

JAN BABICZ

OFFSHORE SUPPORT VESSELS



WÄRTSILÄ

OFFSHORE SUPPORT VESSELS

0. INTRODUCTION.....	7
0.0 General.....	7
0.1 Code of Safety for Special Purpose Ships (2008).....	10
1. SEISMIC SHIPS.....	15
1.0 General.....	15
1.1 Seismic Ships GEO CASPIAN and GEO CORAL.....	18
1.2 X-Bow Seismic Research Vessel OCEANIC VEGA	24
1.3 Seismographic Research Ship AMAZON WARRIOR	25
1.4 RAMFORM TITAN – class Seismic Vessels	27
2. OFFSHORE STRUCTURES.....	29
2.1 Mobile Offshore Drilling Units.....	29
2.1.1 Drillship GLOMAR C.R. LUIGS	31
2.1.2 Ultra-deepwater Drillship DISCOVERER CLEAR LEADER	32
2.2 Offshore Production and Storage Installations.....	33
2.3 Kvitebjørn Gas and Condensate Field.....	37
3. PLATFORM SUPPLY VESSELS.....	39
3.0 General.....	39
3.1 Platform Supply Vessel EDDA FRAM	42
3.2 Voith-Schneider Propulsor	46
3.3 Platform Supply Vessel VIKING ENERGY	47
3.4 Platform Supply, Rescue and Standby Vessel STRIL MERMAID	48
3.5 Hopper and Blow-Pump Bulk Handling System from CARGOTEC.....	50
3.6 REM HRIST - PSV with multi-application tanks and wet exhaust system	52
3.7 Icebreaker standby PSV VITUS BERING	54
3.8 PSV SIEM PRIDE.....	60
4. ANCHOR HANDLING VESSELS	65
4.0 General.....	65
4.1 Anchor Handling Equipment	69
4.2 Offshore Mooring Equipment	74
4.3 AHTS Vessel OLYMPIC OCTOPUS	80
4.4 Rim Drive Thruster	81
4.5 AHTS Vessel BOURBON ORCA	81
4.6 SIEM PEARL VS491 CD - the AHTS with hybrid propulsion system and SCR.....	83
5. SUBSEA SUPPORT VESSELS.....	89
5.0 General	89
5.1 Active Heave-Compensation Technology (AHC).....	93
5.2 Ultra-Deepwater Lifting System from MacGregor.....	94
5.3 Remote Operated Vehicles.....	95
5.4 Multi-Purpose Support Vessel ATLANTIS DWELLER	101
5.5 Multi-Purpose Construction Vessel NORMAND INSTALLER	106
5.6 Offshore Construction Vessel NORMAND SEVEN.....	113
5.7 Offshore Construction Vessel HOS IRON HORSE	114
5.8 FAR SAMSON – the Multifunctional Plough/Tug/Supply/Subsea Vessel.....	116
5.9 IMR Vessel SEVEN VIKING - Ship of the Year 2013	117
5.10 Subsea Vessel ISLAND PERFORMER	120
6. DIVING SUPPORT VESSELS.....	122
6.0 General.....	122

OFFSHORE SUPPORT VESSELS

6.1	Diving System of ADAMS CHALLENGE.....	125
6.2	Specification of the Modular C300 Saturation Diving System.....	126
6.3	Dive Support Vessel SEVEN ATLANTIC.....	129
7.	PIPELAYING VESSELS.....	131
7.1	Pipelaying methods.....	131
7.2	Pipelaying Equipment.....	135
7.3	Pipe Handling Equipment.....	139
7.4	Pipelay and Construction vessel DEEP BLUE.....	140
7.5	Reeled Rigid Pipelaying Ship SEVEN OCEANS.....	142
7.6	Reeled Rigid Pipelaying Ship APACHE II.....	146
7.7	Flexible Pipelaying Ship SEVEN SEAS.....	147
7.8	High-capacity Flexible Pipelay and Construction Vessel POLAR ONYX.....	148
7.9	Pipelay and Construction Vessel CEONA AMAZON.....	150
7.10	Pipelay/Heavy Lift vessel SEVEN BOREALIS.....	153
7.11	Pipelay and Construction Vessel LEWEK CONSTELLATION.....	155
7.12	Crane vessel OLEG STRASHNOV.....	157
8.	CABLE LAYING AND REPAIR VESSELS.....	159
8.0	Cable Handling Equipment.....	159
8.1	Cable layer NEXUS.....	162
8.2	Cable-lying Ship LEWEK CONNECTOR.....	166
8.3	Cable Layer PIERRE DE FORMAT.....	168
8.4	Cable Layer/Subsea Rock Installation Vessel ISAAC NEWTON.....	168
9.	SUBSEA WELL INTERVENTION VESSELS.....	171
9.0	General.....	171
9.1	Riserless Light Well Intervention (RLWI) System.....	172
9.2	Completion Workover Riser System.....	172
9.3	Riserless Light Well Intervention Vessel ISLAND FRONTIER.....	173
8.4	Light Well Intervention Vessel WELL ENHANCER.....	175
9.5	Subsea IMR and ROV Support Vessel EDDA FAUNA.....	176
9.6	Subsea Riserless Well Intervention Vessel ISLAND WELLSERVER.....	183
9.7	Subsea Service Vessel SKANDI AKER.....	184
10.	EMERGENCY RESPONSE AND RESCUE VESSELS.....	185
10.0	General.....	185
10.1	STRIL POSEIDON - the Rapid Response/Rescue and Multipurpose Field Support Vessel.....	189
10.2	Rescue and Standby vessel ESVAGT AURORA.....	190
11.	WIND TURBINE INSTALLATION AND MAINTENANCE UNITS.....	192
11.0	General.....	192
11.1	Wind Turbine Installation Vessel.....	195
11.2	BRAVE TERN.....	198
11.3	Wind Turbine Installation Vessel INNOVATION.....	200
11.4	Wind Turbine Installation Vessel VIDAR.....	203
11.5	Offshore Maintenance Vessel ESVAGT FROUDE.....	206
11.6	“Walk to Work” Maintenance Support Vessel KROONBORG.....	208
12.	APPENDICES.....	210
12.1	Glossary of Juck-up Terms.....	210
12.2	Dynamic Positioning.....	214
12.3	Glossary of Dynamic Positioning Terms and Abbreviations.....	216

