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# V142 – Kaharoa II

Keel Laying to present

Climate, Freshwater & Ocean Science

# Research / Survey Vessel *Kaharoa* (28m – 300 tonnes)





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# Basic design

ARMON

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Skipsteknisk
– freedom to create

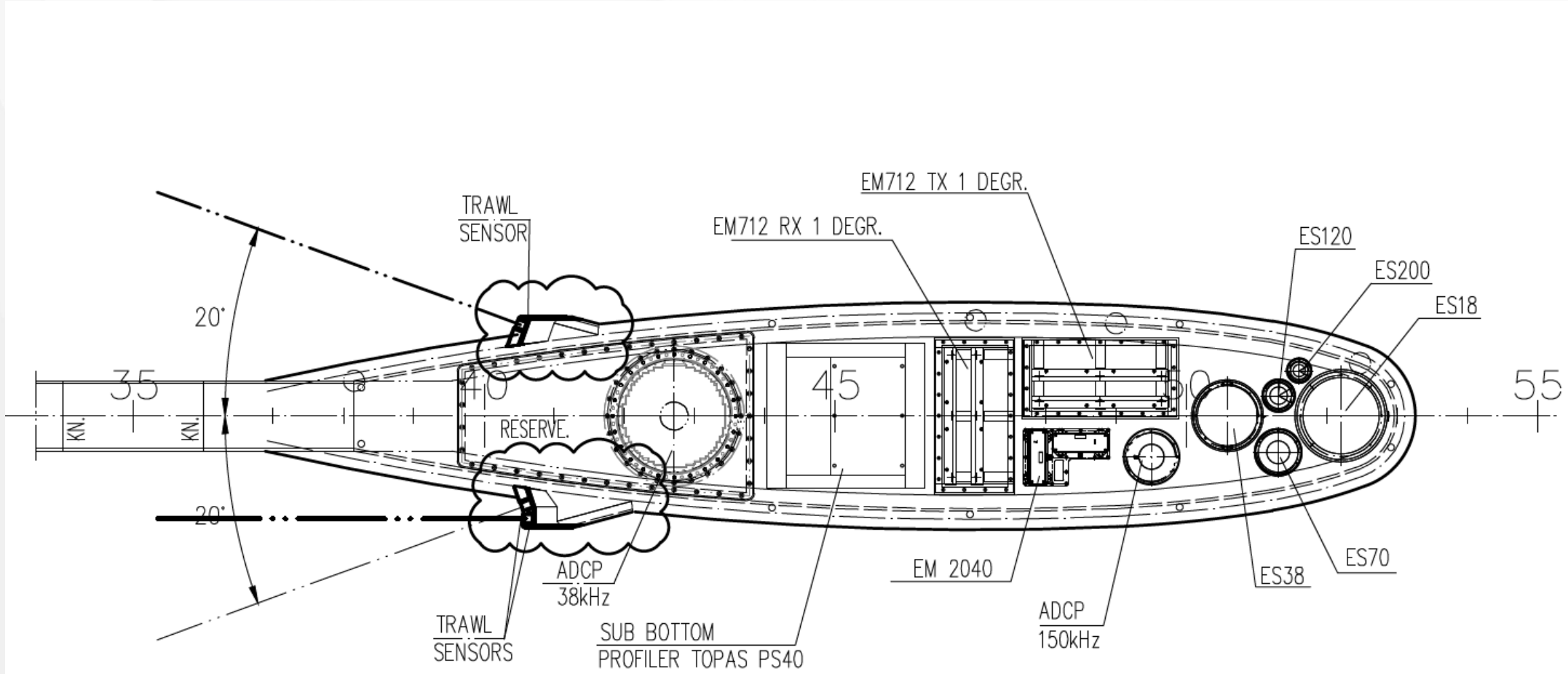
## Specifications

- Fishing boat (unlimited) and workboat classification
- Class  DNV-GL +1A, “Fishing vessel”, DP1, Silent A-F, E0, ER(TIER III), DYNPOS (AUT)
- Gross Tonnage <500
- Length overall 36.10m
- Breadth 9.50m
- Engine Yanmar 6N21A-EWS - Continuous rating : 956 kW/ Speed : 850 rpm
- Speed 12 Knots at 100% of rated propulsion power.
- Sustained economic speed 10 knots
- Sustained minimum speed 0.5 knots
- Draft 3.650m
- 15 POB - 6 crew in single cabins, 8 scientists in double cabins, 1 scientist in a single cabin

## Main Gear

- Two Trawl winches – 2000m.
- CTD Winch – 7000m
- Oceanographic Winch 4000m
- T Frame
- A Frame 10 tonne
- Net Drum
- Main Crane 6t @ 8m and 3t @ 12m

# Sensors




HULL BLISTER FOR ACOUSTIC TRANSDUCERS

**Weight**

Lightweight – 526t

Deadweight – 202t

Total Weight – 728t

# ARMON COMPANIES

- ARMON NAVIA
- AUX NAVAL
- ARMON BURELA
- ARMON VIGO
- CONFORMADO Y CORTE
- ARMON GIJON

ARMON Vigo

**Summary of pathway so far:**

29 & 30 March 2022 - Project Start-up meeting at Armon in Vigo, Spain

# Kick-off Meeting with Armon, Vigo Spain March 2022

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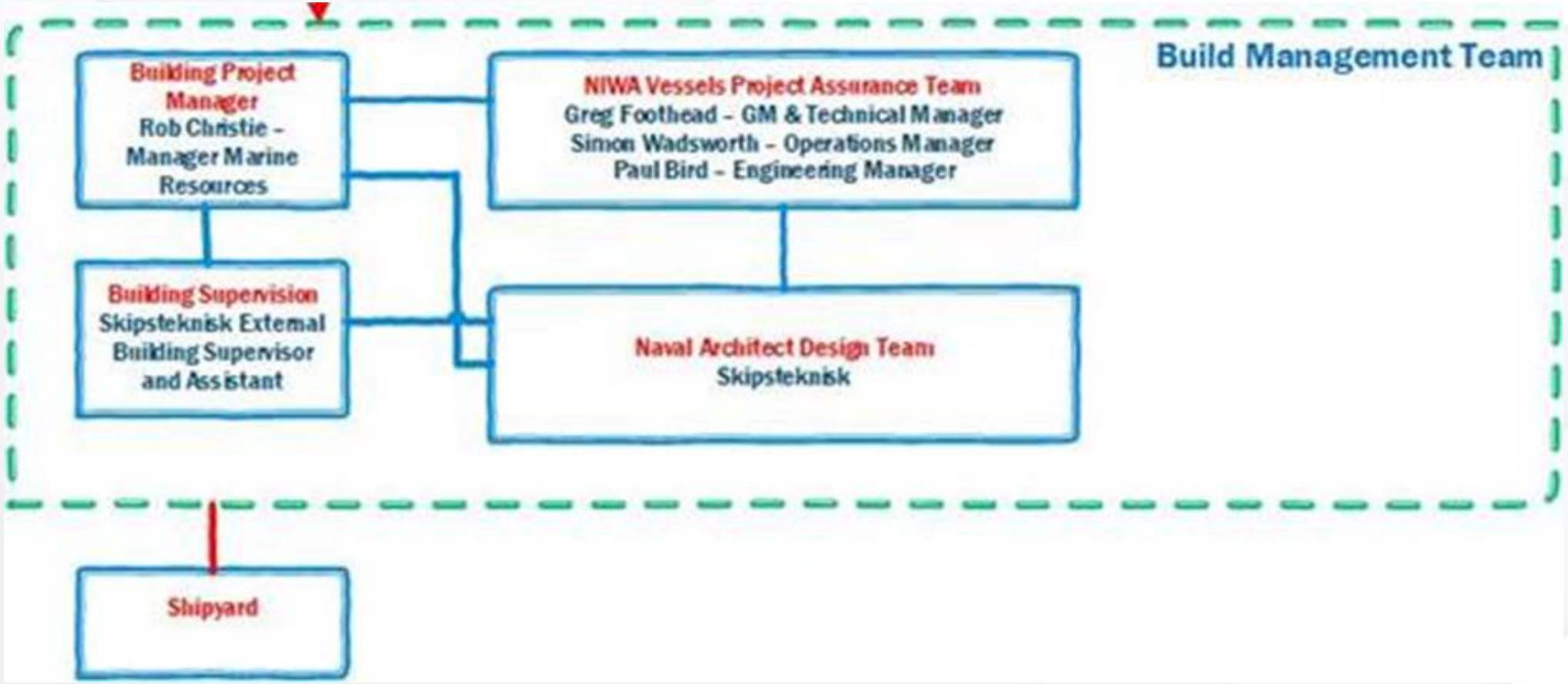
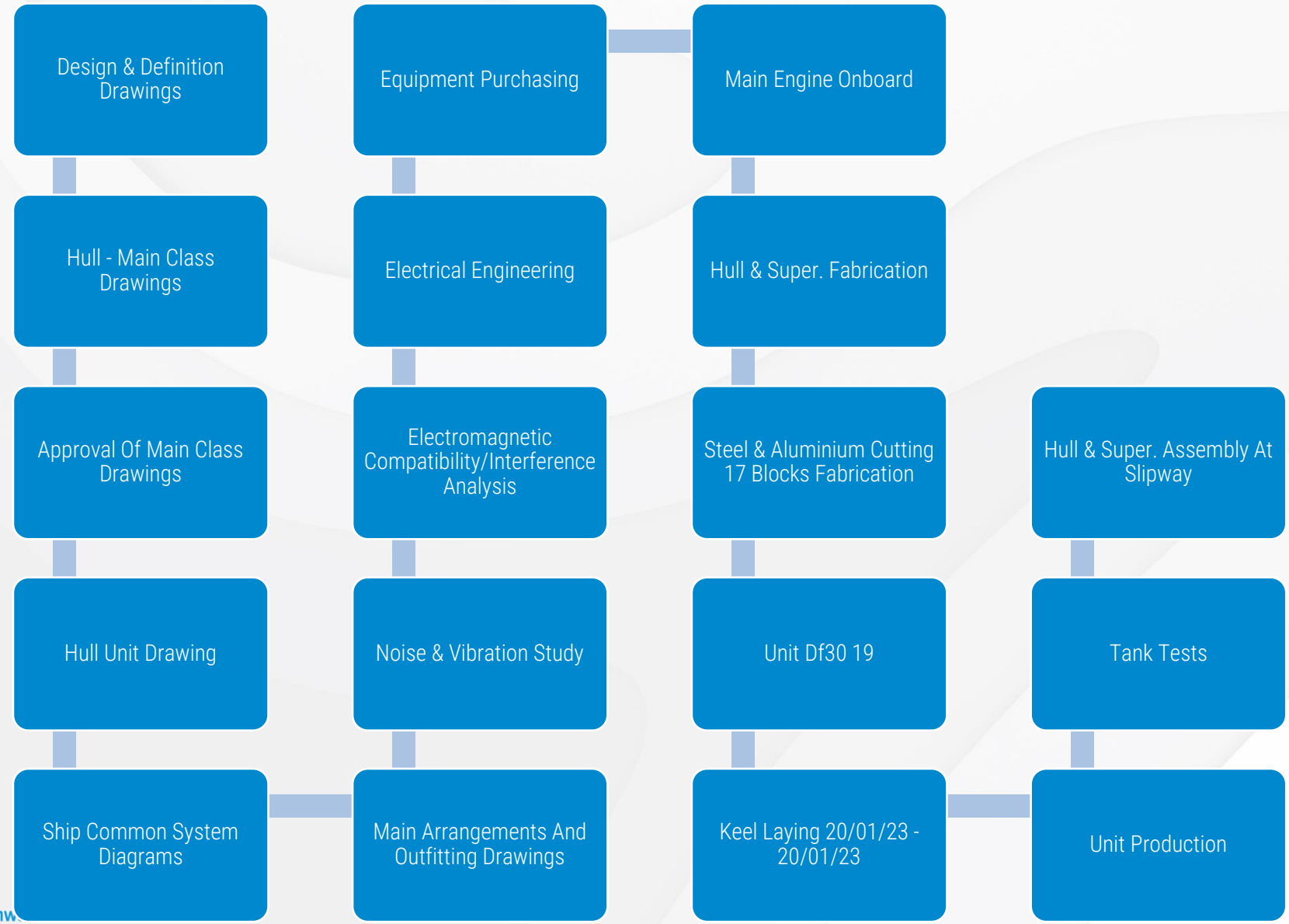

