FLOTTE OCÉANOGRAPHIQUE FRANÇAISE par l'Ifremer

MSRV – Mid-Shore Research Vessel

NSH – Navire Semi-Hauturier

Victor MARTIN – Naval Engineer

June 2024

AGENDA

1. General Vessel Specs
2. Innovative Electrical System
3. Detailed Specs of the Vessel
4. Vessel Operational Scenarios
5. Project Org., Schedule & Progress
6. Challenges

1 – Generalities

Characteritics of the future vessel

Length :
45 m

Breadth :
11,5 m

Draught max :
4,3 m
(incl. gondola)

Accomodation

22 people

- 12 crew
- 10 scientist

19 days of autonomy

At least 30% less environmental impact than a standard-built vessel

"Low consumption" and "silent" ship

Missions Missions to be carried out:

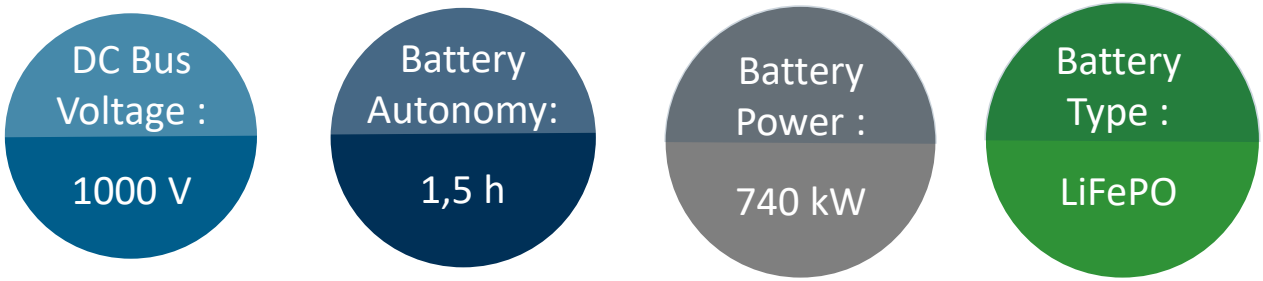
- Physico-biogeochemical campaigns
- Campaigns on biology, ecosystem ecology and fishing technologies
- Underwater research campaigns
- Ecosystem campaigns

2 – Innovative Electrical System

Energy production & distribution system

- Decision for **1000V DC power bus** on board :
  - Variable speed AC Gensets, always use engines at optimal speed for the required load
  - No reactive power on DC / no associated power loss.
  - Easier integration of other power sources (Batteries / solar / wind /…)

- LFP Battery pack of 740 kWh :
  - Ensuring power supply in port, if no quayside supply
  - Power Back-up in case of Genset black-out
  - 1.5h of vessel activity on DP or towing equipment at low speeds (2 to 4kts)



3 – Detailed Specs of the Vessel

General fittings :

Rooms	Target area
Mission control room	20,5 m²
Laboratories (wet and dry)	63 m²
Technical spaces	40 m²
Main deck	110 m²
Electronic workshop	12 m²
LEI	12.5 m²
Mess	28 m²
Galley	16 m2
Cabins	- 6 simples - 1 simple/double - 8 doubles

3 – Detailed Specs of the Vessel

Scientific Equipment

Equipments on keel or gondola	
Kongsberg EK80 Sounders	18, 38, 70, 120, 200 & 333 kHz
Multi beam echo sounders	EM712 0,5° x 1°
Sub bottom profiler	IxBlue T3
ADCP	75, 300 & 600 kHz
Fishery trawl and net monitoring device	Marport equipment
Ultra short baseline (USBL) positioning device	GAPS (mobile equipment)
Several	Acoustic remote control TT-8011 Pinger EA440 Loch Doppler