3.8 PSV SIEM PRIDE

In October 2015 Polish shipyard REMONTOWA SHIPBUILDING handed over to SIEM OFFSHORE the LNG-fueled PSV SIEM PRIDE. The VS 4411 DF design concept and technical documentation was prepared by Wärtsilä Ship Design, while the workshop documentation was done by Remontowa Marine Design & Consulting, a part of REMONTOWA Holding.



SIEM PRIDE is equipped with a complete Wärtsilä propulsion and power electronics system

In addition to ordinary class notations for PSVs, the vessel has been built with equipment and class notations for Fire Fighting (Fi-Fi II), Oil Spill Recovery in Emergency Situations (Oilrec) and according to NOFO guidelines, Rescue and Standby Services to Offshore Installations (Standby Vessel) for up to 300 persons, Safe Hose Operation System and in accordance with Clean Design and Comfort Class criteria.

Class DNVG: 1A1 Fire fighter(II) Offshore service vessel (Supply) Standby vessel (S) BIS Clean (Design) COAT-PSPC COMF(C-3, V-3) DK(+) DYNPOS(AUTR) E0 Gas fueled HL(2.8) LFL(*) NAUT(OSV(A)) OILREC SF

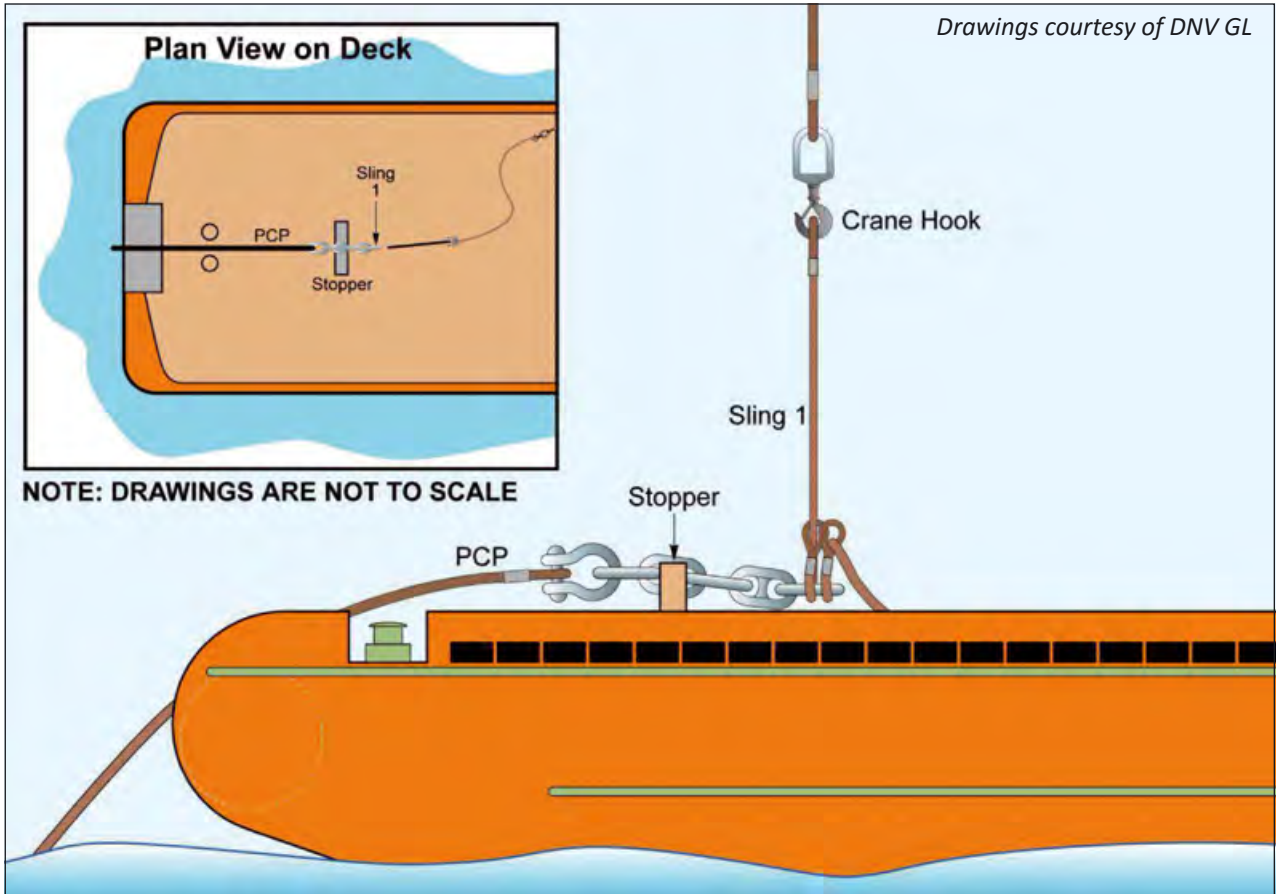
Kongsberg Evotec Launch and Recovery System (E-LARS) is designed to handle work ROVs with or without Tether Management System (TMS) to depths exceeding 4000m. The E-LARS consists of an umbilical winch, cable guides, a handling unit and a common control system. The handling unit handles the ROV/TMS on deck and over the side of the vessel. The umbilical winch handles the ROV/TMS from the handling unit to the operation depth. The system can be operated both in automatic, semi-automatic or manual mode. The advanced control system ensures best possible functionality for the complete system at all times.

