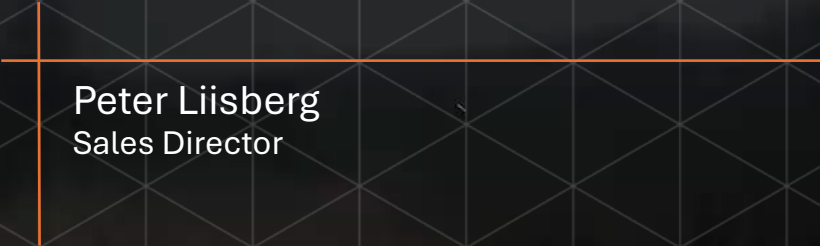


Presentation for AFP

The Cube System – Payloads and Handling System

A graphic consisting of two thin orange lines forming a crosshair. One line is vertical and the other is horizontal, intersecting at a point.

Peter Liisberg
Sales Director



WHO

Peter Liisberg
Sales Director
Responsible for Marketing
Trained as a sergeant in the Danish
Defence within Reconnaissance



SH Defence
Danish maritime defence company



**Launch and Recovery
Systems**



**Containerized
Mission Modules and
Handling Systems**

The Danish Navy



A bit of history.



Modularity is a proven concept

Modules for Harpoon and Sea Sparrow missiles, torpedo launchers, two 76mm OTO Malare and Rheinmetall Millennium gun, ASW and MCM modules and different boat davits.

Still in operation after 40 years
By the Royal Danish Navy



FRIGATE
Three Iver Huitfeldt-class



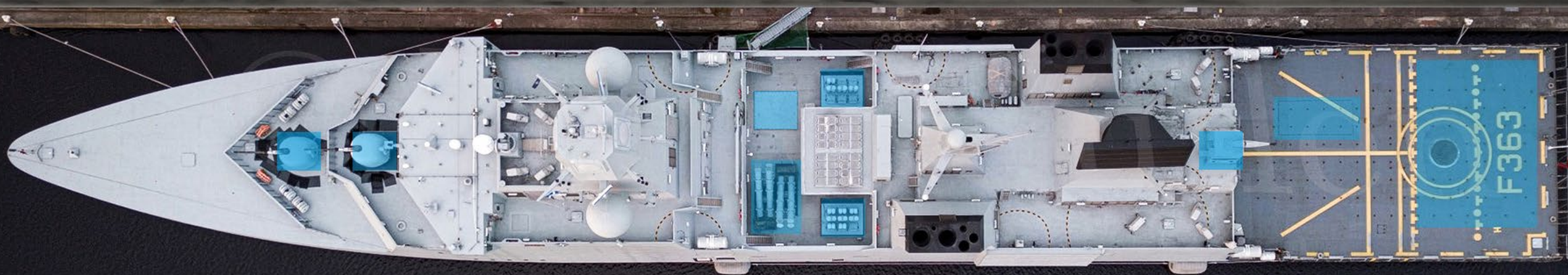
SUPPORT SHIP
Two Absalon-class

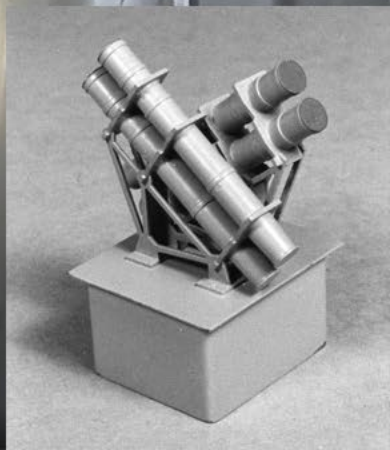
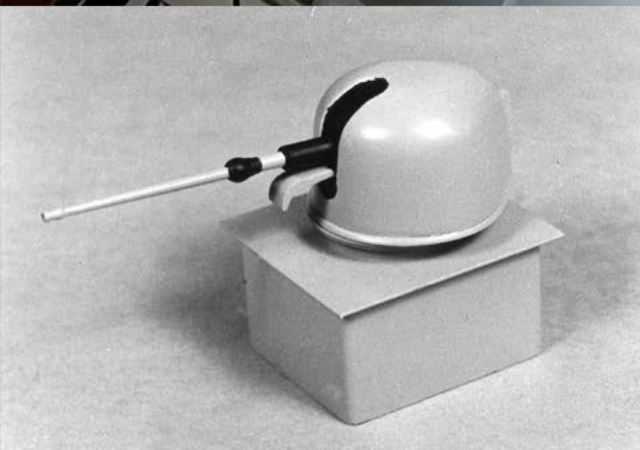


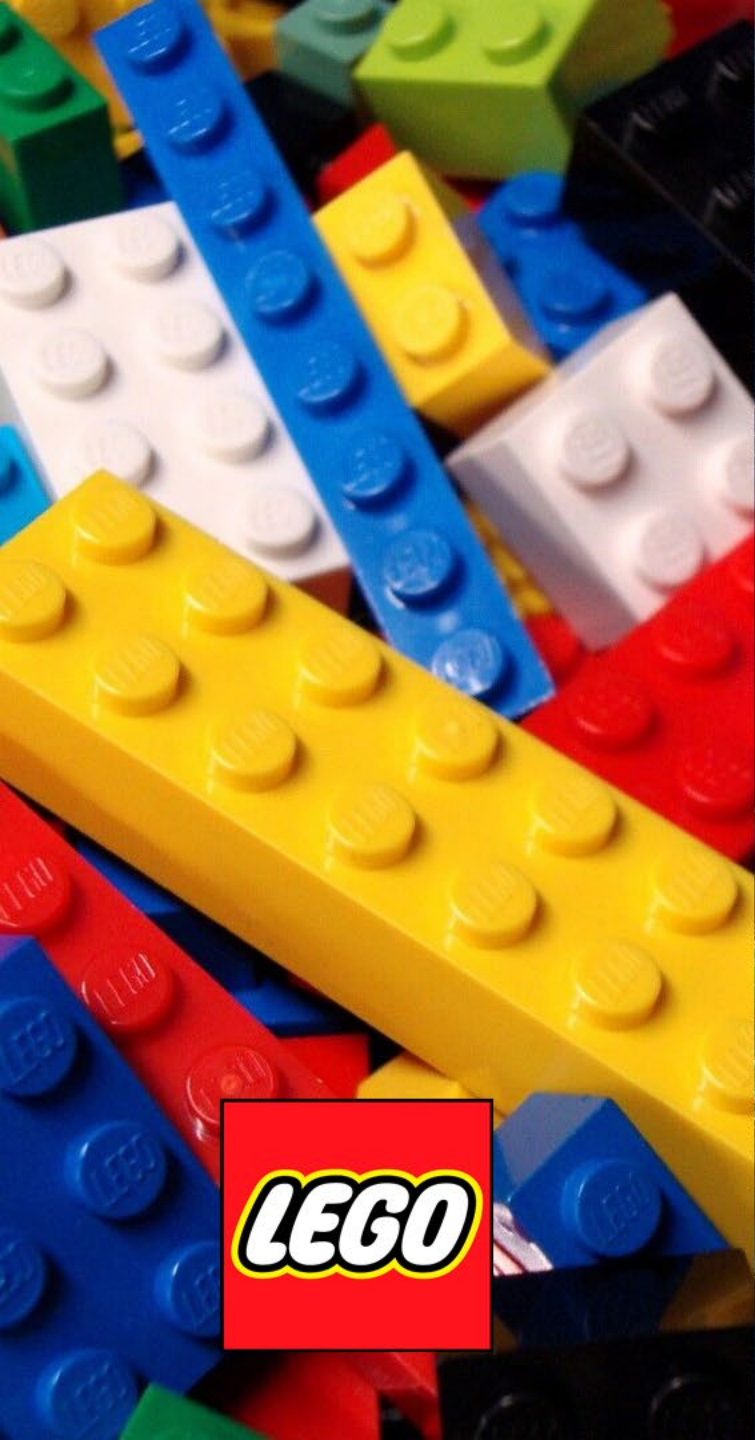
ARCTIC OPV
Three Knud Rasmussen-class



Modules for Harpoon and Sea Sparrow missiles, torpedo launchers, two 76mm OTO Malare and Rheinmetall Millennium gun, ASW and MCM modules and different boat davits.



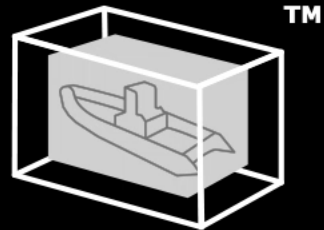




Our heritage lies in bricks that must fit together



MAERSK



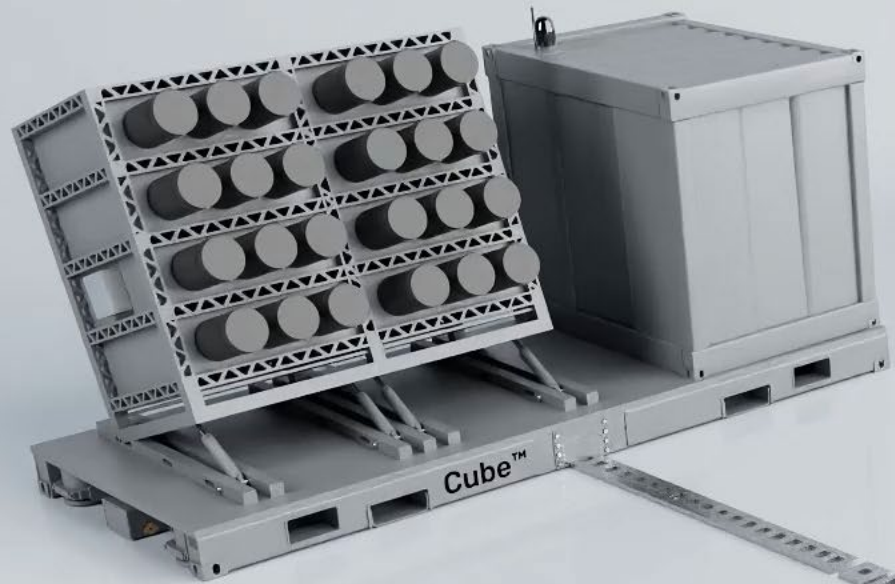
TM

The CubeTM

Multi-Mission Modules for
Coast guard, SAR and Navy vessels

Fully compliant with NATO STANAG 4830 / ANEP-99 - Design and Interface Standards for Containerized Mission Modules





Cube™

Onboard module handling

Remotely Operated Hydraulic Twistlocks





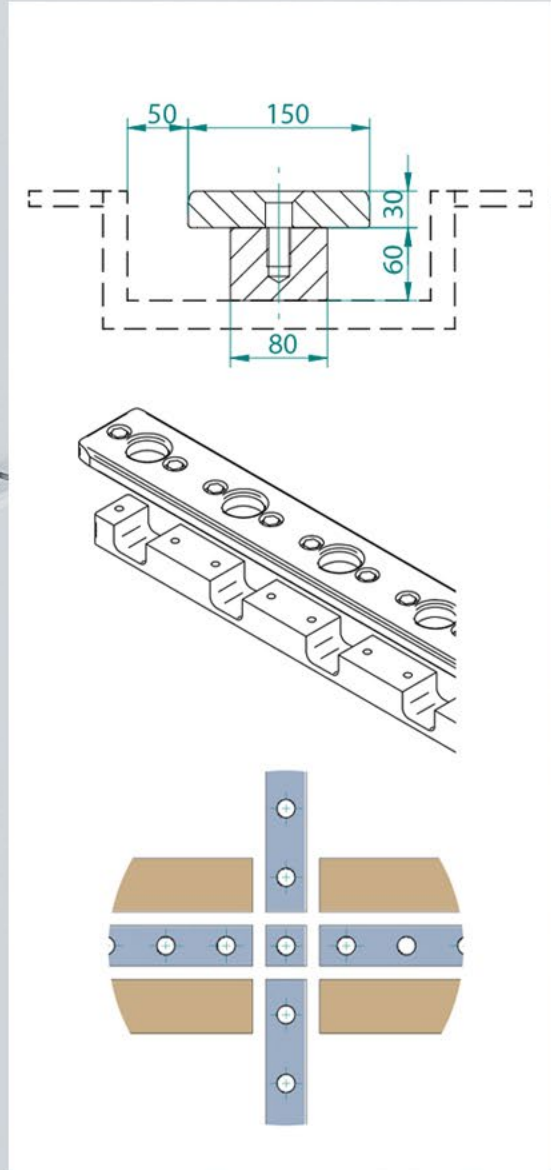
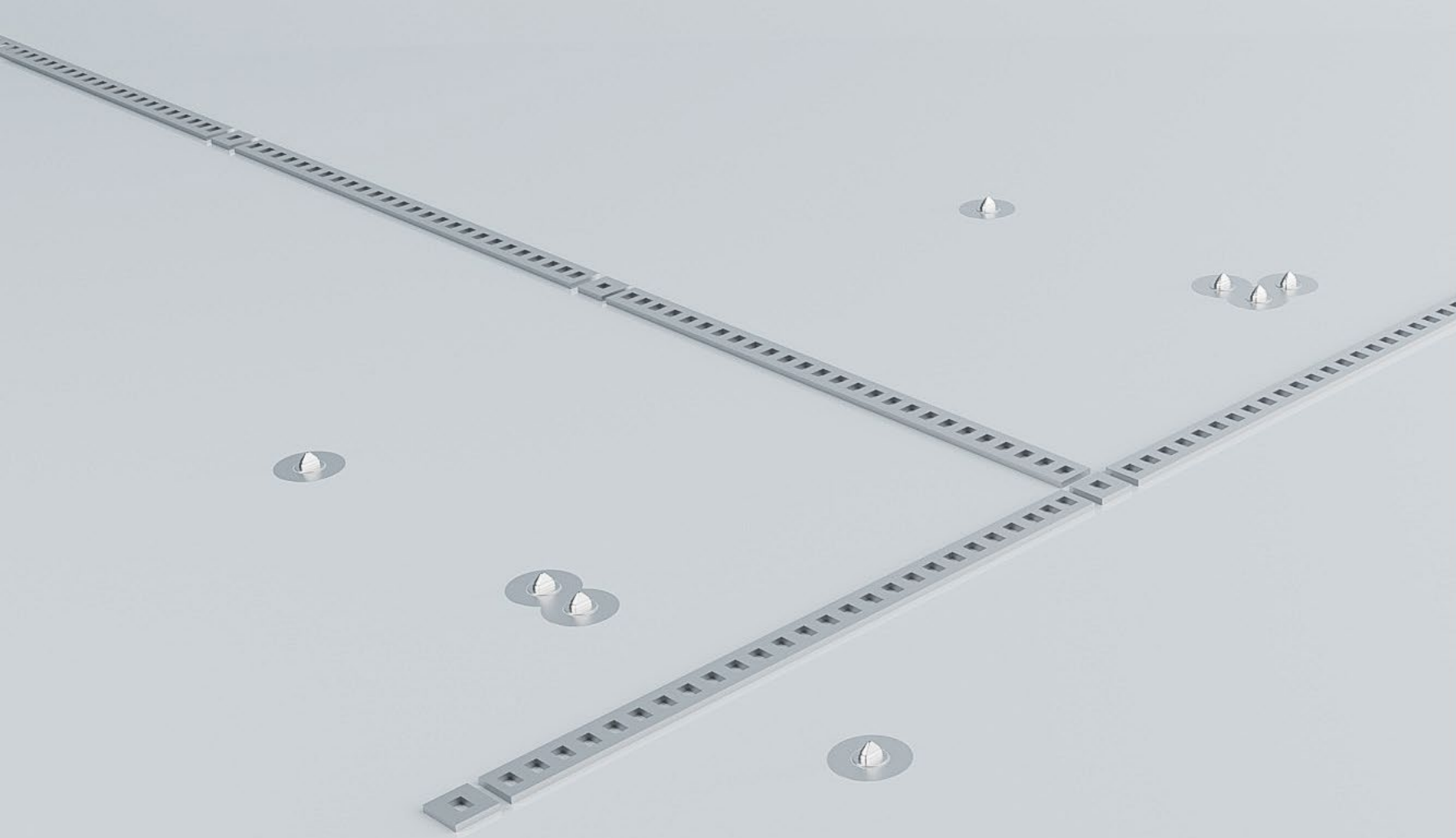
Onboard module handling