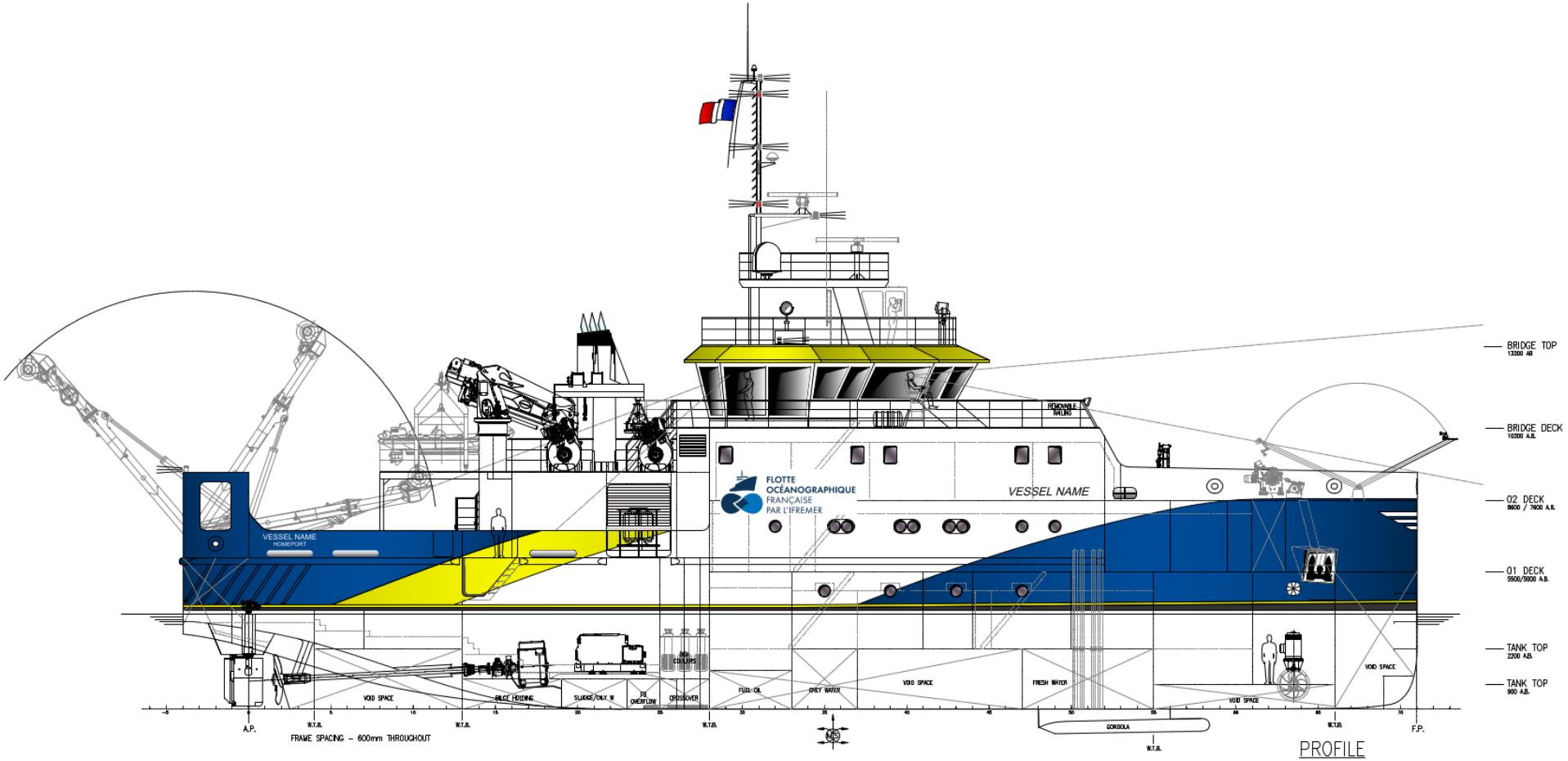
3 – Detailed Specs of the Vessel

Scientific Equipment

Mobile equipment	
Continuous measurements	Thermosalinometer SBE21 + SBE38 Ferry-Box sensors installed on THSM SW-line, with in-house data storage automation.
CTD	SBE11 – SBE19 + deck unit
Underwater vehicles	AUV Asterix ou Idefix HROV Ariane Ulyx
Sismic equipment	Ifremer mobile equipment
Coring equipment	10 m Calypso – **Up to 2000m, cable diam 18 mm** Vibro-carottier –**Thomas Schmidt Type de Geo Marine Survey « 3m »**
Various	LARS ROV

3 – Detailed Specs of the Vessel

General Arrangement – Rev 6



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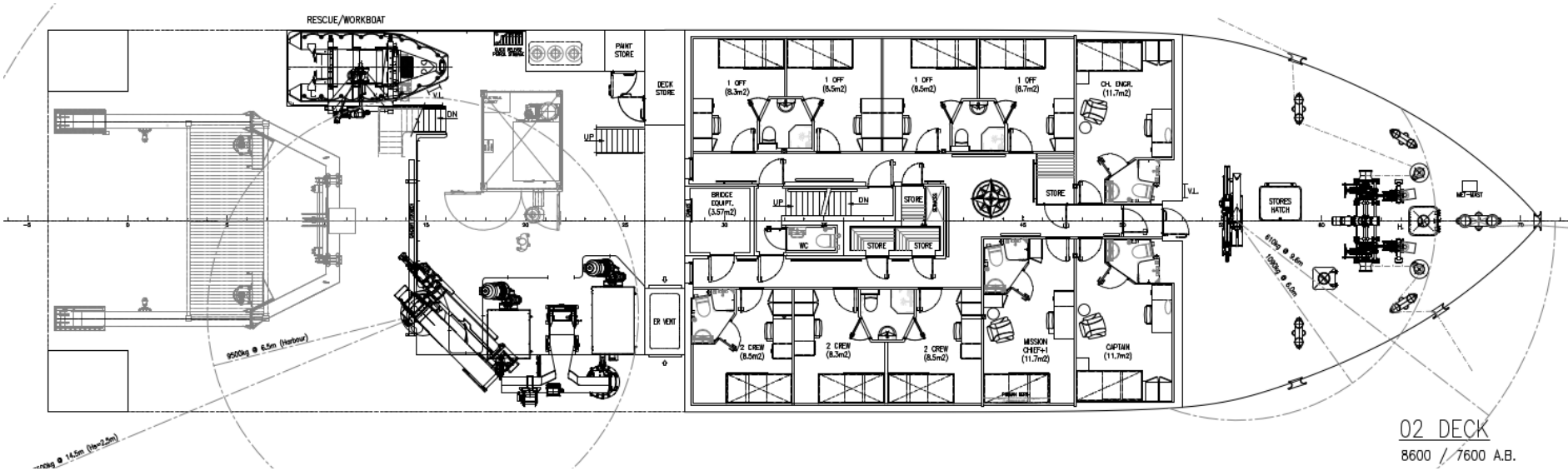
General Arrangement – Rev 6

