



VESSEL & EQUIPMENT SPECIFICATION

Polar Onyx – Construction / SURF Vessel



1) GENERAL

Classification and society:
 DNV, SF, E0, DYNPOS-AUTRO, CLEAN DESIGN, NAUT-OSV(A),
 COMF-V(3),DK(+), HELIDK-SH, CRANE, SPS, VIBR, BIS.

Flag: Norway (NIS)
 Design / Type: Ulstein Design, SX 121
 Built: 2014 / Ulstein Yard, Norway.
 Next planned dry-docking: February 2019
 SPS Code 2008
 IMO: 9664706

2) MAIN DIMENSIONS

LOA	130m
Breadth	25m
Depth	10m
Design draft	7.6m
Deadweight (in SURF mode)	abt. 7200 mt
Tank capacity MDO	2 000 m3
Tank capacity FW	1 400 m3

3) MACHINERY

Main engines: 6x 2700kW / Total 16.2MW
 Main propulsion: 3x Azimuths 3000 Kw
 Thrusters:

- Tunnel thruster: 2 x 2 140 kW
- Azimuth thruster: 1 x 2 000 kW

OPERATION+ - Additional redundancy in DP2 / AUTR. Propulsion and Power Systems arranged to tolerate occurrence of a "single failure".
 Vessel to keep position and remain redundant as defined by class (DYNPOS-AUTR) after such "single failure"

4) PERFORMANCE

Speed / Consumption (fair weather):

- Max speed: 15 kts., abt. 50t/day
- Service speed: abt. 13,5 kts., abt. 32t/day
- ECO speed: abt. 10.5 kts., abt. 18t/day
- DP Operations: abt. 13 mt / day (weather & sea state dependent)
- Max endurance: 80 days (weather dependent)

5) DP SYSTEM

DP3 Class DNV DYNPOS AUTRO (OPERATION+), Kongsberg
 Reference system

- 2 x DPS 132, 1 x DPS 232
- Radius system
- 2 x HiPaP 501

ERN: DYNPOS-AUTR: 99,99,99,99
 DYNPOS-AUTR0: 99,99,99,85

6) NAVIGATION AND COMMUNICATION

Equipment according to GMDSS regulations, Area 3 and Naut-OSV notation
 VSAT high speed, broadband satellite communications

7) HELICOPTER LANDING DECK

Designed for: Sikorsky S-92
 Certified according to: CAA CAP437 / DNV
 Helideck D Value: 20,88m (Total size 26.1m - 1,25D)
 Max take-off weight: 12,8 mt

8) SAFETY EQUIPMENT

MOB/Rescue boat: Mare Safety 600
 2 x enclosed lifeboats, 80 pax each.
 4 x Davit Launch life rafts.

9) ACCOMMODATION

Maritime crew: 36
 Single cabins: 14
 Double cabins: 11
 Charterers' personnel: 94
 Single cabins: 34
 Double cabins: 30

Facilities: On-line room, Off-line room, client offices (4), OIM office, 1 conference room, 1 conference room/ helicopter reception, 33 seats Auditorium w/ video cannon, lounges (3), hospital, fitness room, Male and female wardrobe.