Base Frame placed on Remotely Operated Hydraulic Twistlocks



Onboard module handling

Remotely Operated Hydraulic Twistlocks



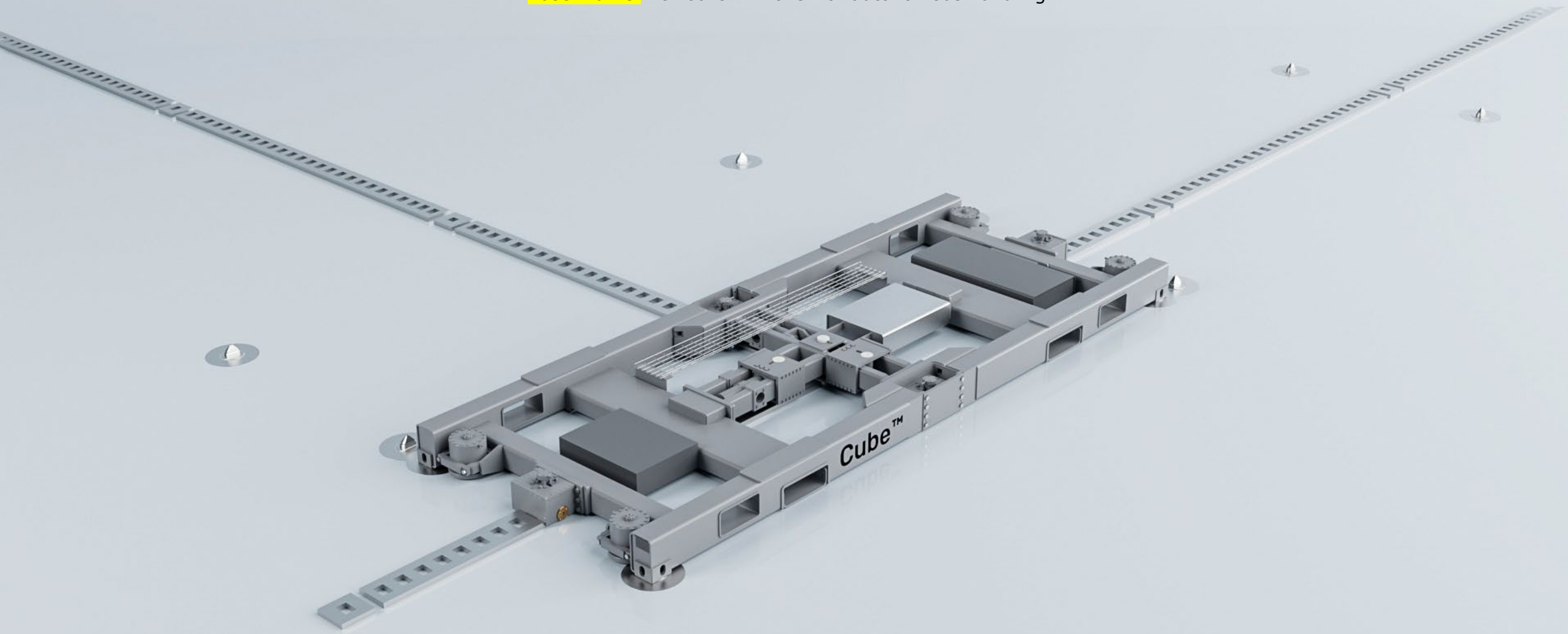
Onboard module handling

Base Frame on Sea State Skidding System secured with Twistlocks

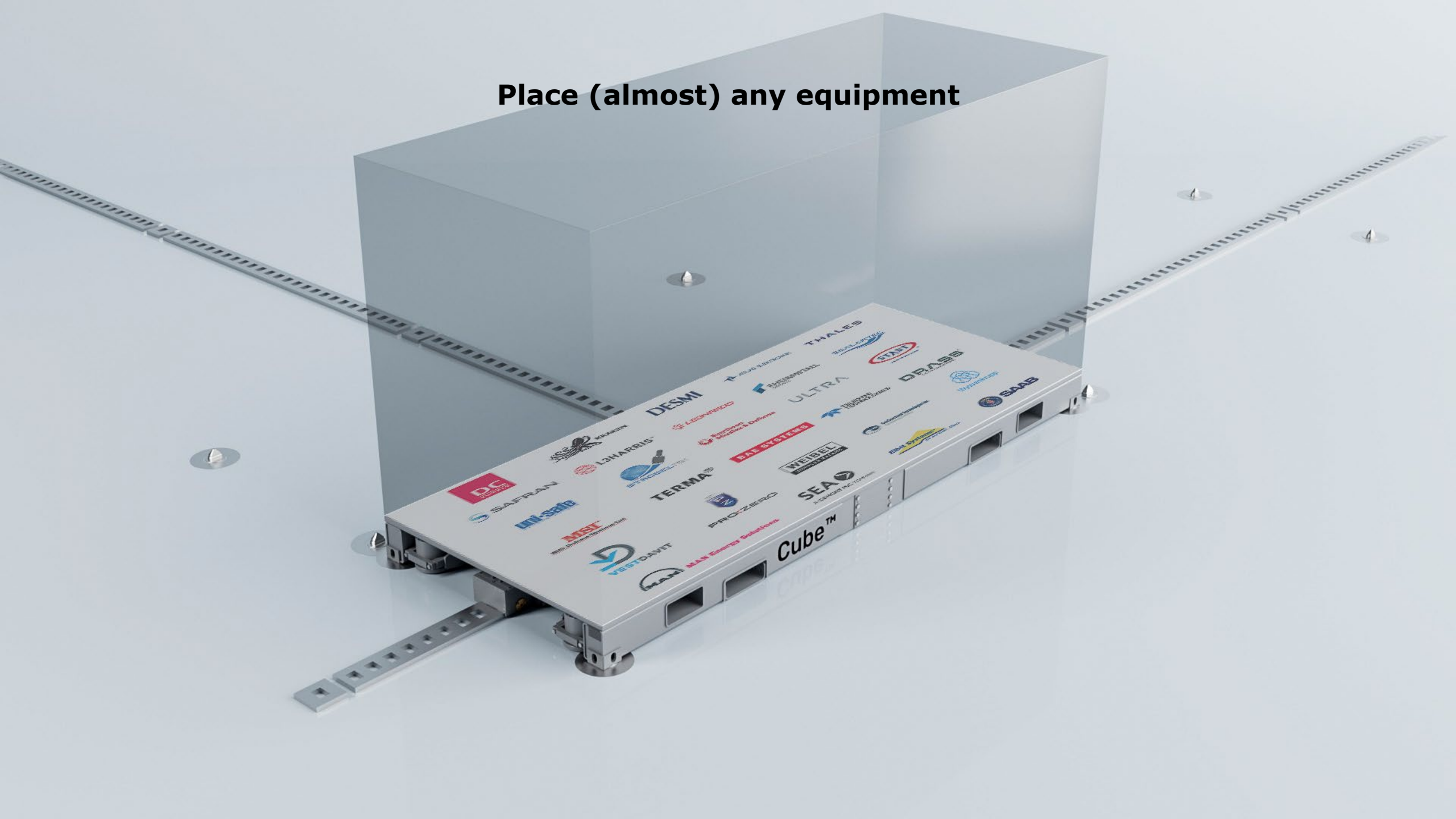


Onboard module handling

Base Frame with built-in mover for autonomous handling



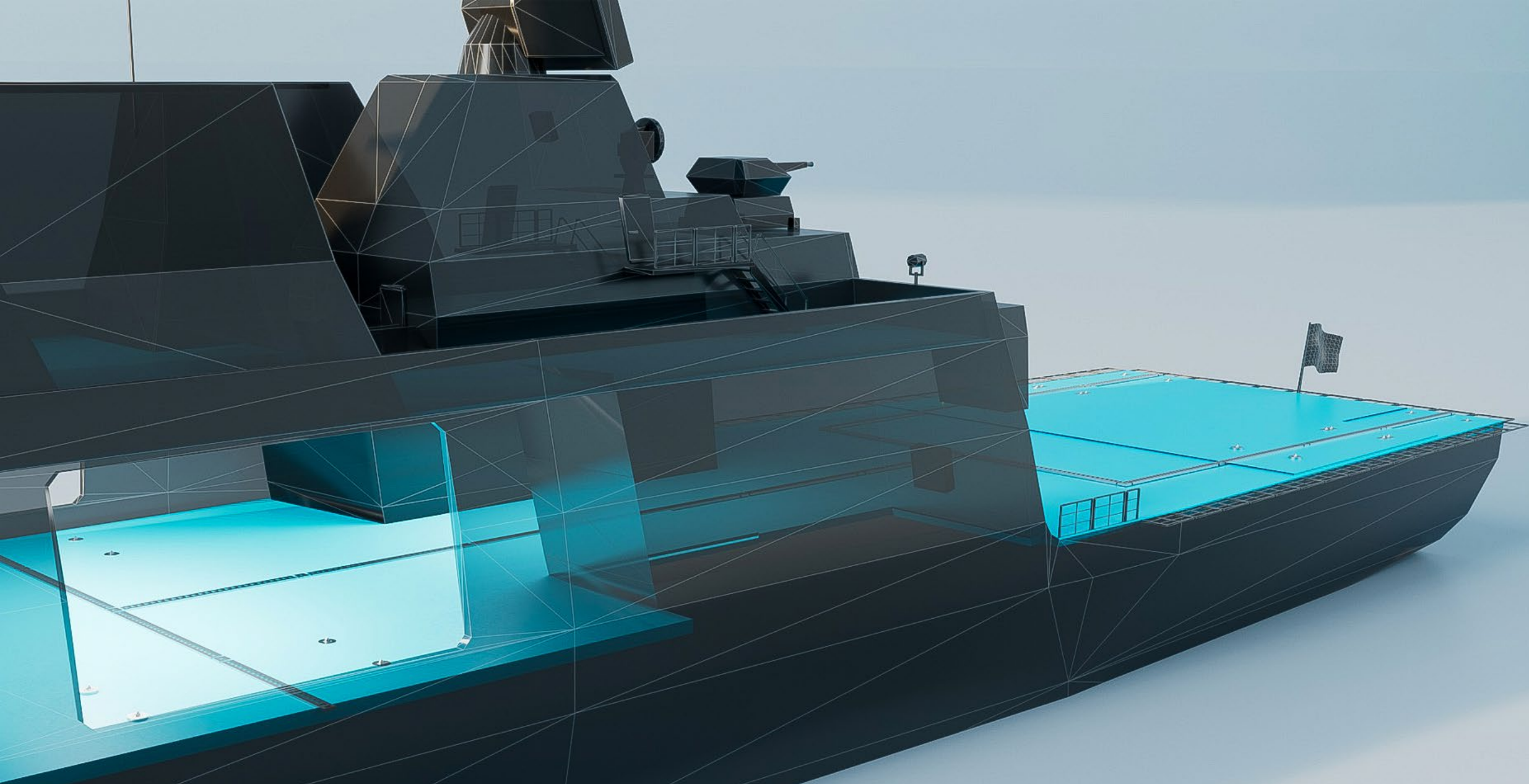
Place (almost) any equipment



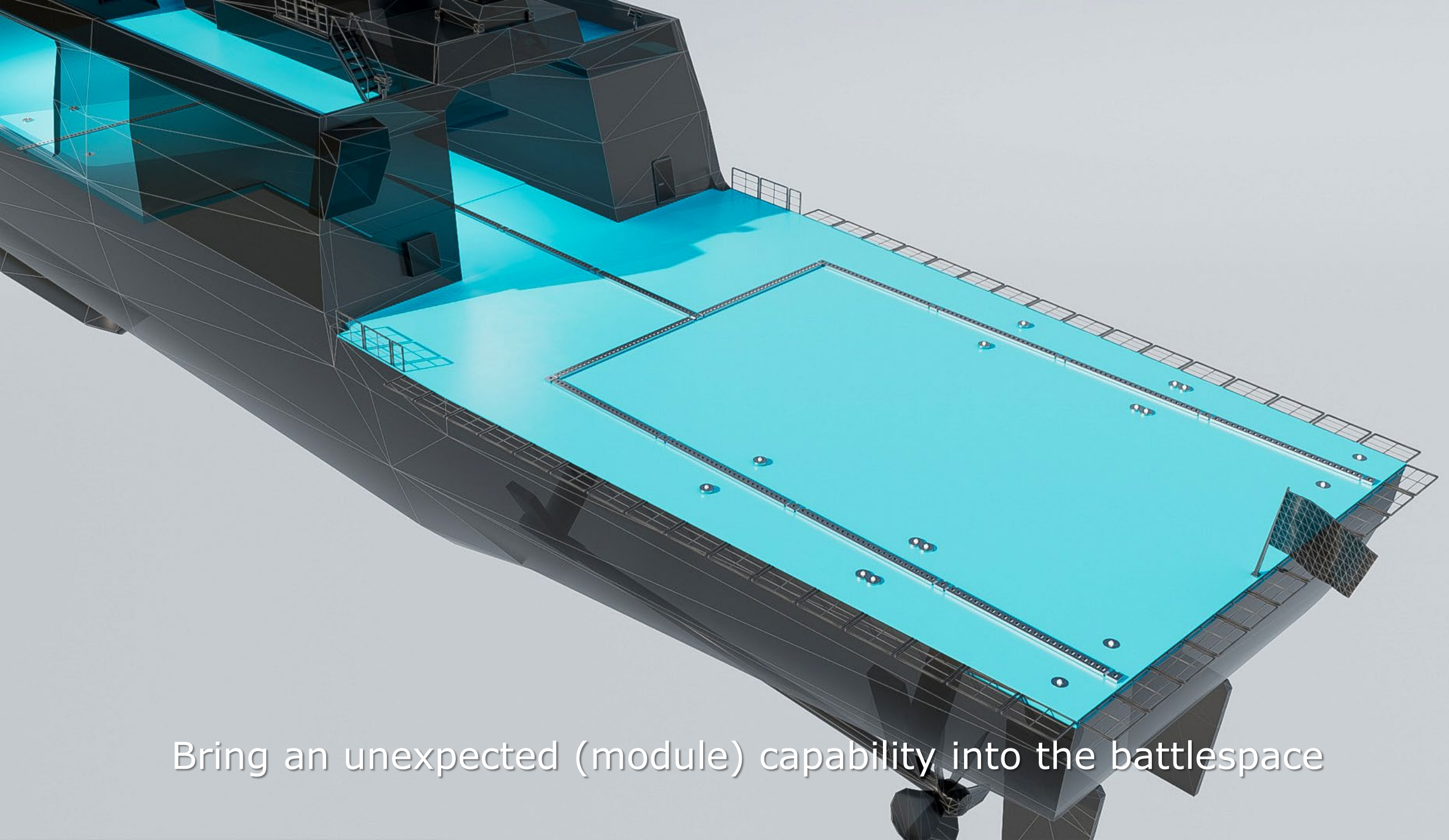
Onboard module handling

Base Frame on Sea State Skidding System





Giving payloads access to Air, Surface and Sub-surface



Bring an unexpected (module) capability into the battlespace

Cube™ -ID

Cube-ID data

Cube ID no.:
 Cube s/n:
 Cube Mission:
 Cube Size:
 Weight:
 CoG:
 DangerZone:

ANEP-99 data

CCTV
 WH Lights on/off
 RED Lights on/off
 GR Lights on/off

Cube-Connect data

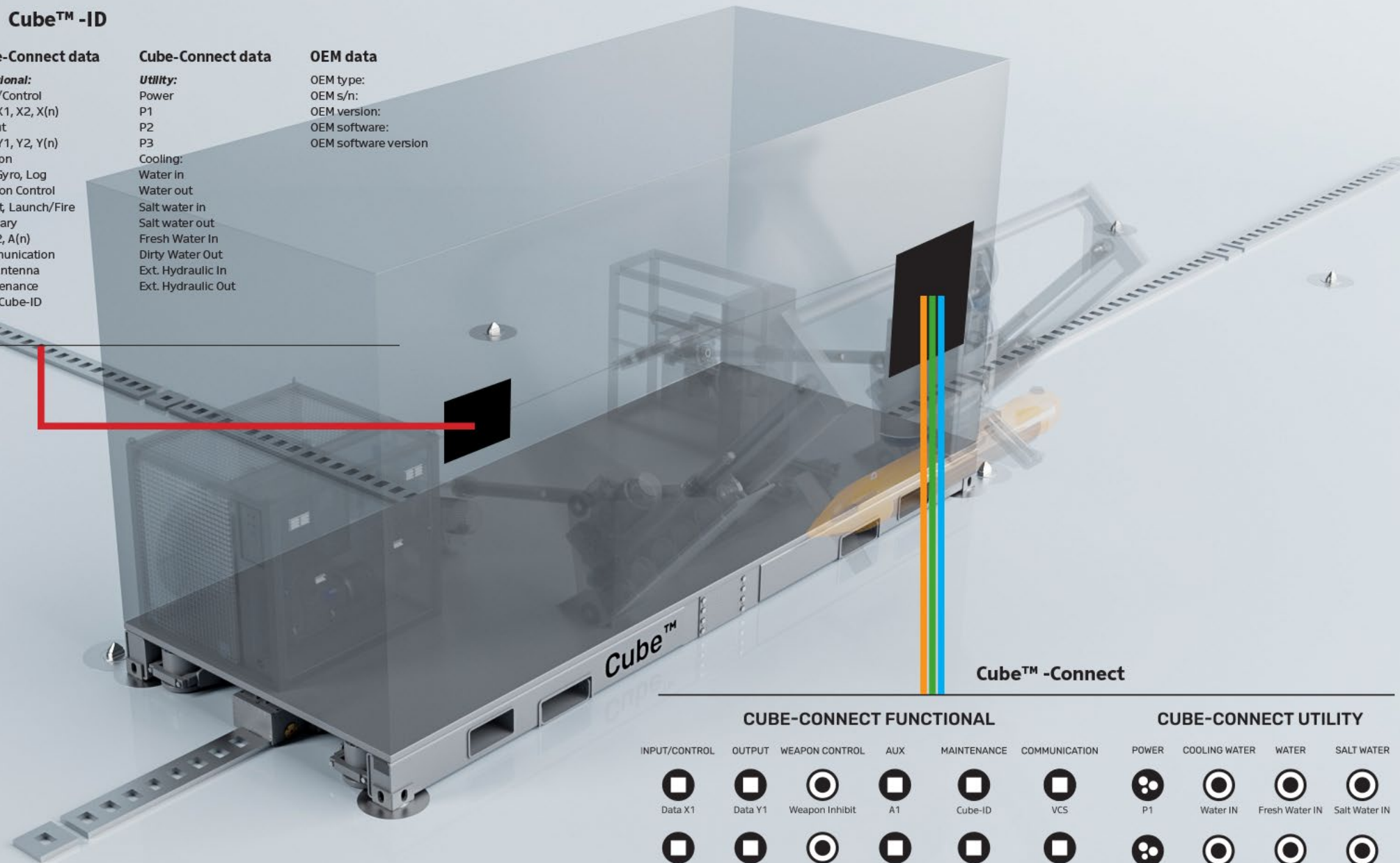
Functional:
 Input/Control
 Data X1, X2, X(n)
 Output
 Data Y1, Y2, Y(n)
 Position
 GPS, Gyro, Log
 Weapon Control
 Inhibit, Launch/Fire
 Auxilliary
 A 1, A2, A(n)
 Communication
 VCS, Antenna
 Maintenance
 OEM, Cube-ID

