

The new RV Belgica



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Timeline

2018-2021

- Pre-June 2018 See poster and previous ERVO presentations (2005 - 2018)
- June 2018 Signed contract (= tender + offer & notification)
- 2018-2019 Design phase (8 months) incl. setup onsite team (3 persons)
- 2019-2020 Building phase (Feb 2019 – Dec 2020; 23 instead of 20 months, cfr. COVID-19)
- 2020-2021 Sea trials (Dec 2020 – Jan 2021) – finalizing the vessel
- 2019-2021 Procurement operator (mixed crew: military & civil) (**main reason delayed delivery**)
- Sept 2021 **Delivery and start operations new RV Belgica**



Specifications

FULL OCEAN RESEARCH VESSEL

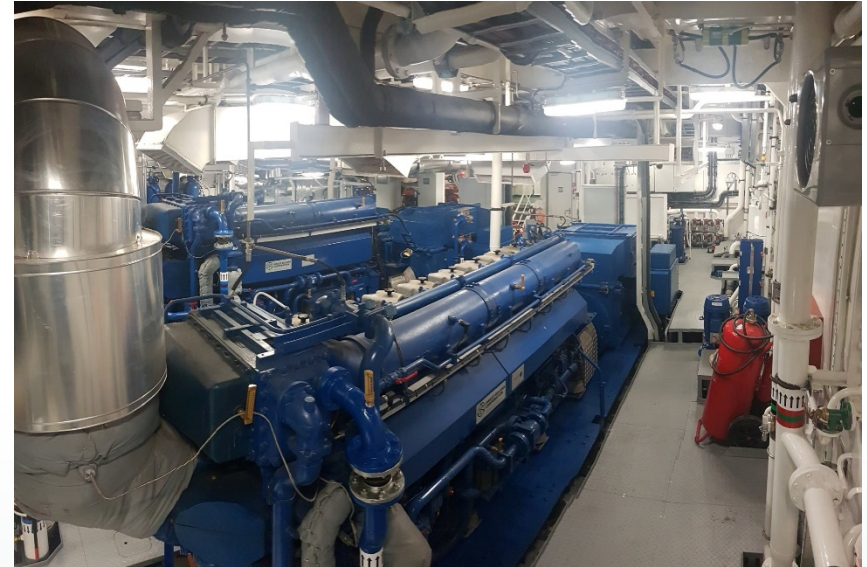
- 71.4 m length, 16.8 m beam, max. 4.8 m draft (cfr. coastal monitoring), 3722 GT
- 40 person complement
- 11 kn operational speed (max. 13 kn), 30-ton bollard pull
- Able to deploy wide range of scientific gear up to 5000 m water depth
- North Sea, Atlantic Ocean, Mediterranean Sea
- Ice Class for summer operations in Arctic areas
- Class: DNV-GL ✕ 1A; ICE-1C; SPS; E0; DYNPOS(AUTR); COMF-V(2); COMF-C(2); BWM-T; TMON; Silent-R; NAUT(AW)



Specifications

SILENT RESEARCH SHIP – GREEN SHIP

- Diesel-Electric propulsion (AC)
 - Main Gensets
 - 2 * ABC 8DZC – 1768 kW
 - 1 * ABC 6DZC – 1326 kW
 - Harbor/Emergency Generator
 - 1 * Mitsubishi S6R2-MPTA – 595 kW
 - Main Propulsion
 - 2 * INDAR – 1200 kW
 - Main propellers
 - 2 * Kongsberg – 5 blade FP – 3300 mm
 - Tunnel Thrusters
 - 2 * Kongsberg bow – 730 kW
 - 2 * Kongsberg stern – 535 kW
- MARPOL TIER III
- Waste-heat & winch energy recovery
- Energy-saving alternatives, e.g. LED lights