10) CREW MATRIX

Manning for 130 crew

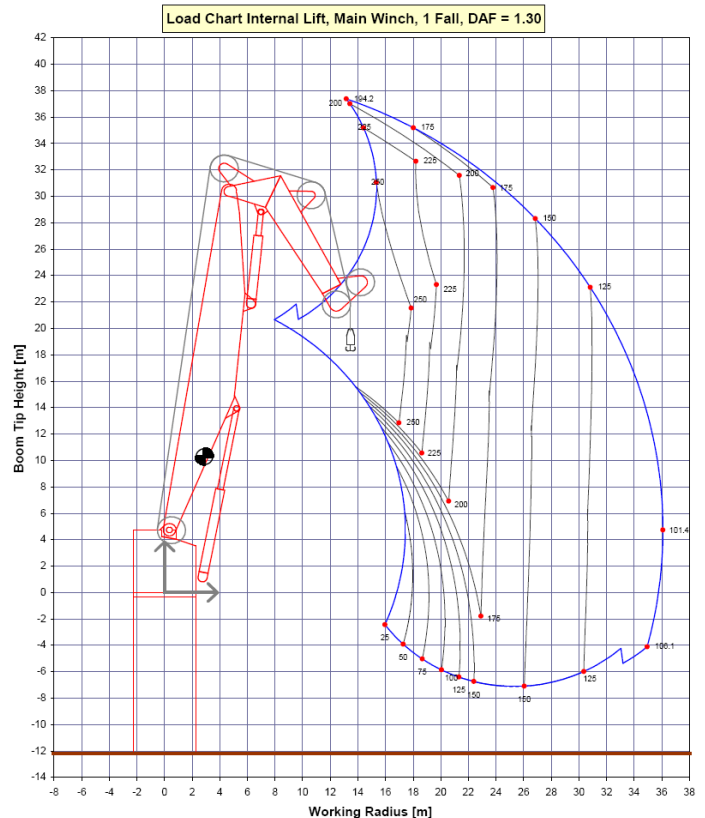
- 1 x Master (Qualified DPO)
- 1 x Chief Officer (Qualified DPO)
- 3 x 2nd Officer (Qualified DPO)
- 3 x Able Seaman
- 1 x Ordinary seamen
- 2 x Bosun/ Qualified Crane driver
- 1 x Chief Engineer
- 1x 2nd Engineer
- 2 x 3rd Engineer
- 1 X Fitter
- 2 x Motormann
- 1 x Electrician
- 1 x Ass Electrician
- 1 x Chief Steward
- 4 x Chief Cook / 2nd Cook
- 4 x Cabin Steward/ Stewardess
- 2 x Galley Steward/ Stewardess
- 2 x Laundry boys

Nationality of the Crew is Owners' discretion. Crew model may be adjusted as need be

11) LIFTING EQUIPMENT

Primary Deck Crane NOV 250t AHC / 3000m wire

- Max lifting capacity: 250t, outreach 16m / 100t at 36m
- Aux hook: 20 mt, 1 fall, with personnel transfer



Secondary Deck crane, port side:

- Knuckle boom, 12 mt @ 15 m
- max outreach 21 m

2 x LARS for deployment of Work ROVs through moonpool and starboard side. SWL 12t

12) DECK

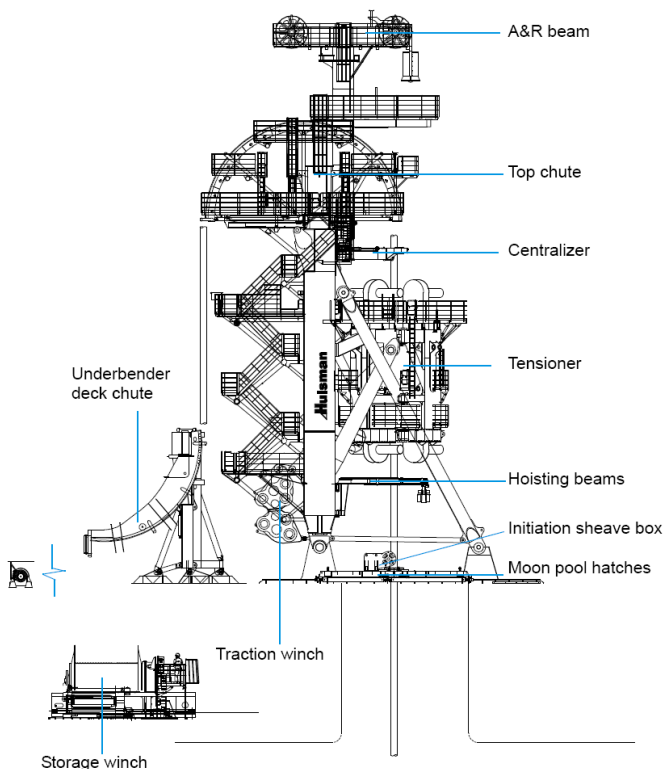
Open deck area: 1700m² (1150m² free area aft of VLS tower)
 Deck load capacity ~5800t (w/crane stowed)
 Deck strength: 10t/m²
 Main Moonpool: 8m x 8m, reinforced for 275MT VLS
 Work ROV Moonpool: 4.9m x 4.9m in hangard