Cube-Connect data

Utility:
 Power
 P1
 P2
 P3
 Cooling:
 Water In
 Water out
 Salt water in
 Salt water out
 Fresh Water In
 Dirty Water Out
 Ext. Hydraulic In
 Ext. Hydraulic Out

OEM data

OEM type:
 OEM s/n:
 OEM version:
 OEM software:
 OEM software version



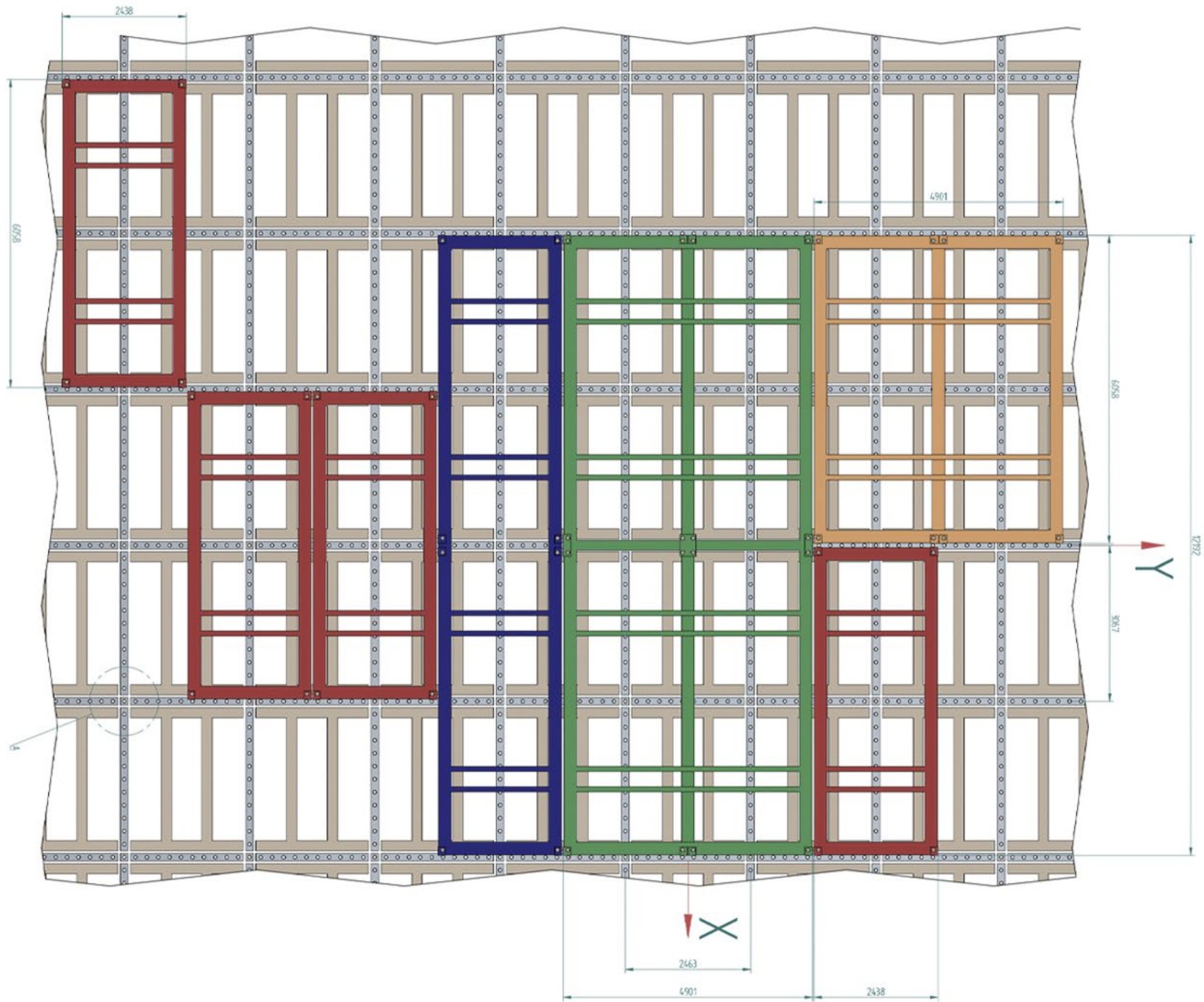
Cube™ -Connect

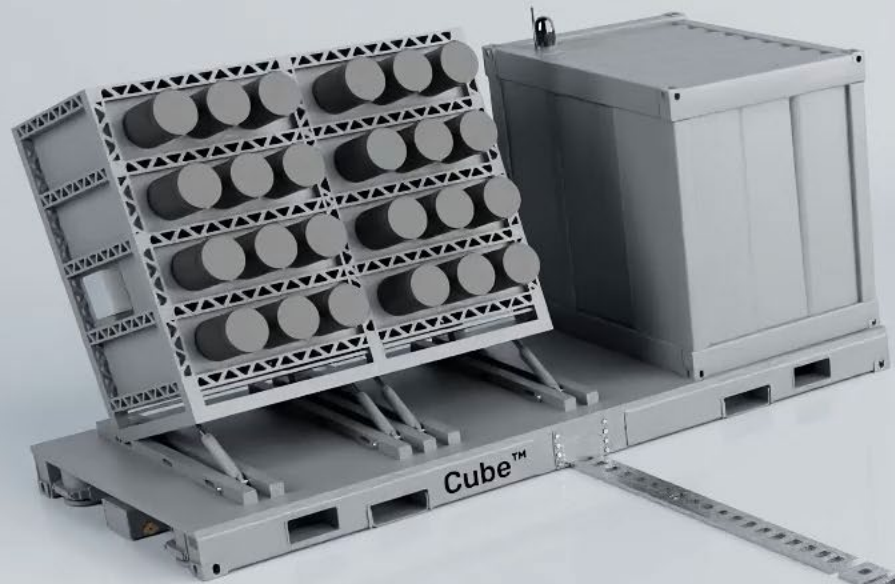
CUBE-CONNECT FUNCTIONAL

| INPUT/CONTROL | OUTPUT | WEAPON CONTROL | AUX | MAINTENANCE | COMMUNICATION |
|---------------|---------|----------------|-----|--------------------------|---------------|
| Data X1 | Data Y1 | Weapon Inhibit | A1 | Cube-ID | VCS |
| Data X2 | Data Y2 | Launch/Fire | A2 | OEM | Antenna |
| Data X3 | Data Y3 | Weapon AUX | A3 | POSITION GPS/GYRO/LOG | |

CUBE-CONNECT UTILITY

| POWER | COOLING WATER | WATER | SALT WATER |
|-------|---------------|-----------------|----------------|
| P1 | Water IN | Fresh Water IN | Salt Water IN |
| P2 | Water OUT | Dirty Water OUT | Salt Water OUT |
| P3 | | | |





Cube™

The following Ship designers are presenting their future Multi-mission platforms using The Cube System





CASE – NTV 130

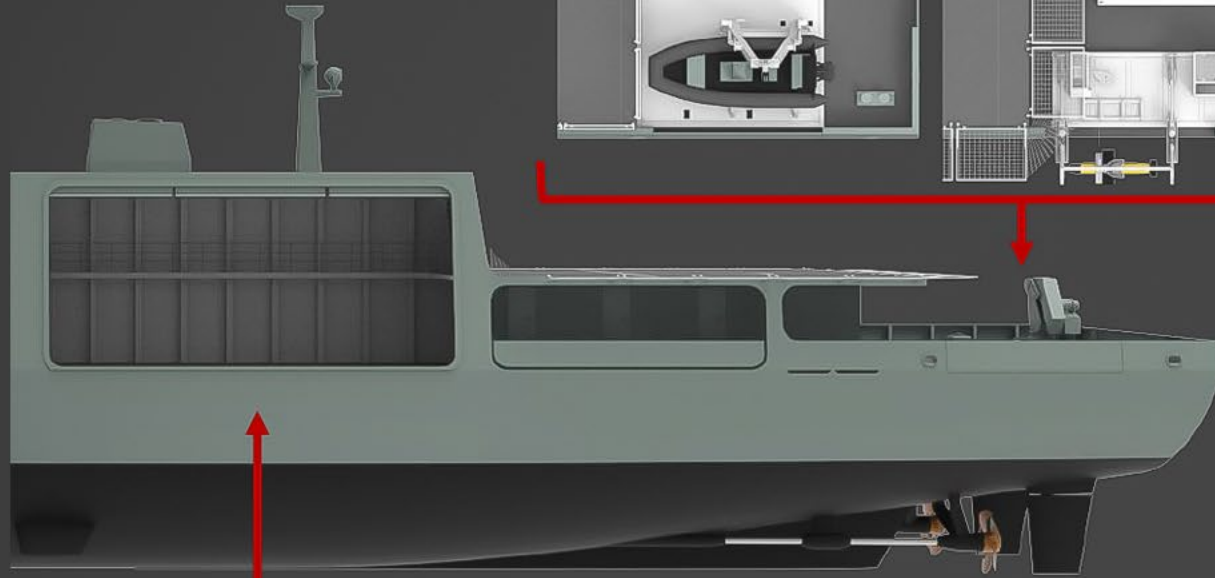
Logistics, operational support and reconnaissance





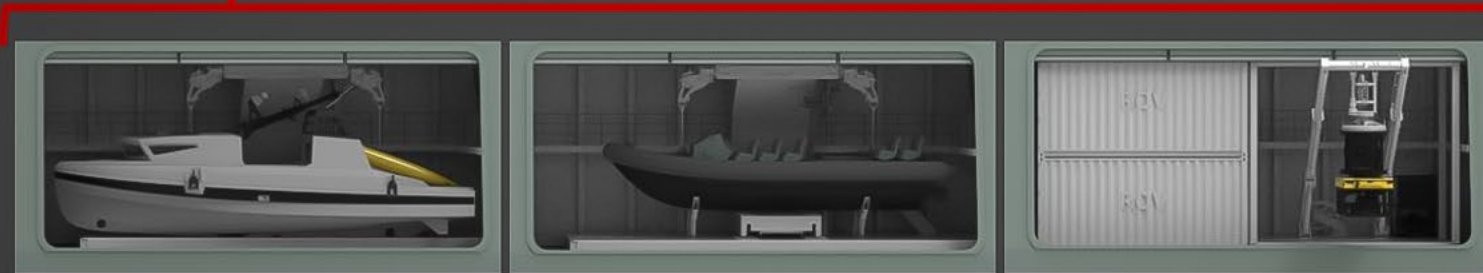
CAPABLE.
FLEXIBLE.
DEPLOYABLE.

TYPICAL MODULAR MISSION DECK LOADOUTS



Modular Mission Packages

- Thales Pathmaster MCM
- Fleet Diving Support
- Route Survey
- Seabed Intervention
- ROV/AUV/UAV/USV Ops
- TAS and VDS Sonar Systems
- Specialized Embarked Craft



TYPICAL MODULAR MISSION BAY LOADOUTS



F363



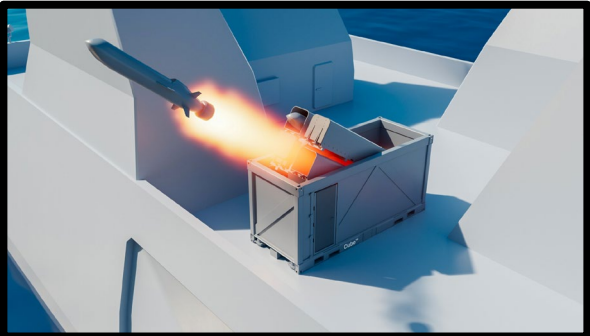
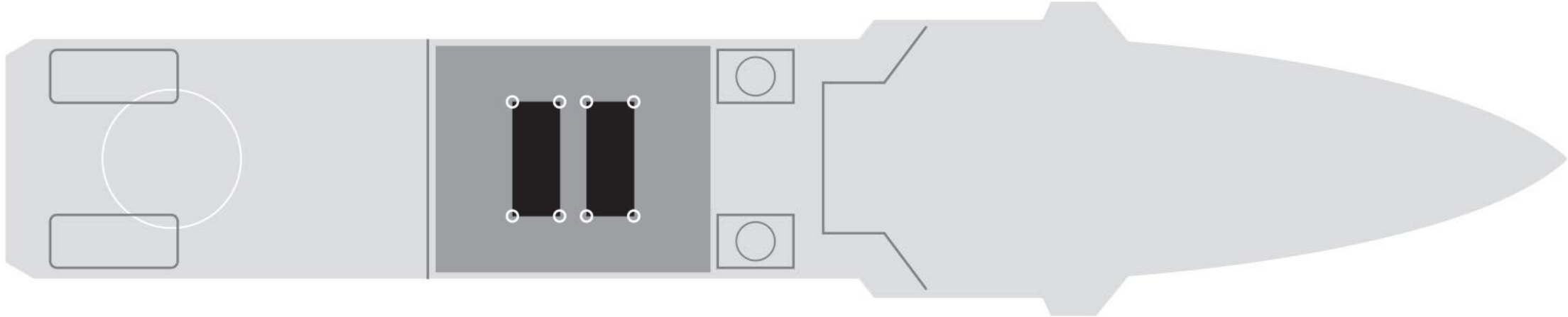
Top mission deck

Flight deck

Quarterdeck

Flexible deck handling

Top mission deck

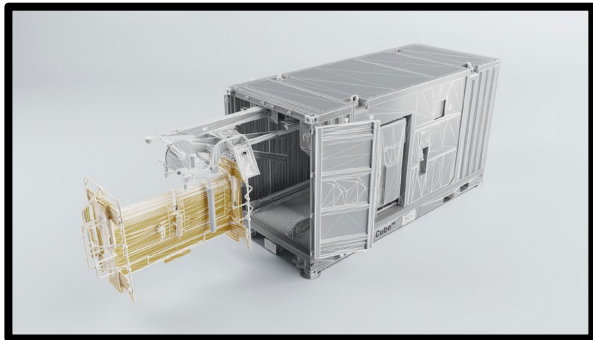
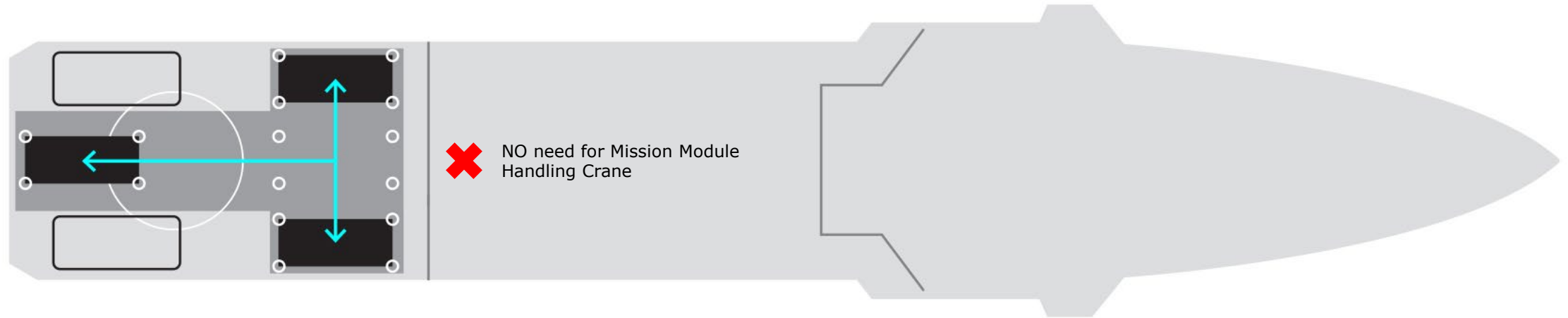


Deck layout:
Cube™ Hydraulic Twistlock: Single = 8 pcs.
Approx. Weight = 1T (8x105kg/pcs)



