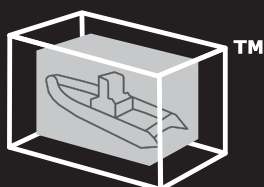


EQUIPMENT

Icebreaker . Research . Naval . Coastguard
vessels



The CubeTM

Multipurpose module for navy vessels

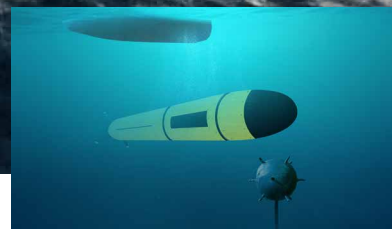
Patent
pending

EQUIPMENT SOLUTIONS

SH Defence master engineering, steel, hydraulics and automation. We combine these into reliable, secure and easy to operate machines and systems solving tasks above and below the waterline.

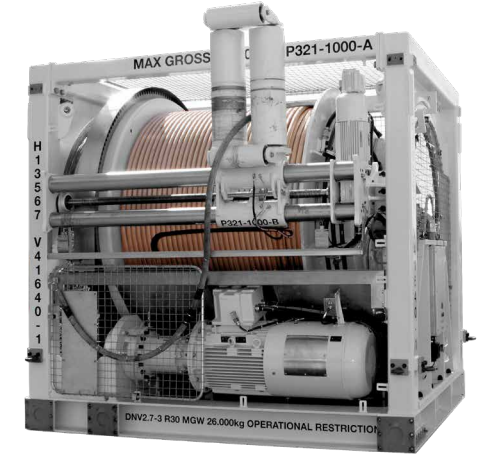
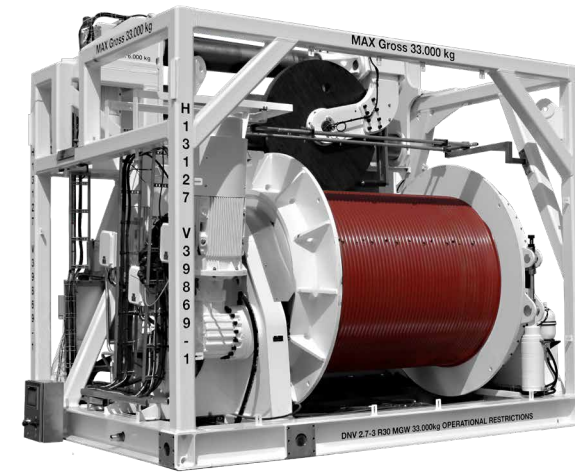


[Video](#)
[Equipment solutions](#)



- | | | | | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>1 Stern door</p> <p>2 Hydraulic boat slipway/cradle
Launching and retrieval of RIBs and fast attack boats.</p> <p>3 Rescue boats/Fast attack boats</p> <p>4 Winches
Winches for ROV, AUV or research equipment handling. Heavy work winches for handling of large modules, tools, trenchers, or fast attack vessels e.g.</p> | <p>5 Steering gear and controls</p> <p>6 Hydraulic Lifting decks
All kinds of side, stern, aft or deck ramps. Elevators for cargo or aircrafts.</p> <p>7 Cranes
Marine and Cargo Cranes up to 120T as: Fixed, Knuckle or Telescopic Jibs.</p> <p>8 Side doors/Hatches
Hangar doors designed to be light in construction, compact in size with maximum durability.</p> | <p>9 Davits
The Boat-In-A-Box™ davit system is installed with either hydraulically controlled davit arms or as a fixed installation. The modular concept means easy installation and easy maintenance.</p> <p>10 Rescue boats/Fast attack boats
High Speed Rigid Inflatable Boats (RIBs), patrol boats, interceptors, workboats for all kind of Naval Operations.</p> | <p>11 Launch and recovery system for ROV/AUV/Drones
Deck mounted and ceiling mounted A-Frames for all purposes with dipping and non-dipping functionality.</p> <p>Extensive outreach for work class ROVs, wide-angle A-Frames to improve performance for launching large subsea tools and AUVs.</p> | <p>12 Hydraulic power units
Design of hydraulic power units and systems to power, control or regulate any machinery or solving any function</p> <p>13 Deck equipment - Winches
Powerful hydraulic or electrical winches for anchoring or mooring functions</p> | <p>14 Deck equipment - Capstans
Anchor, mooring, and towing winches as electric or hydraulic drive systems.</p> <p>15 Gangways
Ship to Ship (STS) motion compensated gangway solutions for personnel or cargo handling.</p> |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|





4

Winches

Rugged and reliable winches for extreme purposes

With the highest quality in mind – From the inside and out SH Defence delivers state of the art winches being **reliable, secure, and easy to operate** in any weather, even the harshest conditions at sea.

With more than 20 years of experience and an excellent track record, SH Defence supplies winches for all types of requirements.

Winches for **ROV, AUV or research equipment** handling. Heavy work winches for handling of large modules, **tools, trenchers, or fast attack vessels** e.g.

Our winches are available in two main types. One is suitable for front spooling, and the other for right angle level wind spooling, allowing the winch to fit in a small hangar or a narrow space.

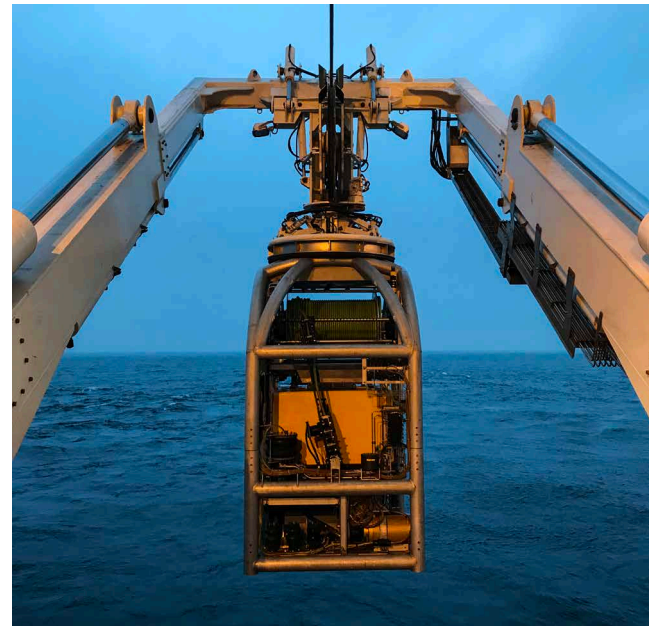
11

Launch & Recovery Systems

SH Defence Launch & Recovery systems combines the best from our **A-Frames**, winches, and software into complete, reliable, and easy to operate, systems. The systems are in operation on **navy, supply, and research vessels** around the world and assist scientists in mapping, and discovering marine life on the sea bed.