Build Management Team
Building Project Manager
Rob Christie – Manager Marine Resources
NIWA Vessels Project Assurance Team
Greg Foothead – GM & Technical Manager
Simon Wadsworth – Operations Manager
Paul Bird – Engineering Manager
Building Supervision
Skipsteknisk External Building Supervisor and Assistant
Naval Architect Design Team
Skipsteknisk
Shipyard

| | Year/Month | NIWA Project Build and Design Team Monthly Meetings | Project Manager (Rob Christie) | Project Technical Manager (Greg Foothead) | ST Build Supervisor on Site (Morten) | Technicians | IT | Chief Engineer | Master and First Mate | 3 Crew |
|---|---|---|---|---|---|---|---|---|---|---|
| **Project Kick-off** | March | 1 | 1 | 1 Kickoff Meeting | | | | | | |
| | April | 2 | | | | | | | | |
| | May | 3 | | | | | | | | |
| | June | 4 | | | | | | | | |
| | July | 5 | | | | | | | | |
| | August | 6 | 2 | 2 | | | | | | |
| | September | 7 | | | As required | | | | | |
| | October | 8 | | | As required | | | | | |
| **Steel Cutting** | November | 9 | | | As required | | | | | |
| | December | 10 | | | 2 week in 4 | | | | | |
| **Keel Laying** | Jan 23 | 11 | | | 2 week in 4 | | | | | |
| | February | 12 | | | 2 week in 4 | | | | | |
| | March | 13 | | Full Time | 3 week in 4 | | | | | |
| **Outfitting** | April | 14 | | Full Time | 2 week in 4 | | | | | |
| | May | 15 | | Full Time | 2 week in 4 | | | | | |
| | June | 16 | | Full Time | 2 week in 4 | | | | | |
| **Launching** | July | 17 | | Full Time | 2 week in 4 | 1 Week (WQ) | | Full Time | | |
| | August | 18 | | Full Time | 2 week in 4 | | | Full Time | | |
| | September | 19 | 3 | Full Time | 2 week in 4 | | | Full Time | | |
| | October | 20 | | Full Time | 2 week in 4 | 4 Weeks | | Full Time | | |
| **Harbour Trials** | November | 21 | | Full Time | 2 week in 4 | 4 weeks | 2 Weeks | Full Time | Full Time | |
| **Sea Trials and Training** | December | 22 | | Full Time | 2 week in 4 | 4 weeks | | Full Time | Full Time | |
| **Science Trails and Training** | January | 23 | 4 | Full Time | 2 week in 4 | 4 weeks | 1 Week | Full Time | Full Time | Full Time |



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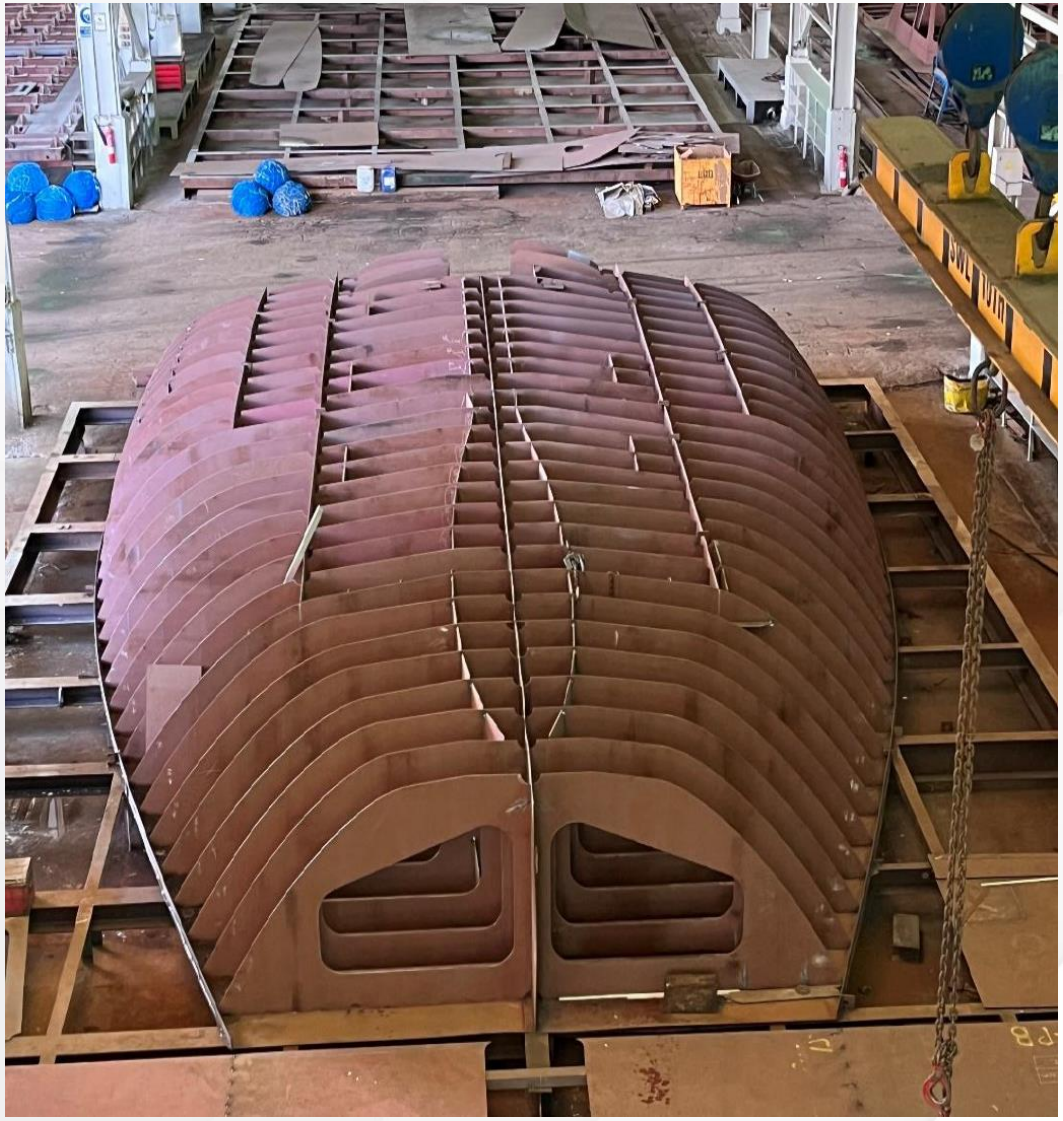
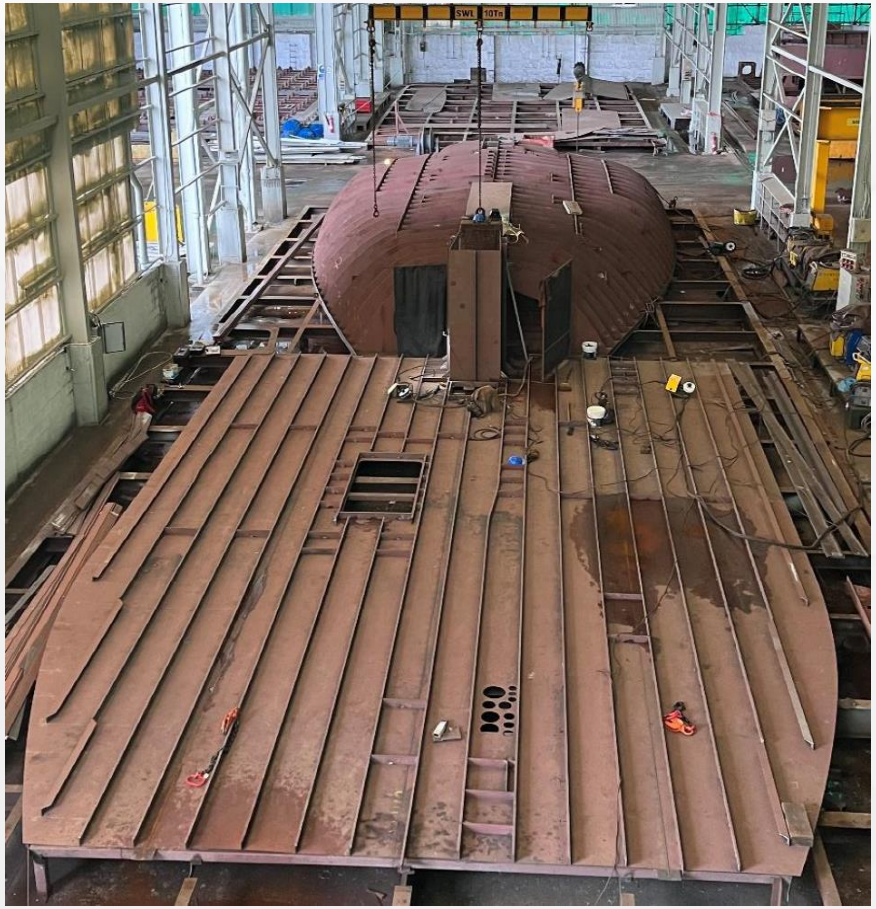
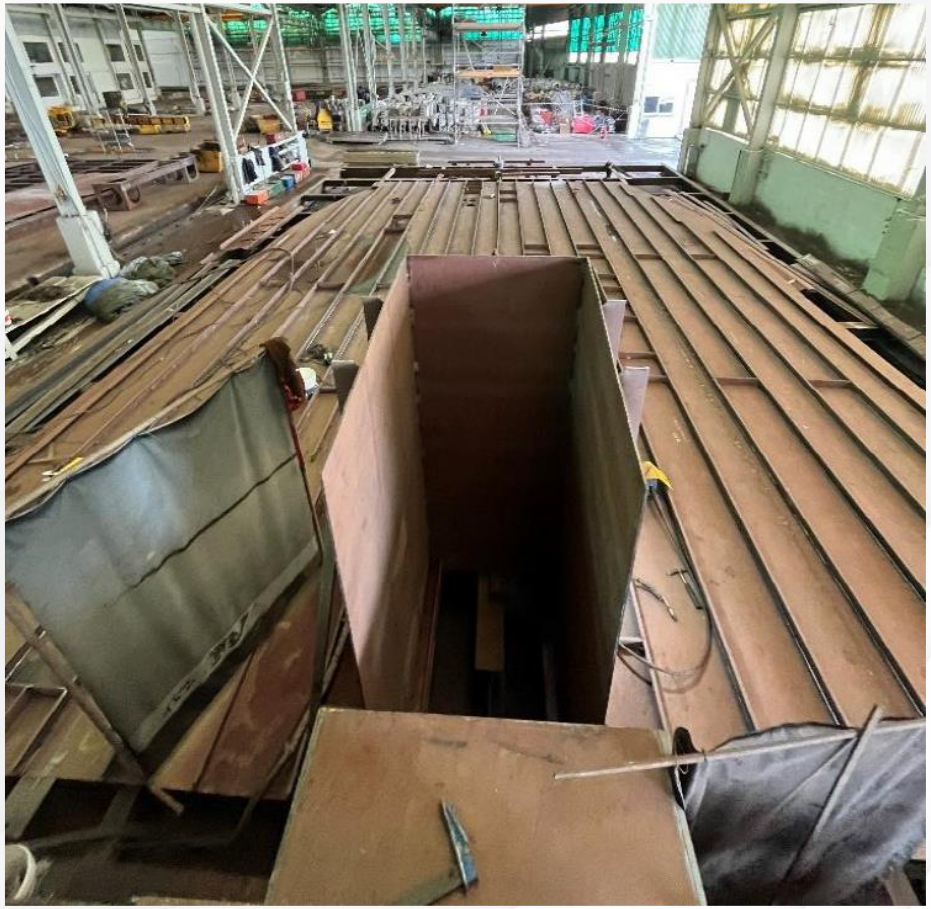
# November 2022 - Week 46