Specifications & SAT results

SILENT RESEARCH SHIP – GREEN SHIP

- DNV-GL Silent-R

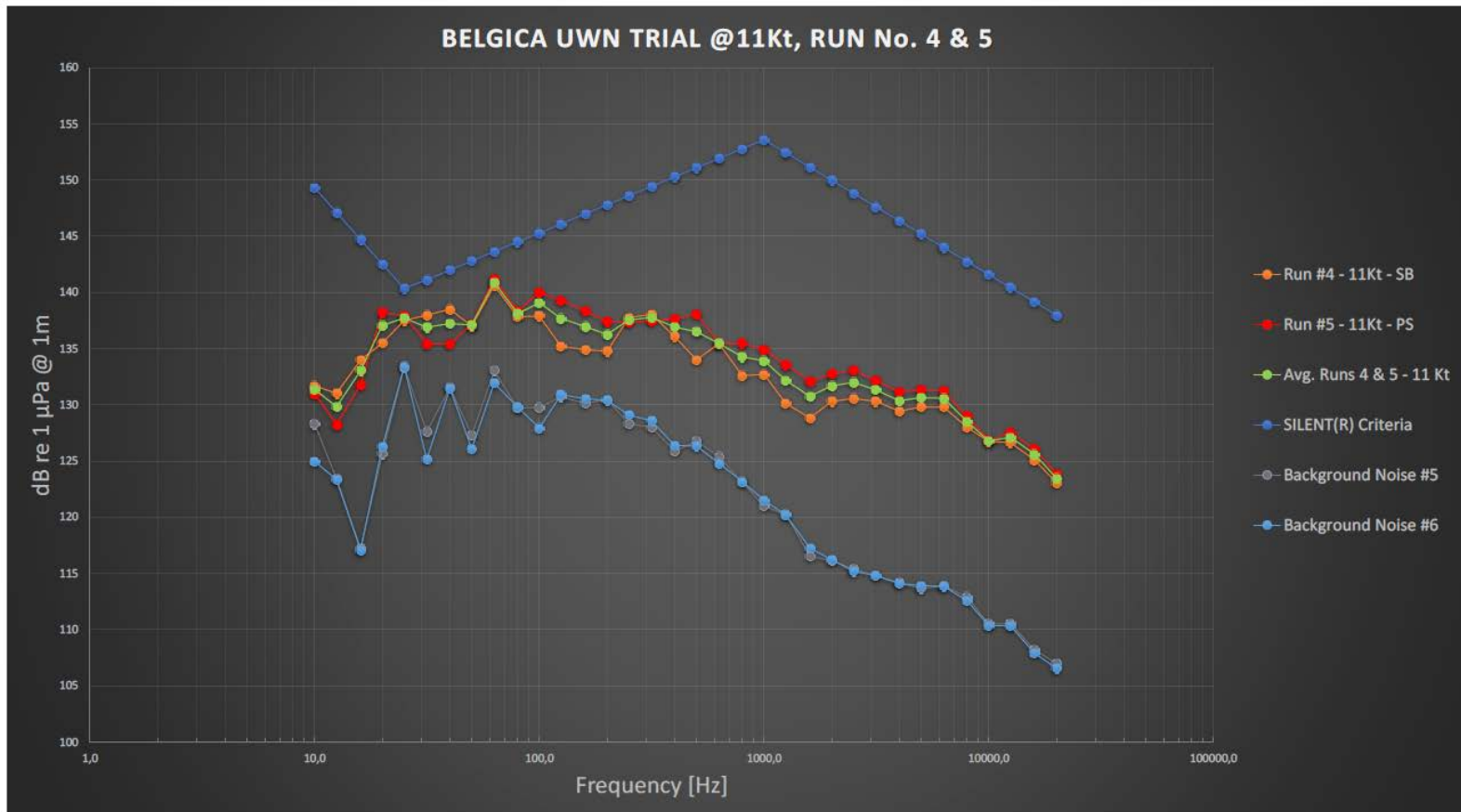


Figure 5-2, Main verification condition at 11 Kt (Run Id no. 4 and 5, distance corrected and averaged spectra)

