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Australian Institute of Marine Science

AIMS UPDATE

New Vessel

Modular Capability

Supporting Infrastructure

IRSO

SEP 2024

AIMS: Australia's tropical marine research agency.

Project Objectives

Construct a research vessel, modular capabilities and support infrastructure to enable science in the tropical environment of northern Australia for the next 20 to 30 years.

- Larger and more capable than both the RV Cape Ferguson and the RV Solander.
- Enhance underway data collection and transmission
- Improve safety.
- Accomplish existing scientific fieldwork.
- Supplement existing fieldwork with autonomous technologies.
- Upgrade capability through modular units, deck space and equipment.
- Facilitate traditional owner engagement by providing additional berths for their participation and involvement.

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Operational Context

Field Operations TROPICAL NORTHERN AUSTRALIA	40,713 NAUTICAL MILES STEAMED	1, 686 SCIENCE FIELD DAYS INCLUDING CHARTERS	5,253 NUMBER OF DIVES	258 COLLABORATORS ON FIELD TRIPS	13,423 RESEARCHER FIELD DAYS
2023-24					
2022-23	42,400	1, 675	4,891	293	11,358
2021-22	42,760	2,537	6,327	261	10,315

RV Solander– 34.9m

RV Cape Ferguson – 23.9m

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Use Cases – Stakeholder Engagement – Requirements

- Project Team gathers AIMS and external stakeholder's input into design through Working Groups.

- Working Group input is scheduled to ensure that design input and review data from AIMS and external stakeholders is provided to meet the design schedule.
- Working Groups draw members from Science Programs, Strategy Development, Vessel Operations, Underway Instruments and Networking, and Safety.
- **10% of AIMS staff are consulted directly under the formal Working Group process.**

Future Vessel – Use Cases and Operating Model

PRE-VOYAGE

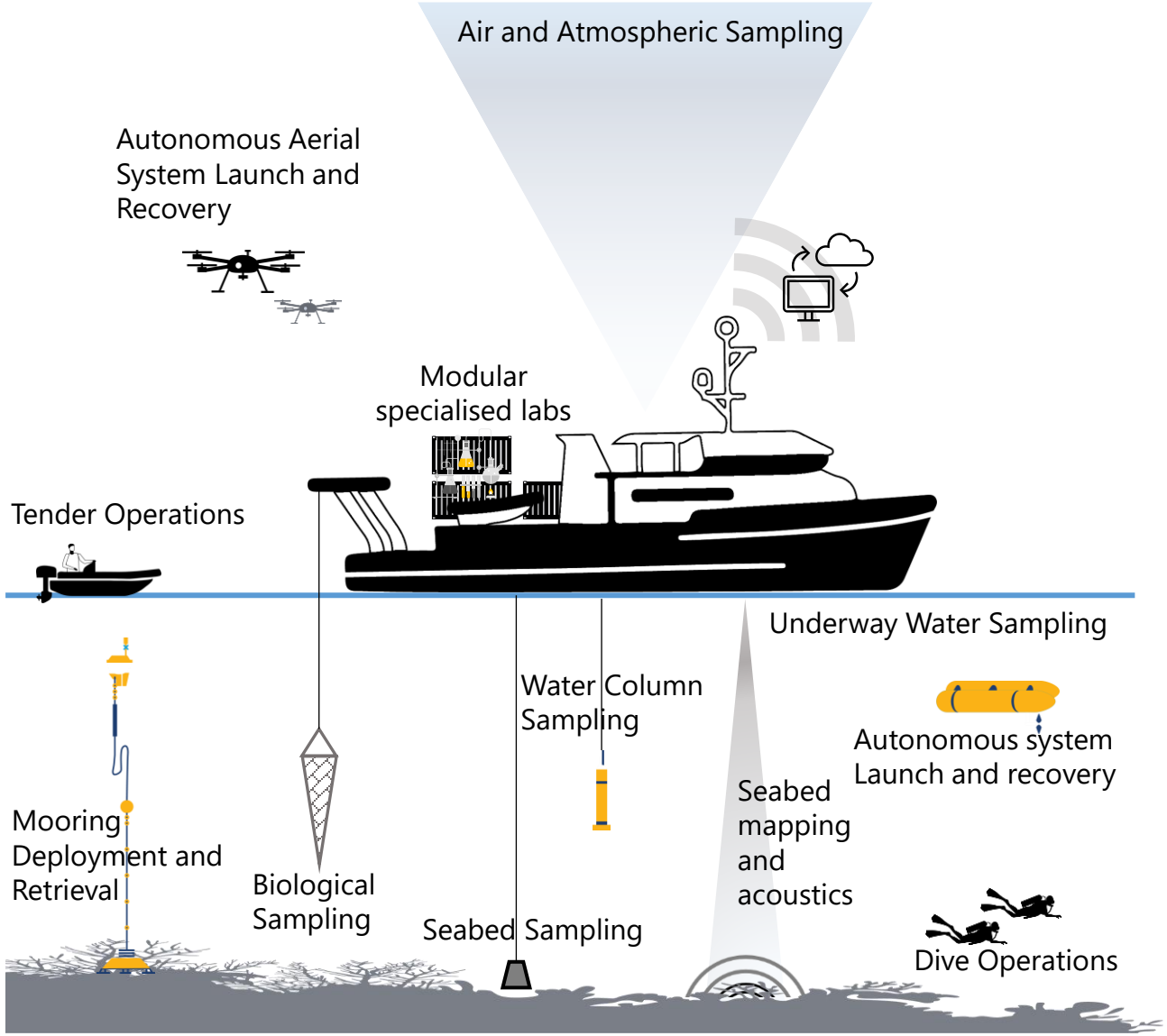
- Science equipment loaded during provisioning window.
- More efficient loading through use of modular systems.
- Scientists embark and vessel departs.