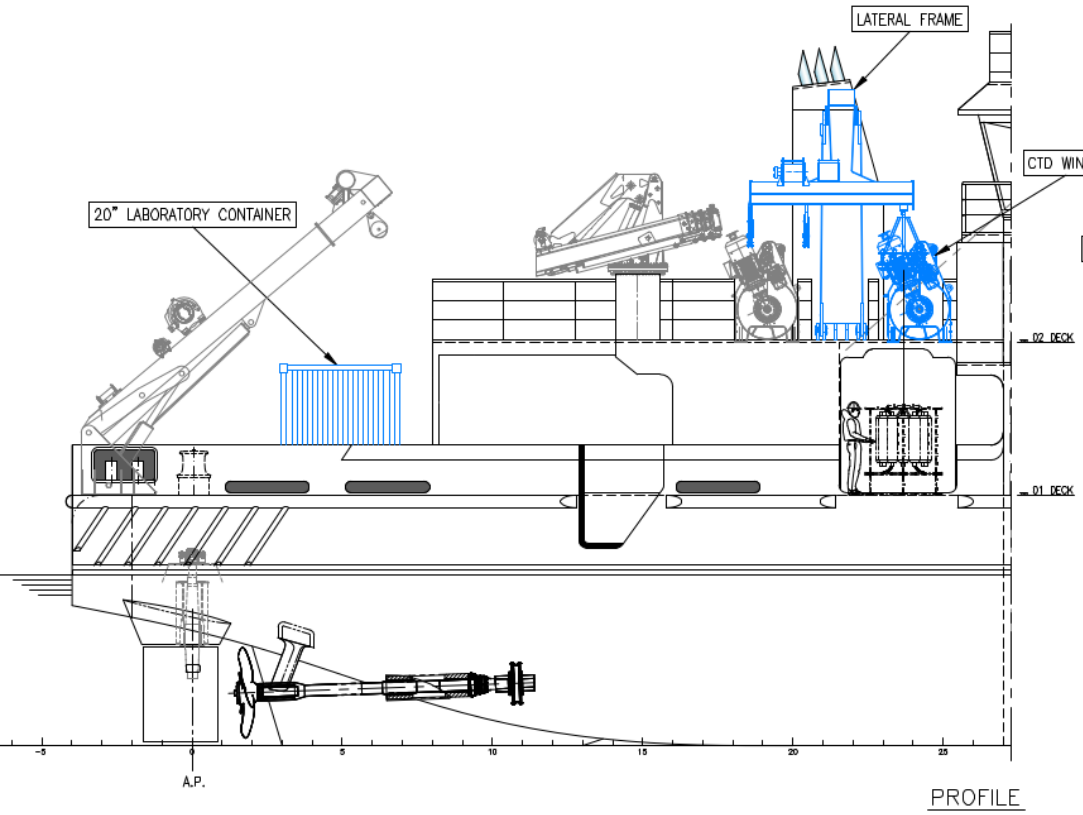


3 – Detailed Specs of the Vessel

New Renderings

4 – Vessel Operational Scenarios

Physico-biogeochimic campaign



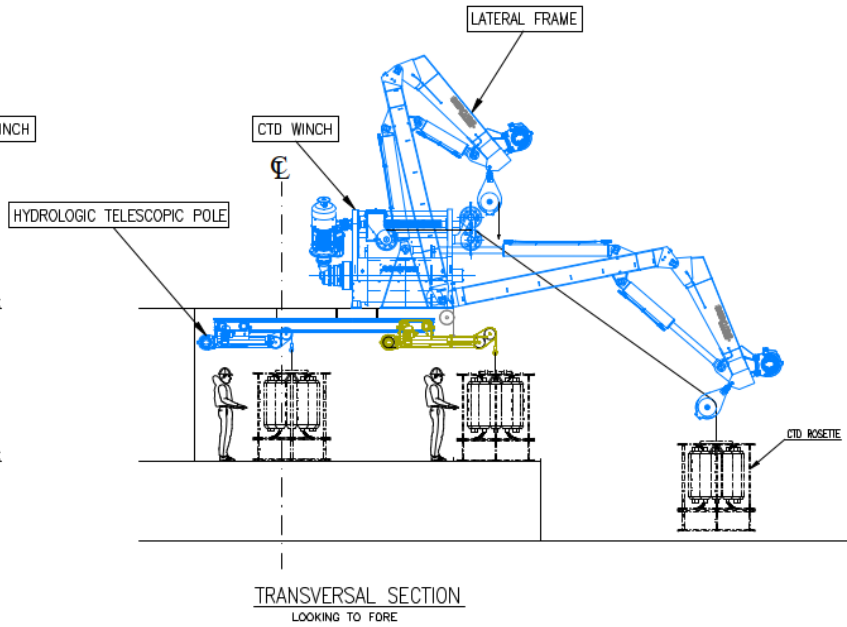
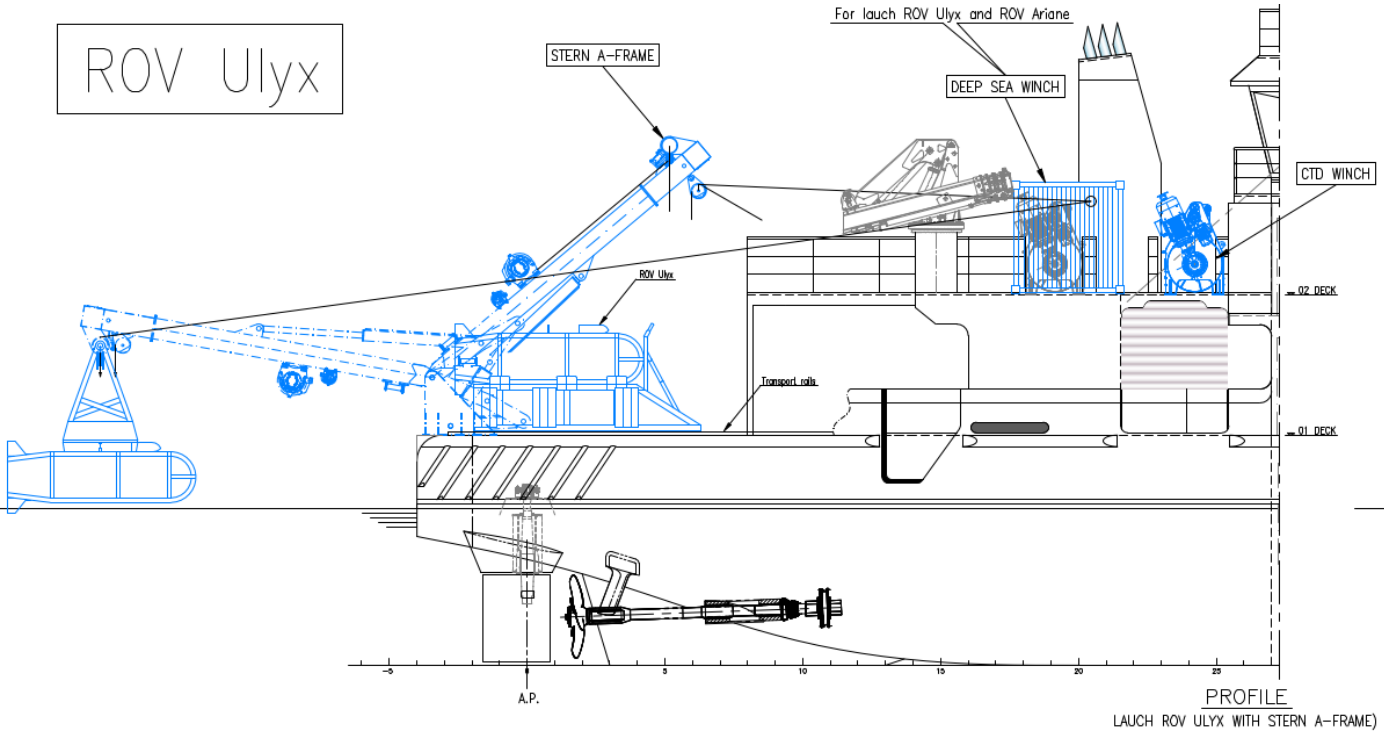
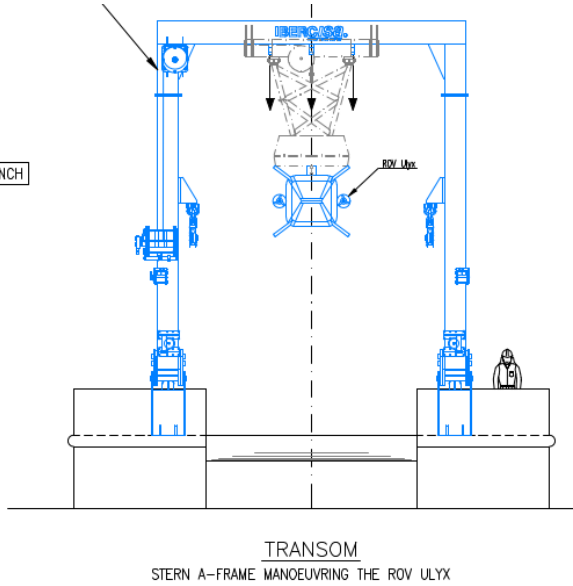