Specifications

NEW CAPABILITIES

- Dynamic Positioning Class 2 (DP-2) (2 stern & 2 bow thrusters)
- Hoppe roll reduction system
- 12 crew – 28 scientists & technicians (14 single - 13 double cabins): to be updated with operator
- 30-day autonomy
- 300 days/year at sea



Tour of the ship

Navigation

- DP2
- Kongsberg integrated bridge system
- Kongsberg bridge KVM system
- Kongsberg scientific KVM system

Tour of the ship

Housing – Galley & Scullery

- Dry provision store & cooler & freezer next door



Tour of the ship

Housing – Mess Room & Day Room & Duty Mess

- 20 people (2 shifts for max. complement of 40)



Tour of the ship

Housing – Cabins

- 10 single cabins
 - 4 cabins with day room
- 13 double cabins
- Infotainment
- Ensuite bathrooms



Tour of the ship

Housing – Change rooms

- General change room
- Fishery change room
- Engineers' change room



Tour of the ship

Laboratories – fixed equipment

- KVM RX + screen in all labs (Access to all scientific acquisition systems & CCTV)
- PC + screen in all labs
- Remote Distribution Boxes (Instrumentation cable, PPS, Oceano fiber optic, LAN, earthing, 24V) in all labs
- Cable lead throughs to other labs & decks in all labs
- Temperature controlled (18-25°C or 4-25°C)
- Scientific sea water in all labs
- 3 laminar flow cabinets
- 3 fume cabinets
- 19 flexible fume hoods (5 labs)
- 500 L -80°C freezer & LN generator
- 600 L -20°C freezer & ice machine
- 600 L fridge
- 2 Mili-Q water systems
- 2 RO water systems
- 2 Memmert incubators
- 3 Memmert ovens
- 1 lab dishwasher
- 1 scientific centrifuge
- Etc.



Tour of the ship

Laboratories – Wet Lab

- 46 m² (of ca. 430 m²)
- Control CTD LARS operation
- Direct access to:
 - Stb deck
 - CTD hangar
 - Science hangar
 - Dry lab 1 & 2



Tour of the ship

Laboratories – 4 Dry Labs

- Lab 1 & 2: 43 m² & 19 m²
- Lab 3: 33 m², ISO 8 clean room, 4°C – 25°C
- Dry Fish Lab: 20 m², 4°C – 25°C



Tour of the ship

Laboratories – Wet Fish Lab & freezer & fridge

- 75 m²
- Freezer & Fridge: 15 m² & 15 m²
- Catch receiving bin from deck to lab
- Overboard direct discard
- 2 + 1 conveyors (5 persons)
- 2 sorting tables (8 persons)



Tour of the ship

Laboratories – Aerosol Lab & AUMS Room & Crow's Nest

- Aerosol: 9 m²
 - Cable lead trough & air ducts to FWD mast
- AUMS: Autonomous Underway Measurement System
 - SubCtech Ocean Pack system – ICOS Ocean station
 - 2 Scientific Seawater circuits
- Crow's nest: 8 m²



Tour of the ship

Laboratories – Operational Center & IT Room

- Operational Center
 - 63 m²
 - 4 - 8 operation stations (10 KVM RX)
 - CCTV & SU90 control station
 - Infotainment
 - View on working decks



- IT room
 - 24 m²
 - 12 racks
 - Kongsberg Signal Distribution



Tour of the ship

Laboratories – Scientific Lab

- Conference & class layout (Max. 28 seats) (52 m²)
- 3 operation stations (5 KVM RX) + 3 workstations
- 75" interactive digital board
- Infotainment
- View on working decks



Tour of the ship

Deck Space & Machinery

- Aft deck (218 m²)
 - 5 * 20' containers
 - 90 cm bolting matrix
 - Built for:
 - Seismic systems
 - EU ROVs – AUVs
 - MeBo70 & BGS RDS
- Stb deck (34 m²)
 - 75 cm bolting matrix
 - 15 m piston corer LARS
- Science hangar (79 m²)
 - 2* 20' containers
 - 75 cm bolting matrix
- CTD hangar (23 m²)
 - Handsfree LARS
 - 2 * 24 bottle rosette