TRANSIT

- Underway systems collecting data.
- On board technician to assist science team.
- Centralized data management and data transmission.

FIELD WORK

- All existing science capability.
- More capable deck equipment, network and communications.
- Specialised labs / equipment through modular capability.
- Safer launch and recovery of equipment and tenders.
- Data collection augmented through autonomous systems.



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Future Vessel - Fleet Strategy

Approval
End of life extension to 2028

Decommission from Fleet

2000
RV Cape Ferguson

2023

2028-29

Operational Contingency

Options study
staff survey
future use cases

Design
- Concept
- Preliminary

Design
- Detail
- Production Readiness

Production

Acceptance
Sea trials

Integration into
Fleet Operation

Future Research Vessel 1

2018-19

2023-24

2024-25

2025-27

2028 - onwards

Yet to be funded

Construction Business Case

Decision
End of life extension to 2032-33

Decommission
Post 2033

2007
RV Solander

2026

2032-33

Operational Contingency

1st Pass Business Case

Lesson learned

2nd Pass Business Case

Production

Acceptance

Integration into
Fleet Operation

Future Research Vessel 2

2027-28

2028-29

Yet to be funded

2030-32

2032- onwards

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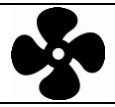
Future Vessel – Key Requirements – Design Brief

Vessel Size		Length <45m	Beam <16m	Draft <3m
Certification		AMSA NSCV 2B Extended (for DCV) DNV 1A E0 LC Cyber (for RAV)		
Range		21 Days 3000 Nm		
Speed		6-10 kn (survey) 12-14 kn (transit)		
Personnel		14 specialised personnel. Day capacity 30 pax.		
Crew		6 (for DCV) 8 (for RAV)		
Science		Dry Lab Instrument Well	Wet Lab Workshop	Hangar Server Room
Modular Capability		2+ 20ft Offshore Containers		
Launch & Recovery		A-Frame Cranes	CTD J-Frame Winches (w/conducting wires)	
Boats		Rescue Craft/Workboat Science Tenders		
Positioning		Position Holding Capability (DP without Certification)		
Propulsion / Power		Hybrid propulsion and fuel saving technology.		