Illustration of S1 – 2D Views of Scenario cases

4 – Vessel Operational Scenarios

Underwater vehicules principles





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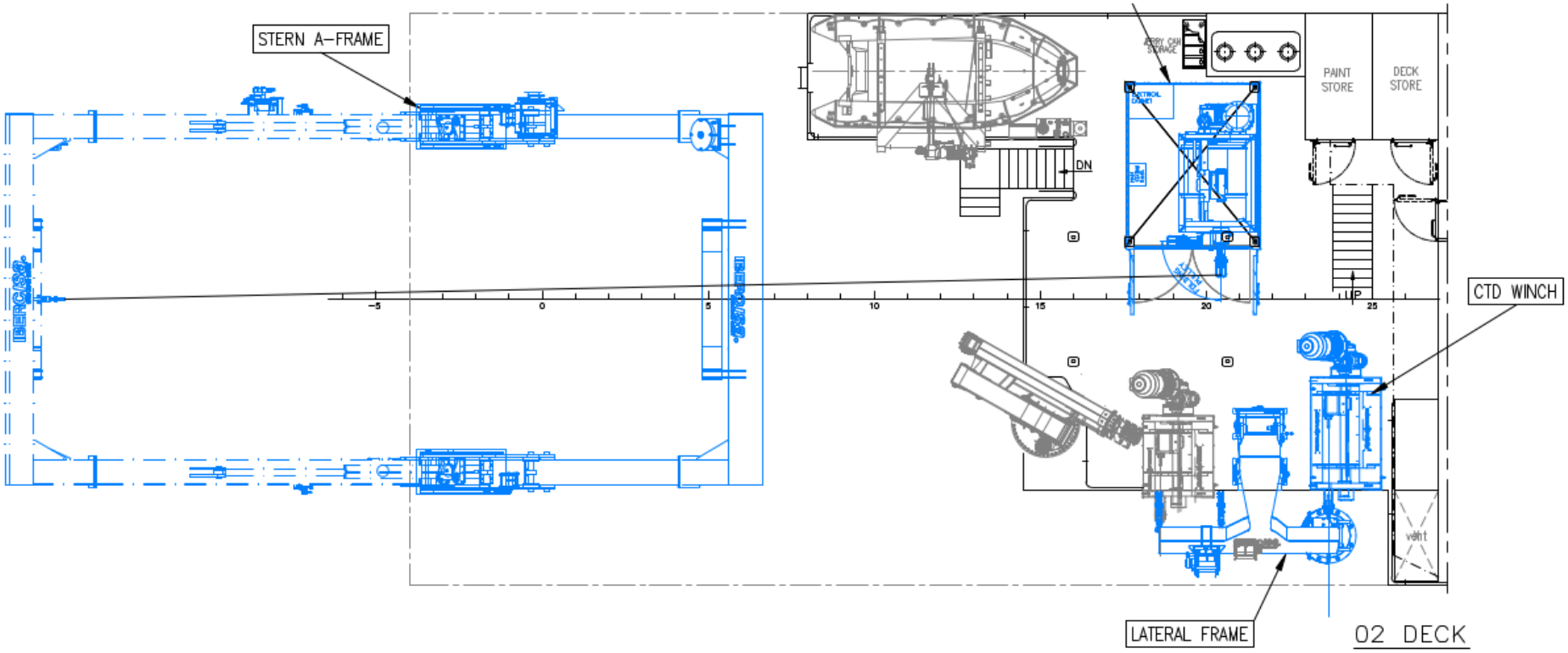

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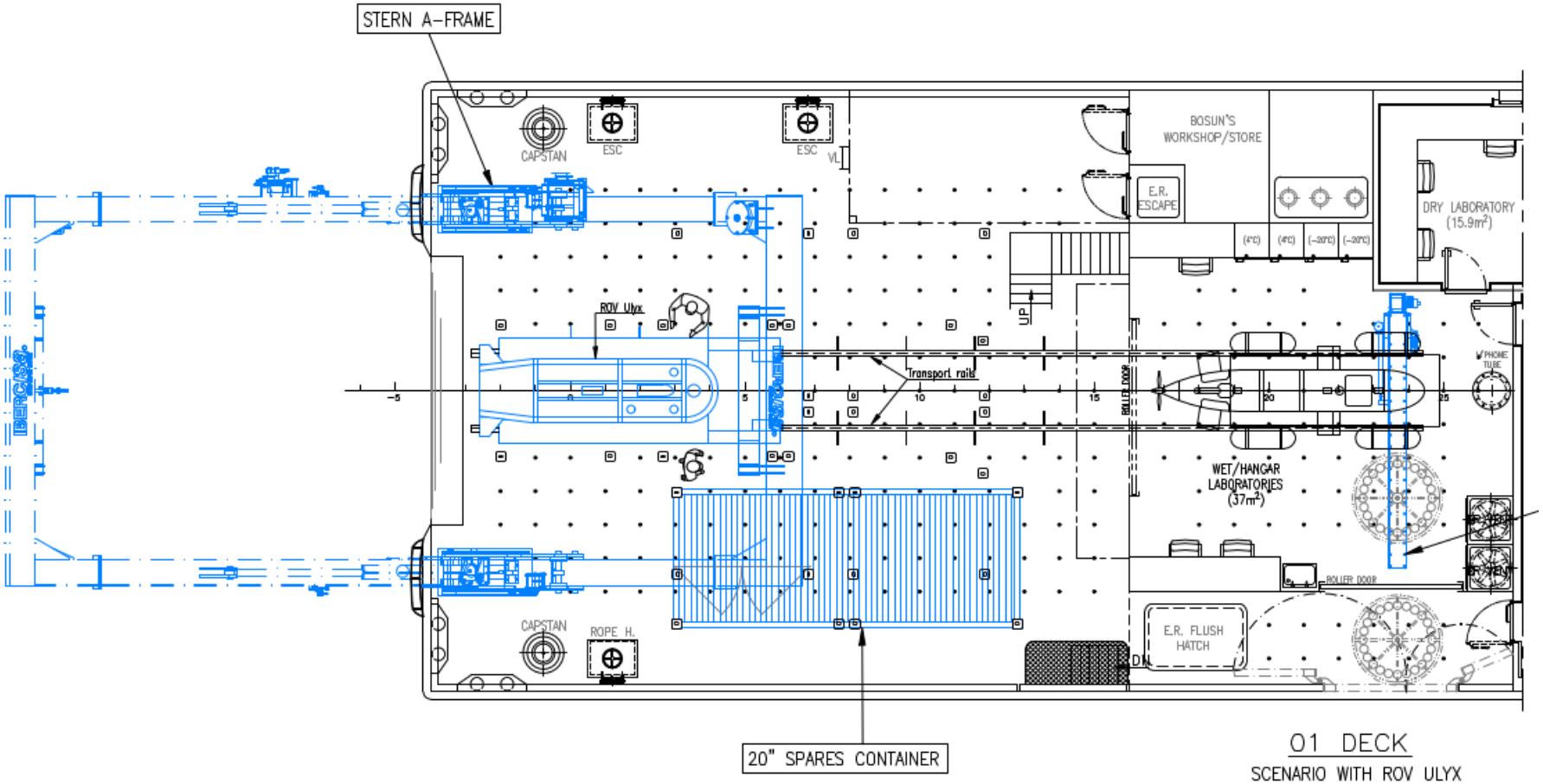