AUV Recovery System

With vast experience from hundreds of systems for recovery of ROVs, research equipment, large modules, tools and trenchers our engineering department know the importance of effective, reliable, and **safe handling of AUVs**. Carried out from a moonpool or from the stern, or midship.



13



Deck equipment

Anchor, mooring, and towing winches as electric or hydraulic drive systems. Capstans and anchor capstans with electric and hydraulic drives. Single delivery or complete packages.

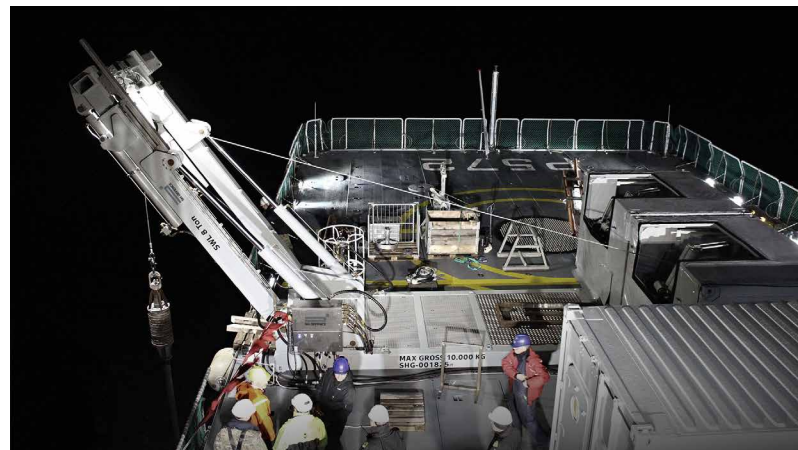
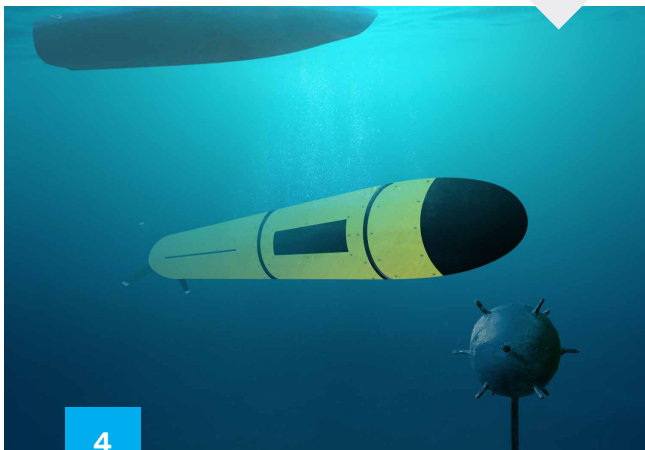
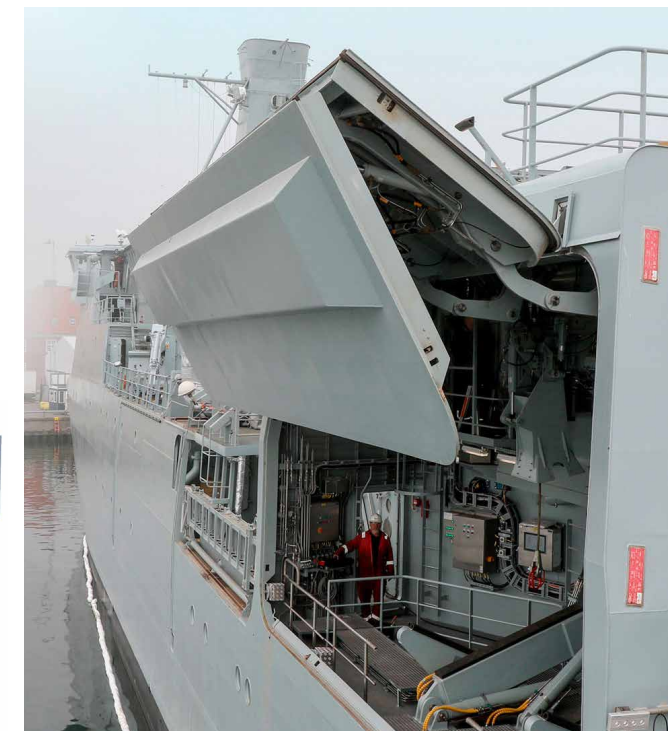
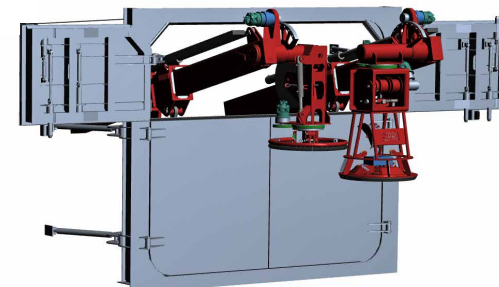
14



8

Side doors and Hatches

The Hangar doors are designed to be light in construction, and compact in size with maximum durability. As **Steel, aluminium and composite** version.



4

5

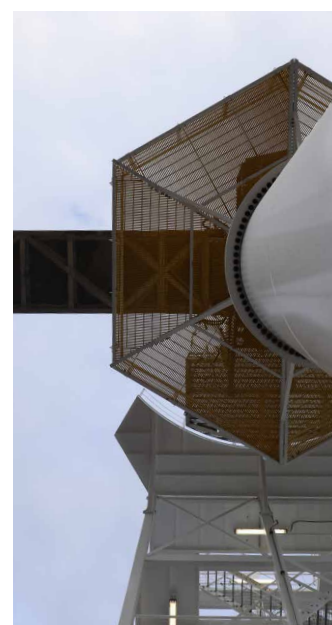
Stern doors and Slipway

Launching and retrieval of RIBs and fast attack boats. SH Defence will provide cradle, roller guides, hydraulics, and control systems.