# December 2022 - Week 49

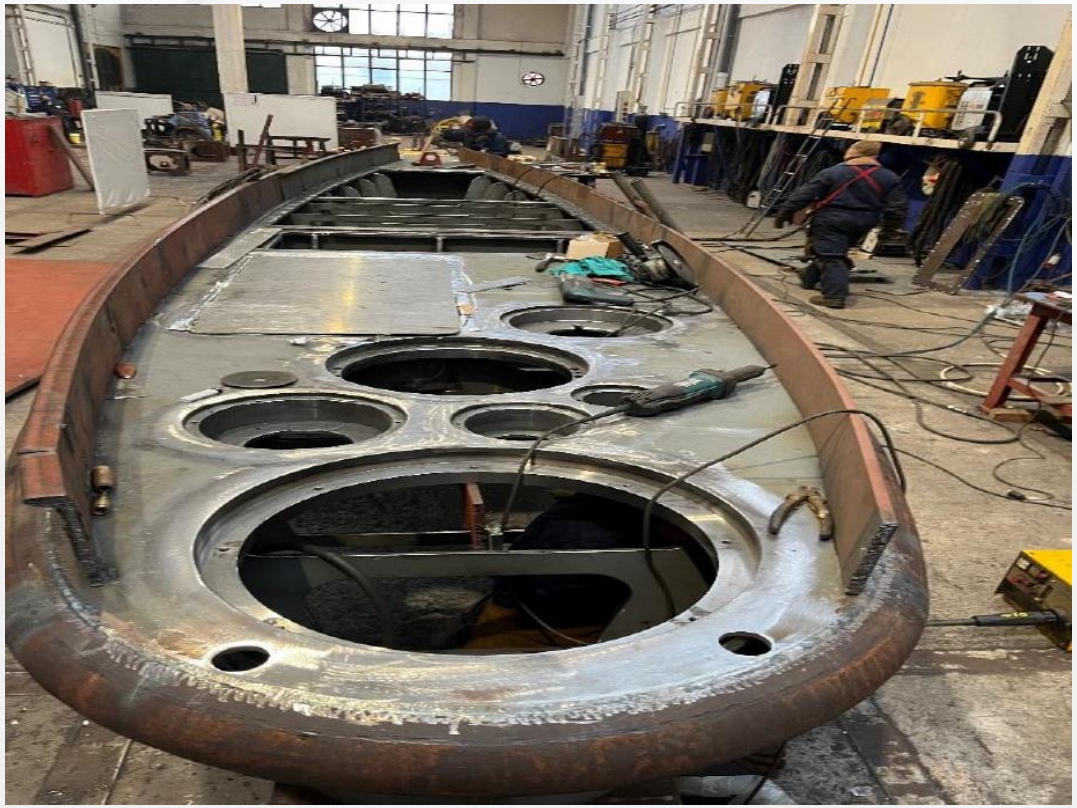


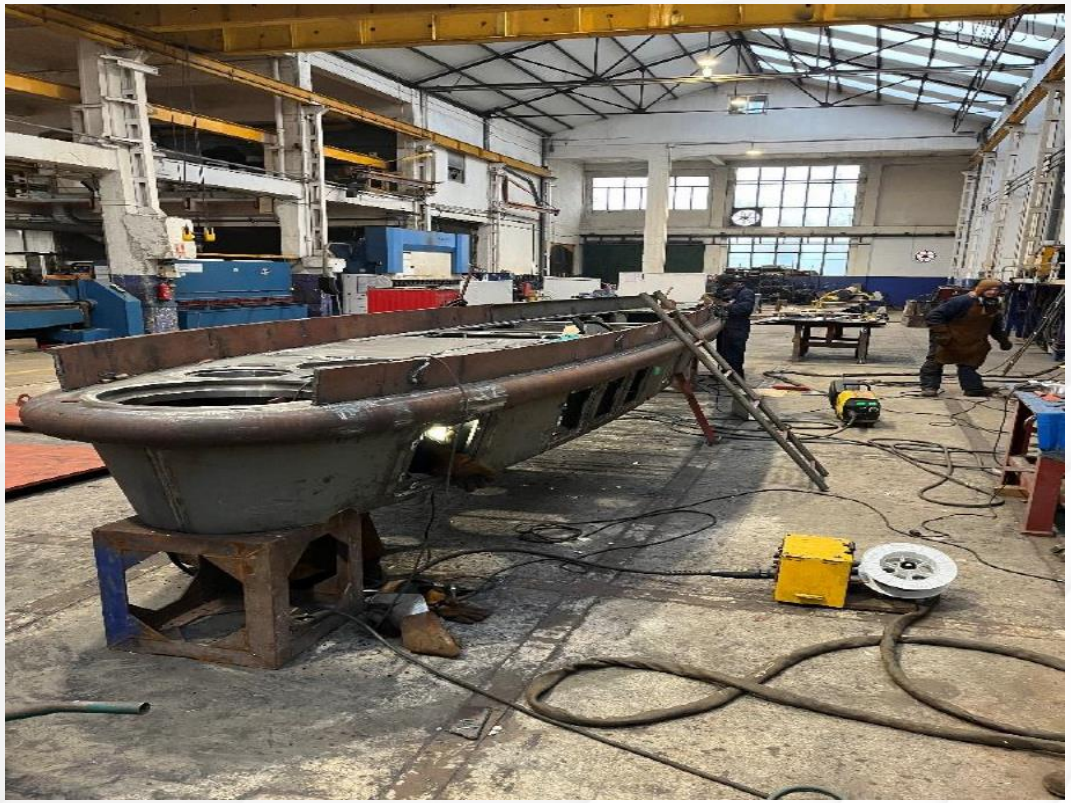
# December 2022



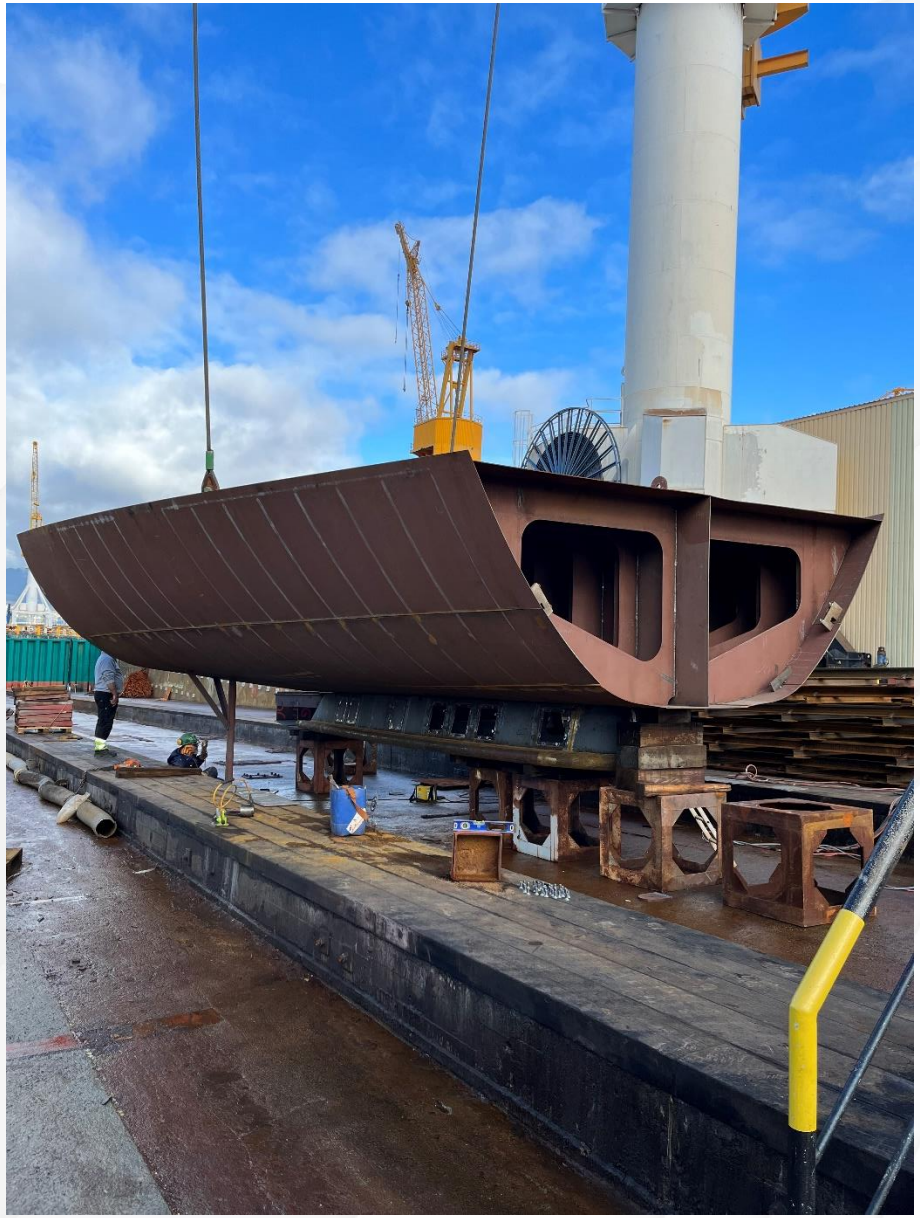


# January 2023 - 2023





# 20 January 2023 – Keel