The ship features complete Wärtsilä delivered diesel-electric marine power plant with Wärtsilä dual-fuel generating sets, the Wärtsilä LNGPac gas storage and handling system, and the complete electrical and automation system, including Wärtsilä Low Loss Concept solution.

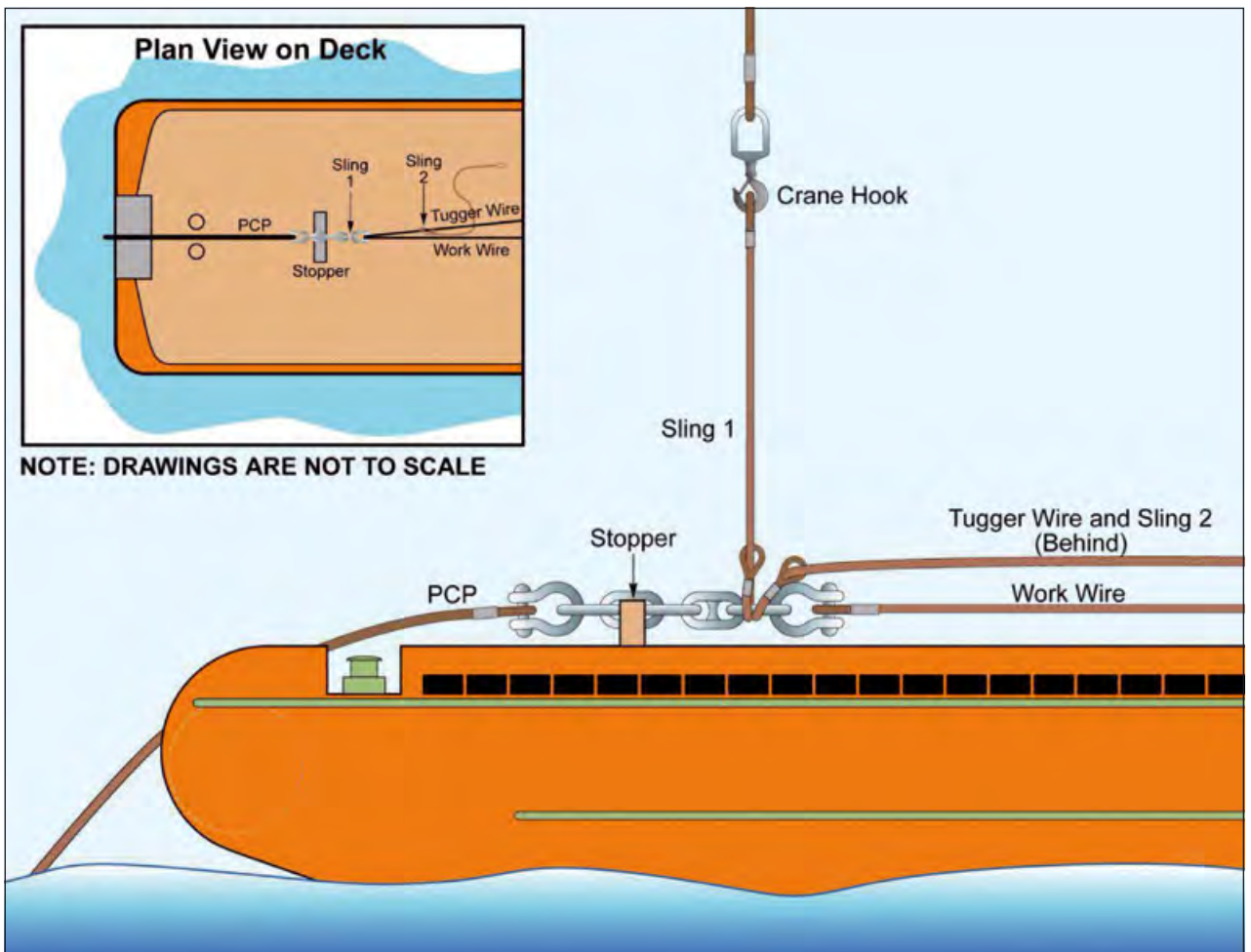
The Wärtsilä outfit embraces two 6L34DF engines (MCR 2610kW at 720rpm) and two 8L20DF engines (1408kW at 1200rpm). All engines are designed for continuous operation, without reduction in rated output, on natural gas. LNGPac H230 gas storage and handling system is fitted in a compartment with A60 fire insulation, and is well protected (B/5 from ship side, B/15 from bottom). The system is based on a double shelled vacuum insulated LNG tank IMO type C. The LNG tank insulation is sufficient to keep the gas in liquid state for extended periods, even without any gas consumption.