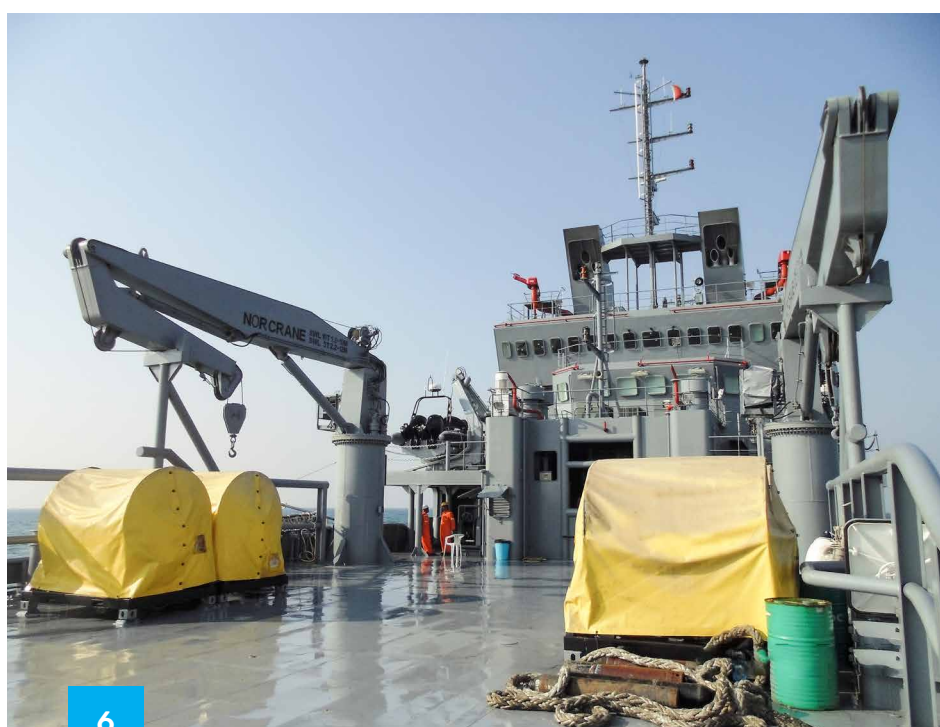
Rescue and fast attack boats

High Speed Rigid Inflatable Boats (RIBs), patrol boats, interceptors, workboats for all kind of Naval Operations.



Gangways and towers

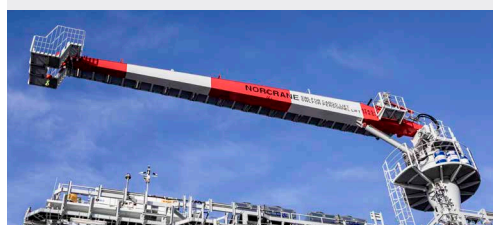
Ship to Ship (STS) motion compensated gangway solutions for personnel or cargo handling.



Cranes

Whatever the configuration our cranes can be modified to do the job. SH Defence delivers Marine and Cargo Cranes up to 120T as: **Fixed, Knuckle or Telescopic Jibs.**

Cranes can be designed to be extremely low in maintenance due to the choice of materials and special anti-corrosive surface coatings.



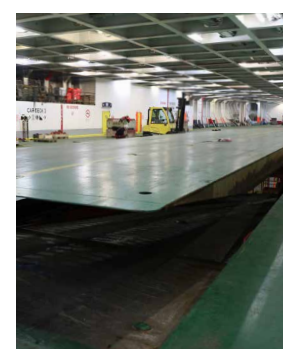
Optional Artic System (IMO Polar Code).

The Boat-In-A-Box™ davit system is a **fully insulated and air heated** closed box performing to **-20 degrees** celcius. Fully operational during ESD and capable of withstanding any extreme weather conditions.



Hydraulic power units

We design and build hydraulic power units and systems from the ground up (also in stainless steel) to power, control, or regulate any machinery or solving any function on request. Our engineering department will Shock test all components on the delivered equipment to simulate explosive charges in the water near a warship.



Hydraulic decks and ramps

All kinds of side, stern, aft or deck ramps. Elevators for cargo or aircrafts.

Davits

The Boat-In-A-Box™ davit system protects the boat, the winch, the hook system, as well as all components and wires.

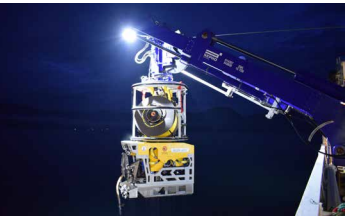
The Boat-In-A-Box™ davit system is installed with either hydraulically controlled davit arms or as a fixed installation. The modular concept means easy installation and easy maintenance.



Steering gear

We design and manufacture **complete steering gear solutions** including **digital control** system with multiple functions and features for all types of navy vessels.





4

Winches

Rugged and reliable winches for extreme purposes
With the highest quality in mind – From the inside and out SH Defence delivers state of the art winches being **reliable, secure, and easy to operate** in any weather, even the harshest conditions at sea.

With more than 20 years of experience and an excellent track record, SH Defence supplies winches for all types of requirements.

Winches for **ROV, AUV or research equipment** handling. Heavy work winches for handling of large modules, **tools, trenchers, or fast attack vessels** e.g.

Our winches are available in two main types. One is suitable for front spooling, and the other for right angle level wind spooling, allowing the winch to fit in a small hangar or a narrow space.

Ship name: Lauge Koch
Deep Sea research equipment for mounting on naval inspection vessel for arctic use. **Design Temperature is -30°C to +40°C.**

The LARS System consists of two hydraulic winches: 50 kN Winch/10 kN Winch and A-Frame 80 kN with a hydraulic extension boom to deploy and recover scientific instrumentation (CTD and water sampling rosette, seismic equipment and cable sheaves for up to 4000 m with 16mm rope/wire.

A The LARS system at the test chamber, where the equipment undergoes a realistic simulation of sea conditions like: Temperature, humidity and salt water. All factors that are essential to know, when the LARS system is in operation for scientific purposes in arctic places.

Ship name: G.O.SARS
Institute of Marine Research, Norway

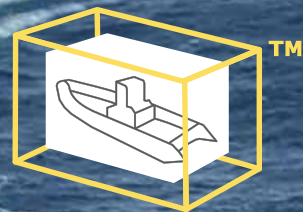
- 1 x DPL 15 A-Frame
- 1 x Ocean Fighter 4400 AHC Winch
- 1 x ROV Container / Workshop with skidding pallet
- 1 x Routing Sheave Arrangement
- 1 x Mochness Winch: 6200m Ø16.3mm
- 1 x CTD Winch: 6200m Ø16.3mm
- 1 x Slow Tow Winch: 6200m Ø16.3mm
- 1 x Hydrographic Winch: 4550m Ø6mm
- 1 x CTD Winch: 4900m Ø8.15mm
- 1 x Deep Tow Winch: 7500m Ø14.3mm
- 1 x Multi Net Winch: 10000m Ø16.3mm
- 1 x Rope Winch: 2000m Ø16mm

Ship name: Shinsei Maru
Jamstec - Japan Agency for Marine-Earth Science and Technology



Name	General Survey Winch	CTD Winch	Medium Wire Winch
Wire diameter	ø10 mm	Ø9,53 mm	ø10 mm
Wire length	7.000 meters	8.000 meters	7.000 meters
Pull on bottom	40 / 32 / top kN	40 / 32 / top kN	59 / 48 / top kN
Speed on bottom	100 / 122 / top m/min.	120 / 145 / top m/min.	120 / 147 / top m/min.
Main drives	2 x 37 kW @ 50 Hz	2 x 45 kW @ 50 Hz	2 x 75 kW @ 50 Hz
Level wind drive	1 x 7,5 kW @ 50 Hz	1 x 7,5 kW @ 50 Hz	1 x 15 kW @ 50 Hz
Frequency converters	2 x 45 + 1 x 7,5 kW @ 50 Hz	2 x 55 + 1 x 7,5 kW @ 50 Hz	2 x 90 + 1 x 15 kW @ 50 Hz
Weight winch	6.000 kg	5.300 kg	7.200 kg
Weight wire	2.520 kg	3.200 kg	3.360 kg
Weight of scientific equipment	800 kg	600 kg	1.000 kg