Laying



# February 2023 - Week 5

# February 2023 - Week 7

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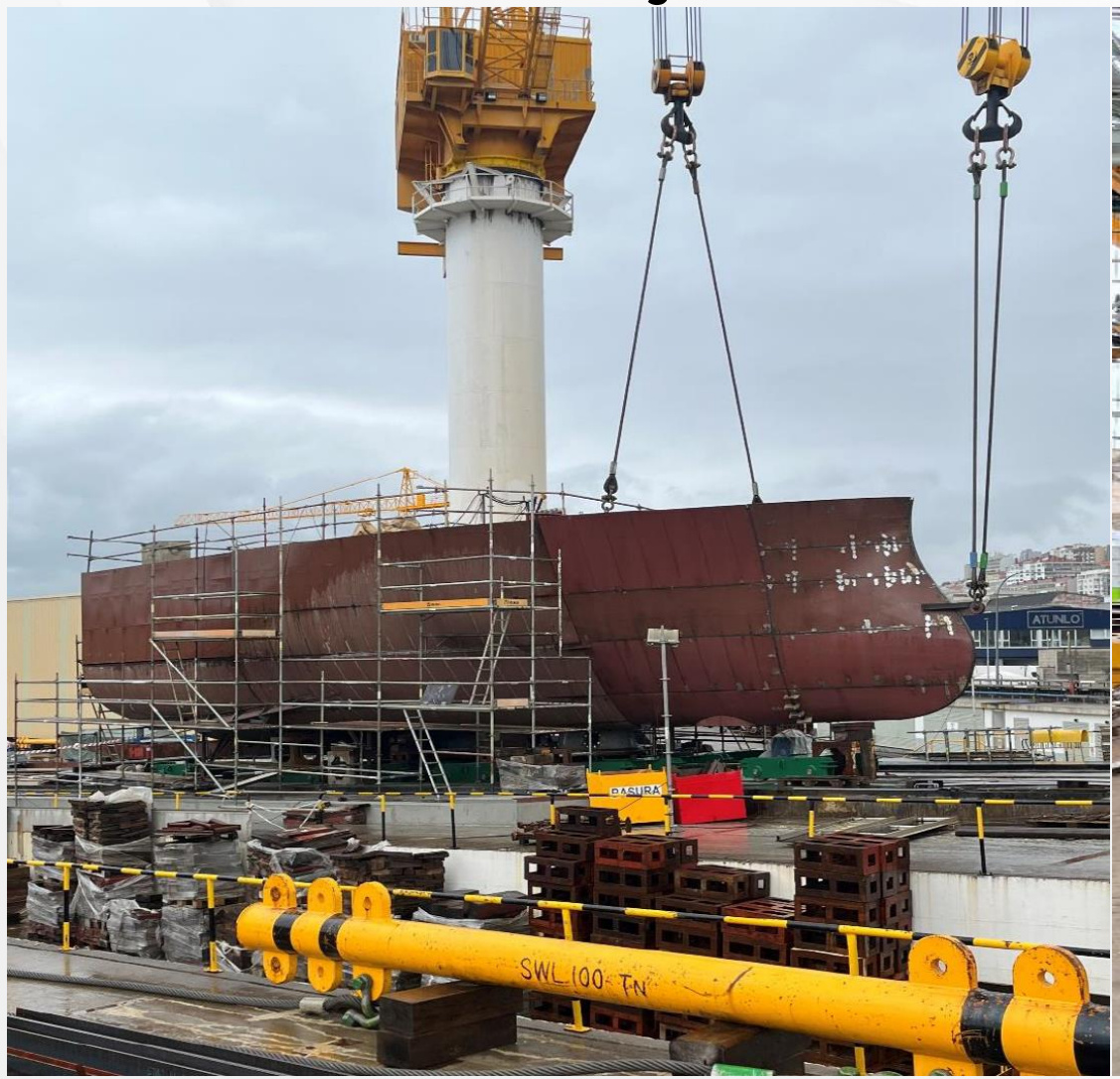
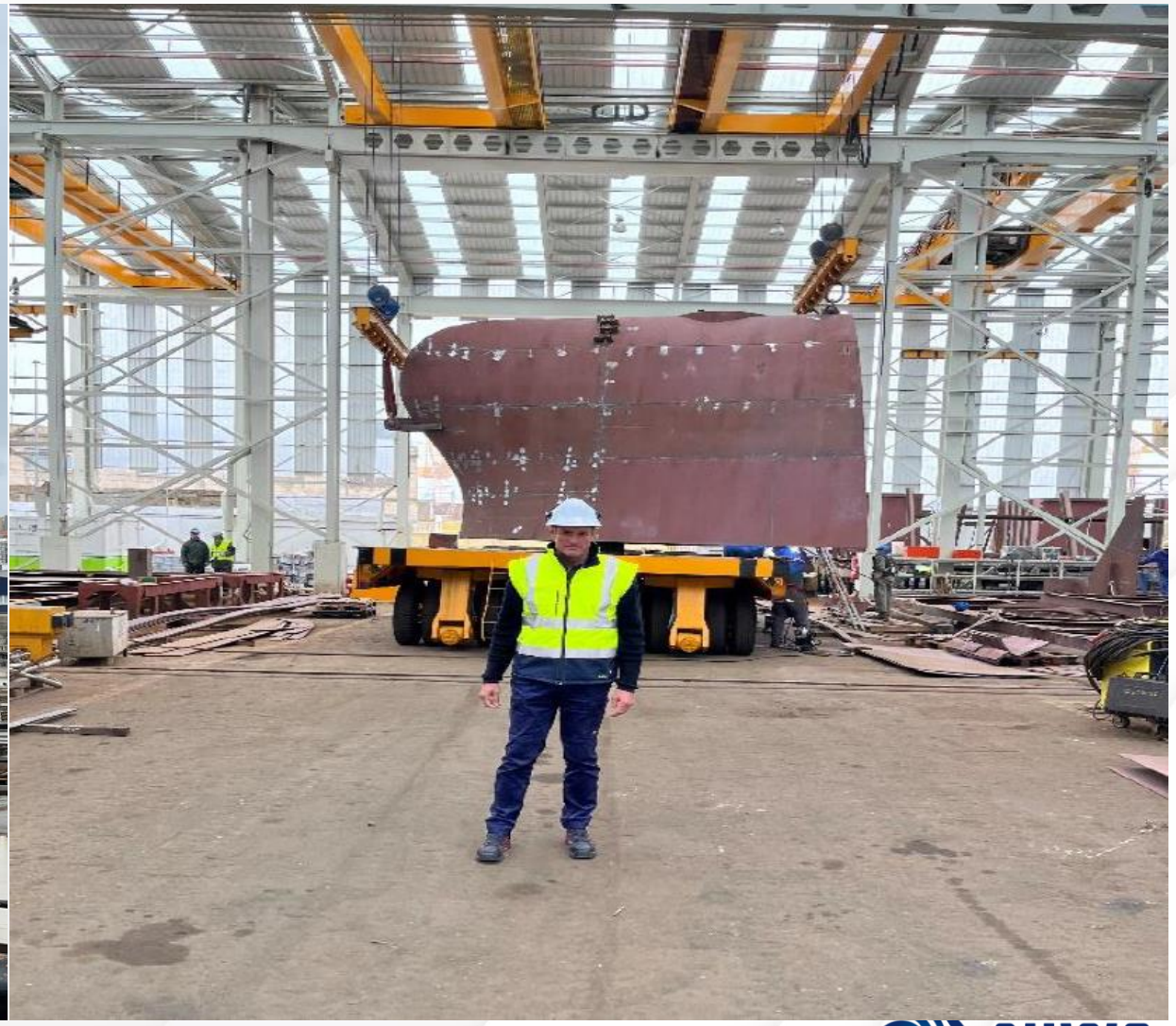
# March 2023 - Week 10