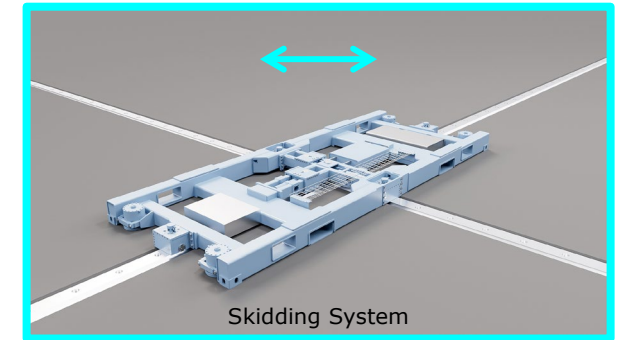
Flexible deck handling

Flight deck



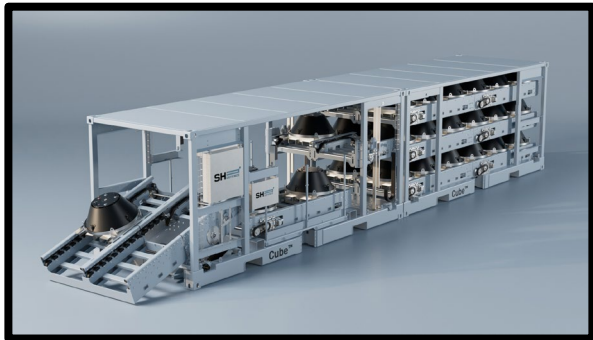
Deck layout:
Cube™ Hydraulic Twistlock: Single = 16 pcs.
Approx. Weight = 1.7T (16x105kg/pcs)

Cube™ Skidding System: 20m + 10m
Approx. Weight = 1.8T (30mx60kg/m)



Flexible deck handling

Quarterdeck



Deck layout:
Cube™ **Hydraulic Twistlock**: Single = 12 pcs. / Double = 8 pcs.
Approx. Weight = **2.1T** (20x105kg/pcs)

Cube™ **Skidding System**: 2x20m + 10m
Approx. Weight = **3T** (50mx60kg/m)





Mission: Onboard Handling system
Name: Cube™ Sea State Skidding System
Company: SH Defence
Integration: Shipyard / SH Defence

Price: On the following page

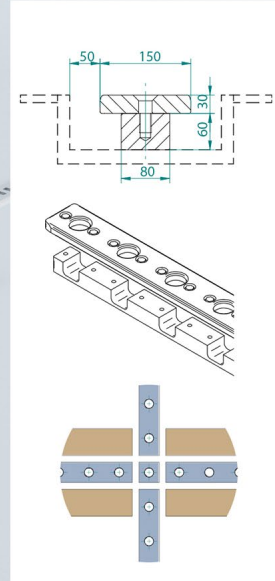
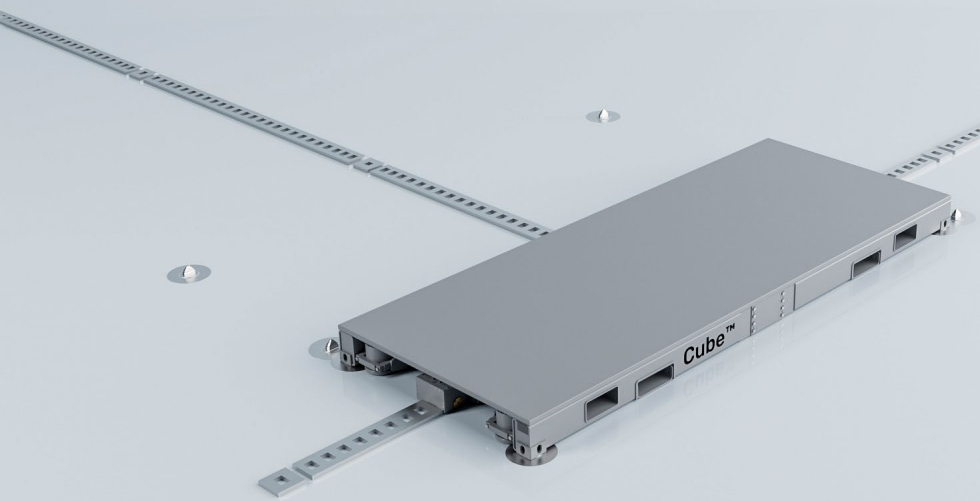


The Sea State skidding system allows moving Cube™ compatible modules around on the open deck or inside the hangar. It is mission bay compatible and can work together with the hydraulic-driven twist lock system.

The Mover unit, a key component of the Sea State Skidding System features a moving cylinder for longitudinal movement, one for transverse movement, and three hydraulic-operated lock pins.

The operational maximum accelerations are horizontal, 0.5 g, and vertical, 0.8 g. The maximum roll angle is 22.5 deg.

The expected moving speed will be 2-2.5 m/min with modules weighing 15 Tons or less.



Flexible deck handling





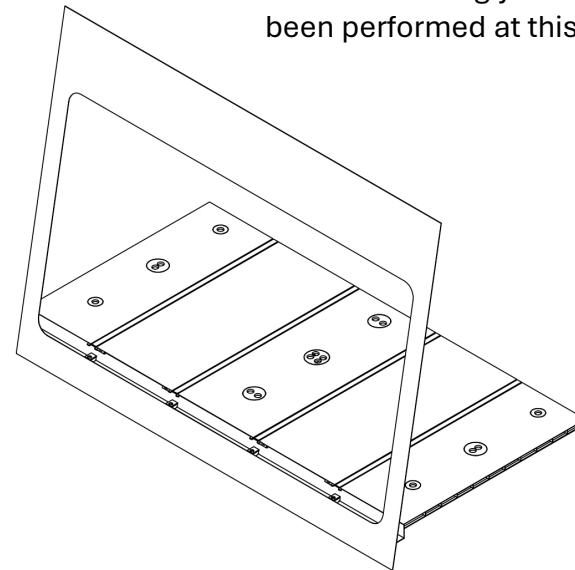


Mission: Onboard Handling system
Name: Cube™ Hydraulic Twistlock System
Company: SH Defence
Integration: Shipyard / SH Defence

Price: On the following page

The Cube Twist Lock System for securing payloads consists of remotely operated hydraulic twist locks (with a remote lock indicator) integrated into the deck structure, arranged in groups of 4 each matching a 20ft container. The total number of twist locks for a mission bay is up to $4 \times 4 = 16$.

Shock qualification of shipboard equipment.
Depending on requirements, ship construction and classification society, SH Defence believes that the Twistlock System can be authorized accordingly. However, these tests have not been performed at this time.





Mission: Onboard Handling system
Name: Cube™ Sea State Skidding System
Company: SH Defence
Integration: Shipyard / SH Defence

Flight deck

Top mission deck

Quarterdeck

Top mission deck

Twistlocks = 8 pcs
 HPU = 1
 Control panels = 1

Example ROM Price: USD 227.695

Flight deck

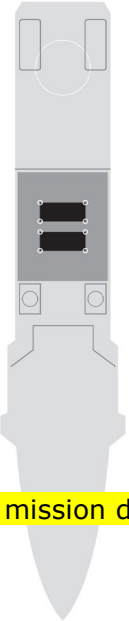
Sea State Skidding Rail = 20m + 10m
 Twistlocks = 16 pcs
 HPU + Hydraulic hose = 1
 Control panels = 1

Example ROM Price: USD 443.156

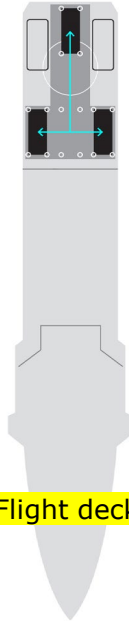
Quarterdeck

Sea State Skidding Rail = 2x 20m + 10m
 Twistlocks = 20 pcs
 HPU + Hydraulic hose = 1
 Control panels = 1

Example ROM Price: USD 570.578



Top mission deck



Flight deck



Quarterdeck

Interchangeable mission modules

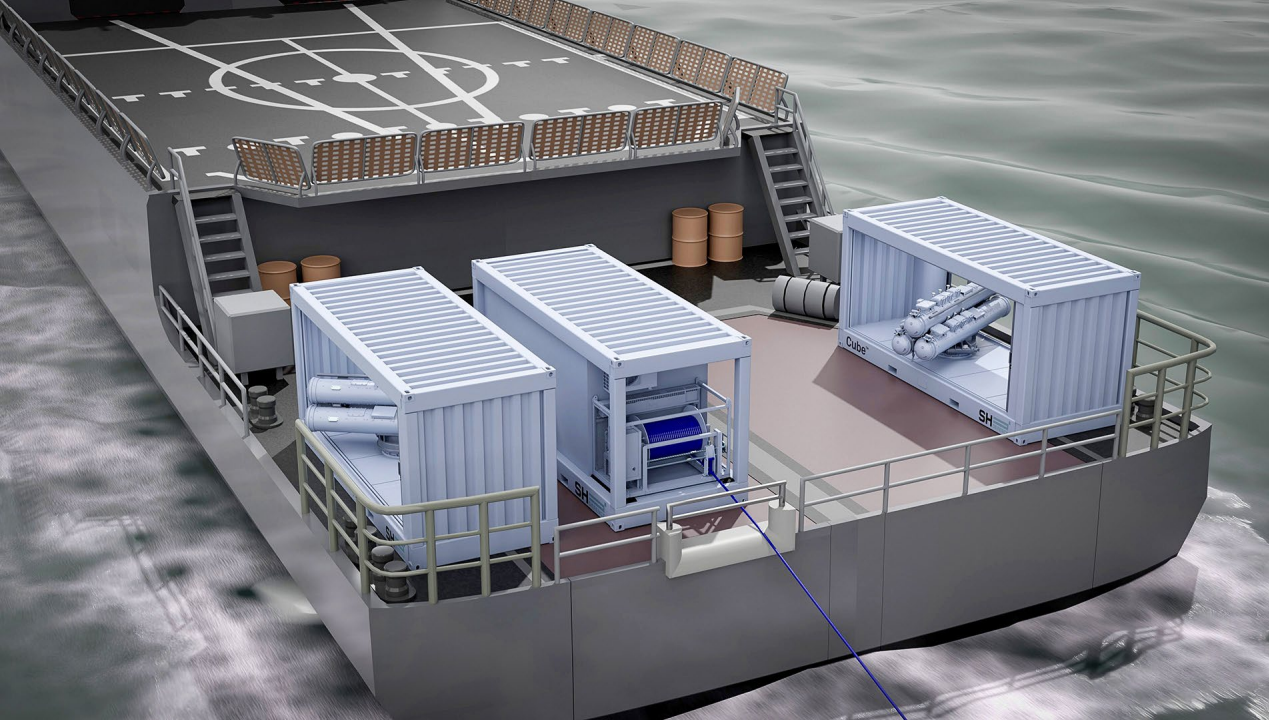


Modularity is a feature of (almost) all future naval ship designs

1. New ships can be built *for* but not *with* capabilities
2. Keeping up with technological development
3. A ship is built to last 30-40 yrs but equipment might last 36 months
4. Counter new threats faster
5. Bring an unexpected (module) capability into the battlespace
6. Rapid mission assignment and interchangeability between platforms
7. No more welding of equipment onto the deck structure
8. Repair and replace broken equipment without long and costly yard stays
9. Train at the Naval base



20ft Cube™ Module
ASW towed array – KraitSense by SEA Ltd.



Mission: ASW module

Name: Kraith Sense

Company: SEA (Systems Engineering & Assessment)

Prime: SEA

Integration: SH Defence

Price ASW module: Approx. USD 5.8 million

Price integration: Approx. USD 950.000 million

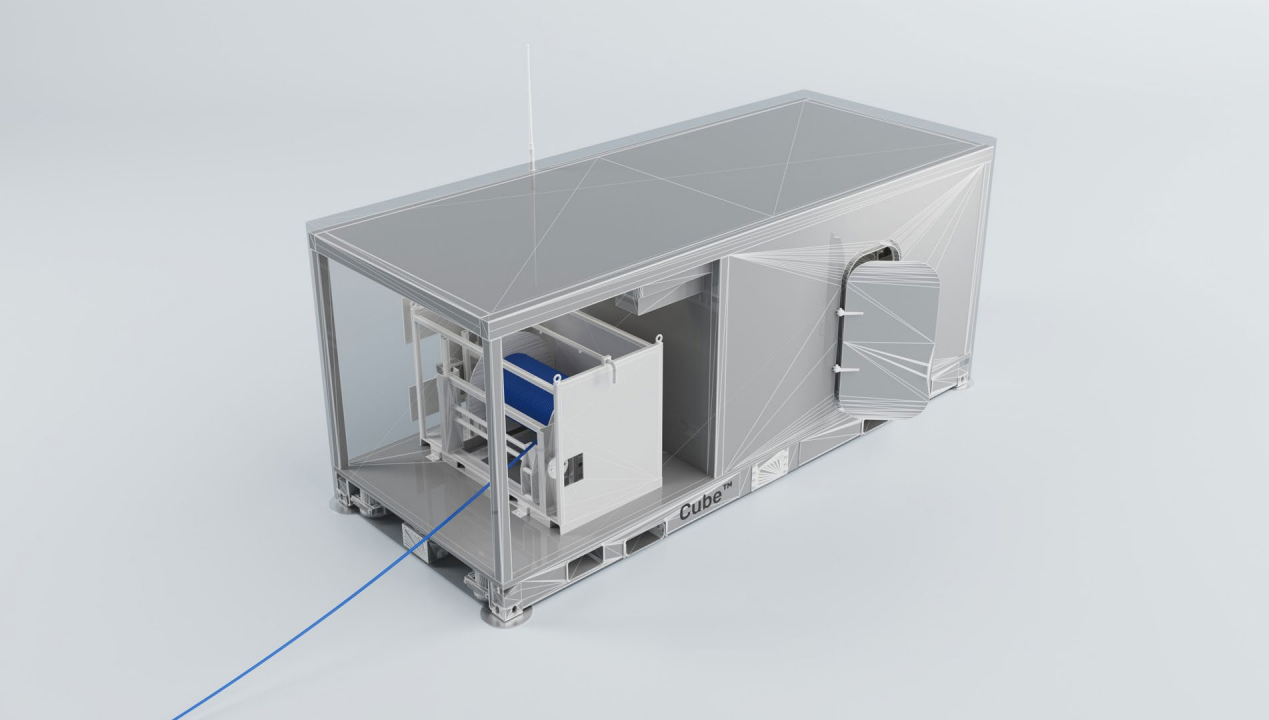
The prices are indicative and must be negotiated with the equipment supplier. ILS and Standard approvals and documentation are not included.

ASW System for non-specialist platforms such as OPVs

A complete, lightweight passive ASW system, which is designed to give smaller, non-specialist platforms such as OPVs, a leading ASW capability.

The system contains a low-profile sonar sensor, KraitArray, handling equipment, processing hardware and software as well as an interactive user control station to view, analyse, report sonar contact information

- Underwater threat detection
- Easy ship fit
- Small diameter
- Low weight & drag
- Low power consumption