4 – Vessel Operational Scenarios

Fishery campaign

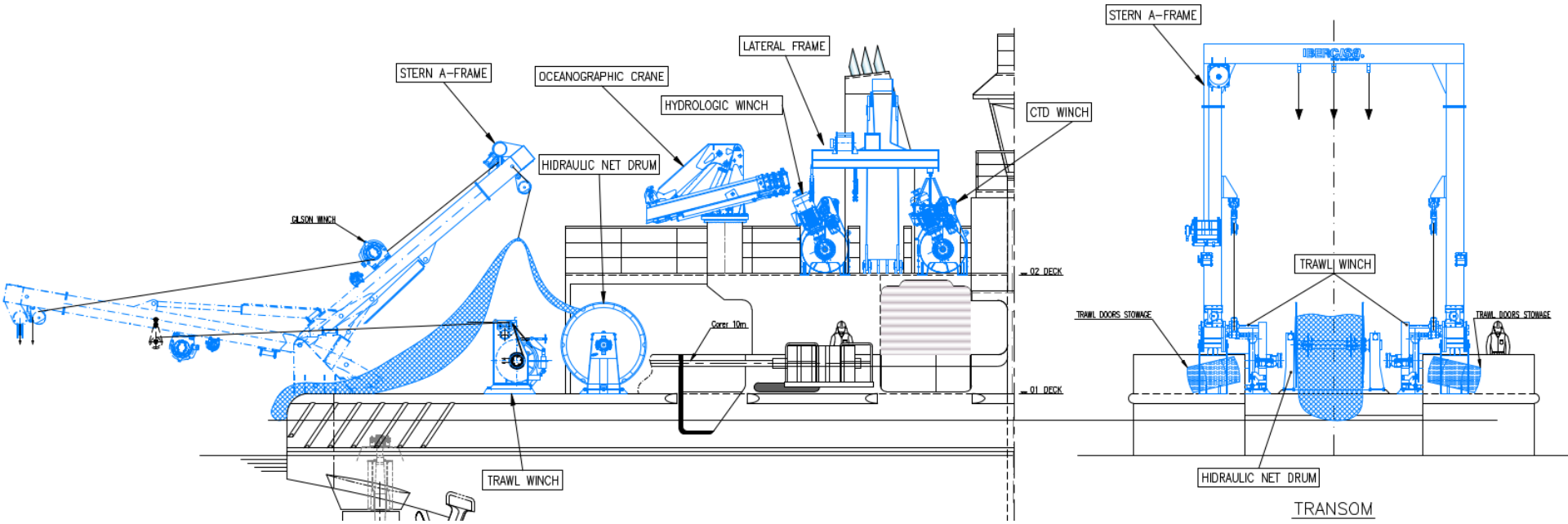
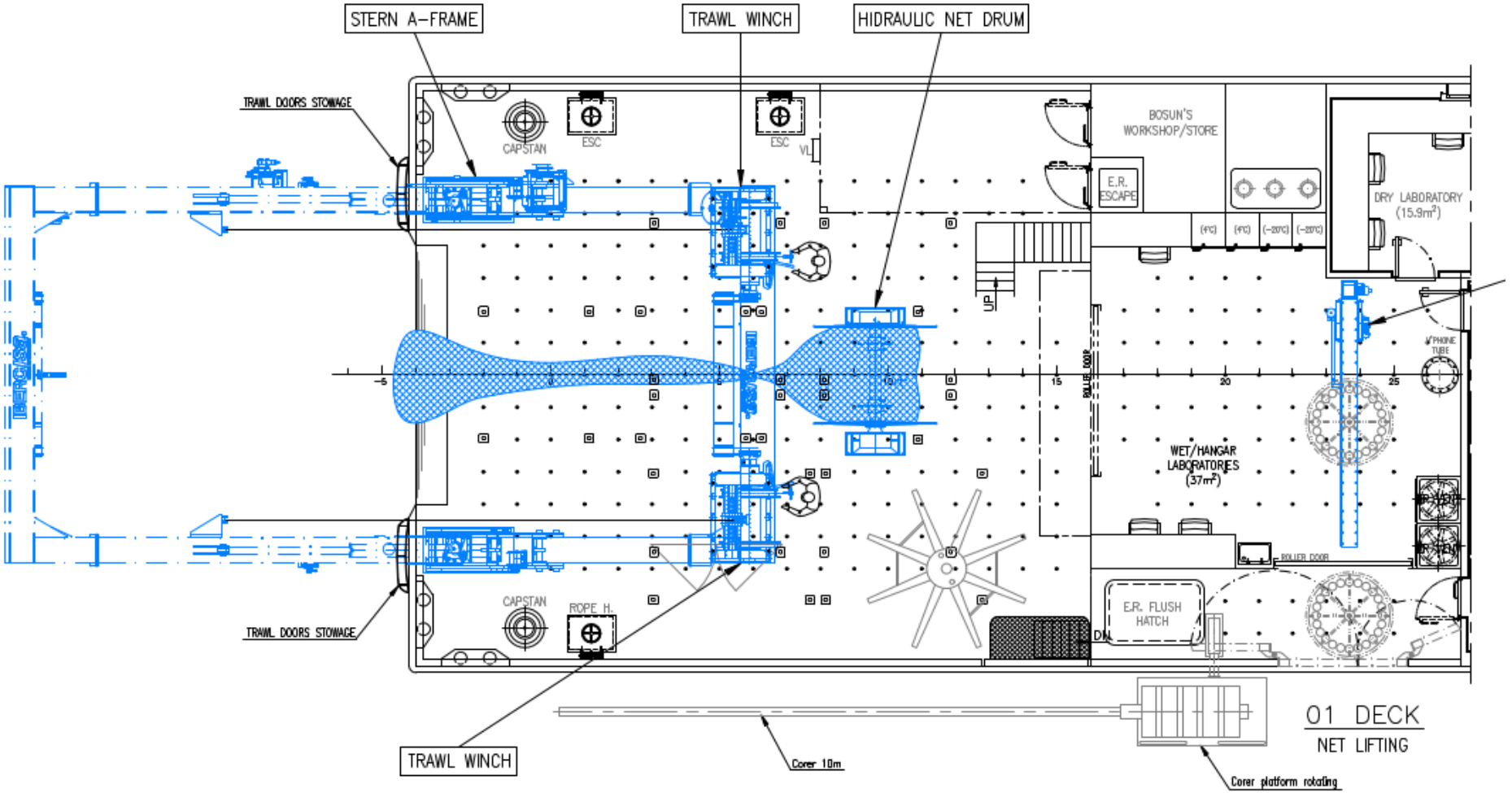