The LNG is processed inside the Tank Connection Space. The Tank Connection Space is a gastight enclosure with dedicated ventilation, made of stainless steel and therefore functioning as a second barrier to avoid LNG spill to

Drawings courtesy of DNV GL



Connecting Chasing Pendant

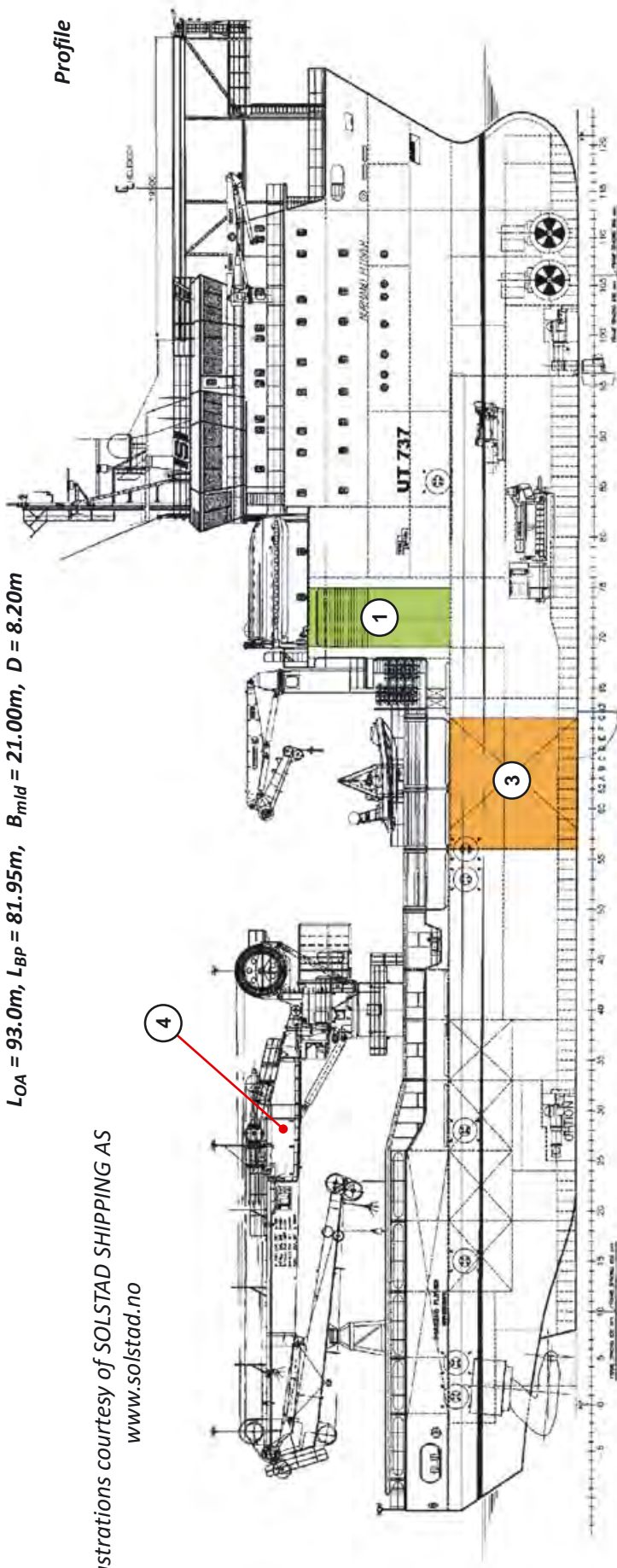


Releasing Chasing Pendant

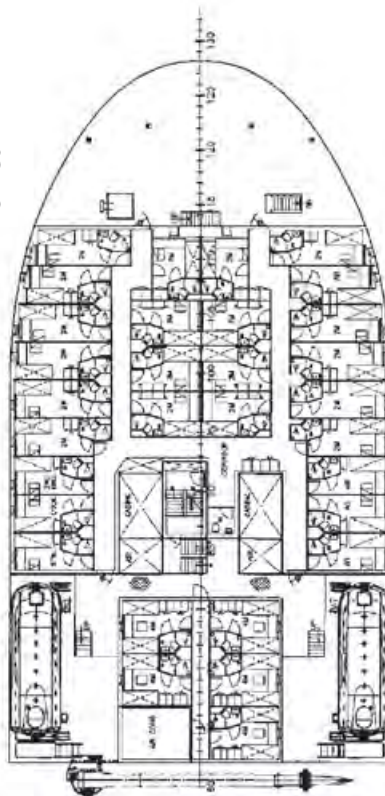
SUBSEA SUPPORT/SUPPLY VESSEL NORMAND FLOWER
 $L_{OA} = 93.0m$, $L_{BP} = 81.95m$, $B_{mid} = 21.00m$, $D = 8.20m$