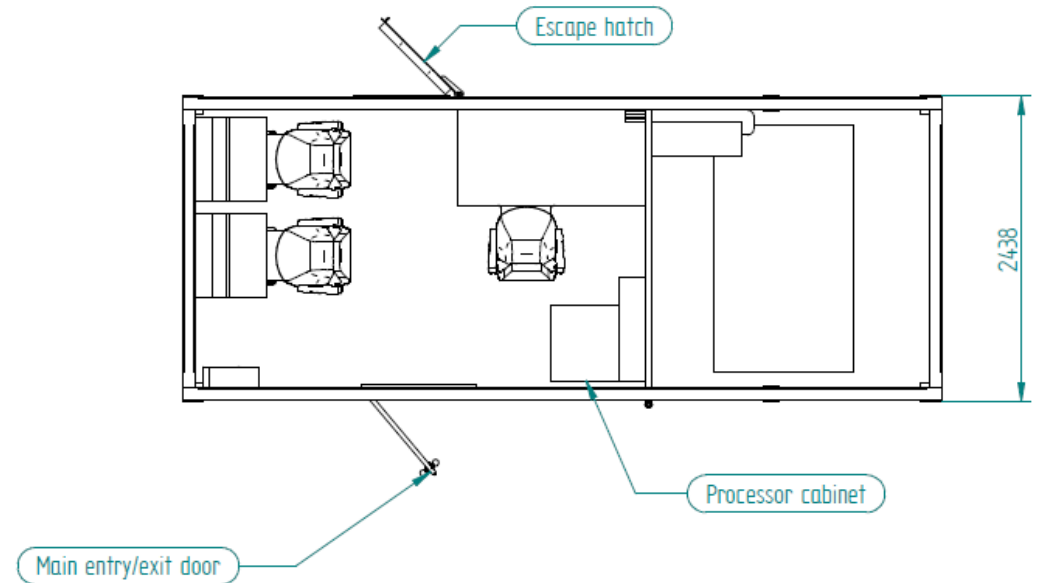
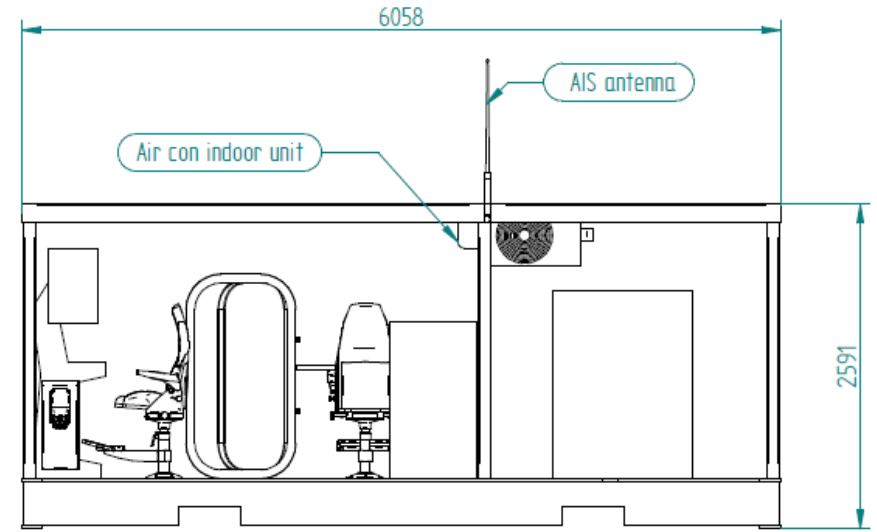
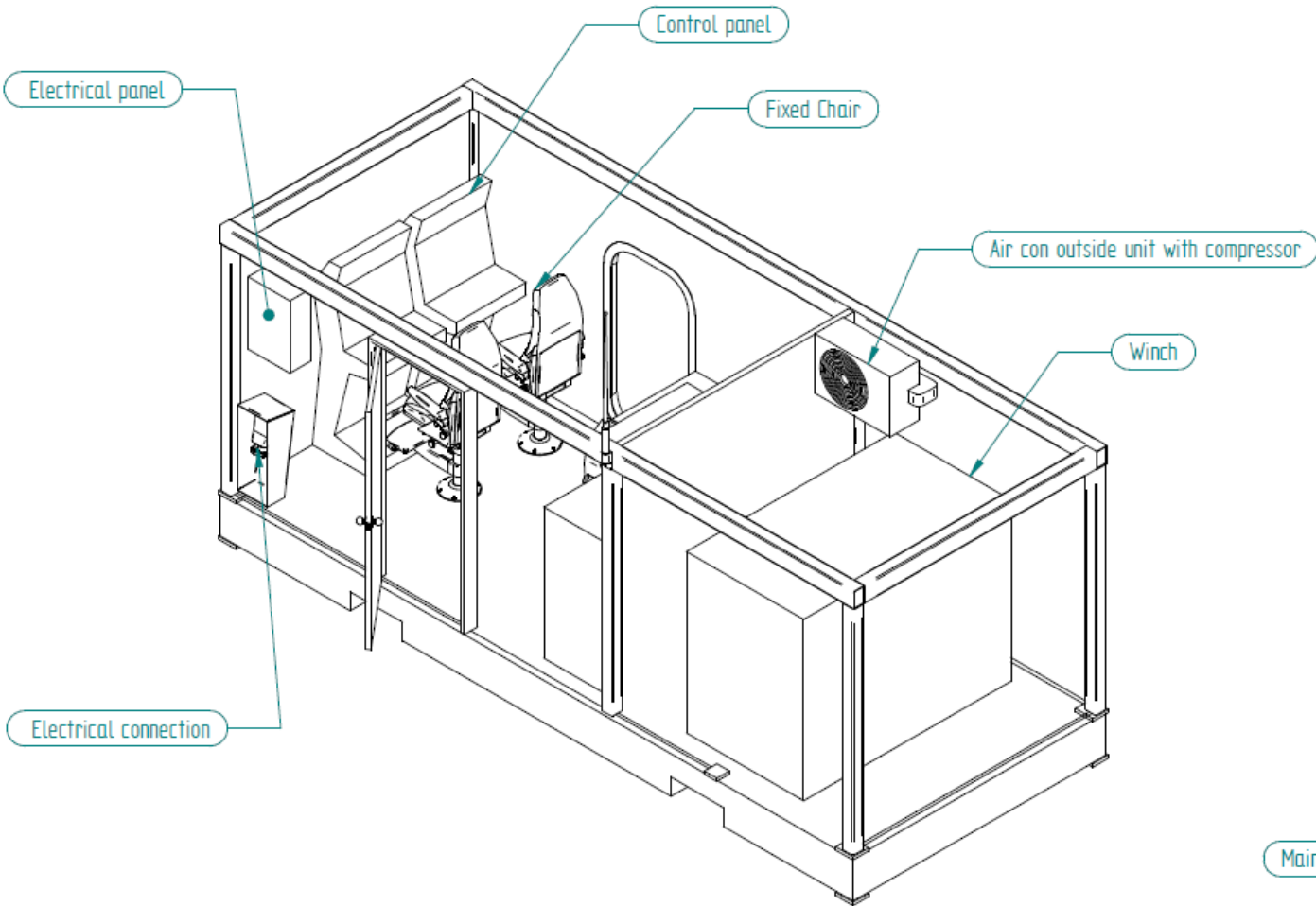




+



A COHORT PLC COMPANY

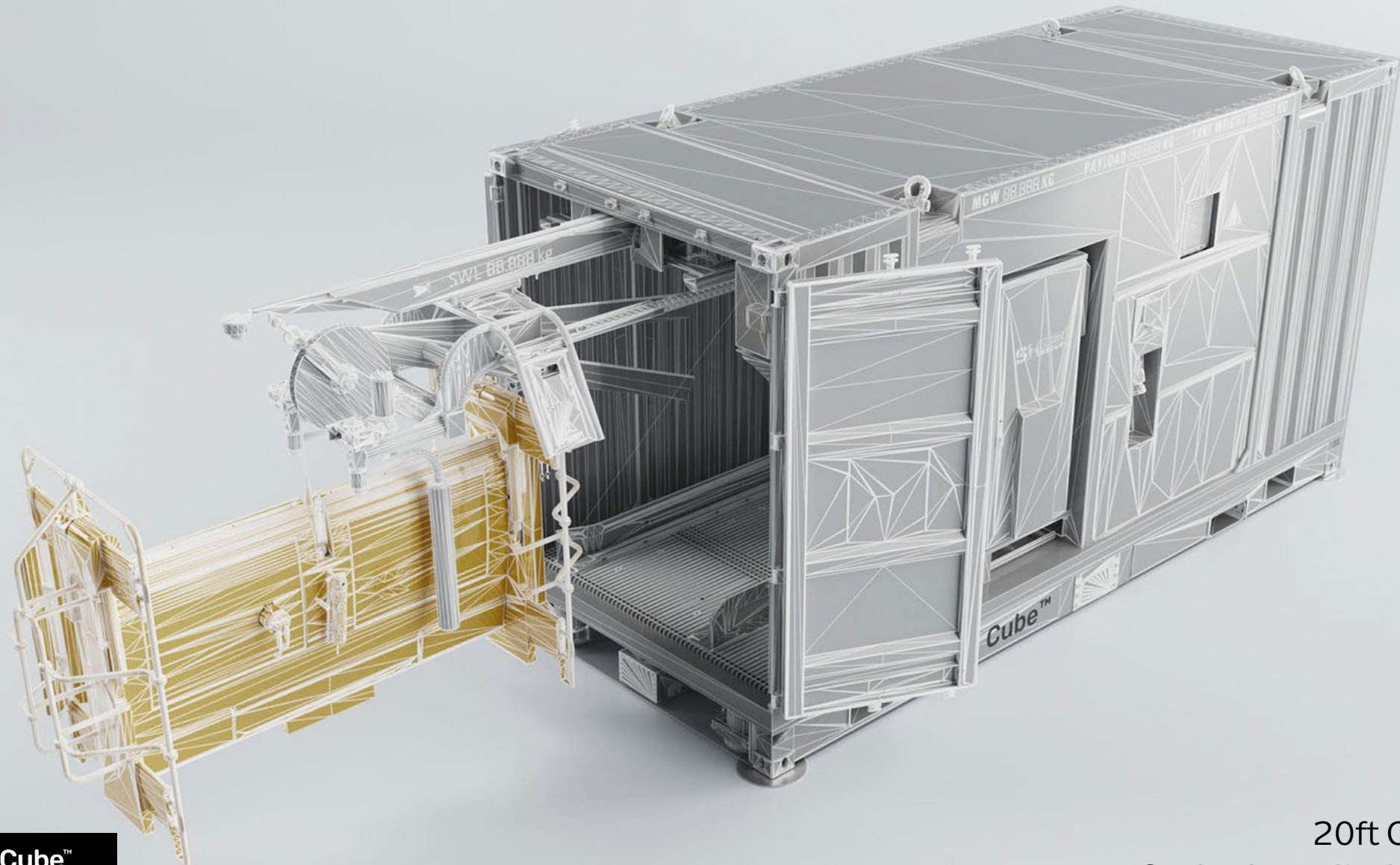


IN THE
DEVELOPMENT

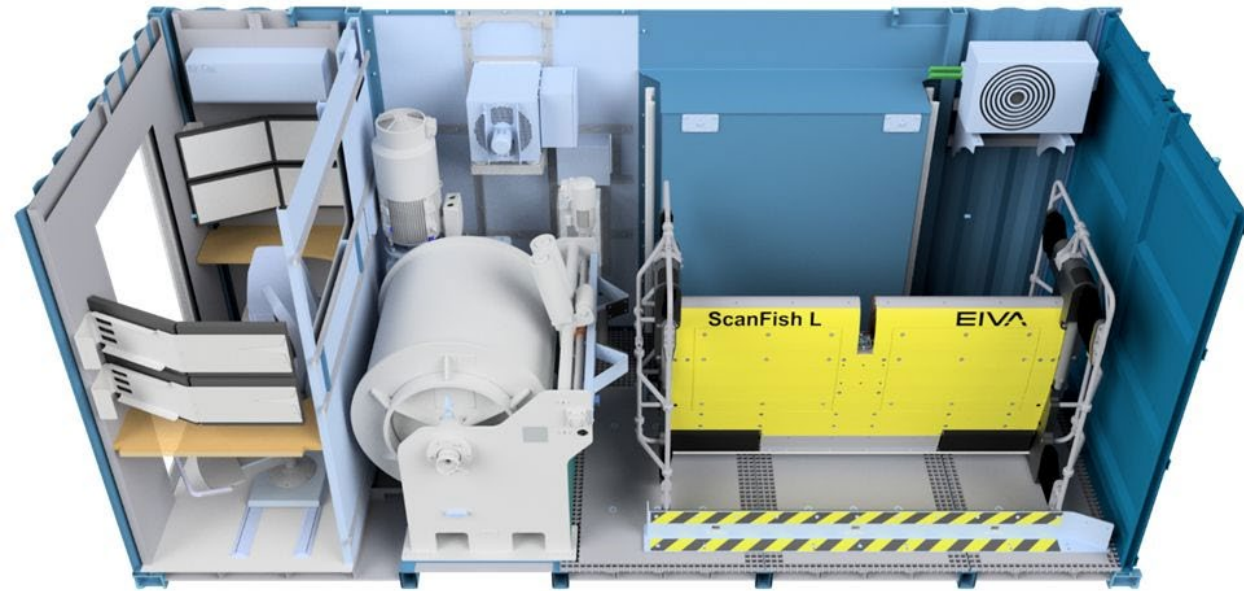


Cube™ Module

Thales CAPTAS 2+4 In the early development stage



20ft Cube™ Module
Seabed monitoring by EIVA A/S



Mission: MCM - Mine Countermeasures

Name: ROTV - Remotely Operated Towed Vehicle

Company: EIVA (Part of Forcys)

Prime: EIVA

Integration: SH Defence

ROM Price MCM tool: Approx. USD 5.75 million

ROM Price Module/Integration: Approx. USD 1.2 million

The prices are indicative and must be negotiated with the equipment supplier. ILS and Standard approvals and documentation are not included.

Towed Array Sonar

The EIVA ScanFish remotely operated towed vehicle (ROTV) models can follow the seabed, keep a fixed depth, or undulate up and down through the water. A multi-aperture sonar specifically designed for mine-hunting operations in the littoral.

Specs.:

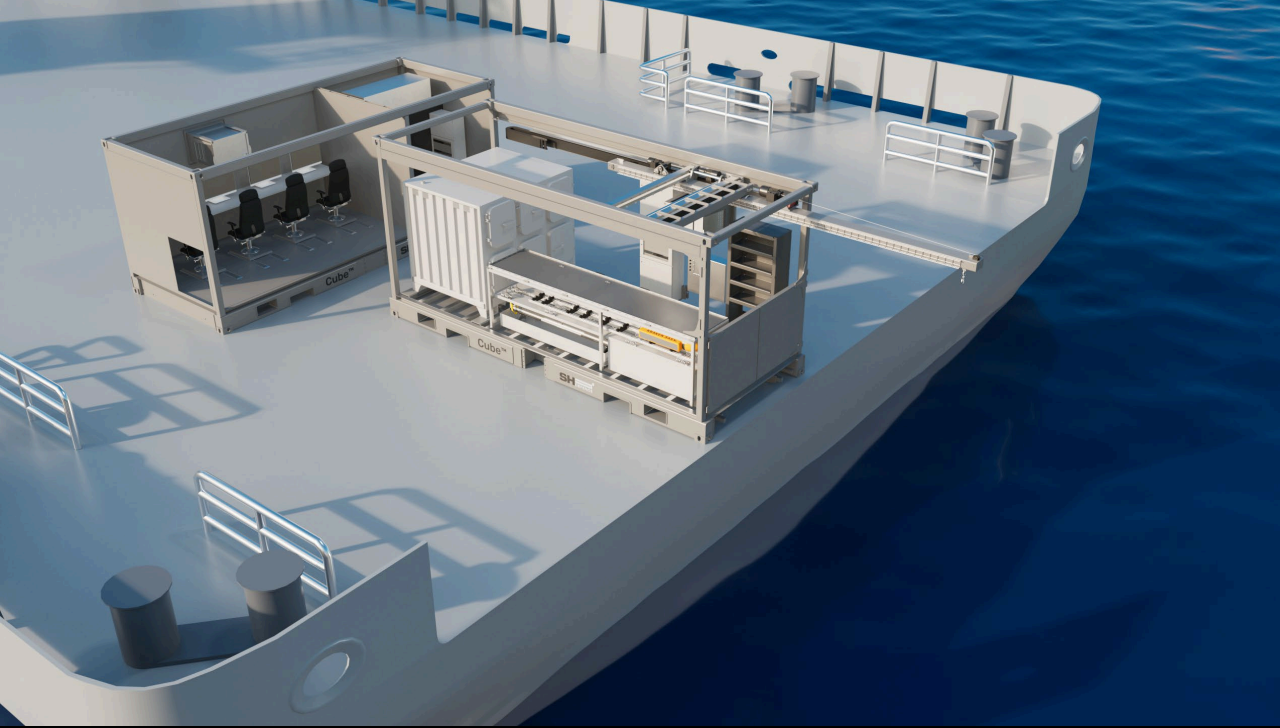
Weight: 14.6T

SWL (as shown): 850kg

Winch SWL: 3.5T

Work station: Two man





Mission: MCM - Mine Countermeasures

Name: Remote Minehunting and Disposal System (RMDS)

Company: Kraken Robotics

Prime: Kraken Robotics

Integration: SH Defence

ROM Price MCM tool: AUV and SeaFox (mine disposal)
sold separately

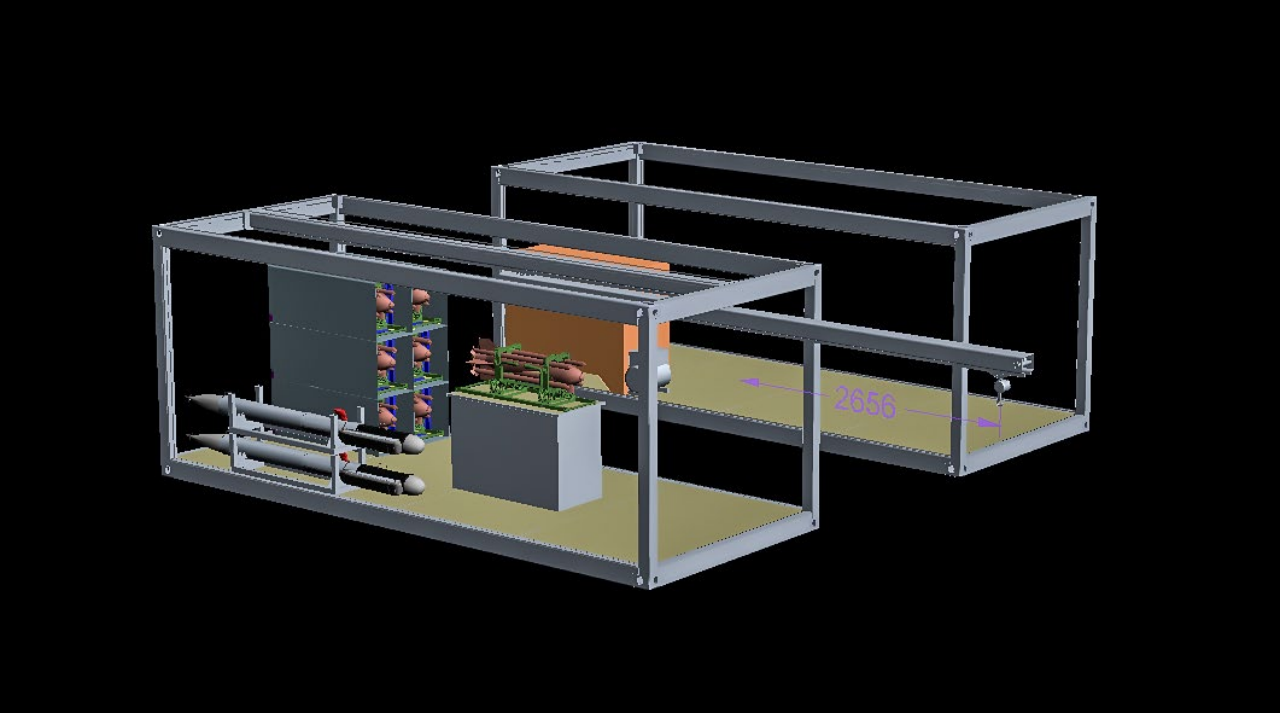
ROM Price Module/Integration: Approx. USD 1.7 million

The prices are indicative and must be negotiated with the equipment supplier. ILS and Standard approvals and documentation are not included.