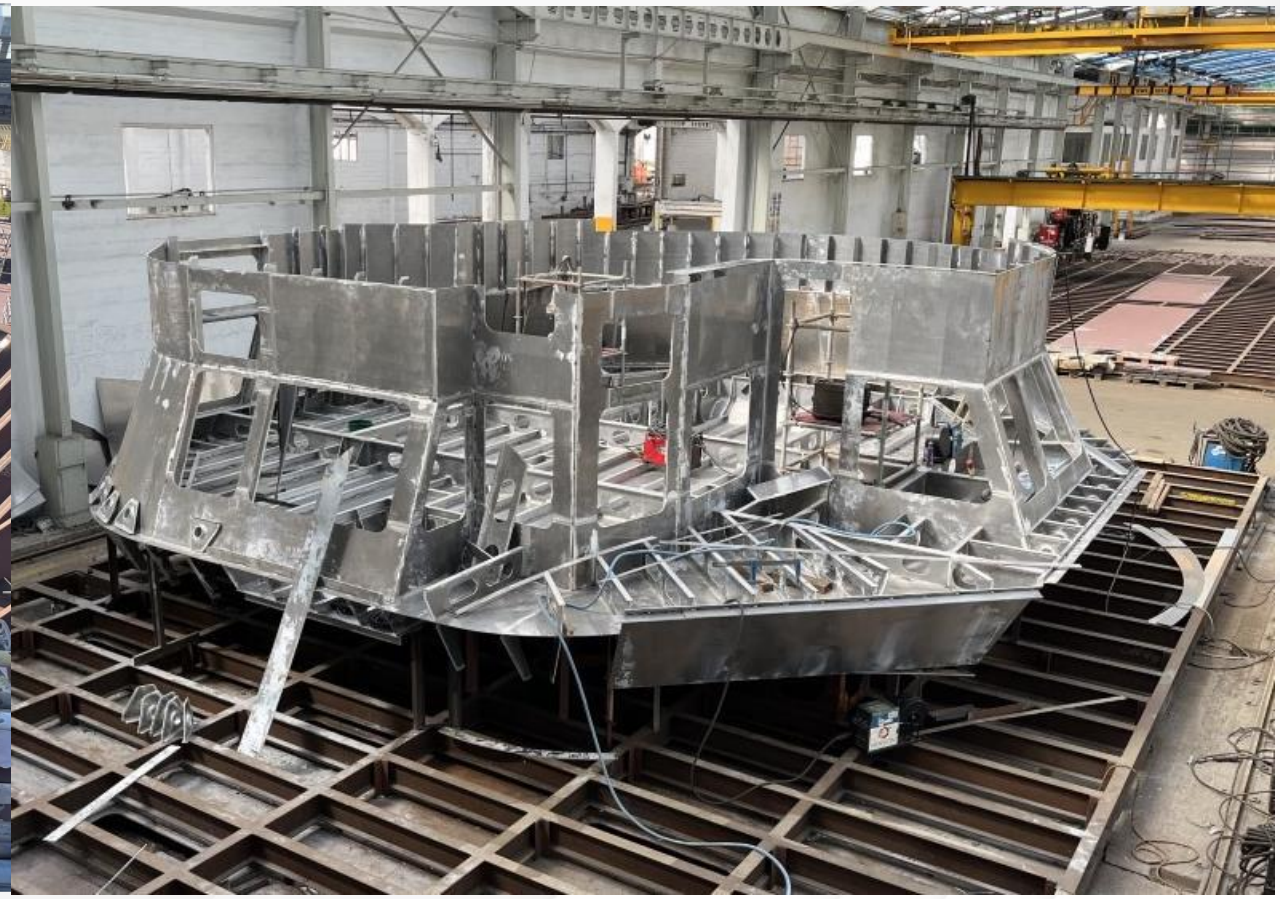
# March 2023 - Week 12 – Greg on Site



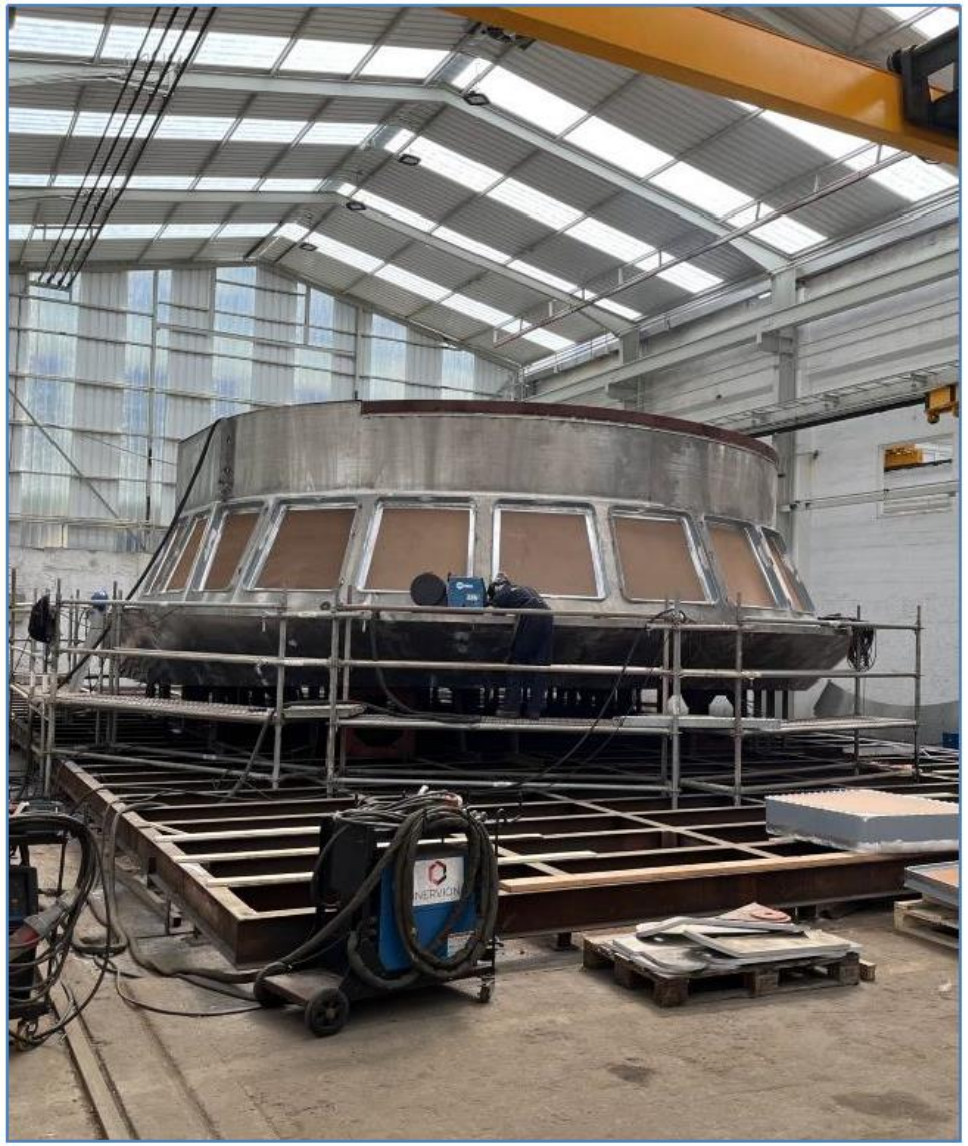



# May 2023 – Week 17


# May 2023 - Week 19

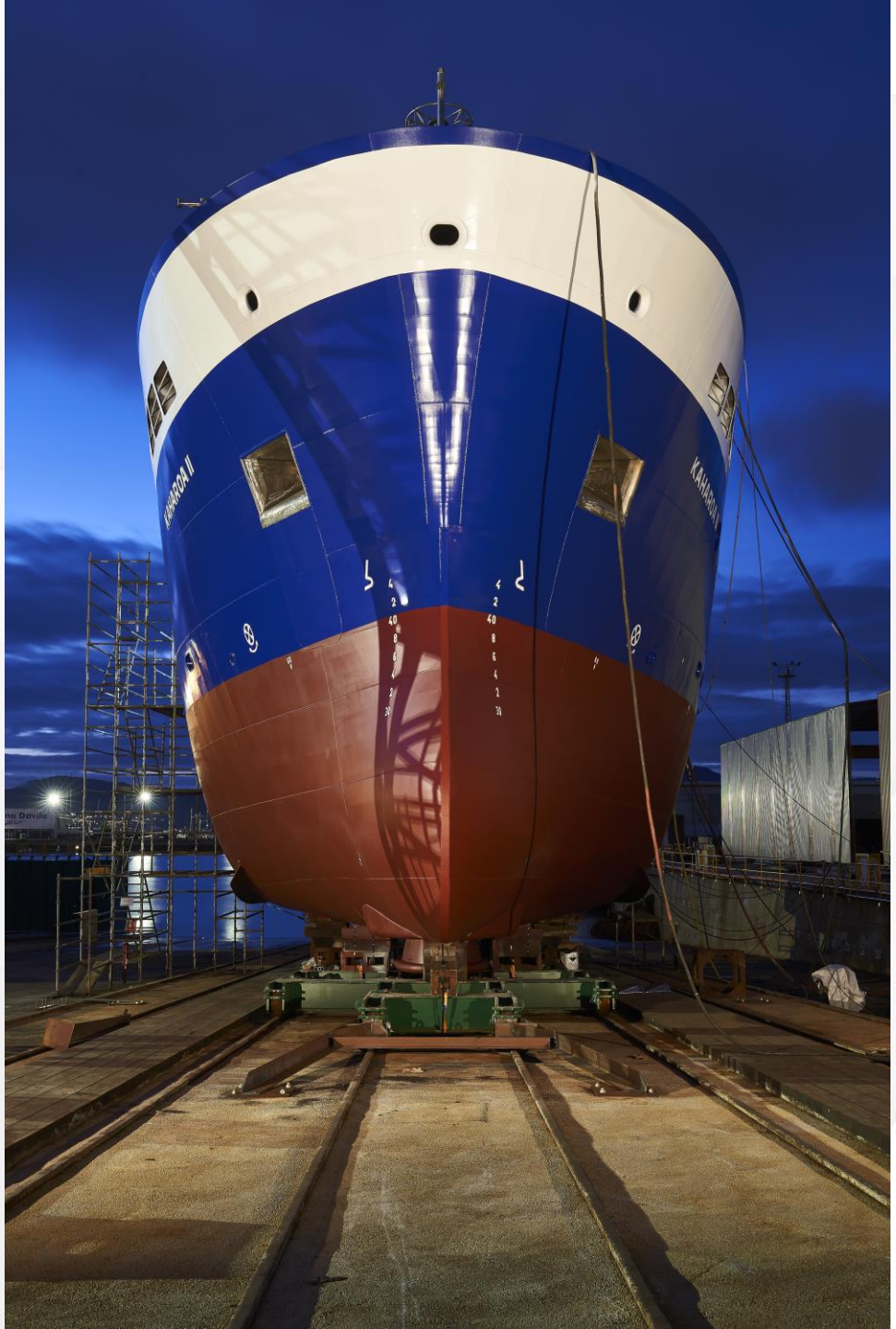


# June 2023 - Week 21



# July 2023 – Week 28


# 30 August 2023 – Ready for Launch

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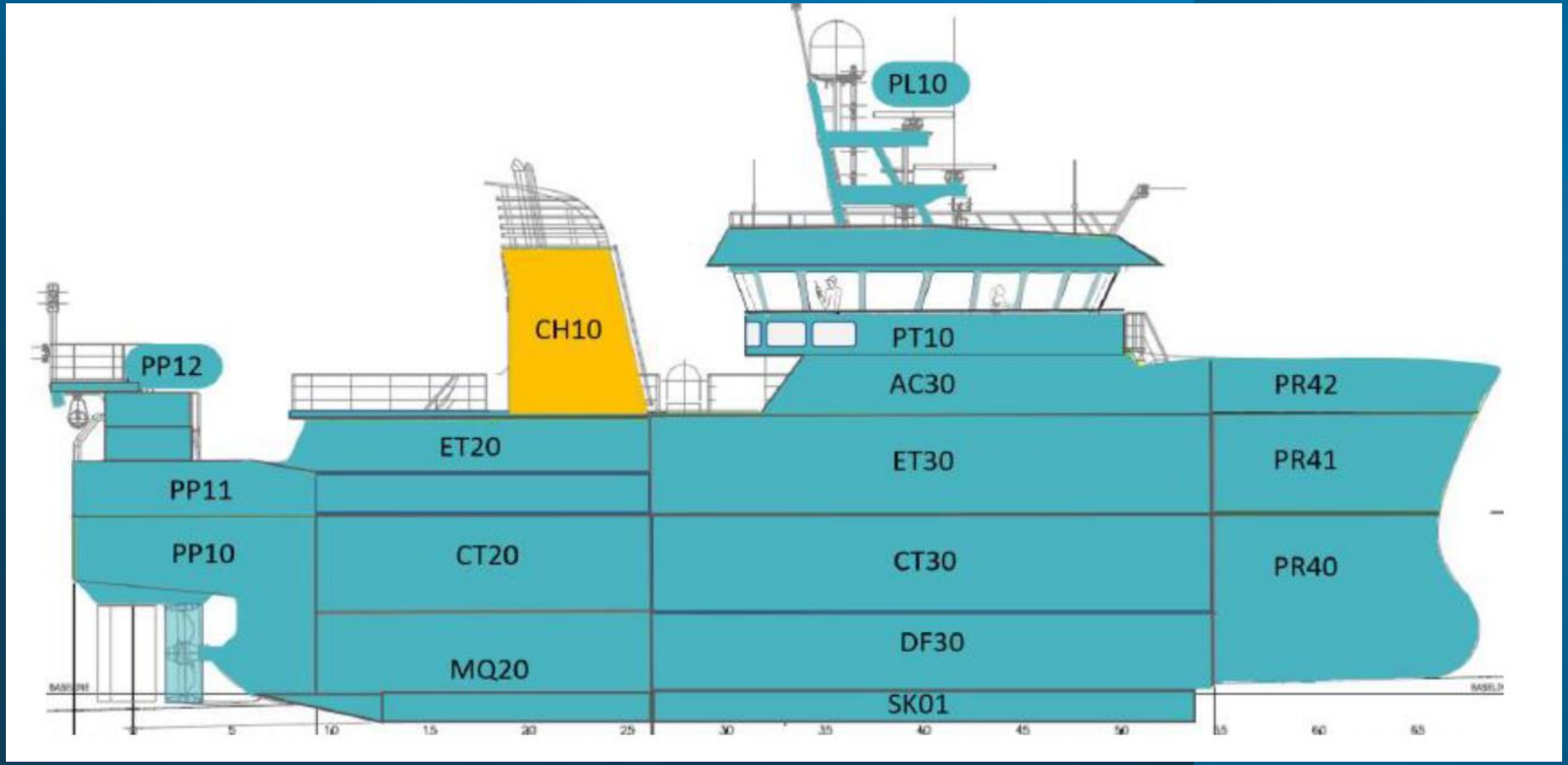
