Radio Plant Furuno RC-1800T 250 W GMDSS Dual C with SSAS & LRIT compliance
ECDIS:	Furuno FMD3200 x 2 units
Weather Fax:	Furuno FAX-408
Satellite Communication:	FBB: Sailor 500 VSAT: Sailor 900
AIS:	Furuno FA-150
Voyage Data Recorder(VDR):	Furuno VR-3000 VDR

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VHF: Furuno FM 8800S semi duplex marine VHF, Furuno FM 8800D full duplex marine VHF

### Discharge Pumps

Fuel Oil:	1 x 150 m <sup>3</sup> /hr - 9 bar (90 m head)
Base Oil:	1 x 150 m <sup>3</sup> /hr - 9 bar (90 m head)
Dirty Oil:	1 x 9 m <sup>3</sup> /hr - 2 bar
Potable Water:	1 x 150 m <sup>3</sup> /hr - 9 bar (90 m head)
Ballast / Drill Water:	1 x 150 m <sup>3</sup> /hr - 9 bar (90 m head)
Liquid Mud:	1 x 75 m <sup>3</sup> /hr - 18 bar
Brine / Mud:	1 x 75 m <sup>3</sup> /hr - 18 bar
Dry Bulk:	50-80 t per hour
Cargo Flow Meters :	Fuel Oil, base oil and fresh water
Hose Connections :	All systems have 5" female camlock couplings with all liquid cargo discharge points installed capable of fitting "Avery Hardoll Dry Break Couplings".

### Dynamic Positioning

Type:	Duplex C series from Converteam
Reference Systems:	Guidance Navigation RadaScan Veripos DGPS HPR prepared
Control Modes:	Control Modes Minimum Power: Joystick manual/auto heading, Mixed axis mode, Auto pilot mode, Ship Follow, ROV follow, Auto Track mode, Auto Sail mode, Simulation, Model Control, Dynamic Positioning
Joystick:	Independent Joystick Converteam

### External Fire Fighting

Capacity:	2400 m <sup>3</sup> /hr, independent from propulsion engines
Monitors:	2 x 1200 m <sup>3</sup> /hr
Throw Length:	120 m
Throw Height:	50 m
Drenching System:	Installed

### Standby Rescue Equipment

1. 1 x SOLAS Type Approved FRC MP 660 Springer with 230hp inboard diesel engine water jet propulsion. Max: 10pax. Speed with 2 persons approx. 32 knots. Davit for quick launch and recovery.
2. Rescue zone on both Port and starboard side Main Deck.

### Ice Capability

1. Ice(C) class



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### Anti-Pollution

Dispersant Tank:	17 m <sup>3</sup>
Spray Booms:	Fixed installed spray nozzles for neat and dilute, PS and SB.

### Accommodation

Berths:	29 x 1 man (single) cabins 4 x 2 man (double) cabins 37 persons (Total) 1 x Client's office 1 x Messroom 1 x Dayroom 1 x Conference room 1 x Hospital
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### Environmental Features

1. All mud tanks of free flowing design with external stiffening and sloped floors. Mud tanks have their own recirculating system with internal spray nozzles.
2. Oily water separator with 15 ppm monitor but can operate below 5 ppm according IMO MEPC 107(49).
3. Sewage Treatment Plant according IMO MEPC 159(55).
4. Cargo loading & discharge station provided with save all to inboard tank.
5. Stern Roller fitted with environmental friendly grease system.
6. Galley macerator

### Miscellaneous

1. Deck strengthened for heavy cargoes 10 t/m<sup>2</sup>.
2. Pneumatic bulk handling system, capable of discharging 2 type of dry bulk simultaneously.
3. Provided with 3 Xenon 2000 watt search lights.
4. Wood sheated main deck except for aft area which is steel plated for anchor handling activities.
5. Provided with anchor recovery frame suitable to launch and recover torpedo anchors.
6. CCTV monitoring system for winches and deck.

### Observation ROV

Model:	Sperre SUB-fighter 15k
Depth rating:	2000m
Speed:	Horizontal 2.5 knot, Vertical 1.9 knot, Lateral 1.8 knot, Turn 60 deg/sec
Manipulators:	4 function and 5 function HYDRO-LEK
TMS:	250m tether capacity
LARS:	Active Heave Compensated Marine Crane LARS
Location:	Installed in ROV Hangar with separate ROV control room

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## FUEL EFFICIENCY

### FUEL OIL CONSUMPTION ON PASSAGE

Fuel Oil Consumption (t/24 hours)-Seastate 2Φ				
Draft(m)	10.00 knot [MAIN ENGINE 1 & 2 WORKING]	12.00 knot [MAIN ENGINE 1 & 2 WORKING]	14.00 knot [MAIN ENGINE 1 & 2 WORKING]	16.00 knot [MAIN ENGINE 1 , 2,3 &4 WORKING]
5	16.98	20.11	26.09	38.89
5.5	18.52	21.92	28.25	41.95
6	20.03	23.21	30.25	44.96
6.5	21.26	25.12	33.04	48.21
7.5	23.95	28.68	36.94	54.82

Φ: Seastate 2 is Light breeze, 4–6 knot wind, 1–2 ft wave height