Remote Minehunting and Disposal System (RMDS)

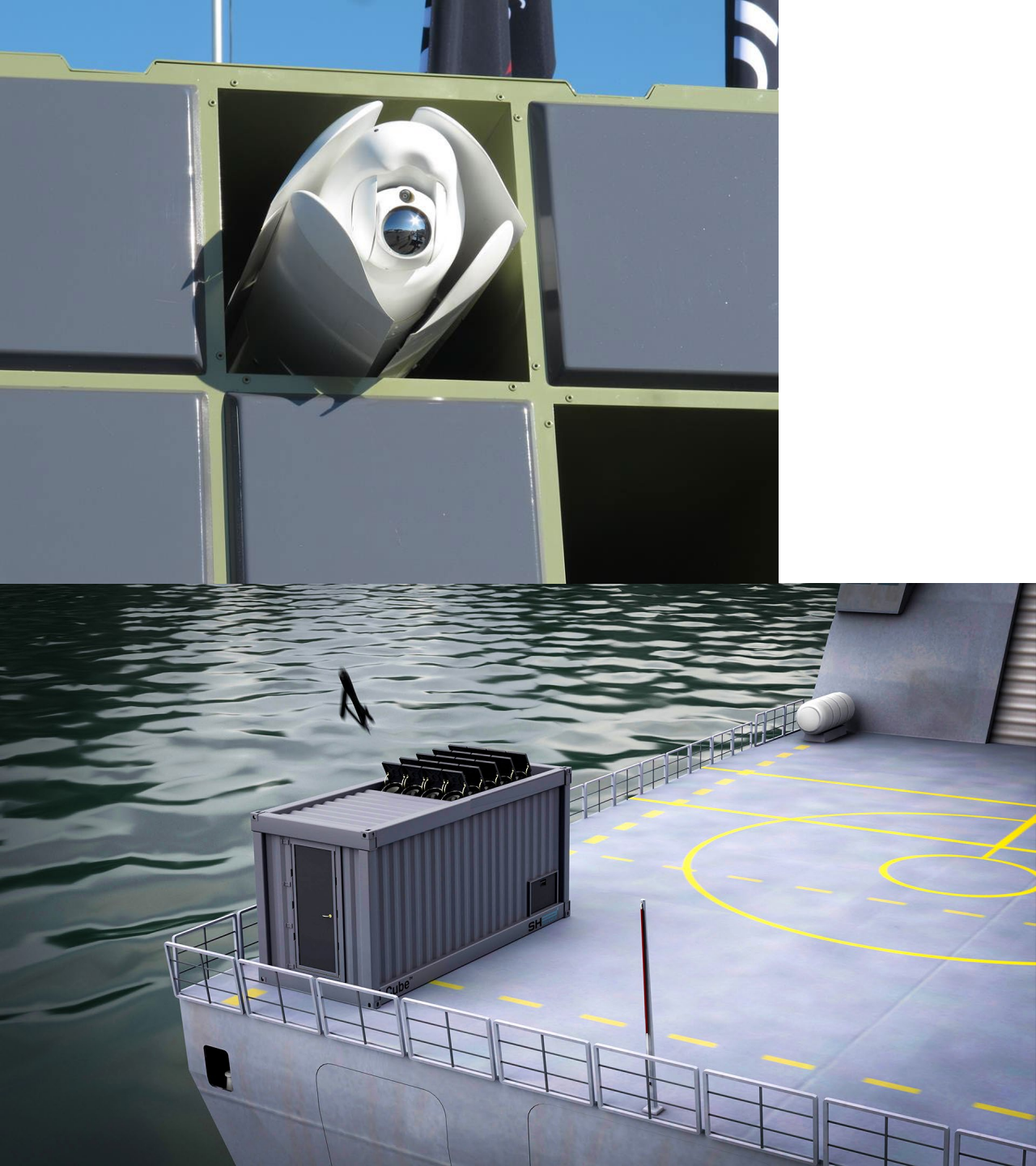
This mine hunter capability is a stand-alone system that includes several suppliers: a C2 container and Launch and recovery system from SH Defence, a REMUS AUV from HII with a multi-sensor platform from Kraken Robotic Systems, and a SeaFox from ThyssenKrupp AG.

The mine disposal system can be put on any prepared naval vessel, Coast Guard vessel, or commercial ship.





20ft Cube™ Module
Loitering munition from UVision



Mission: Loitering Munitions and Drones

Name: HERO 120

Company: Uvision

Prime: UVision

Integration: SH Defence

ROM Price Loitering Munition module: USD 8-10 million

ROM Price Module/Integration: Approx. USD 1.5 million

The prices are indicative and must be negotiated with the equipment supplier. ILS and Standard approvals and documentation are not included.

Loitering munitions offer significant tactical advantages for warships, enhancing their operational capabilities through extended range, precision targeting, cost-effectiveness, and versatility. Beneficial for engaging smaller or less critical targets.

Specs.:

Weight: 14.5 kg

Warhead: 4.5 kg

Range: 60+ km

Endurance: 60 min.

Also in dialogue with

Uvision
Smart Loitering Systems

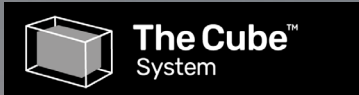
AV
AeroVironment™

TERMA[®]

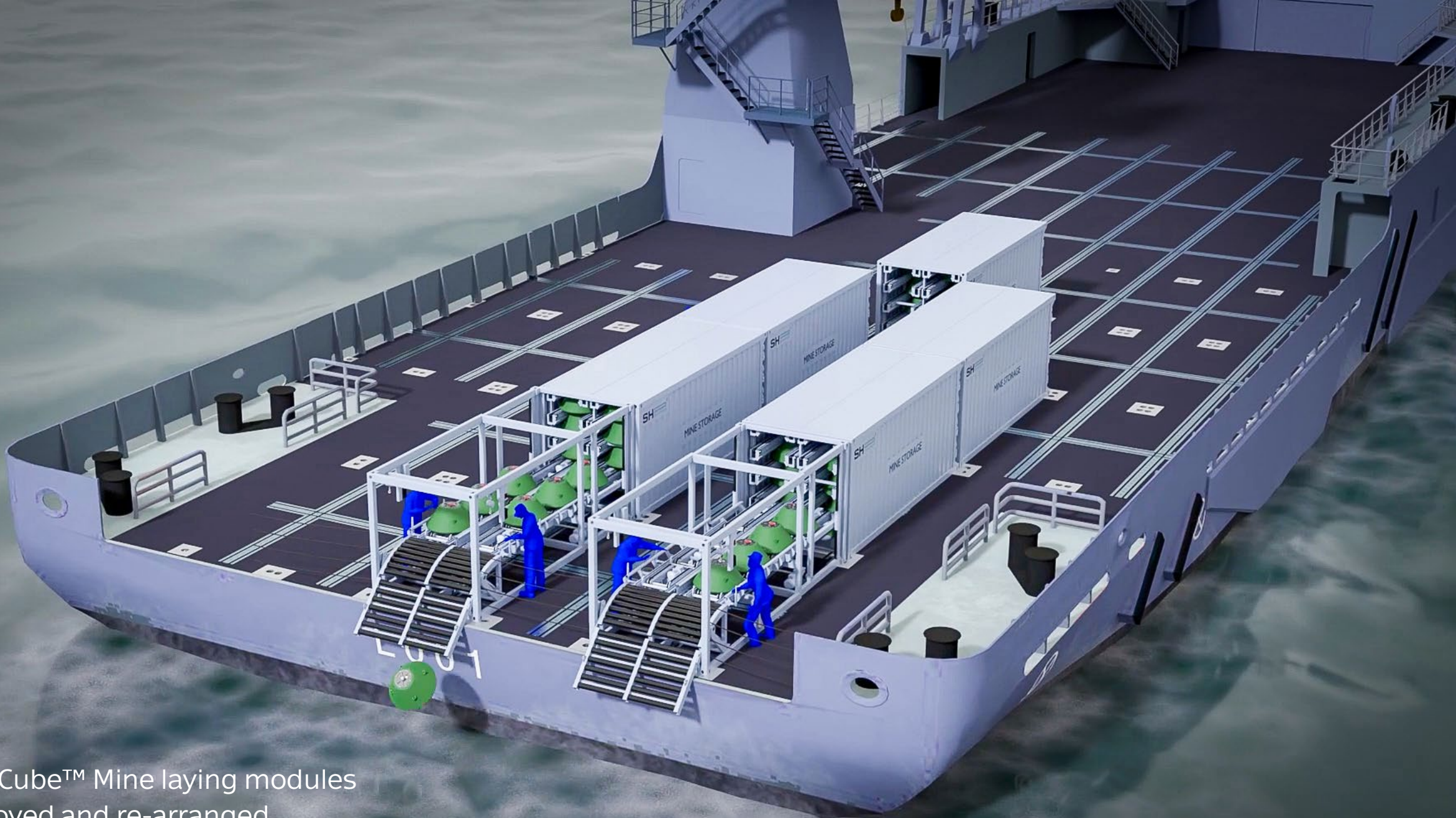


SCANTER
6000

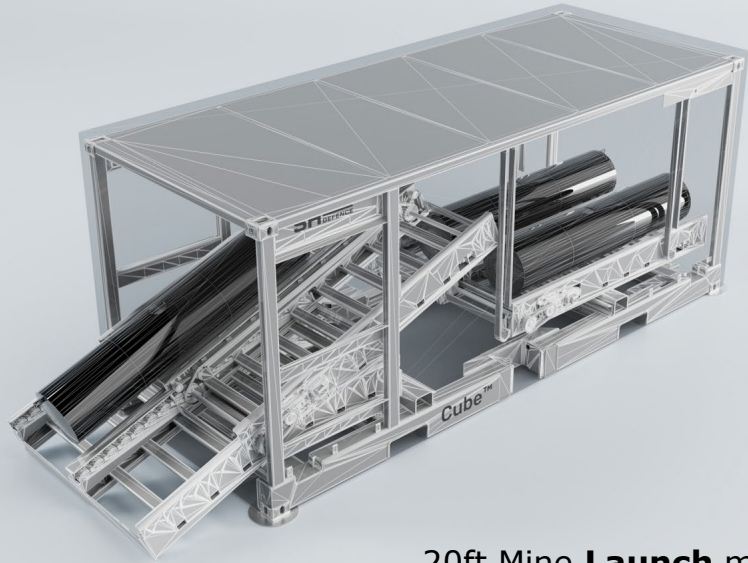
Cube™



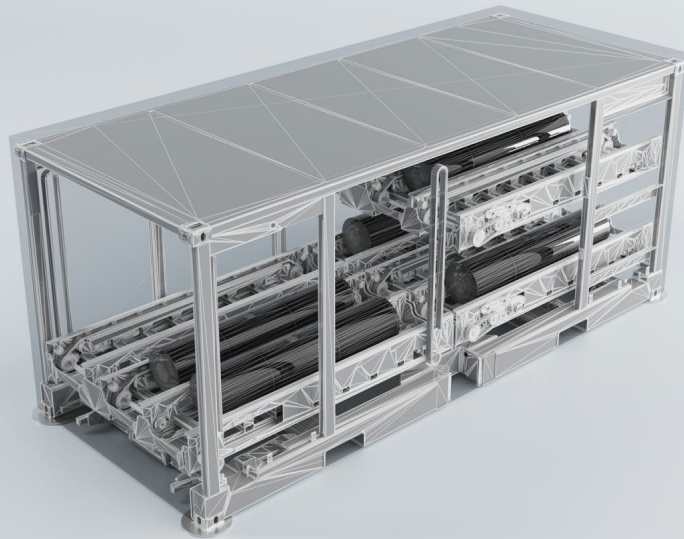
20ft Cube™ Module
Naval Surveillance Radar by Terma



20ft Cube™ Mine laying modules
deployed and re-arranged



20ft Mine **Launch** module



20ft Mine **Storage** module

Mission: Sea Mine laying

Name: Cube™ Sea Mine laying System

Company: SH Defence

Prime: SH Defence + Mine manufacturer:
Rheinmetall, Forcit, SAES +

ROM Price Mine Launch module: Approx. USD 654.000

Price Mine Storage module: Approx. USD 551.000





2x 20ft Mine Laying **System** modules

Mission: Sea Mine laying

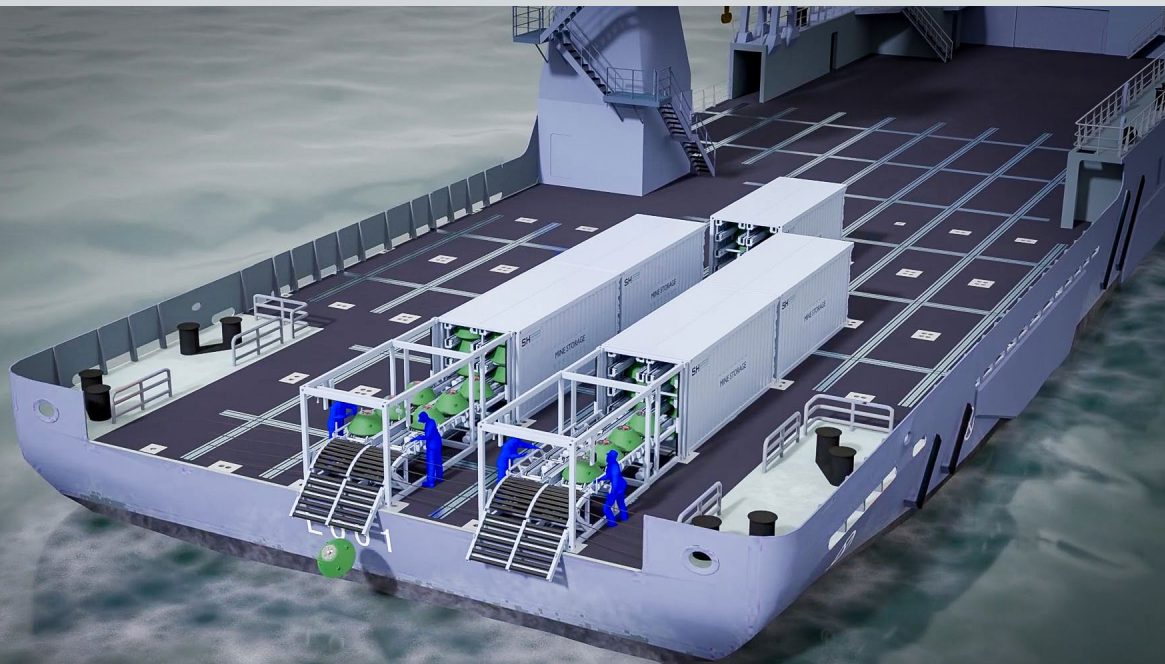
Name: Cube™ Sea Mine laying System

Company: SH Defence

Prime: SH Defence + Mine manufacturer:
Rheinmetall, Forcit, SAES +

ROM Price Mine Launch module: Approx. USD 654.000

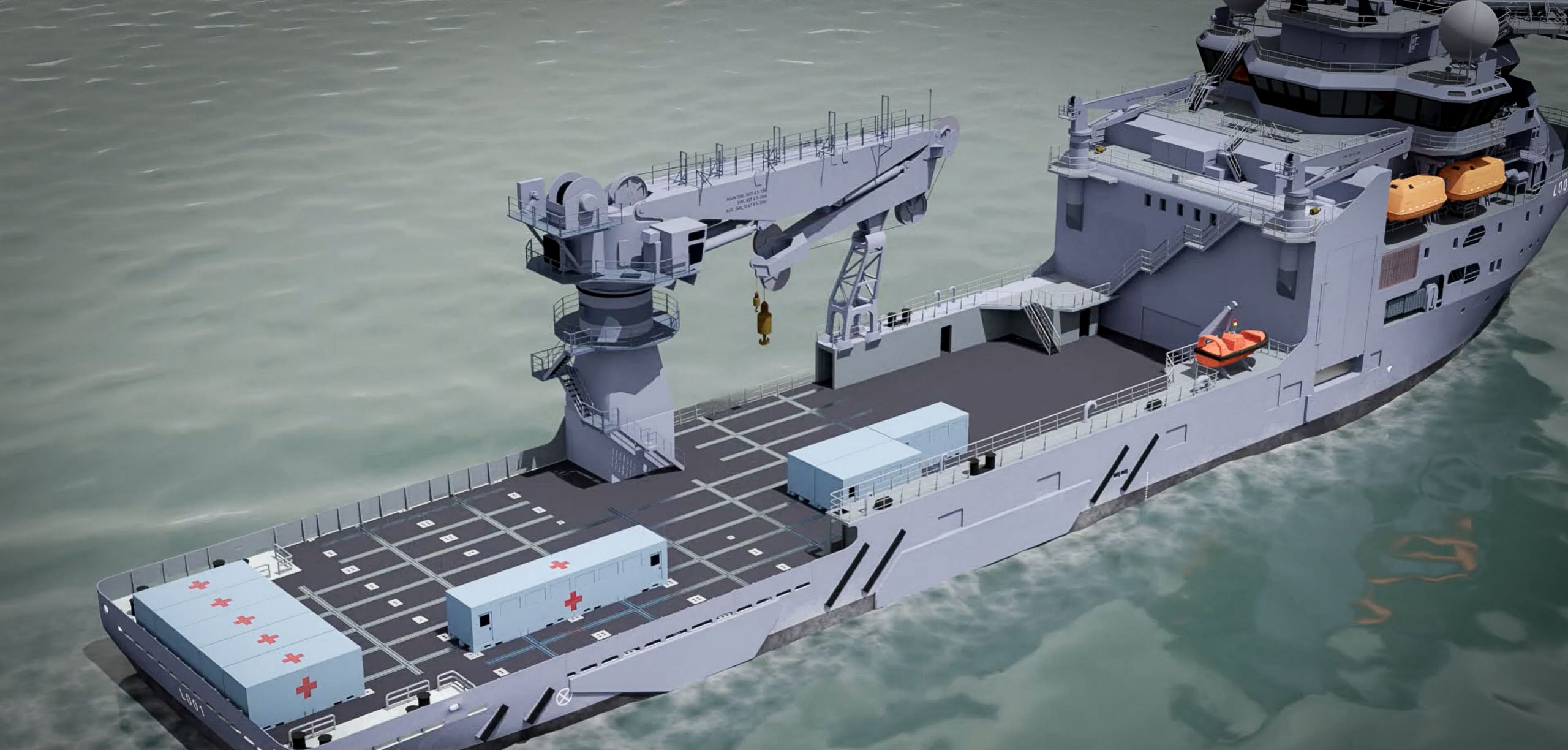
Price Mine Storage module: Approx. USD 551.000