Illustration of S4 deck configuration - Iso view

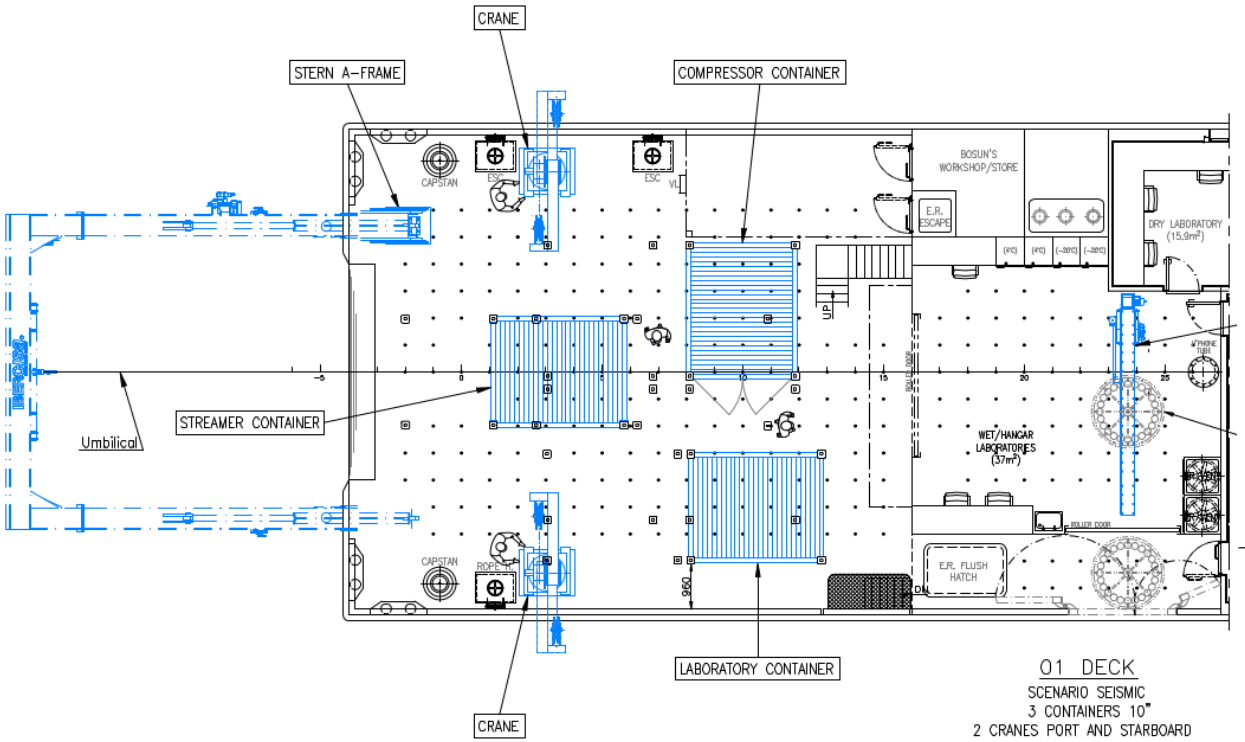
4 – Vessel Operational Scenarios

Fishery campaign



4 – Vessel Operational Scenarios

Geoscientific



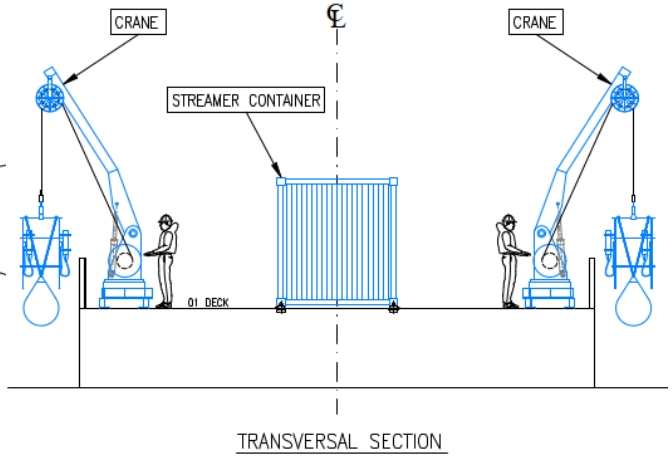
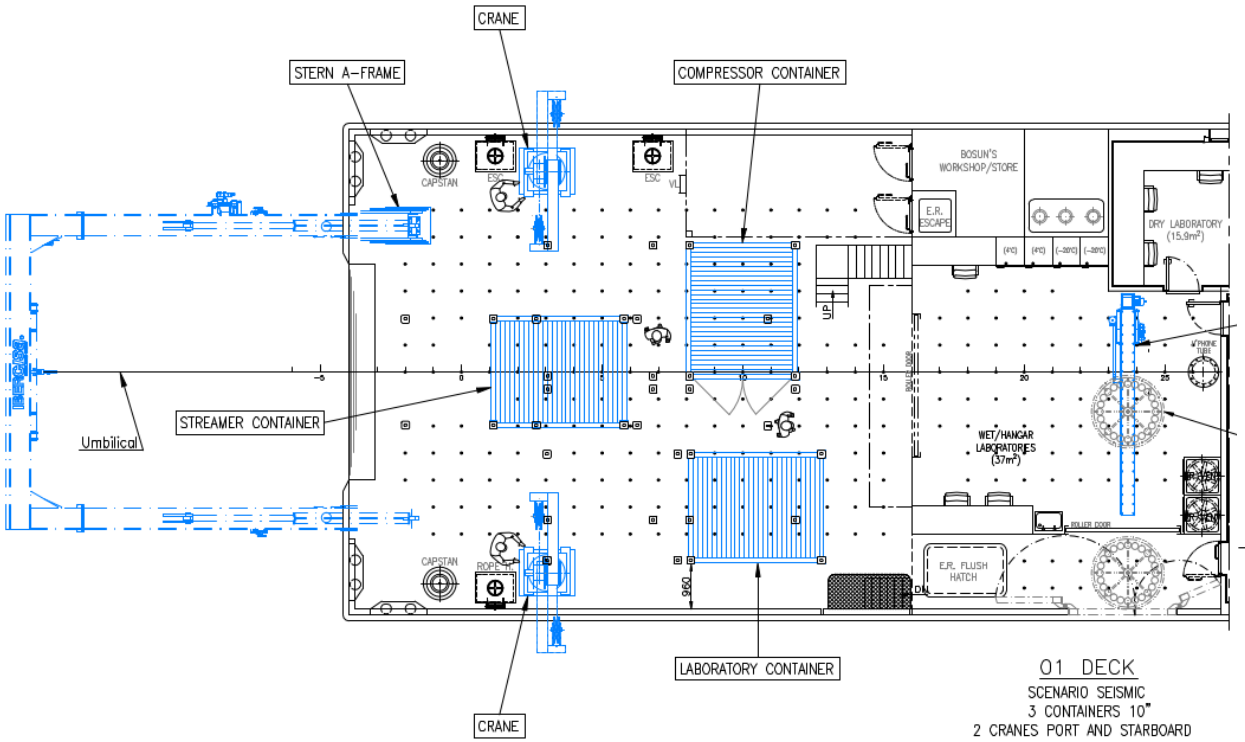