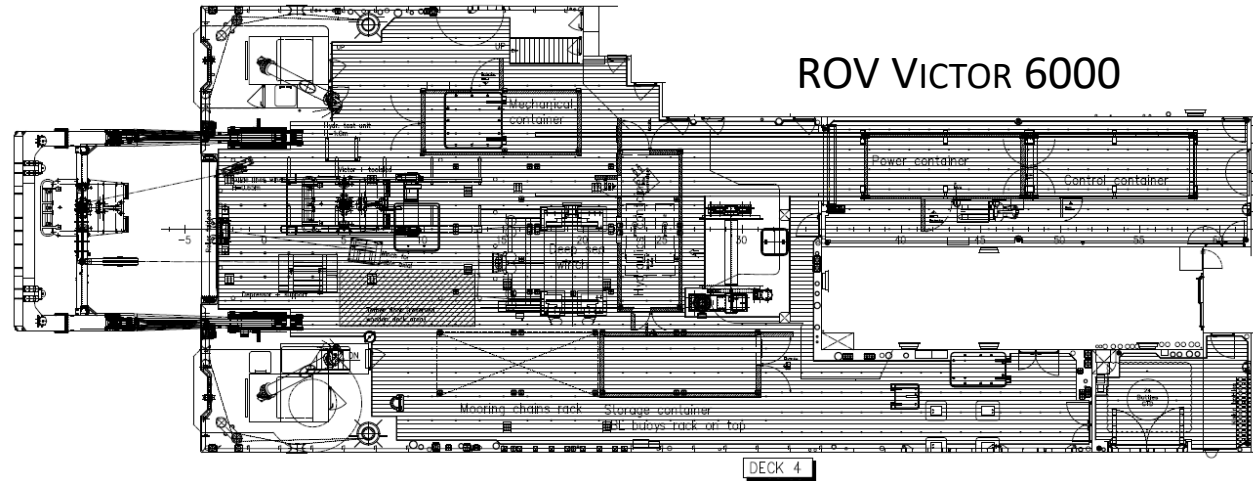


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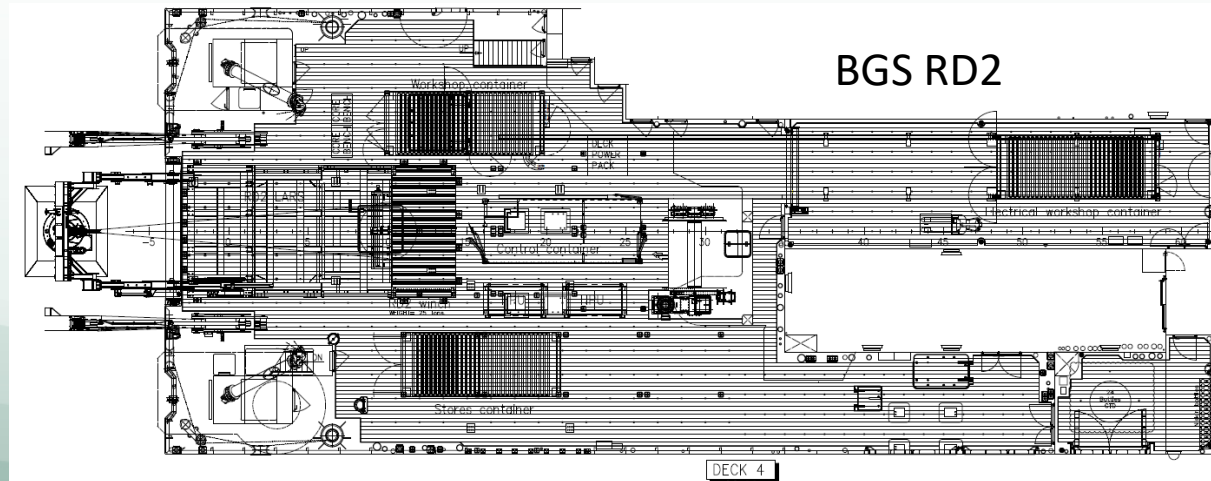
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ROV VICTOR 6000