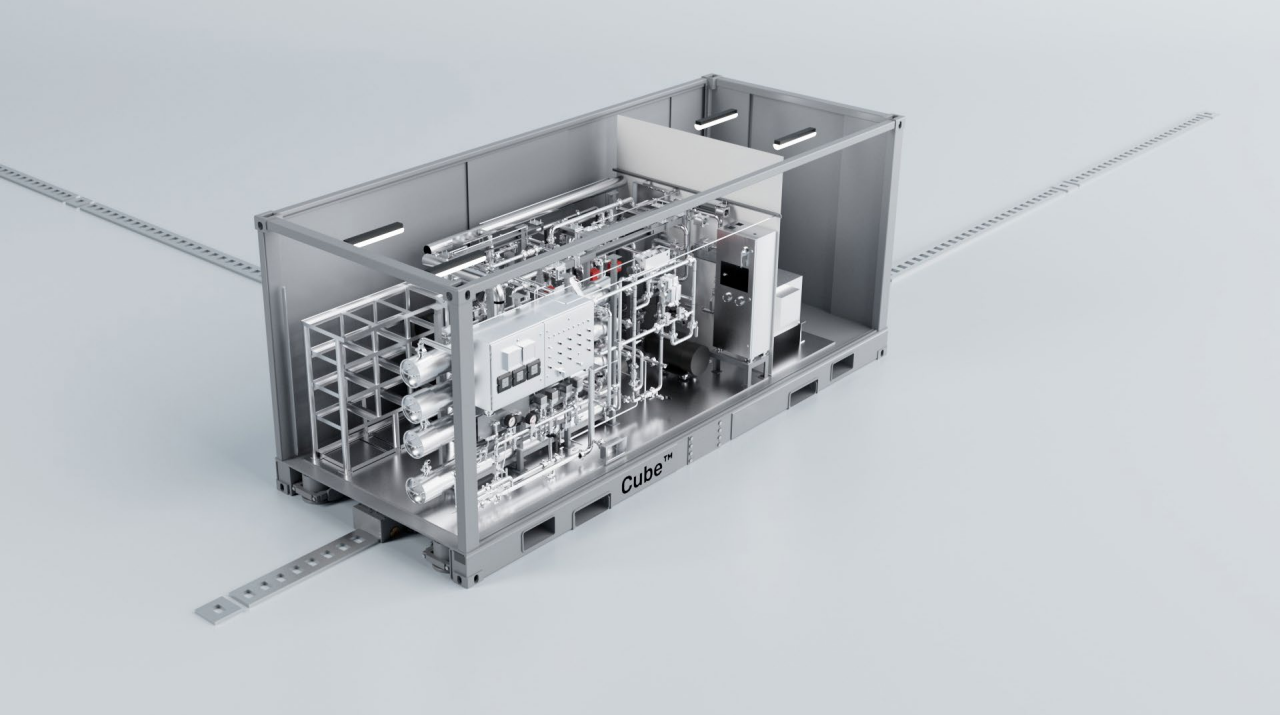


SH DEFENCE

Cube™



Naval Disaster Relief Operations



Mission: Sea Water Desalination

Name: ROWPU

Company: Blu Metric Environmental

Prime: SH Defence

Integration: SH Defence

Price ROWPU module: Approx. USD 725.000

Price integration:

The prices are indicative and must be negotiated with the equipment supplier. ILS and Standard approvals and documentation are not included.

BluMetric currently supplies the Canadian Department of National Defense (DND). Delivering fresh drinking water within hours of set-up. One ROWPU can provide 150m³/day of drinking water, which is enough water for 3,000 people at an average consumption of 50 litres/day/person. The ROWPUs are used during military operations, humanitarian and disaster relief missions.

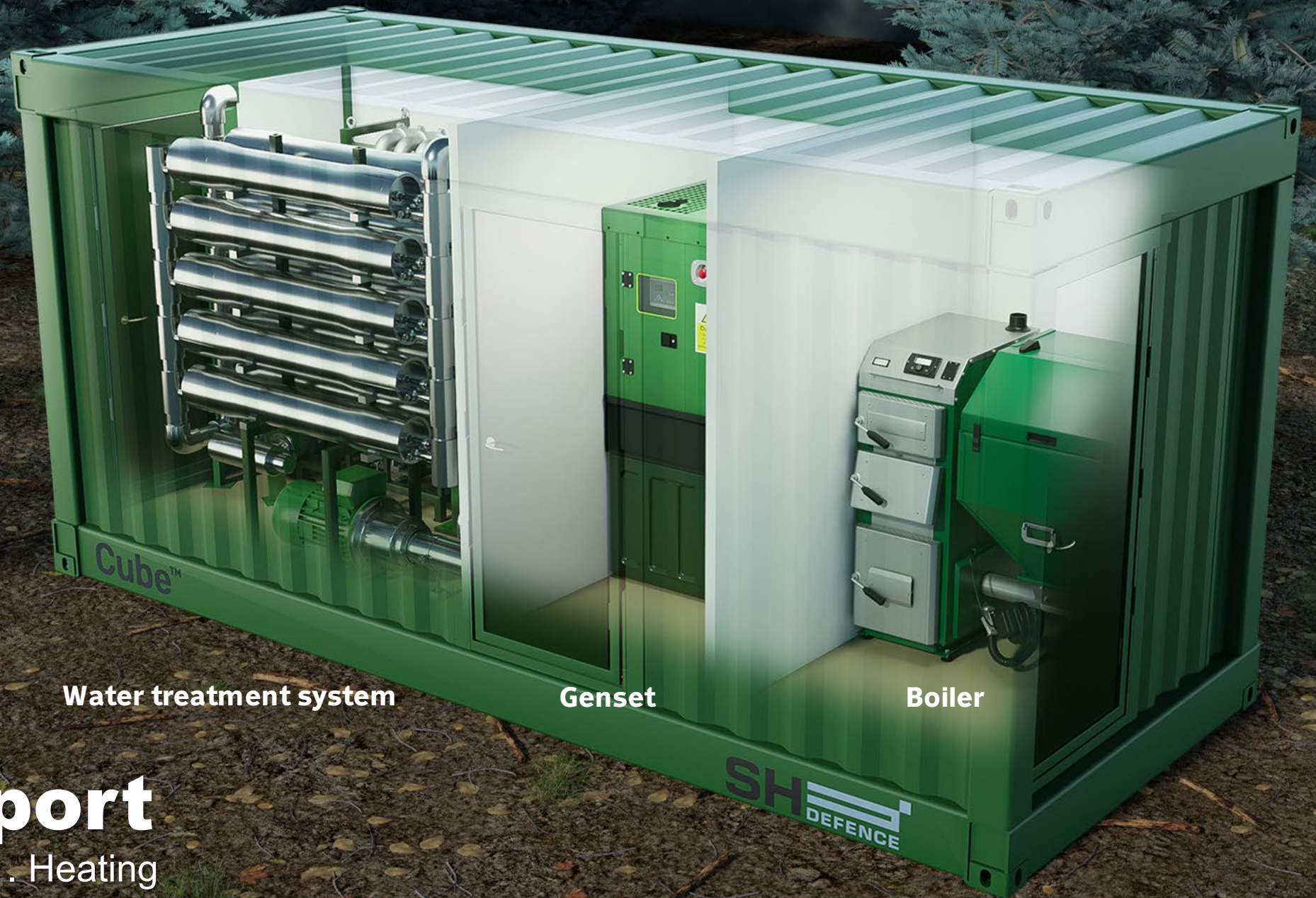
Key:

Fully self-contained in a 20' container

Onboard power through diesel generator/battery storage, plus local power (when available)

Reliable water purification (source water: fresh, brackish, salt, turbid)





Water treatment system

Genset

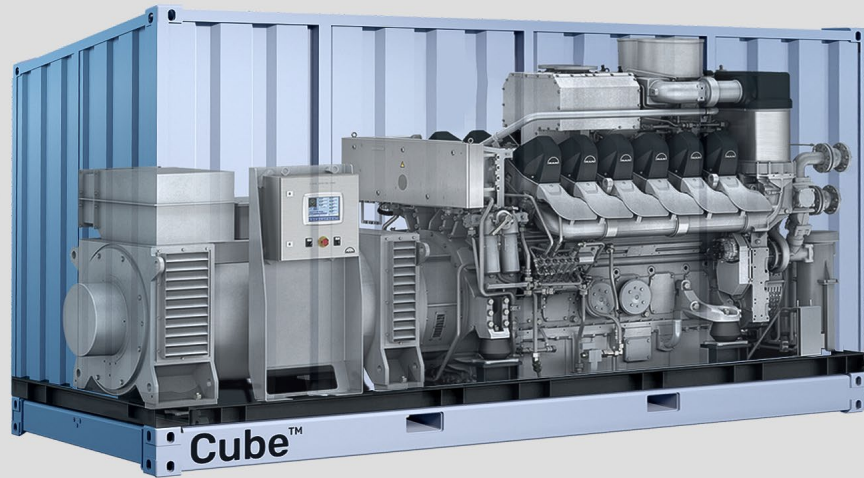
Boiler

Life support

Clean water . Power . Heating



3-1 system



MAN175D - High-speed genset

Mission: Power System

Name: Life Support – Power and Heating

Company: SH Defence + Suppliers

Prime: SH Defence

Integration: SH Defence

Price Power System module: Approx. USD 1 million
(Requirements?)

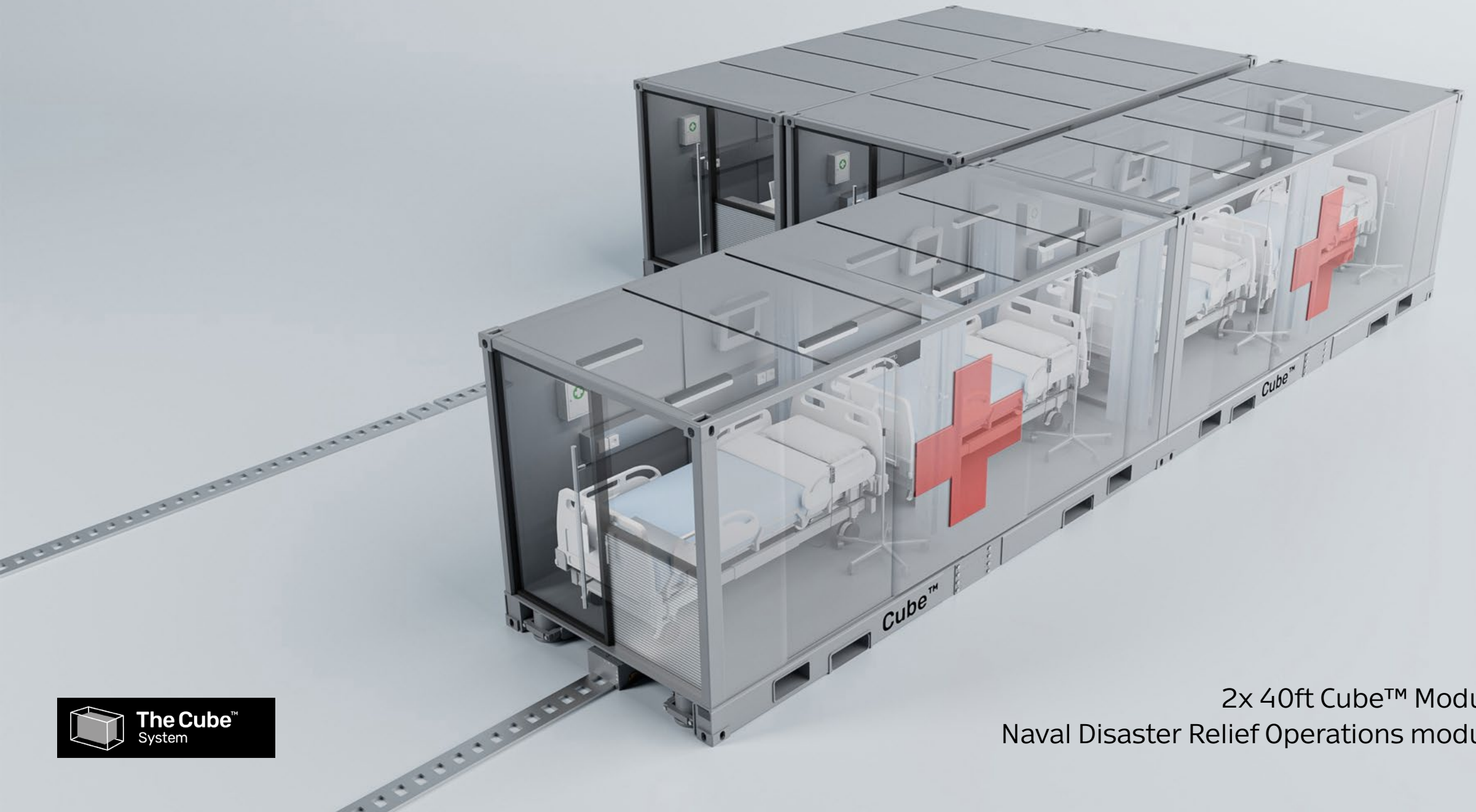
Price integration:

The prices are indicative and must be negotiated with the equipment supplier. ILS and Standard approvals and documentation are not included.

Stand-alone Generator Set, Solar Power System with battery power storage

Genset is designed to run at full capacity in land-based harsh environments. The Boiler system for heating houses, supply to hospitals or other mobile container solutions like offices, field kitchens and hospitals.