Illustrations courtesy of SOLSTAD SHIPPING AS
www.solstad.no

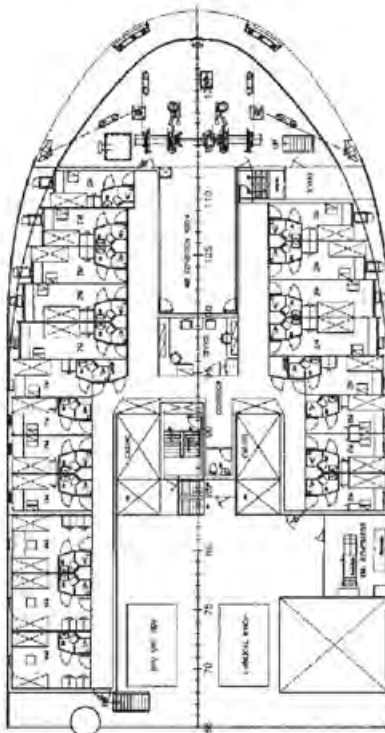
Profile



C-Deck

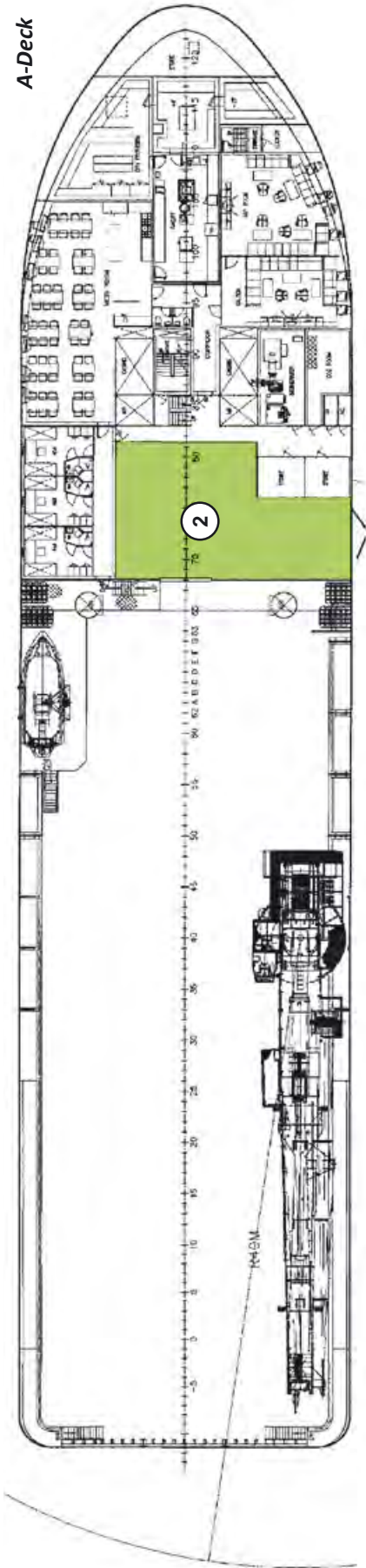


B-Deck

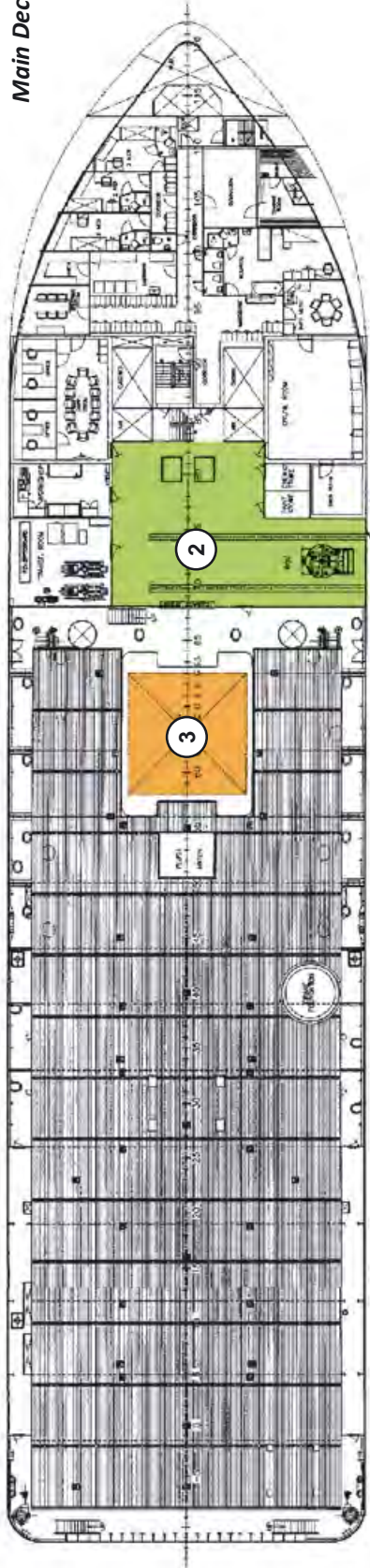


1. ROV hangar door, 2. ROV hangar, 3. Moonpool, 4. AHC crane

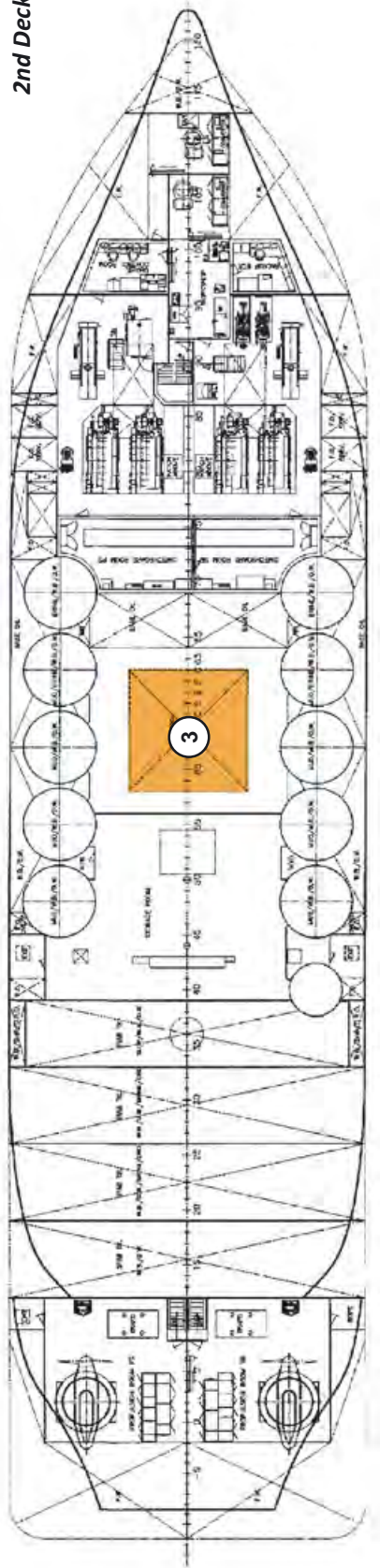
A-Deck



Main Deck

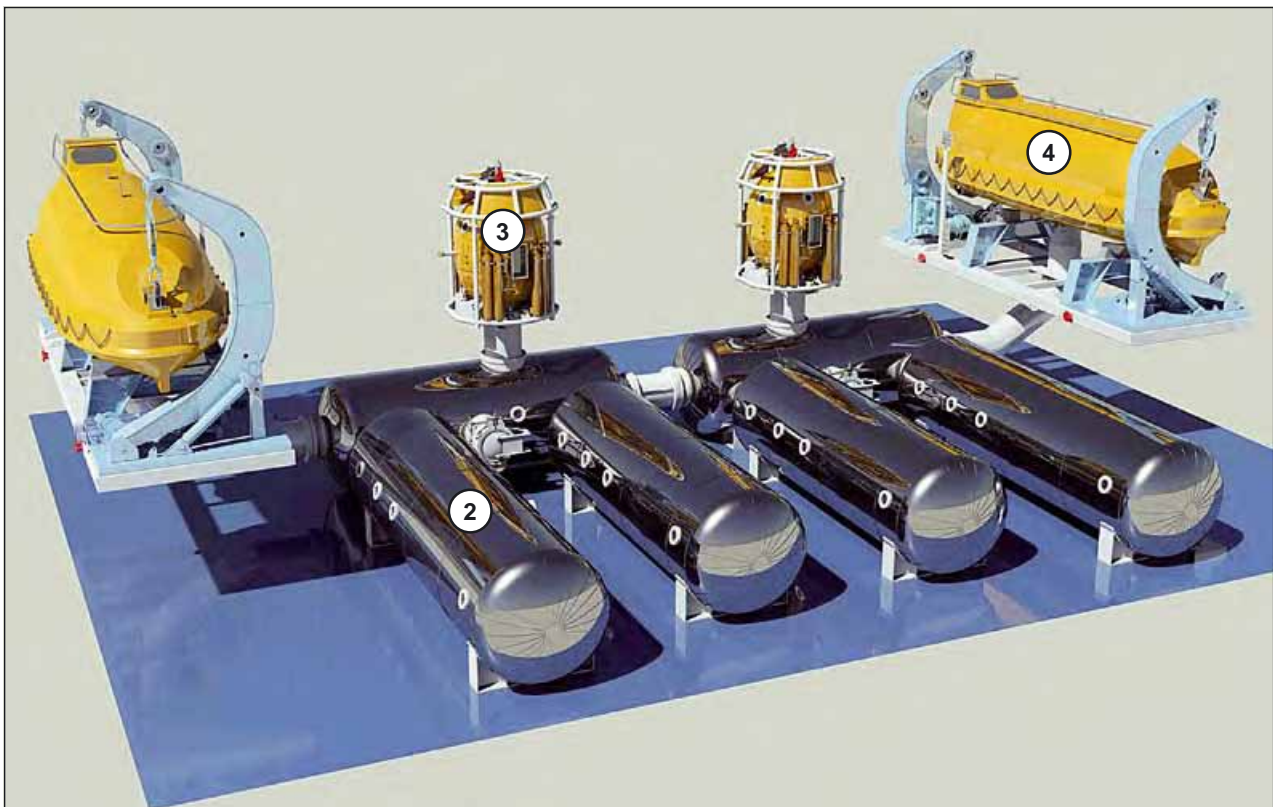
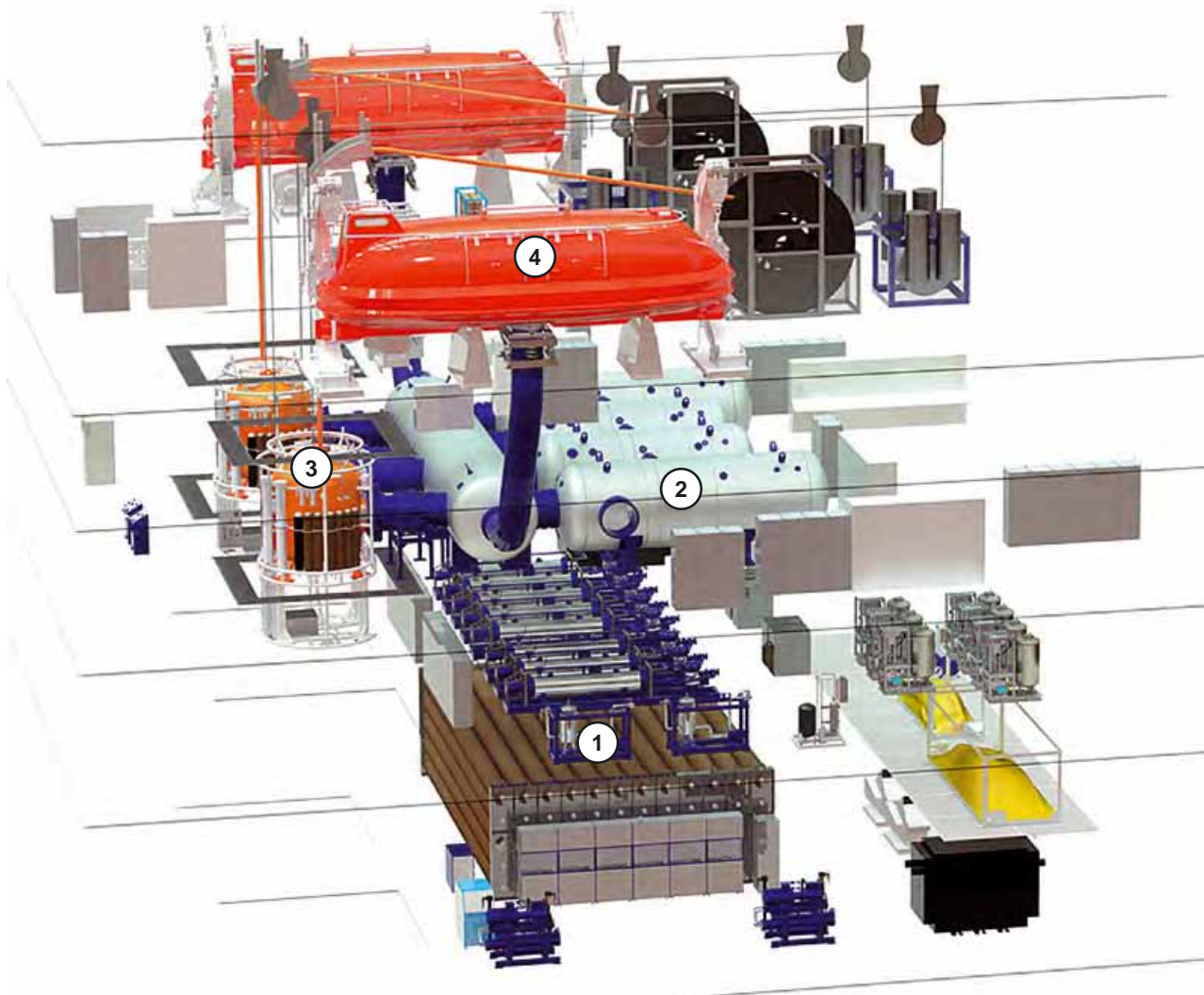


2nd Deck



OFFSHORE SUPPORT VESSELS

SATURATION DIVING SYSTEM



1. Life support system 2. Decompression chamber 3. Diving bell 4. Hyperbaric lifeboat

9.7 Subsea Service Vessel SKANDI AKER

SKANDI AKER is built according to the STX Europe OSCV 06 L design and is arranged for deep water riser-based intervention as well as for shallow water riserless subsea intervention, including subsea construction and installation work as well as maintenance work. The vessel is capable of performing well intervention operations at water depths up to 3000m, while other existing well-intervention vessels are limited to about 800m depth.

Furthermore, and perhaps the most striking technical feature of this vessel, is that she can operate as a light drilling unit, and thus the ship has been classified as both ship and drilling unit. It is thus evident that when it comes to technical features this ship is in the forefront in this field today. Instead of labelling her narrowly as well-intervention vessel, well cleaning vessel, vessel for coil-tubing or as a drilling unit, the shipyard has introduced the collective term "Subsea Service Vessel".