Large Wire Winch	Deep Tow Winch	Water Sampling Winch	Mooring Survey Winch
Ø14 mm	Ø17,4 mm	ø14 mm	ø14 mm
10.000 meters	8.000 meters	7.000 meters	6.000 meters
137 / 106 / top kN	98 / 67 / top kN	19,6 / top kN	22,5 / 14,5 / top kN
120 / 156 / top m/min.	90 / 131 / top m/min.	90 / top m/min.	165 / 250 / top m/min.
6 x 55 kW @ 50 Hz	3 x 55 kW @ 50 Hz	2 x 22 kW @ 50 Hz	2 x 37 kW @ 50 Hz
1 x 22 kW @ 50 Hz	1 x 15 kW @ 50 Hz	1 x 11 + 1 x 1 kW @ 50 Hz	1 x 2 kW @ 50 Hz
3 x 132 + 1 x 22 kW @ 50 Hz	3 x 75 + 1 x 15 kW @ 50 Hz	1 x 44 + 1 x 11 kW @ 50 Hz	1 x 75 kW @ 50 Hz
23.000 kg	19.100 kg	6.800 kg	5.500 kg
9.400 kg	8.480 kg	3.640 kg	910 kg
1.500 kg	760 kg	N/A	N/A



The Cube™

Multipurpose module for navy vessels

Patent pending



Modular system with endless functions

About the system

The modern role of a vessel is diverse. Today a vessel has to be capable of carrying out different missions and roles whether it is peacetime or wartime.

Such role could be, to act as a minesweeper carrying AUVs and ROVs. The design allows the AUV to launch from the module safely below the splash zone by the compact launch and recovery system.

Other roles could be Diving module with a decompression chamber, a module to deploy and recover scientific equipment, working crane module, weapon systems, surveillance equipment, or fast attack boats or RIBs.

The possibilities are endless.

Storage, maintenance, and transport of such a module has similar advantages. Any given module can be changed within hours, transported overland by truck, and maintained or troubleshot by qualified personnel on a different location.

Key benefits:

- Modular system with endless functions
- Custom made or off the shelf - cost-effective
- Easy maintenance, storage, and handling

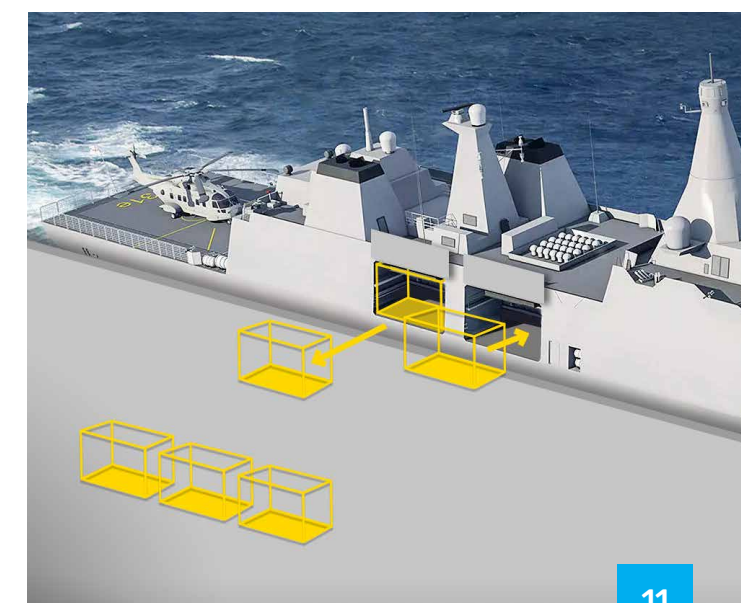
SH DEFENCE

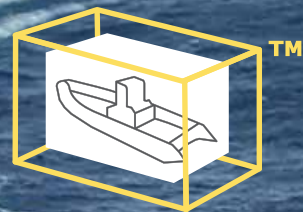


Change of modules can be completed in any harbour in less than a day and only requires a crane.

Example of module functions

- Davit / Fast attack/rescue RIB boat
- Fuel hose winch f or STS
- Office Unit / Medical unit / Lab Unit
- Davit / minesweeper vessel
- Launch & Recovery for Drones / AUV equipment
- Diving module with a decompression chamber
- Foldable crane and lifting equipment
- Air drone launch system
- Enviomental cleaning unit
- Crew boat
- Sonar equipment
- Fire Fighting systems
- Various weapon solutions
- + **And many more options**