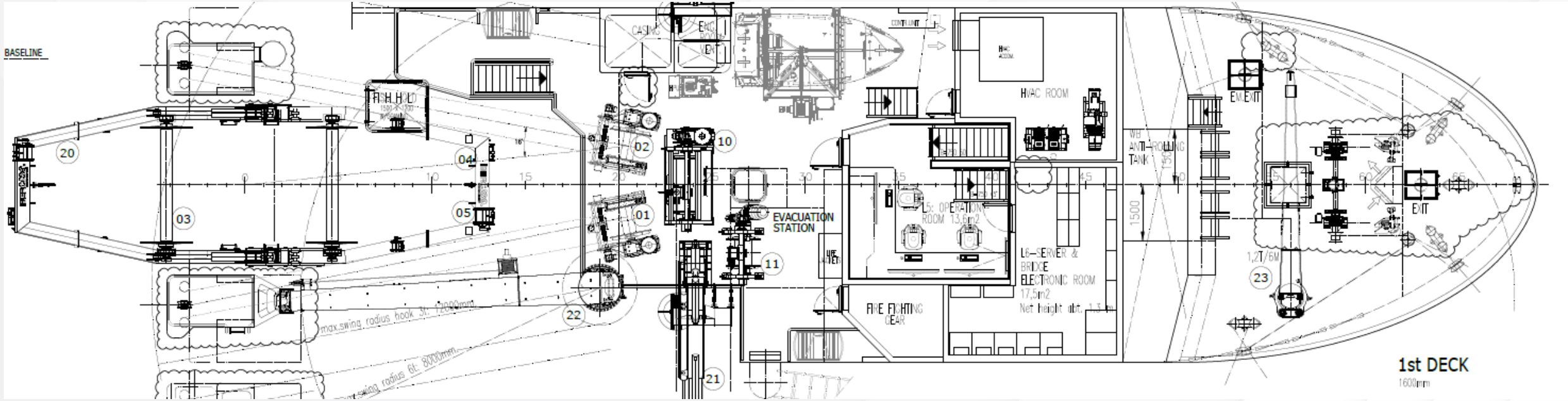

PL10
CH10
PT10
PP12
AC30
PR42
ET20
ET30
PR41
PP11
PP10
CT20
CT30
PR40
DF30
MQ20
SK01


KAHAROA II
WELLINGTON
KAHAROA II

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KAHAROA II
WELLINGTON


ODÓN DE BUEN
KAHARDA II
ST-381
KAHARDA II
3°VI-51600


ODÓN DE BUEN

Hydraulic Power Unit




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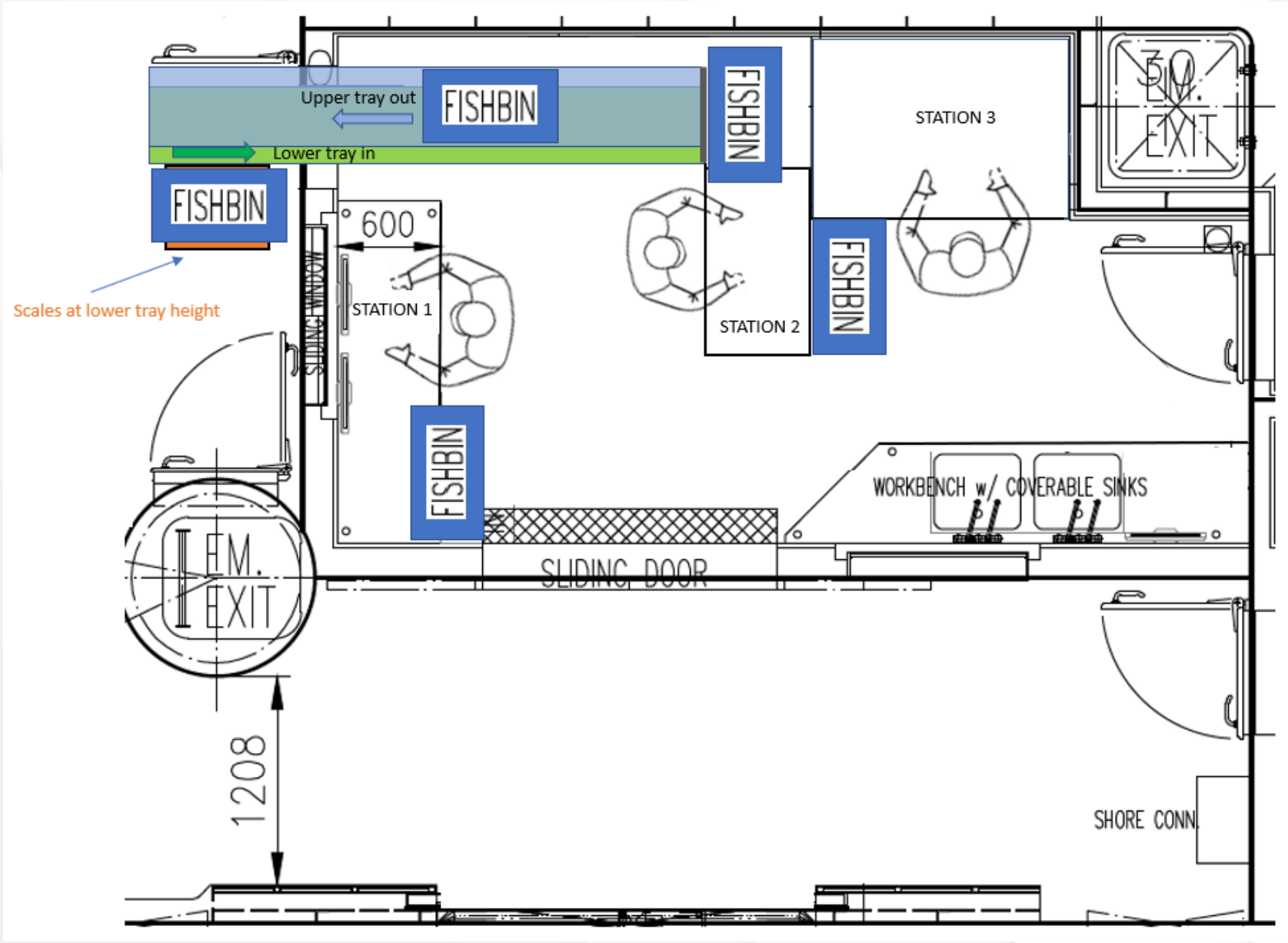