Photo courtesy of STX/H.Volderhaug

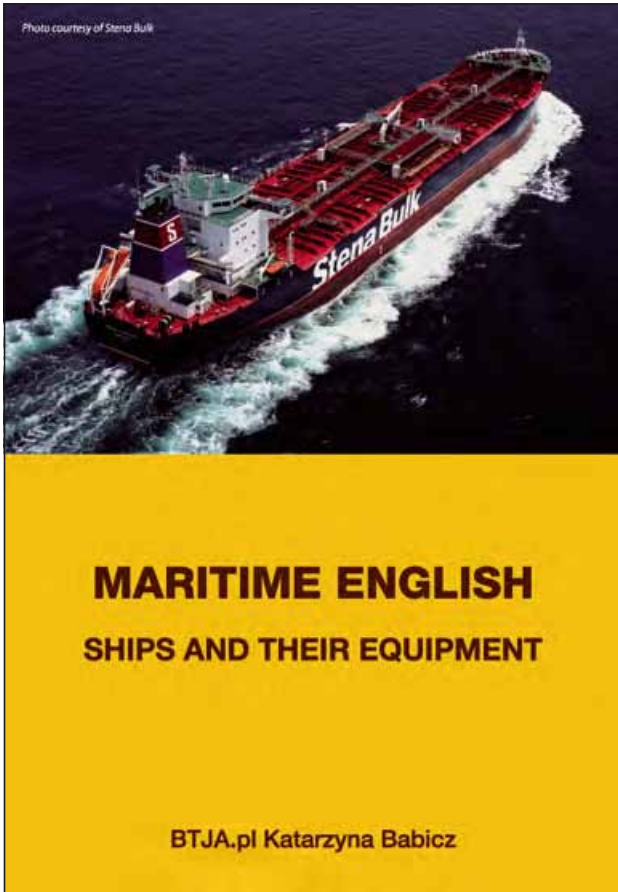


SKANDI AKER is the first intervention vessels to classified according to DNV's WELL-Notation, meaning the vessel is able to take oil on board. As a result, the vessel can perform well-testing and clean-up, flaring off hydrocarbons through a flare at the stern. The vessel can also perform through-tube rotary drilling with coil and downhole motor, and managed-pressure drilling. When she is not performing well intervention work she can perform subsea installation and construction work, handling 225t structure down to 3000m.

SKANDI AKER is built to DNV class @1A1 with ICE-C, Well Intervention Unit, COMF-V(3)C(3), DYNPOS-AUTRO (IMO III), NAUT-AW and CLEAN DESIGN to mention some of the notations.

The 157m long ship is the largest monohull subsea well intervention vessel built, boasting a large deck space, heavy capacity subsea cranes, excellent seakeeping performance, all interventions using dynamic positioning system, and 18 knots transit speed. She is equipped with a module handling system and a 400t AHC crane.

The vessel has a diesel-electric propulsion system with three propulsors: central screw propeller + two wing contra-rotating azimuth thrusters (2x3000kW). Length, oa: 156.9m, Length, bp: 137.7m, Beam, mld: 27.0m, Depth, mld to the main deck: 12.0m, Max draught: 8.5m, Deadweight, open moonpool/closed moonpool: 11,500/13,000t, Output: 19,200kW, Main propulsors: Screw propeller + two contra-rotating azimuth thrusters 2x3000kW, Speed: 18 knots.



This publication is intended for people with a reasonable/basic command of English who want to learn/acquaint themselves with technical maritime vocabulary. It is primarily designed as a self-study publication but it can also be used for classroom work and help teachers of English at Maritime Academies.

The publication consists of two parts: a book, Maritime English, comprising 53 units and a CD with exercises.

First 37 units are dedicated to descriptions of equipment and systems in use on modern ships. Each unit introduces a number of specialist technical terms from particular domain. Most of the important new vocabulary is shown in bold print. If you meet a word you don't know, you can try to work out the meaning from the context. Use your dictionary to find out if you understood the meaning correctly.

Units 1-6 are dedicated to theoretic issues like flotability, deadweight, stability and strength. Units 7-18 contain mainly descriptions of deck equipment; anchoring and mooring equipment, lifting appliances and lifesaving equipment, whereas readings in units 19-37 cover propulsion systems, propulsors, engines and various machinery equipment and systems.

The general idea is that each unit can be treated as a separate and complete whole, so it is up to the reader to decide what to read and when to read. All you need to do is to choose units that are interesting for you.

Second edition of the Dictionary of Marine Technology Gdańsk 2014, Publisher: BNC, Authors: K.Babicz & J.Babicz, ISBN 978-83-925155-9-3, Hardback, 400 pages, lavishly illustrated book, size 245 x 175mm.

New version contains the enlarged "classic dictionary" and list of acronyms and abbreviations (252 pages), as well as 146 full color pages of picture dictionary.

There are a lot of new rules and regulations issued by IMO and Authorities in order to ensure safer shipping. However, safety at sea depends on many factors. The least but not last is good knowledge of professional maritime English. This knowledge is very important at all stages: during design, construction and operation of the ship. For these reasons a good glossary of marine technology is invaluable for any person involved in international shipbuilding and shipping industries.

We believe, the improvement of professional marine English in design offices, shipyards, and on board ships is very important factor of safety at sea, and this dictionary is our modest contribution in this huge task.

**For further information
write to
baobab@post.pl**