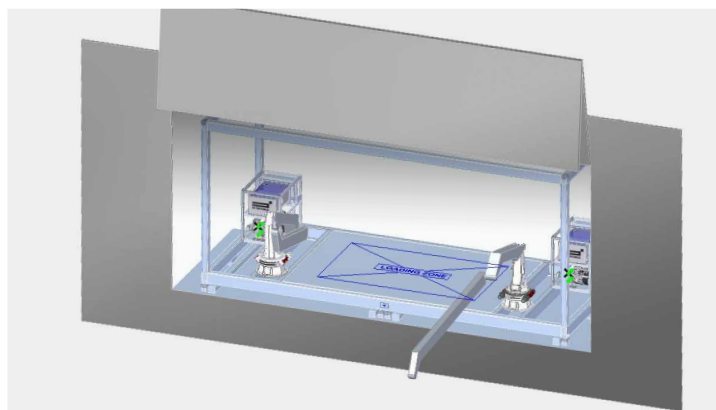
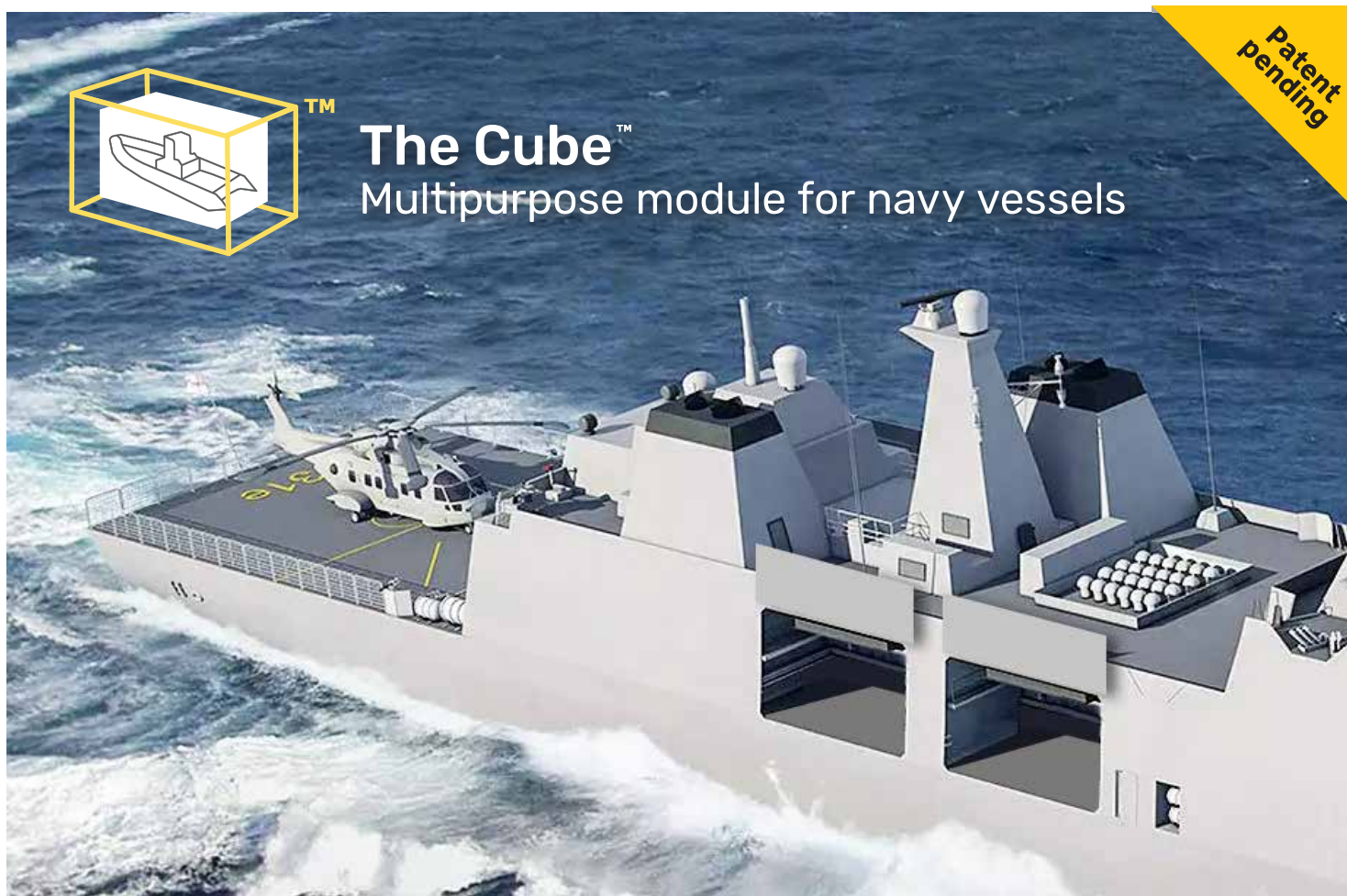




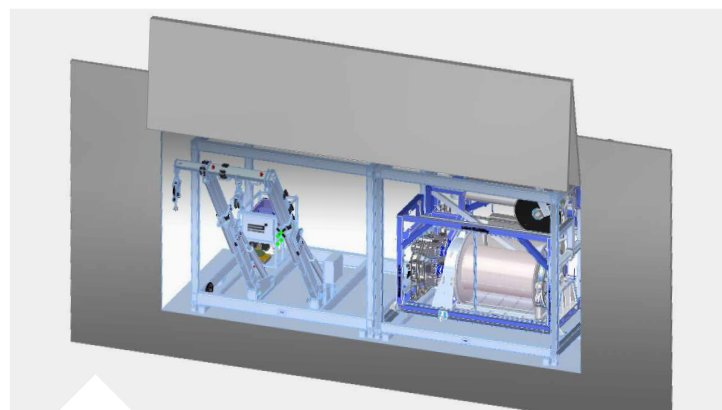
The Cube™

Multipurpose module for navy vessels

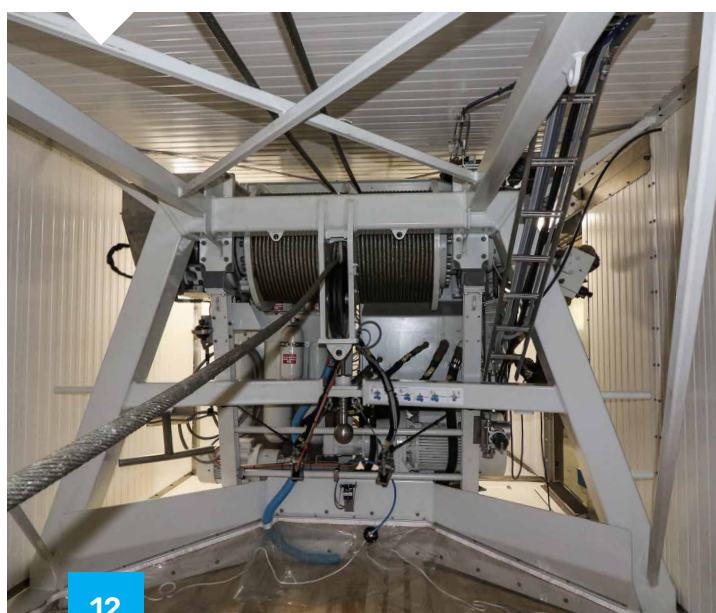
Patent
pending



Inside a SH Defence CUBE, for a Fast Rescue Boat. **A compact and protective environment** with frame, winches and control cabinets.



Electrical driven umbilical winch designed to be as compact as possible. Drum capacity: 3300 meter Ø12.7 mm wire (Optional).



CUSTOMIZED SERVICE

And fast delivery of special manufactured spareparts

SH DEFENCE

The service part covers: Inspection, repair, overhaul and root cause investigations on all kind of hydraulic and electric equipment. Pre-manufacturing, mounting, flushing and pressure test of pipes and hoses, valve overhaul, In-situ machining, laser measuring and alignment.



Frigate F362 Peter Willemoes

Built at Odense Staalskibsværft by SH Defence (SH Group) among others in 2009-2011.