Illustration of gravity corer deck configuration – Iso view

Illustration of light seismic deck configuration – Iso view

4 – Vessel Operational Scenarios

Geoscientific campaign



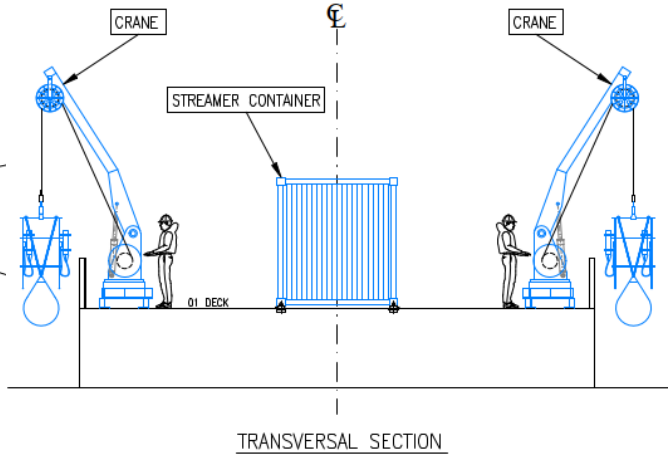


Illustration of gravity corer deck configuration – Iso view

Illustration of light seismic deck configuration – Iso view

4 – Vessel Operational Scenarios

Paleoclimatic campaign

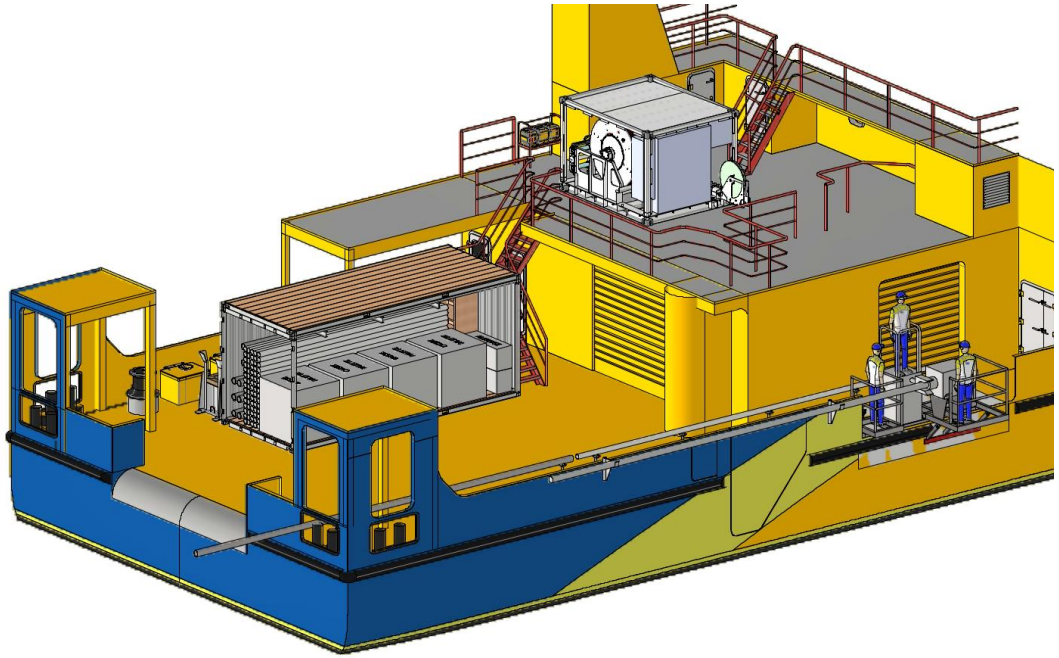


Illustration of gravity corer deck configuration – Iso view

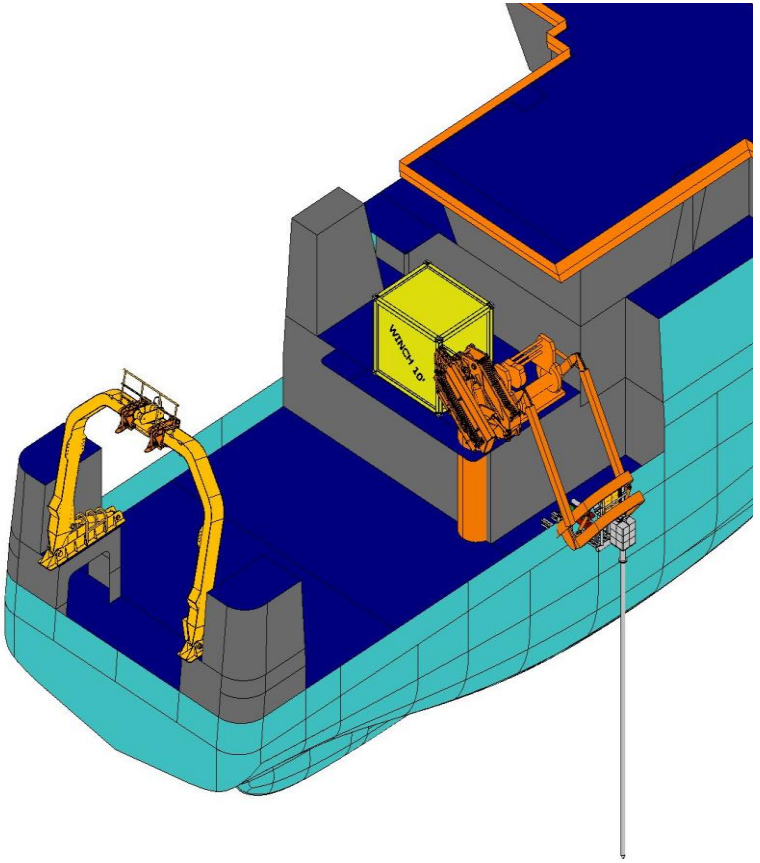


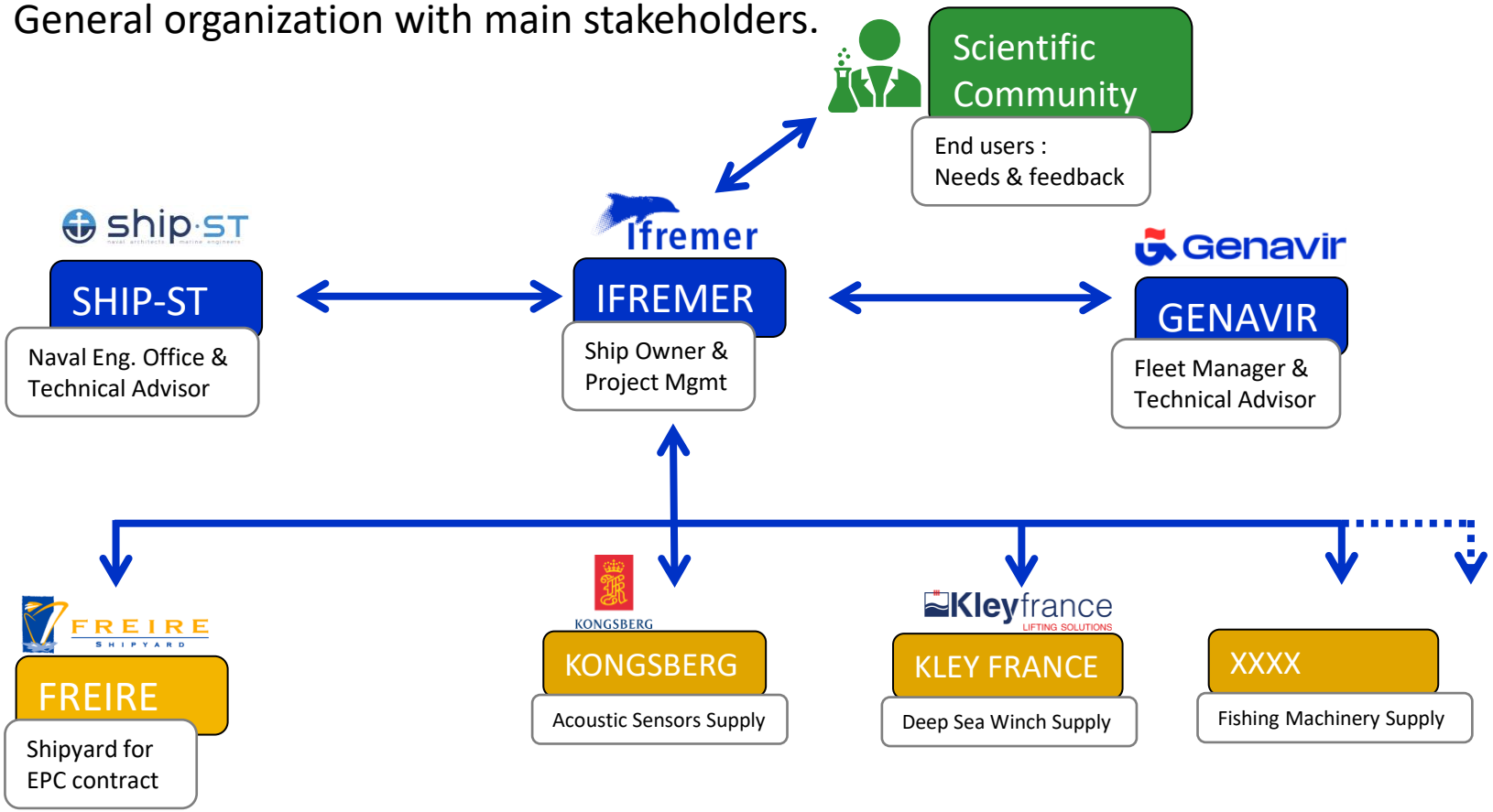
Illustration of light seismic deck configuration – Iso view

5 – Project Org. Schedule & Progress

- Signature of EPC contract : 10 May 2023 with **CONSTRUCCIONES NAVALES P. FREIRE S.A. at Vigo**.
- Design process well-advanced, Steel Structure almost frozen
- Steel Cutting of the first sheet : 24th of April 2024
- Keel Laying : 12th of July 2024
- Launching : February 2025