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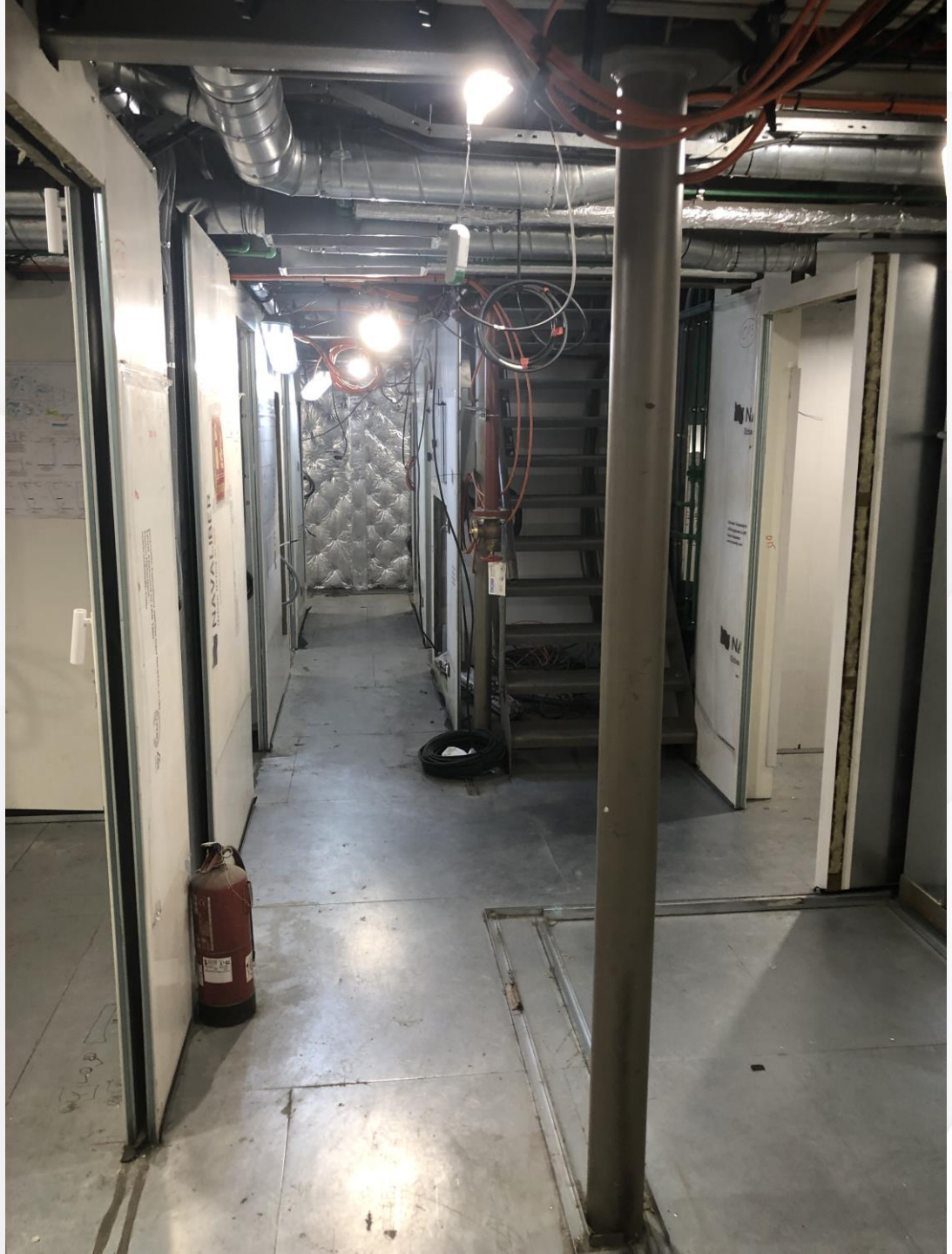
EXTINTOR


NAVALIBER
Urban living
at sea
Marine Interior


NAVALIBER
Urban living
at sea
Marine Interior



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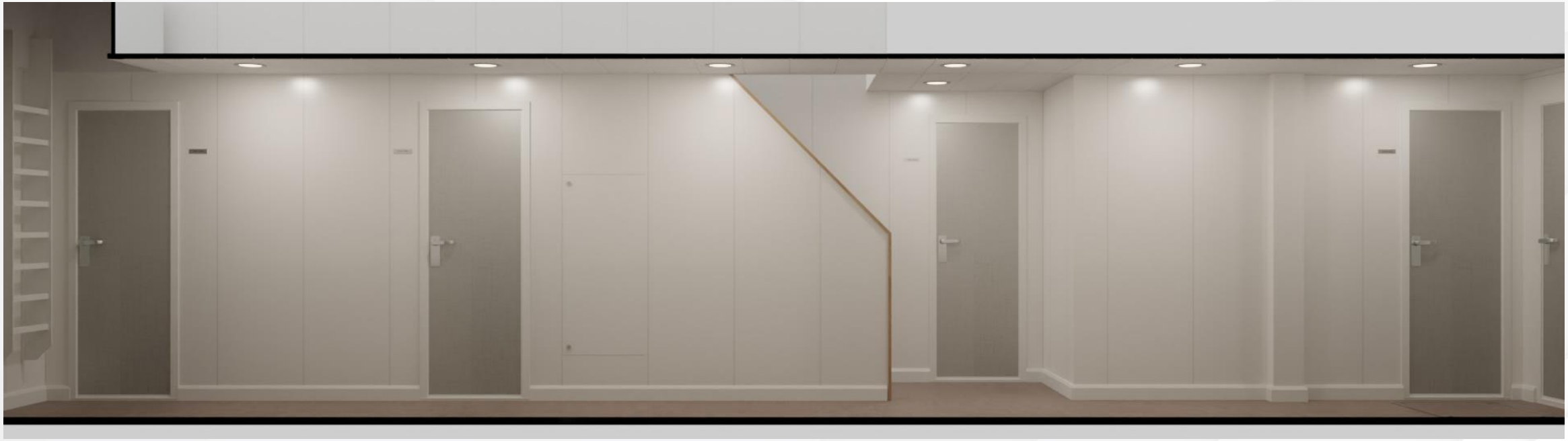

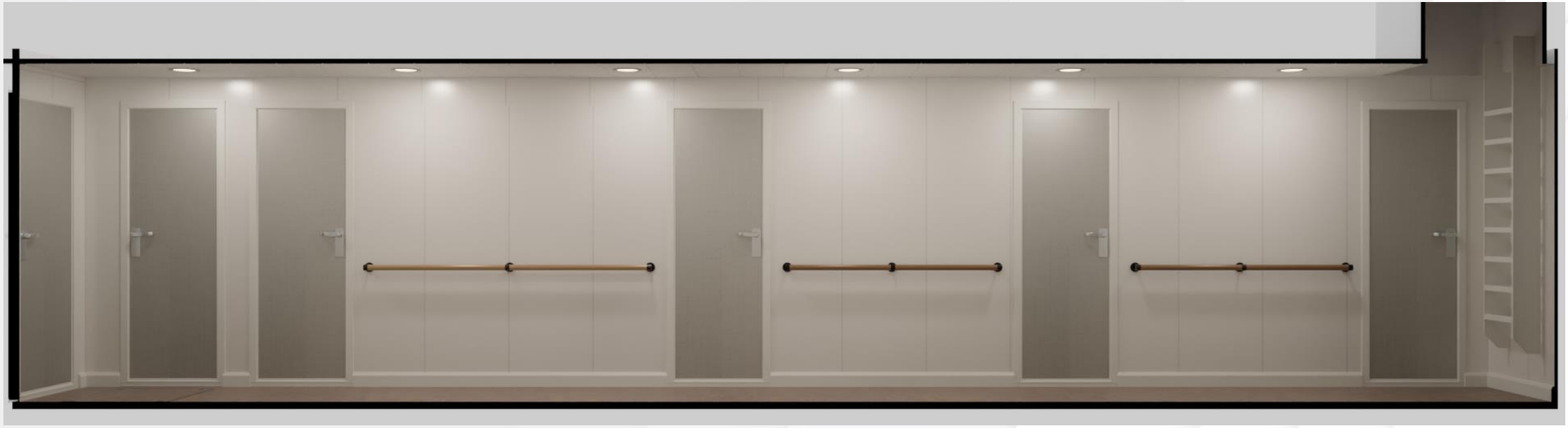


CALENDARIO


CALENDARI


CALENDARI

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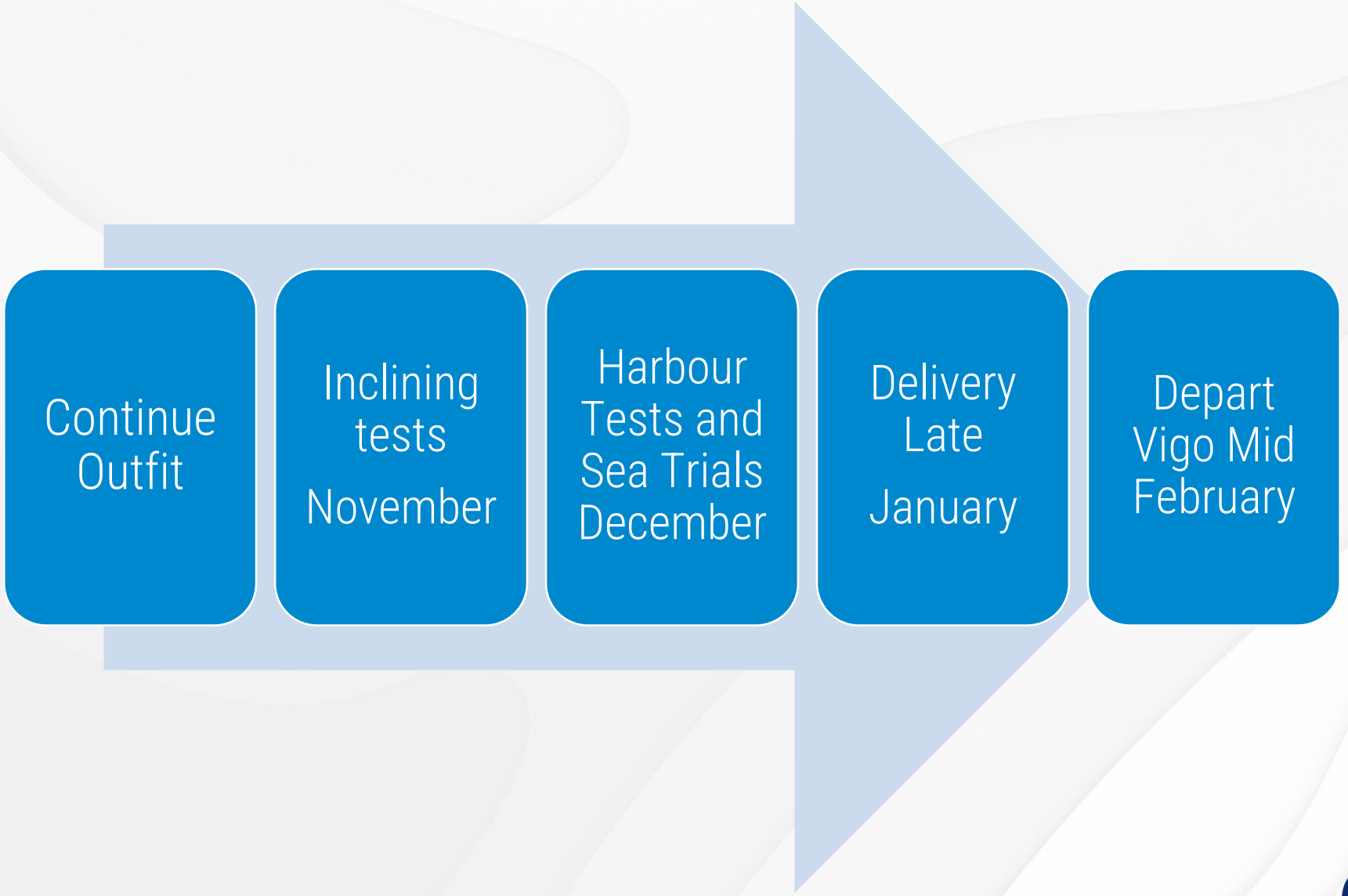
# Next Steps