Delivery of complete switchboard package

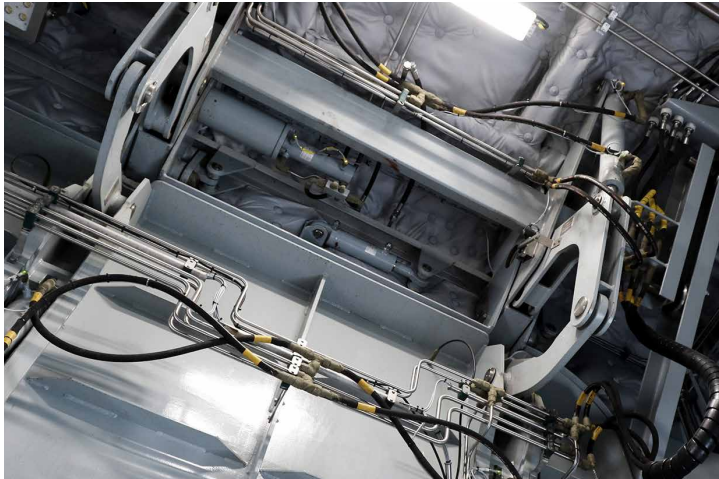
- Main Switchboards
- Emergency switchboard
- Motor Control Centers
- Motor starters
- 400V/230V/24V Distribution panels
- Miscellaneous Control Boards

Service tasks

- 1 or 5 year inspection on all cranes
- Pipe manufacturing and mounting
- Flushing and pressure testing of pipes e.g. Valve hydraulics, CCP systems, hatches, bowthruster, steering gear, WT doors, Fin stabilizers, quick closing valves, deck cranes, davits and helicopter handling
- Laser alignment and measurement service

SERVICE

Inspection, Troubleshooting and Repair



Hydraulic service and engineering

- Service of hydraulic power packs and systems
- Pressure testing and flushing
- Troubleshooting
- Pipe installations up to 115 x 15 mm onsite
- Hose management - replacement
- Implementation of tagging system onsite
- Upgrade of existing equipment
- In-house design and production of HPU's, valves, and control systems

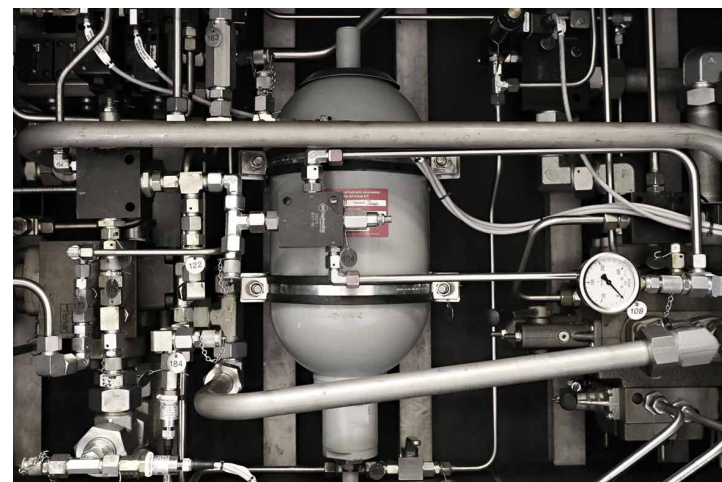
Pipe manufacturing and mounting

- Complete Automation Project Package
- Software development PLC, HMI, Scada
- Frequency drives system
- Ex Control panels according to IEC/Class DNV, LR./UL508A
- Wiring diagram in Caddy++ and PC Schematic
- Remote Access Support on delivered products
- Machine Safety - Risk Assessment
- FMECA, Failure mode effects and critical analysis



Mechanical Service

SH Defence master engineering, steel, hydraulics and automation. We combine these into reliable, secure and easy to operate machines, and systems solving tasks above and below the waterline.

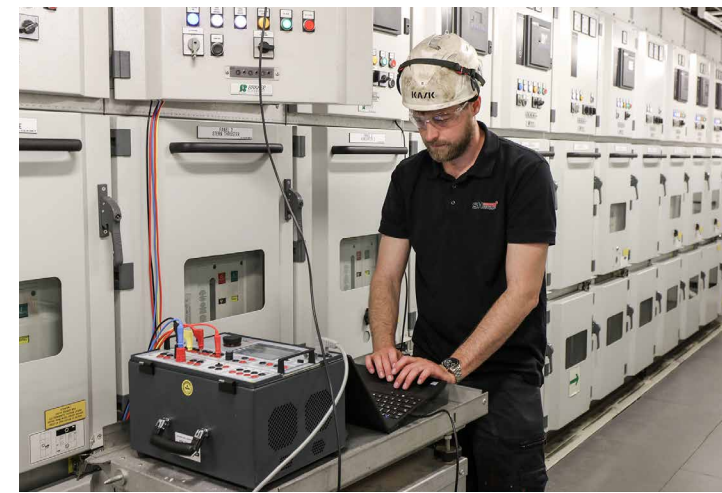


Onsite valve and actuator service

- Service
- Repair
- Testing
- Survey
- Installation
- Recertification
- Positioners calibration
- Technical field support
- Failure analysis
- Valve diagnostics
- PPM check

Related service

- Hydro Pressure testing acc. to API, ASME and manufacture spec.
- N2 Pressure testing acc. to API, ASME and manufacture spec.
- Low-pressure air testing
- Modifications & upgrades with OEM and certified non-OEM parts
- QC & Non-destructive testing
- Report and certificates
- Control panel repair and design
- Actuator service and repair, electrical, hydraulic, and pneumatic
- In-house machining and manufacturing

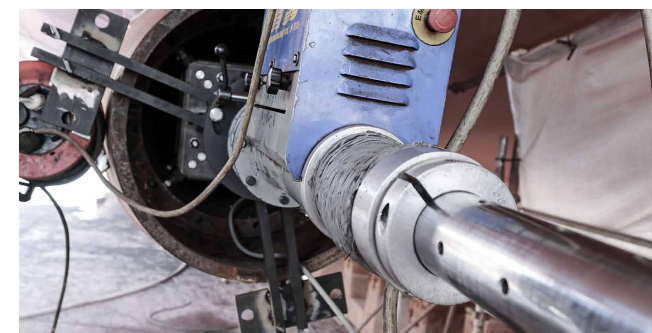


Megger test

Switchboard cleaning and maintenance

Automation

- Complete Automation Project Package
- Software development PLC, HMI, Scada
- Frequency drives system
- Ex Control panels according to IEC/Class DNV, LR./UL508A
- Wiring diagram in Caddy++ and PC Schematic
- Remote Access Support on delivered products
- Machine Safety - Risk Assessment
- FMECA, Failure mode effects and critical analysis



Trouble shooting on all types of equipment

- Mounting / Dismounting
- Assembly / Disassembly
- Inspection and troubleshooting
- Overhaul of gears, winches, cranes, davits, launch and recovery systems, and hydraulic equipment etc.