BGS RD2



Tour of the ship

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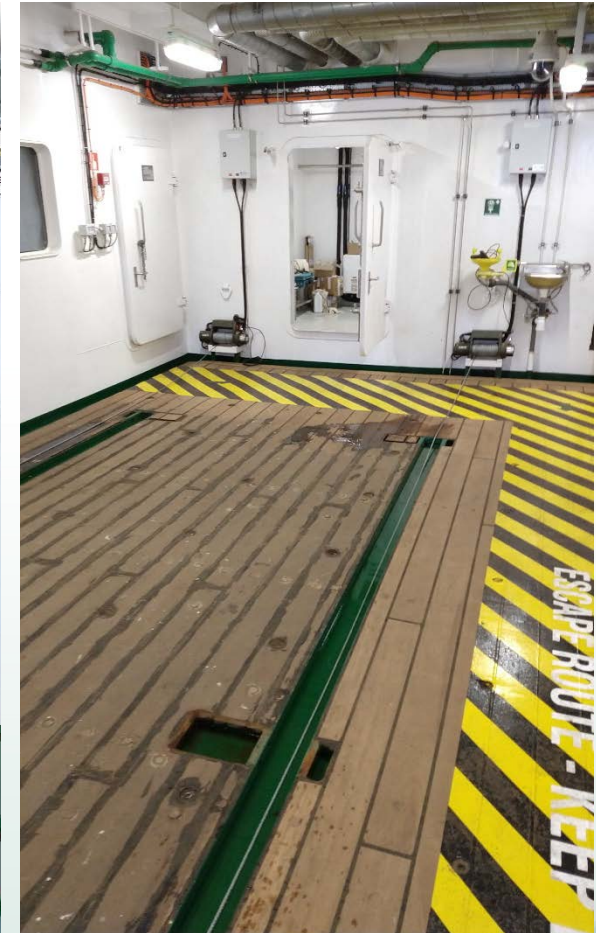
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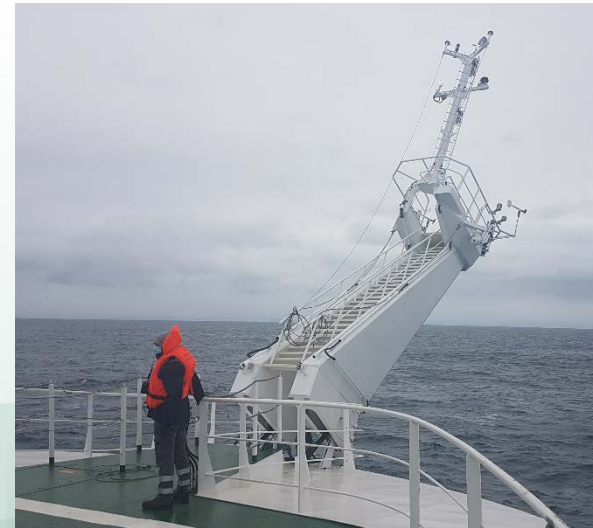