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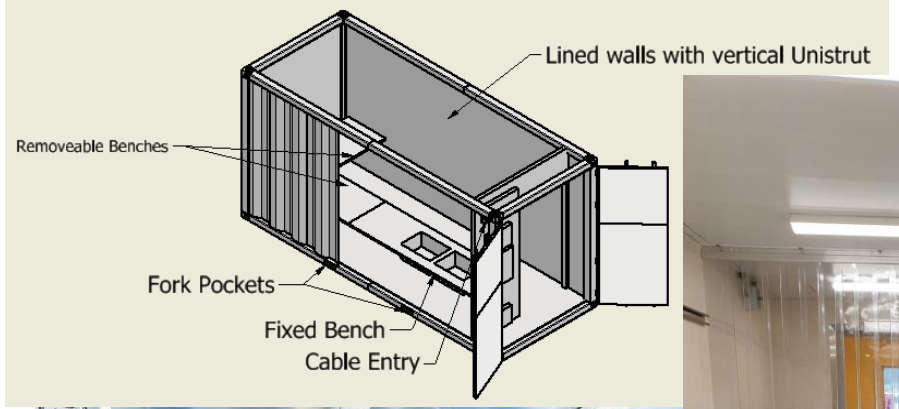
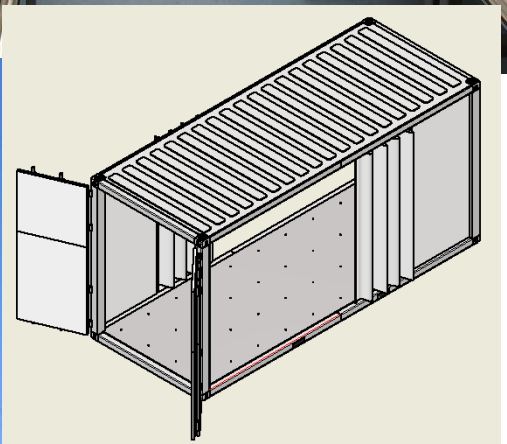
Modular Capabilities

- Specific science (e.g. aquaria) or can be general purpose.
- Dive spread, moorings, ASV/UAV/ROV, workshop, refrigerated or general stowage.
- Configured prior to loading onboard.
- Deploy equipment on a trip-by-trip basis.
- Used across range of vessels.
- Optimise vessel layout and capability.
- Standard ISO 20ft containers.
- Class certified - DNV 2.7-2.
- Standard interface including foundations, power, water, drainage, alarms etc.
- Australian inter-agency working group convened to identify opportunities for standardisation.