Electrical service and engineering

- Highly skilled flying squad
- LV/MV switchboard and switchgear service
- Certified Schneider Electric partner - level 3
- Calibration of protection devices
- Ex-test and report by Certified Ex-technicians
- PA/GA
- Fire detection
- CCTV
- Spare parts supply

Circuit breaker test/service and replacement

Thermographic analysis

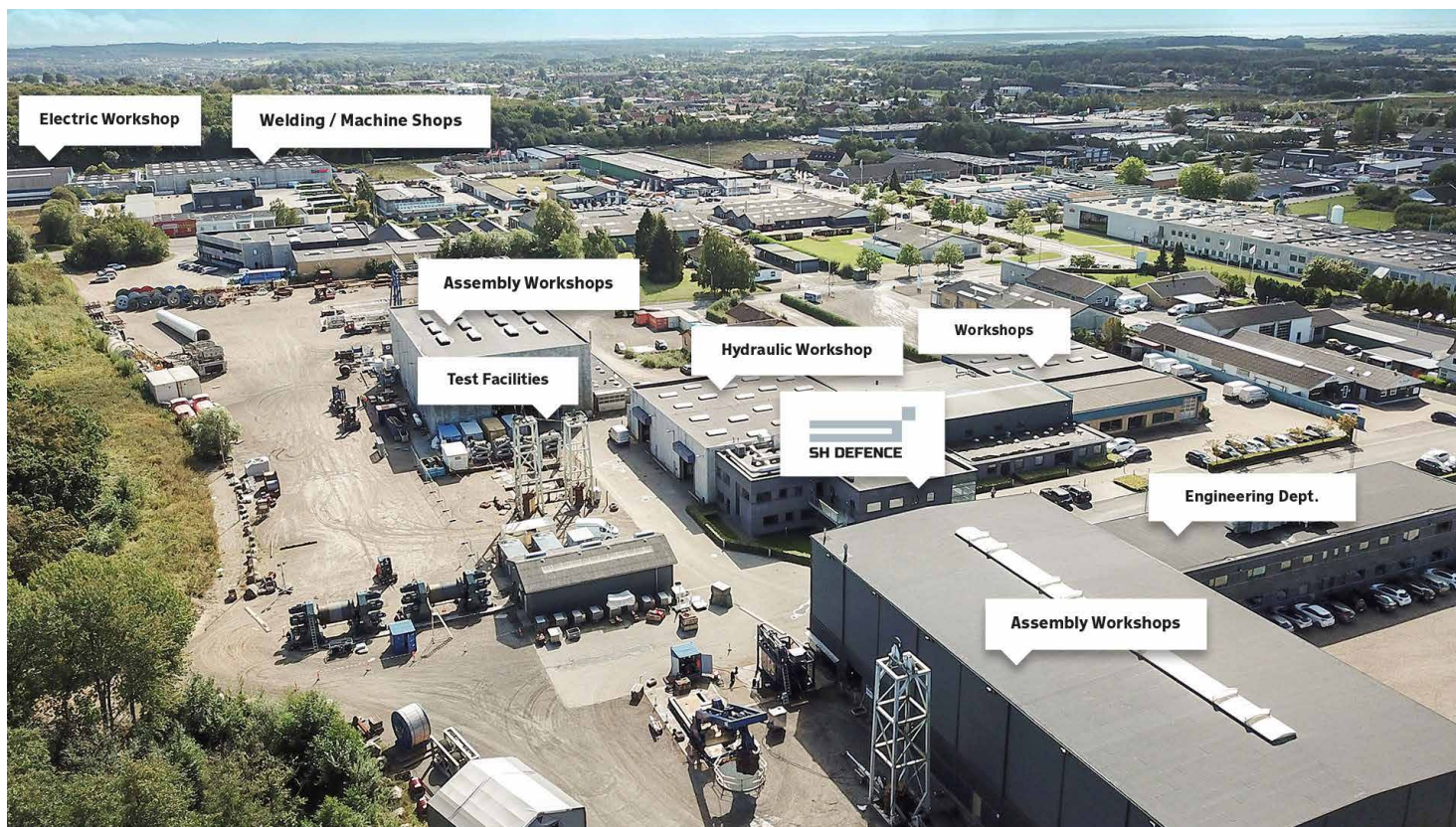
Overhaul on electric motors

- A workshop run in partnership with ABB
- Machine washing station
- Drying oven / Vacuum drying oven
- Armature balancing machinery
- Testing stations
- Painting cabin
- Laser alignment and vibration detection equipment

In-Situ machining tools

Some of our tools for worldwide service:

- In/out line machining
- Flange surface machining
- Foundation machining
- Alignment of engine/generator/propeller shaft/PTO etc.
- Thermal carbon lancing
- Tightening of tension torque bolts
- Hydraulic troubleshooting
- Flushing/pressure test - hydraulic systems
- Boosting nitrogen
- Pipe bending
- Overhauling of hydraulic equipment
- Loadtest to whatever size required
- Service on cranes/LSA equipment according to 402(96)
- Induction preheating
- NDT
- Fab of SMO/FO/HFO/HT/LT and scrubber pipe systems
- Welding of SS and Inconel pipes



About SH Defence

SH Defence has served navies all over the world for more than three decades and has always been compliant with the security regulations in force.

SH Defence is a result of three decades of turnkey equipment and service solutions to various national navies, delivered by the central organisation SH Group.

Facilities

The new department has its own in-house engineering department with state-of-the-art design tools, modern production facilities, and test grounds operated by a highly experienced workforce with security clearance.

Custom-made equipment and retrofit solutions

The product line, among others, covers: launch and recovery systems for drones, diving equipment and mini-

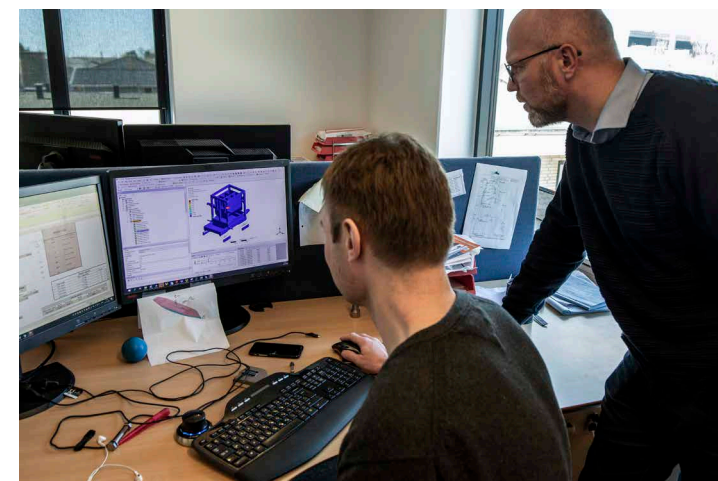
subs, winches, A-Frames, lifting decks and platforms, handling systems, hydraulic power units, steering gear and control systems, Bulkhead doors, side/bow and stern ramps and, special marine cranes.

Service part

The service part covers: Inspection, repair, overhaul and root cause investigations on all kind of hydraulic and electric equipment. Pre-manufacturing, mounting, flushing and pressure test of pipes and hoses, valve overhaul, In-situ machining, laser measuring and alignment.