- Delivery : End of 2025 – After Shipyard trials
- Scientific trials : 3 months – Q1 of 2026
- Fleet entry: Q2 of 2026

5 – Project Org. Schedule & Progress

General organization with main stakeholders.



- XXXXXX : Deck Machinery
- XXXXX: Electrical System & Mgmt
- XXXXXXX : Electrical Installation
- XXXXX : Propulsion
- ….

6 - Challenges

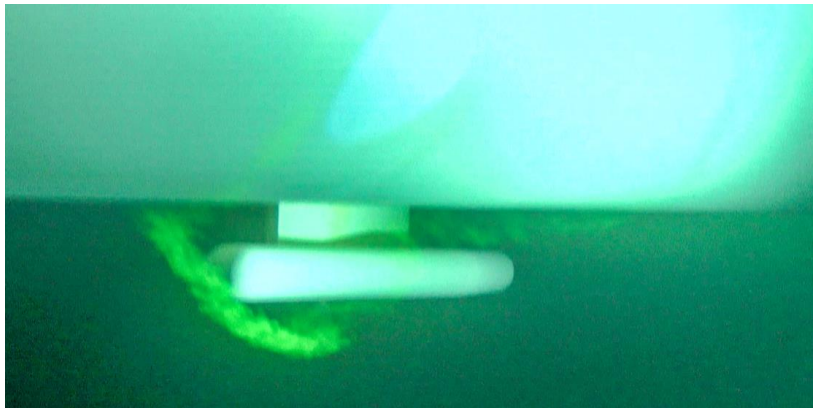
Past Challenges :

- Hull shapes design for vessel stability
- Hull & Gondola shapes / positioning for optimized Bubble sweep-down.

Complete Vessel shapes redesign after Tank tests in Oct-2023.

Vessel Bow extended (Loa = 40 -> 45m), vessel breadth increased (10,2 -> 11,5m).

6 months of project delays for complete re-engineering done in-house at the shipyard.



6 - Challenges

Upcoming Challenges :

- Management of Batteries on board (storage, safety, etc)
- Implementation of a DC high-voltage bus (1000V) for all main power consumers.

Thank you for your attention