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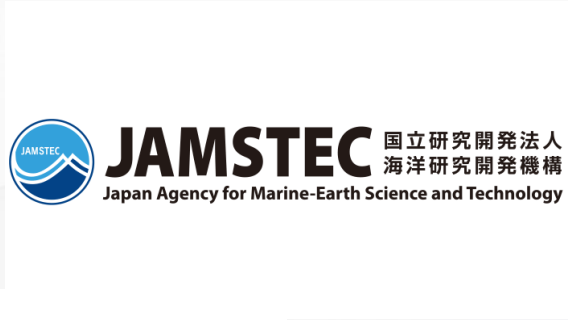
## Learnings to share

1. Both Skipsteknisk and Armon have been excellent to work with.
2. The Armon reporting structure and delegated authority is short and efficient – Project manager to General Manager of Yard.
3. The Skipsteknisk architect's project structure is also highly responsive with Hans GM of ST personally attending most meetings.
4. Shipyard planning is very fluid. Our building supervisor's mantra is 'Roll with it. They will get it done. High trust relationship.
5. Weight. Always a known risk from the start.
6. Permits for working in Spain (9 months)
7. Undercover build (Specify)
8. Science equipment changes over the build period – Unavoidable.
9. Accommodation and services

RVONZA

# Collaborating Agencies











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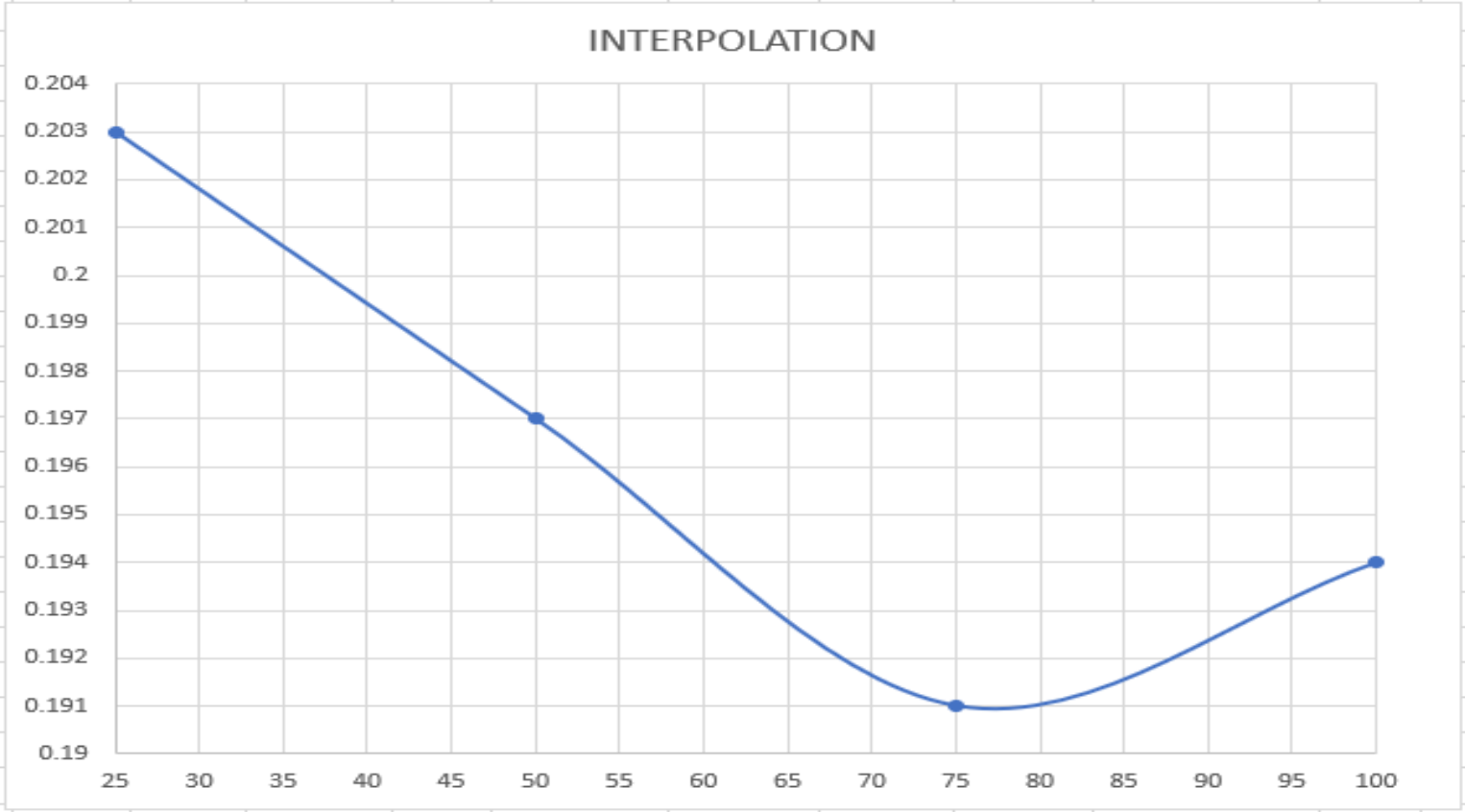
# DECK EQUIPMENT

| POS. | QUAN. | NAME | SWL(t) | CAPACITY | WEIGHT(kg) ex. wire/cable |
|---|---|---|---|---|---|
| 01 | 1 | TRAWL WINCH SB | 8 | 2900m/14mm | 2650 kg |
| 02 | 1 | TRAWL WINCH PS/CORER WINCH | 8 | 2900m/14mm | 2750 kg |
| 03 | 1 | NET DRUM | 4 | 4 m3 | 1700 kg |
| 04 | 1 | GILSON WINCH MOUNTED IN A-FRAME | 5 | 50m | Incl.A-frame |
| 05 | 1 | COD-END WINCH MOUNTED IN A-FRAME | 5 | 50m | Incl.A-frame |
| 06 | 1 | AUX. WINCH | 2 | 20m | Incl.A-frame |
| 07 | 1 | AUX. WINCH | 2 | 20m | Incl.A-frame |
| 08 | | | | | |
| 09 | | | | | |
| 10 | 1 | CTD WINCH CAMERA, ACOUSTIC | 5 | 7000m/10,59mm | 4900 kg |
| 11 | 1 | OCEANOGRAPHIC WINCH | 3 | 4000m/8mm | 2500 kg |
| 12 | 1 | MOBILE SCIENTIFIC WINCH | | | |
| 13 | | | | | |
| 14 | | | | | |
| 15 | | | | | |
| 20 | 1 | STERN A-FRAME ex. Net Drum | 8 | - | 8000 kg |
| 21 | 1 | SIDE T-FRAME | 5 | - | 4500 kg |
| 22 | 1 | MAIN CRANE | 6/3 | 8m/12m | 7500 kg |
| 23 | 1 | FORW. PROVISION CRANE | 1,2 | 6m | 2000 kg |

| Yanmar 6N21A-EW | | | | |
|---|---|---|---|---|
| % Load | 25 | 50 | 75 | 100 |
| SFOC | 0.203 | 0.197 | 0.191 | 0.194 |




| | |
|---|---|
| 25% | 0.203 |
| 30% | 0.202 |
| 35% | 0.2005 |
| 40% | 0.1995 |
| 45% | 0.1982 |
| 50% | 0.197 |
| 55% | 0.1957 |
| 60% | 0.194 |
| 65% | 0.193 |
| 70% | 0.1917 |
| 75% | 0.191 |
| 80% | 0.191 |
| 85% | 0.1915 |
| 90% | 0.1924 |
| 95% | 0.1933 |
| 100% | 0.194 |

| | |
|---|---|
| | m3 |
| Vessel fuel cap. | 122 |
| 10% | 12.2 |

| | | | | | | | | | | | Fuel consumption | | | Remaining |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V (kn) | Prop. | Weather | SCR | Hotel (kW) | Total kW | ME load | SFOC | Distance (Nm) | Hours | Days | kg/day | l/day | Trip (m3) | Fuel oil (m3) |
| 8 | 120 | 1.25 | 1.03 | 100 | 255 | 27% | 0.203 | 6500 | 812.5 | 33.9 | 1240 | 1459 | 49.4 | 72.6 |
| 9 | 200 | 1.25 | 1.03 | 100 | 358 | 37% | 0.2005 | 6500 | 722.2 | 30.1 | 1720 | 2024 | 60.9 | 61.1 |
| 10 | 320 | 1.25 | 1.03 | 100 | 512 | 54% | 0.197 | 6500 | 650 | 27.1 | 2421 | 2848 | 77.1 | 44.9 |
| 11 | 550 | 1.25 | 1.03 | 100 | 808 | 85% | 0.191 | 6500 | 590.9 | 24.6 | 3704 | 4358 | 107.3 | 14.7 |
| 12 | 850 | 1.25 | 1.03 | 100 | 1194 | 125% | 0.194 | 6500 | 541.7 | 22.6 | 5561 | 6542 | 147.7 | -25.7 |

# Operational Profile

- 20% Long transits of Pacific and Indian Oceans, speed abt. 10 -11 kn.
- 40% Fishery and Trawl Surveys, speed abt. 4 kn.
- 20% Oceanography, 0–9 kn.
- 10% Transits to Survey, speed 9 – 11 kn.
- 10% Alongside.

# Operational Areas

- New Zealand Exclusive Continental Shelf (ECS).
- Australian waters.
- Southern Ocean - Subantarctic Islands North of 60 degrees South.
- Tropics south of the equator.
- Pacific and Indian Ocean transits.

## Environmental footprint

1. Size and weight limitation. Wide capability for materials utilised.
2. Modern more efficient engine chosen that can run on biofuels.
3. Tier 3 emissions standards – SCR fitted to reduce NOx (injecting a Urea-Water solution into the exhaust gas stream in combination with a special catalyst unit).
4. Design speed to a sensible level.
5. Silent DNV classification – A and F
6. Modern bilge water and effluent treatment standards and effluent holding capacity.
7. External cathodic system - Impressed current system – Reduce antifouling application and biofouling risk.
8. Ability to run on low loading PTO from generator/aux engine or shore side connection option reducing fuel and emissions.

## Dimensions

- Gross Tonnage <500
- Length overall 36.10m
- Breadth 9.50m
- Classification; Fishing boat (unlimited) and workboat
- Class  DNV-GL +1A, “Fishing vessel”, DP1, Silent A-F, E0
- Yanmar 6N21AW - 956kW @ 850 rpm
- Speed 12 Knots at 100% of rated propulsion power.
- Sustained economic speed 10 knots
- Sustained minimum speed 0.5 knots
- Draft 3.650m
- 15 POB - 6 crew in single cabins, 8 scientists in double cabins, 1 scientist in a single cabin