13) DECK OUTLET

Marine Diesel: 117 M3/h - Bunker manifold. 0.9 M3/h - Hose reel
MEG: 318m³ tank capacity. 2 x 100m³/h pump capacity
Fresh Water: 50 m³/h
Working air: hand tools outlets. Work air compressor: 200M3/h, 7 Bar.
Sea Water Service: 2 x 74 m³/h pump capacity
Power outlets: 110V, 230V 450V power outlets for tools and eq.
 450V power outlet for project equipment: 1 Transformer 3 phase 440V 60Hz 350KVA feeding 3 circuits: 2 circuit 450A. 1 circuit 250A
 In addition 1 separate circuit 3 phase 440V 160A
Ac/Ox welding outlet
Survey Interface deck, PA, telephone, Eternet, Clear Com

14) SURF Lay Equipment

275t Huismann Vertical Lay System



- Tensioner

- The tensioner consist of a 4 track tensioner frame that is possible to retract out of fire line. The tensioner can be operated in both a 2 track and 4 track mode.
- Max line pull 4 track mode – 275 Te including 1,2 dynfactor.
- Nominal line pull 230 ton – Pay out speed 19m/min

- Reduced line pull 117 ton – Pay out speed 32 m/min
- Including 6 set of tensioner pads with varying size and contact angle as per pressure squeeze calculations. Capable of handling product diameter from 50mm to 630mm
- Fully controlled with Scada system optimizing squeeze pressure.

- Centralizer

- Retractable Centralizer roller box of two arms with each to rollies that centre the product in the firing line.
- 5m free passage diameter
- Side load capacity of 7,5 ton.

- Top Chute

- Radius controller with 6m radius with. 18 pcs rollers.
- 3m Horizontal Adjustment of location for A&R operations

- Abandon and Recovery (A&R system)

- 15 ton under deck storage winch
- Approx. 3000m of 96mm wire
- 300 ton traction winch with two capstan drums with several windings
- Nominal line pull (dyn factor 1,25) 240ton – pay out speed 19 m/min
- Reduced line pull less than 120tonn – pay out speed 32m/min
- A&R deployment beam located on top of tower with socket catcher.
- Compact socket with swivel.
- Height between A&R socket and tensioner – 10 m
- Height between Tensioner and Hang off Clamp – 6m

- Moon pool worktable.

- Hydraulic operated moon pool hatch with tow hatches sliding aft/fwd.
- Distance between rail stb/ps 5,9m maximum opening 7,8m
- Equipped with an integrated hang off clamp.
- SWL including 1.25 DAF 300 ton
- Hang off clamp inserts of inner diameter 800mm and 250mm with deflector flare of 5700mm radius.
- Maximum horizontal loading from flexible product of 26 ton in all direction. Mechanically locked to ensure safety.
- Aft hatch have detachable initiation sheave box for wire up fire line.
- Moon pool area is covered by 2 davits with hoisting trolleys. 5ton SWL
- 2 tigger winches located on each side of the moon pool for supporting handling in moon pool – SWL 10 ton.
- Moon pool area covered by both vessel cranes.

- Initiation winch.

- Initiation winch to be project specific installed.
- SWL 20 ton
- Approx. 300m wire 36mm
- Electrically driven, locally controlled.

- Underbender.

Currently not installed - to be project specific mobilised (from Stavanger)

- Deck chute with 6,0m bending radius.
- Fleet angle of 100° to cover entrance location for products. Can also handle up to 10° off-lead angle to the chute.
- Equipped with captive rolles below the chute, hydraulic operated and support the product when slack tension.
- Equipped with load tension to measure the back tension of the flexible product. Also equipped with an overload protection device.
- Integrated into Scada control system.