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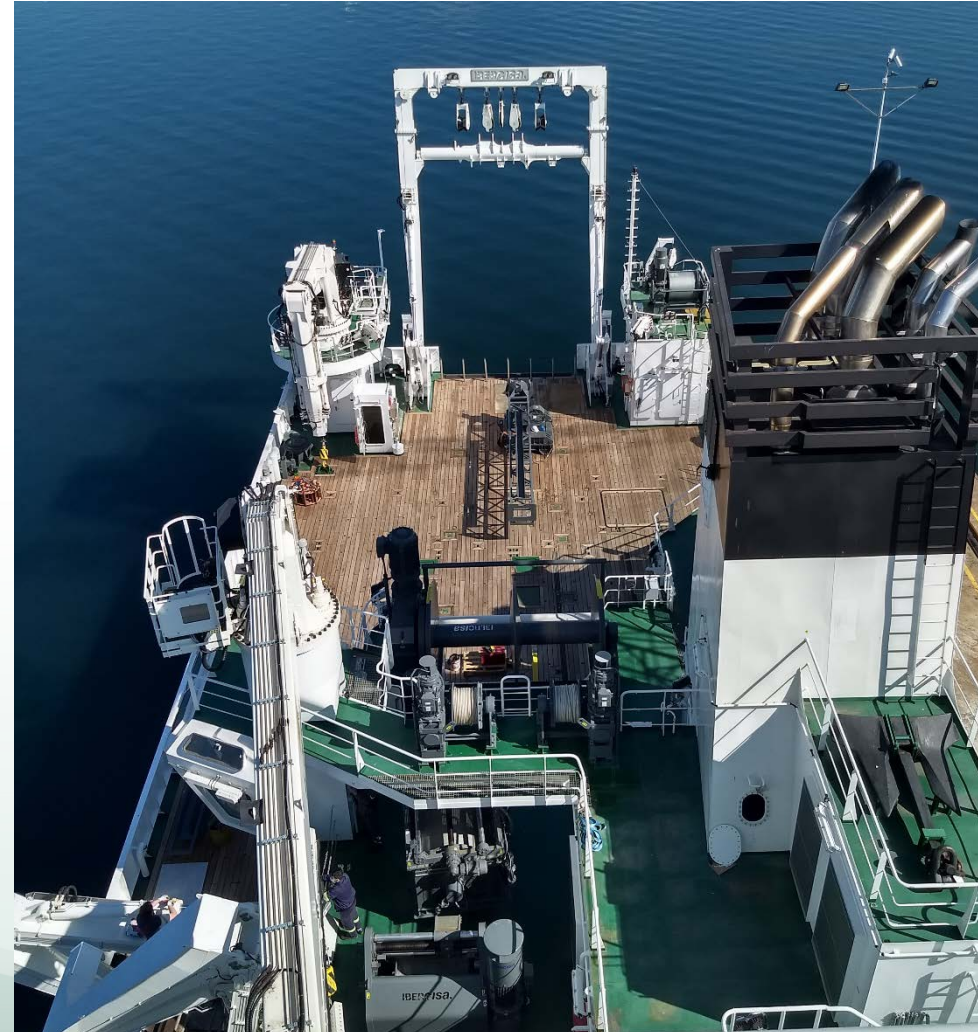
- FWD deck (83 m²)
 - 2 * 20' containers
 - UAV landing pad
- FWD foldable mast
 - Ad hoc instruments