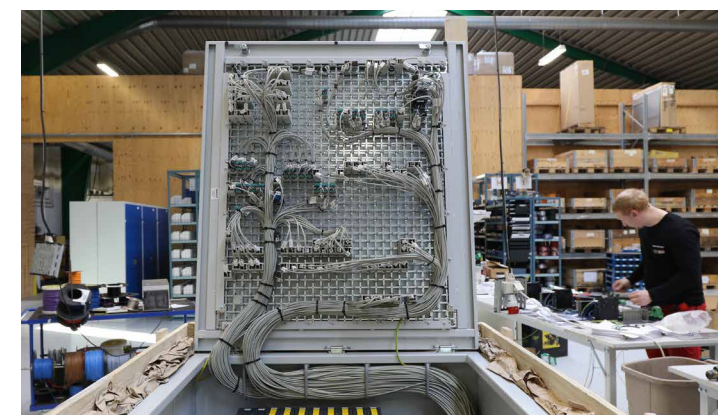
About

Founded in 1974, SH Defence currently employs about 320 qualified employees at the headquarter in Denmark.



SH Defence delivers

- 3D design
- 2D drawings
- FEM calculations
- FEM analysis
- Non linear FEM analysis
- Non linear transient dynamic analysis
- FEM Modal analysis
- CE marking
- Documentation
- HSE
- Project Management
- Site Commissioning
- Field assistance – Supervising



Electrical and Automation

We do inspection, troubleshooting, and repair of electrical systems and have the capability to take responsibility for full project management. We provide electrical engineering and turnkey electrical packages for new builds, retrofits, and conversions.

Our automation department delivers complete project packages, software development, and Ex control panels according to IEC/Class DNV, LR./UL508A.

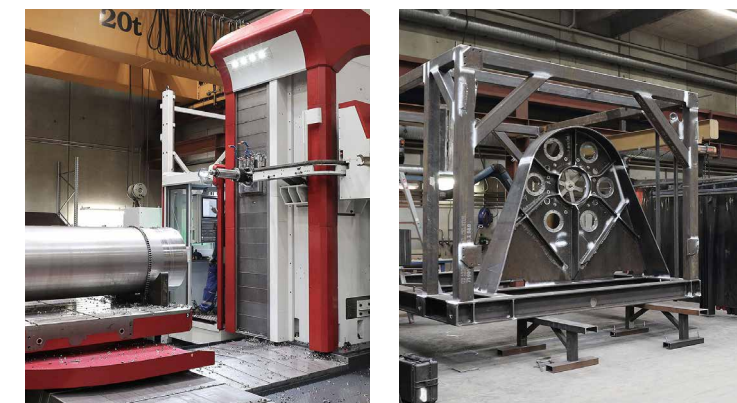
Engineering

The mission of our engineers is to design and manufacture custom-made solutions according to our client's actual needs and technical requirements.

Our solutions are often complex mechanical machines and systems built from the ground up. They combine design, steel, hydraulics and automation and must be reliable, secure and easy to operate above and below the waterline, in any weather conditions and during combat.

Next to the high demands of the navy are the demands and requirements of the oil & gas industry in the northern hemisphere. With the delivery of hundreds of systems and equipment solutions, for more than three decades to this demanding segment, SH Defence will be a perfect partner to take on any engineering challenge.

Our products meet the highest standards!



Machine workshop

SH Defence has its own in-house machine shop with state-of-the-art production tools like horizontal/vertical and multi-task turning-milling machines, heavy-duty lathes, and CNC lathe/milling machines.

Welding workshop

SH Defence delivers welds in aluminium, black steel, carbon steel, stainless steel 304 + 316, duplex steel, and CuNiFe including WPQR (In-house certified IVS).

We deliver NDT testing services on components and all types of materials (also onsite).

Some of our approval partners:



ISO 9001

ClassNK



PARTNERS, AGENTS AND CLOSE SUPPLIERS



Naval team Denmark works in close cooperation with the Royal Danish Navy (RDN) and has an ambition to become a registered and desirable trademark of proven innovative solutions with an exclusive reference to the Royal Danish Navy for both regular and affiliated members.

Naval team Denmark was founded in 1992 and approved by parliamentary authorities in 1995.

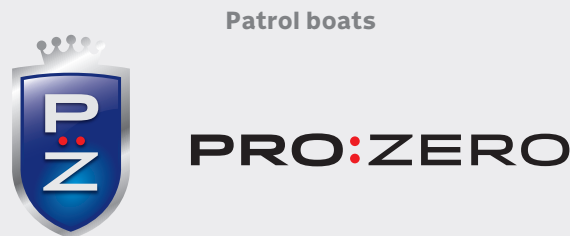
See member list: www.navalteam.dk



Omahams Corp is a certified ISO 9001: 2015 company, actively involved in providing marine-related services and products to the Royal Malaysian Navy and shipyards in Malaysia since 2004.

Omahams Corp main business activities are ship repair and shipbuilding services, including project management, the supply of marine products, and conduct professional and corporate training.

www.omahams.com



Patrol boats

The ProZero series features a line of vessels designed specifically for military use. This includes patrol boats, interceptors, workboats, and more.

Every ProZero Defence vessel possesses all the characteristics essential for long-range security operations. The vessels are designed in close dialogue with individual clients and arranged to accommodate any request for specialized mission equipment. The cockpits are organized to ensure maximum usability of cutting-edge operations management equipment and electronic aids for situational awareness.

www.prozero.dk

Rescue, life and tender boats



Fassmer has a long tradition of building rescue, life and tender boats for many international Navy fleets.

Fassmer’s in-house research and design department is constantly working to further improve the safety and reliability of its products, forcing engineers to stay up-to-date with this cutting-edge industry.

Fassmer’s wealth of experience and knowledge places Fassmer as highly customisable state-of-the-art Navy vessels among the best that are available today.

www.fassmer.de



- | | | |
|----------------------------------------|-------------------------------------------------|-----------------------------------------------------------------------------|
| 1 Stern door | 4 Winches for ROV and Research equipment | 11 Launch & Recovery Systems |
| 2 Hydraulic boat slipway/cradle | | 13 Deck equipment - Winches |
| 3 Rescue /Fast attack boats | 7 Cranes | Powerful hydraulic or electrical winches for anchoring or mooring functions |



Established since 1984, Thai Kolon Company Limited has become a renowned leader among ship machinery and marine equipments’ suppliers e.g. the Royal Thai Navy. As a “One-Stop-Service” supplier, Thai Kolon Company Limited provides the best solution to serve every customer’s requirement at the utmost satisfaction.

www.thaikolon.co.th



Odense Maritime Technology (OMT) was established in 2010. OMTs unique strength lies in the technology expertise and experience within ship design, shipbuilding, ship retrofit concepts, ship licenses, and ship repair coupled with the availability of a team of qualified naval architects, maritime engineers, project management and consultants.

www.odensemartime.com

Worldwide

Custom-made equipment, retrofit solutions, and
full-service for all types of naval vessels



Contact SH Defence

Marketing

Peter Liisberg

+45 4070 3523
pl@shdefence.com

Director

René Bertelsen

+45 2760 1155
rb@shdefence.com

Sales

sales@shdefence.com

Technical Support

technicalsupport@shdefence.com



www.linkedin.com/company/shdefence



Kuopiovej 20 . 5700 Svendborg . Denmark
www.shdefence.com