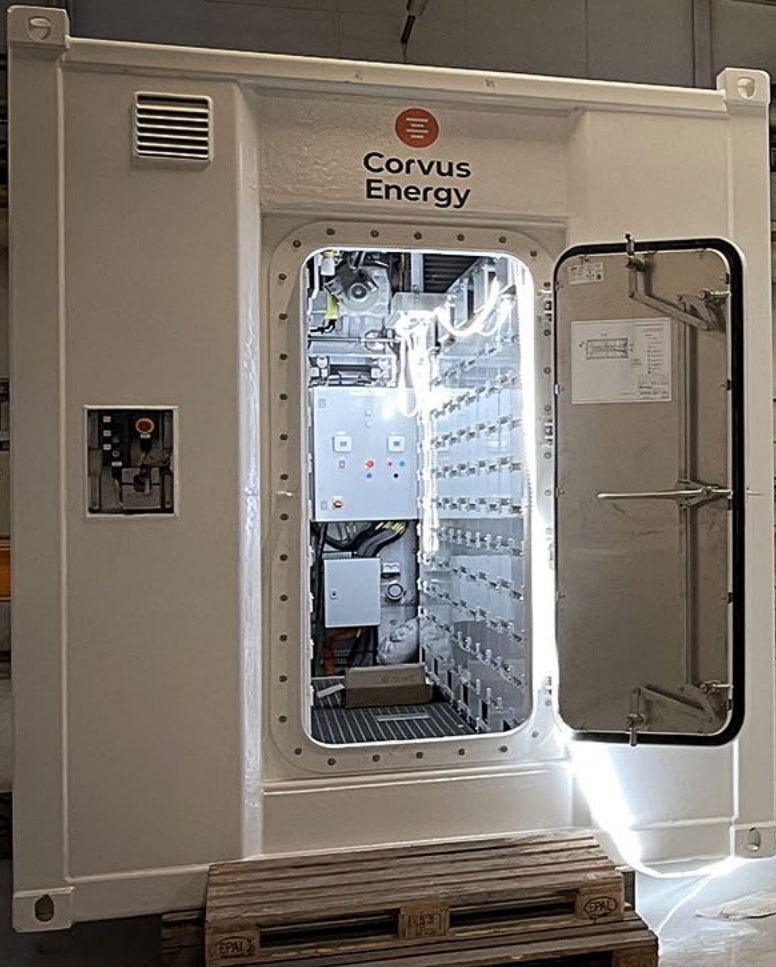


2x 40ft Cube™ Module
Naval Disaster Relief Operations module



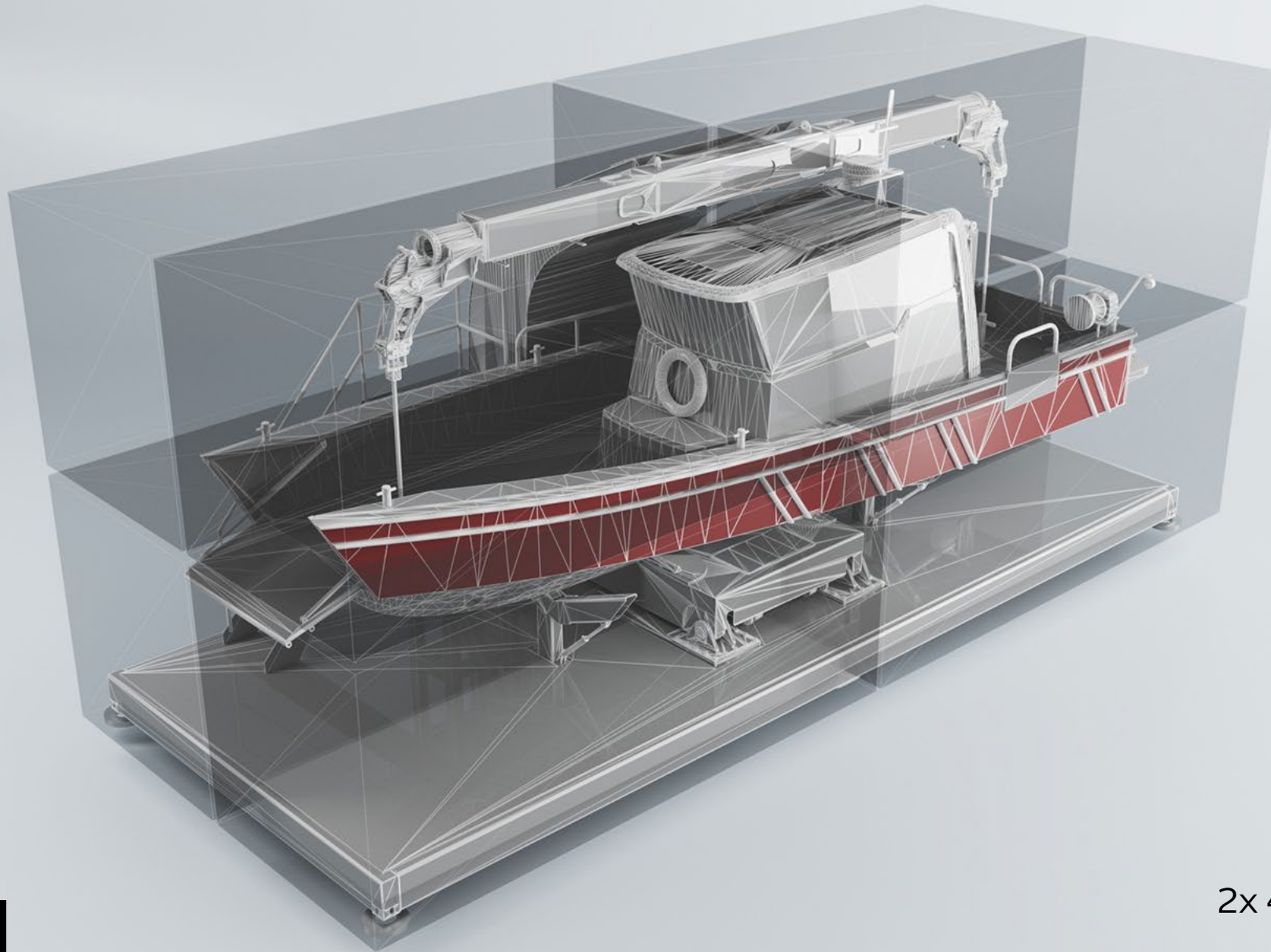
20ft or 40ft Cube™ Modules stacked
Naval Disaster Relief Operations module / Submarine Rescue Systems





BATTERY ROOM

Containerised battery and fuel cell solutions



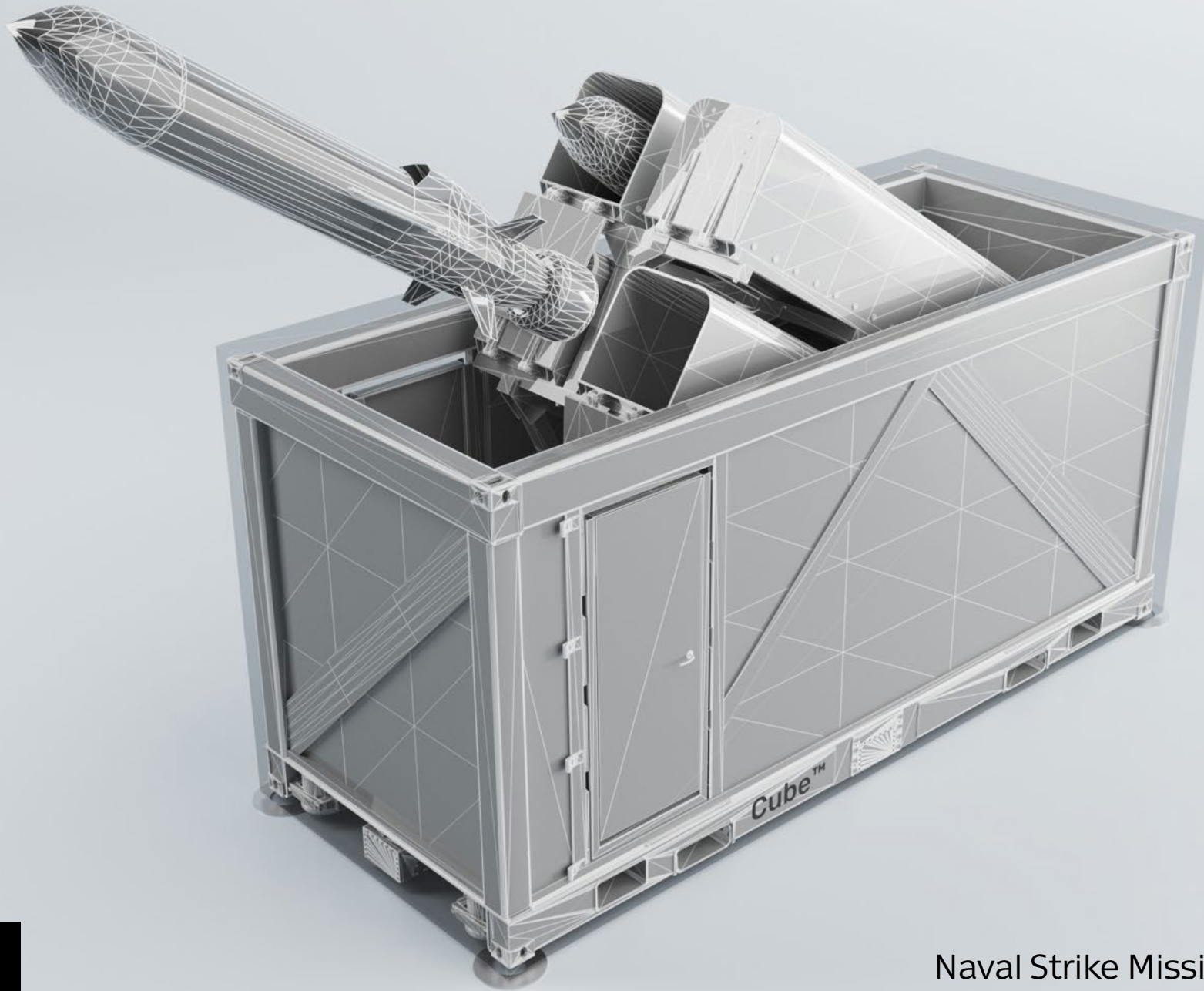
2x 40ft Cube™ Module
Boat Davit System



2x 40ft Cube™ Module
Boat Davit System



2x 40ft Cube™ Module
Oil Containment System



20ft Cube™ Module
Naval Strike Missile (NSM) by Kongsberg





**IN THE
DEVELOPMENT**



Mission: Anti-ship missile
Name: NSM – Naval Strike Missile
Company: Kongsberg
Prime: Kongsberg
Integration: SH Defence

Price NSM module:
Price integration: Approx. USD 656.000

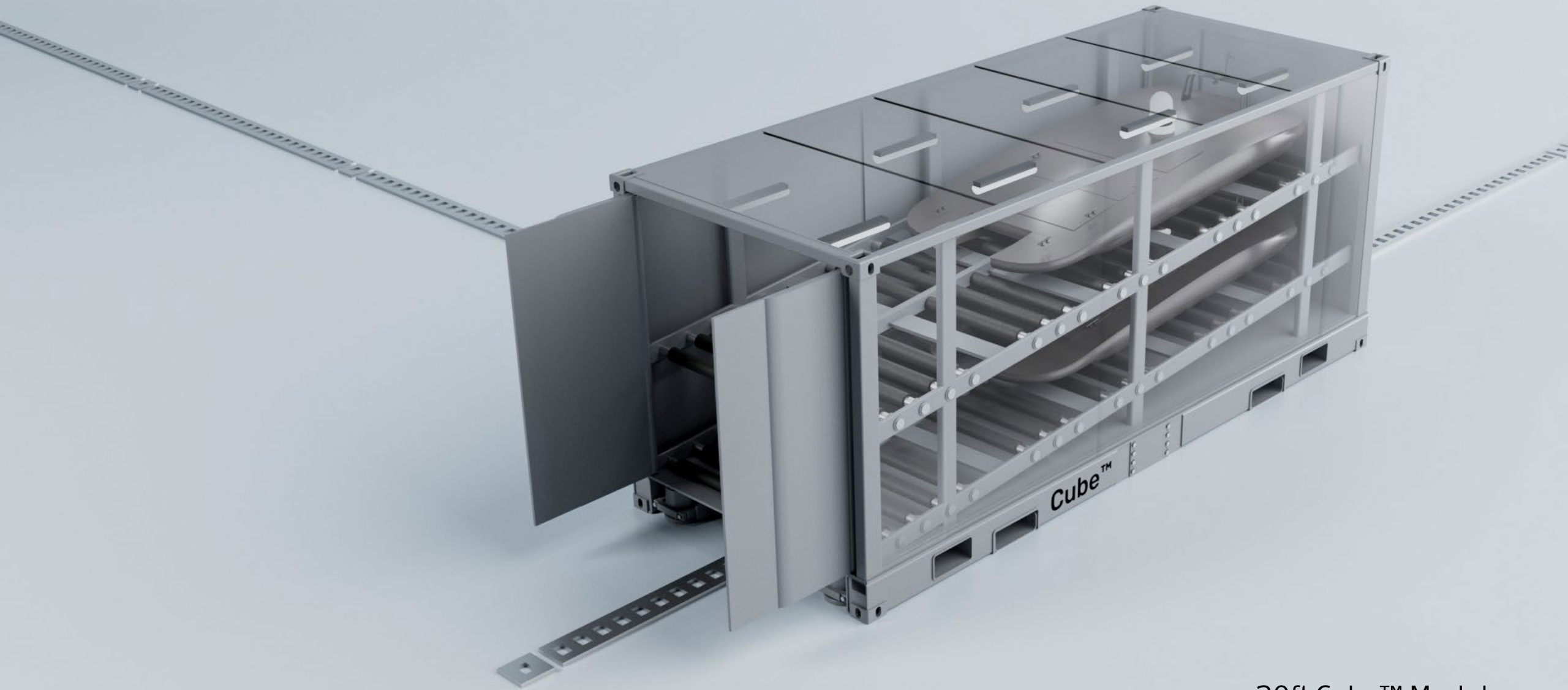
The prices are indicative and must be negotiated with the equipment supplier. ILS and Standard approvals and documentation are not included.

The Naval Strike Missile is a long-range, precision strike weapon that seeks and destroys enemy ships at distances greater than 100 nautical miles (185km).

The NSM is a very flexible system, which can be launched from a variety of platforms against a variety of targets on sea and land. The NSM is a fifth-generation anti-ship missile, produced by Kongsberg.

Specs.:
Speed: High Subsonic
Weight: 407 kg (897 lbs)
Length: 3,96 m (156 inches)
Range: >185 km (100 nm)





20ft Cube™ Module
MANTAS USV – Unmanned Surface Vessel by MARTAC



Mission: Multi-role USV
Name: T12 – Unmanned Surface Vessel
Company: MATAAC
Prime: MARTAC
Integration: SH Defence

Price MANTAS T12: N/A
Price integration: N/A

The prices are indicative and must be negotiated with the equipment supplier. ILS and Standard approvals and documentation are not included.

A solid system for littoral environments, hosted from a mothership. Deployable from shore, ship or boat with supporting launch and recovery equipment.

Mine Countermeasure
Search and Rescue
Security Monitoring
ISR Swarm
EW/SIGINT
Shallow and Deep Water Mine Countermeasure
Swarming Operations

Specs.:
Length: 12 ft (3.6 m)
Max Payload: 140 lbs (64 kg)
Powertrain: Electric
Burst Speed: 30+ kts



MARTAC
Beyond Human Capability



Mission: C-UAS - Counter Unmanned Aerial Systems
Name: Seahawk Paladin System
Company: SEA (Systems Engineering & Assessment)
Prime: SEA
Integration: SH Defence

ROM Price N/A

The prices are indicative and must be negotiated with the equipment supplier. ILS and Standard approvals and documentation are not included.

Modular and Scalable C-UAS system.

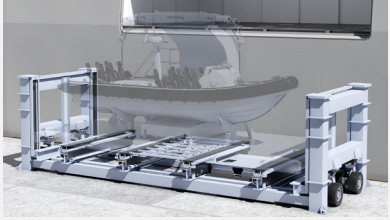
Capable of engaging multiple types of surface and air threats the MSI-DS SEAHAWK DS A3 system is optimised for combating small boat swarm attacks with highly accurate and precise gunfire. station to view, analyse, report sonar contact information

- MK 38
- Underwater threat detection
- Easy ship fit
- Small diameter
- Low weight & drag
- Low power consumption

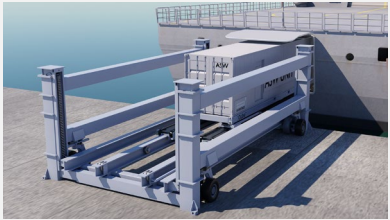
MSITM
MSI-Defence Systems Ltd

The Cube™ System

Onshore Handling



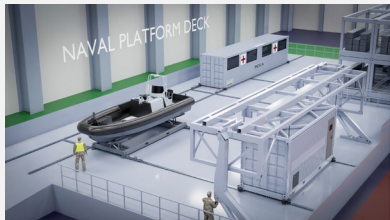
Mobile Side loader



Mobile Stern loader



Container/
Cube loader system

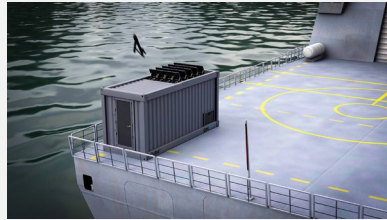


Facility for
Storage, Test,
Maintenance

Cube modules



Naval warfare

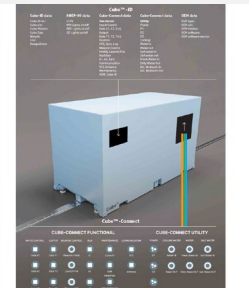
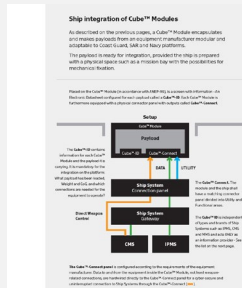


Maritime
Interdictions



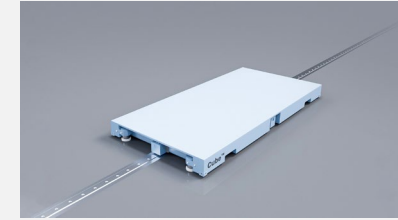
Disaster relief
Oil Spill Recovery
Search and Rescue

Integration to Ship system



Cube ID
Cube Connect

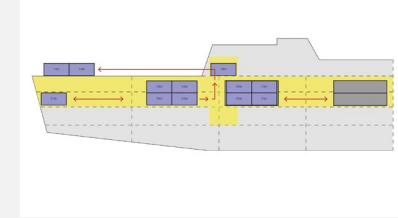
Onboard Handling



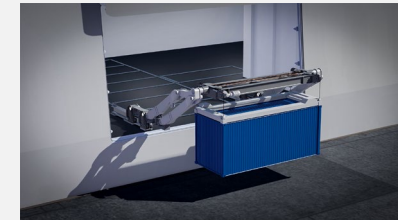
Cube
Skidding
System



Mission bay
doors and
Twistlocks



Elevators and
infrastructure



Side davit