Tour of the ship

Deck Space & Machinery

- 3 Cranes (FWD, MID, AFT) – 1.5t, 4t, 8t @16m
 - 2 CTD Winches (STBD) – AHC – 2.9t – 5500m
 - Multifunctional Winch (STBD) – 9t – 5500m
 - Hydrographic Winch (AFT/STBD) – 5.2t – 5500m
 - 2 Trawl Winches – 40.2t – 5500m
 - Net Drum Winch – 40.4t – 10m³
 - Split Net Drum Winch – 30.2t – 8m³ each
 - Net Sonde Winch – 4.2t – 5500m
 - 2 Gilson Winches – 10.5t – 200m
 - CTD LARS – 1.7t SWL @SS4 – 4.9t MBL
 - 2 stb T-frames – 3t SWL @SS4 – 15t MBL
 - AFT A-Frame – 10/11t SWL @SS4 – 30t MBL
 - Intermediate beam (for ROVs)
 - Work Boat – 7 m
 - Piston corer incl. LARS solution – 15 m
- Able to deploy wide range of scientific gear up to 5000 m water depth





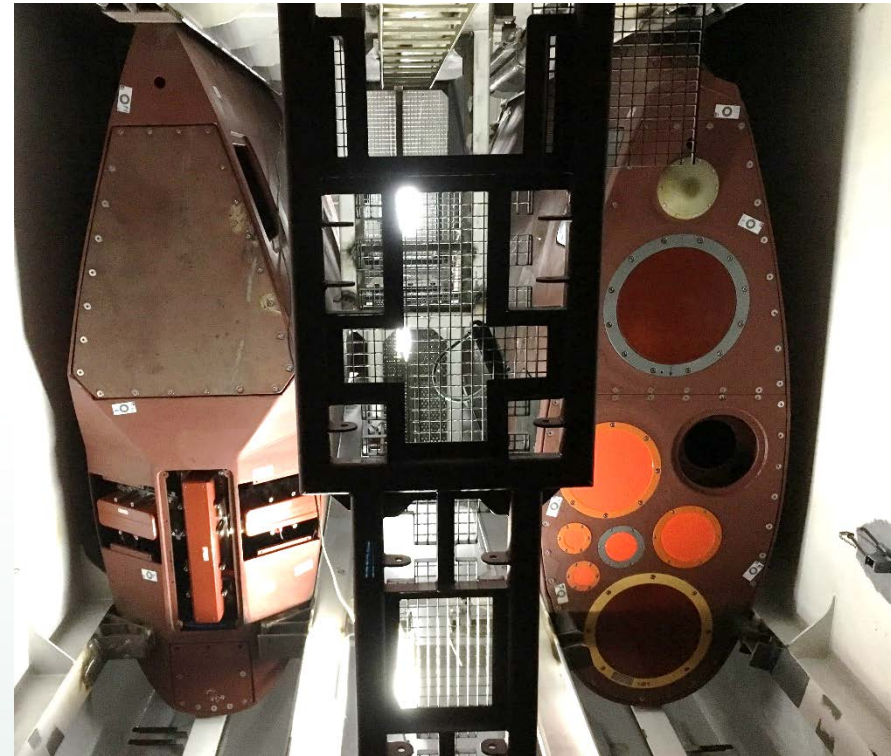
KONGSBERG

Acoustic instrument Suite

- Shallow (**EM2040**) and deep-water (**EM304**) bathymetric multibeam echosounders (600 m & 8000 m)
- Parametric subbottom profiler (**Topas PS18**) (11000 m)
- Scientific multibeam (**ME70**) & split-beam wideband echosounder (**EK80**) (>5000 m)
- Omnidirectional fish sonar (**SU90**) (4500 m)
- Net- and catch monitoring system (**PX & FX80**)
- Underwater position-reference system (USBL) (**HiPAP 502**) (5000 m)
- Acoustic Doppler Current Profilers (**Ocean Surveyor 75 kHz & Workhorse 600 kHz**) (1000 m & 50 m)

Results

- 2 drop keels
 - Good results with double RX + TX config. for EM2040 in drop keel, even in bad weather
 - Good results with winch encoder & posiwire cable extension sensor for precise depth determination of drop keel
- **Good SAT results**, bubble sweep down EM304 possible issue – ADCP 75 kHz sent back to factory



Conclusions

We got the multidisciplinary Research Vessel we wanted!

- Our **tender was sufficiently detailed** for a **1 phase tender** (for Design & Build) with **limited budget** (<45 M€ excl. VAT) for a **highly complex and capable vessel**.
- It was clearly an advantage to work with a **shipyard with a wide experience** in building RVs. A **designer** and **suppliers** with very **recent RV experience** was also very favorable.
- **Onsite team** (Marine Engineer, Marine Technician, Scientific Engineer) was sufficient. An extra onsite member for Electricity and/or IT could have been helpful (but was covered by **offsite team**).
- Due to the **delayed procurement** for the **operator**, the operator couldn't be involved in the commissioning of the vessel – no negative influence for the moment.
- **Support of the ERVO & IRSO colleagues and several technical managers** was paramount!
 - As a Marine Geologist, I was prepared to be the **Project Manager of the build** thanks to **ERVO, IRSO, Eurofleets** meetings and **maintenance issue experience** with the old RV Belgica.

Thank you!



Please visit: odnature.naturalsciences.be/belgica & belspo.be/NewRV

Website, Facebook, Twitter, etc.