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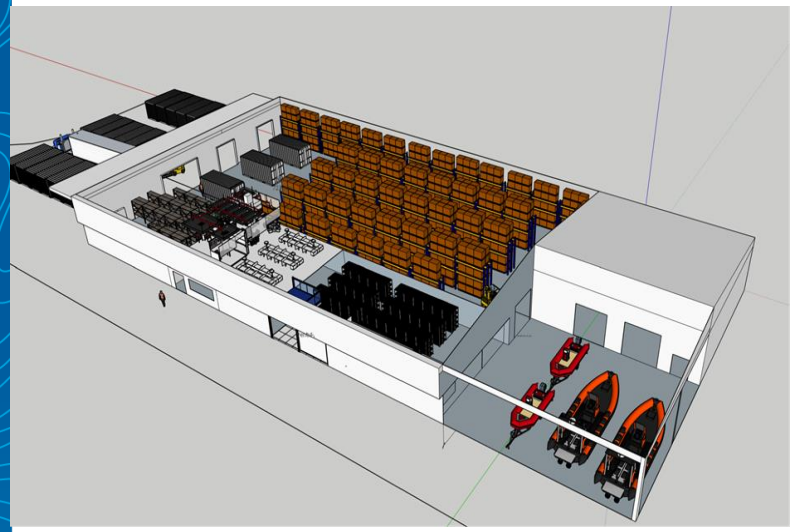
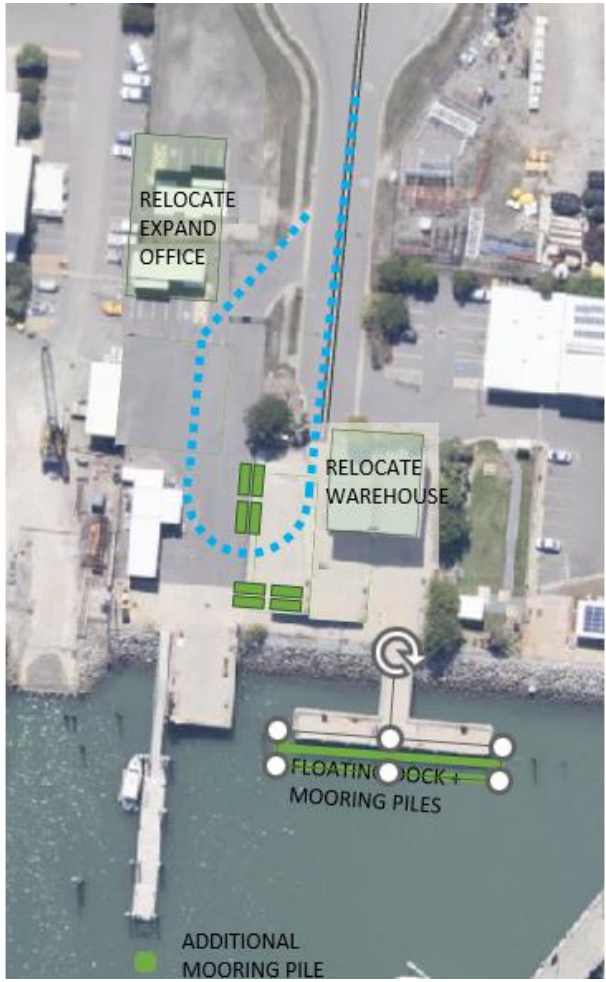
Related Projects – Logistics and Wharf Upgrades



- AIMS Logistics Centre – Cape Cleveland
  - Science and operations equipment storage and mobilisation of field work.
  - Support logistics operations - maintenance, materials handling, freight.
  - Adjacent to support services.

- AIMS Vessel Facility – Townsville
  - Expand lease at Townsville Port.
  - Expand office, warehouse and modular container capabilities.
  - Upgrade berthing facilities.



- AIMS Wharf Remediation – Cape Cleveland
  - Modifications to prevent silting up of wharf area.
  - Improve vessel access and ability to load modular capabilities on new vessel.

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Project Budget

Planning Phase

- Funding announced in March 2022 for design of research vessel covering:
  - Vessel concept development.
  - Preliminary and Detailed Design.
  - Class pre-contract plan appraisal.
  - Production readiness.

Delivery Phase

- Funding to be requested via a specific business case for consideration to cover:
  - Vessel Production
  - Modular capabilities and supporting infrastructure.
  - In-service support development.
  - Ongoing operations.

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Future Steps & Procurement Process

Current activities:

- Business Case Update for Vessel Construction - Aug 24 to Oct 24
- Class Pre-Contract Plan Appraisal and De-risking Exercise - Aug 24 to Feb 25
- RFT and Draft Contract Preparation - Aug 24 to Feb 25
- Production Readiness - Feb 25 to Jun 25

Planned activities *subject to future funding*:

- Shipyard Request for Tender - Mar 25 to Jun 25
  - Tender to be sent to 10 down selected shipyards from EOI process.
  - Based on Detailed Design Data and Pre-Contract Plan Appraised (DNV) documentation.
  - Released approximately March 2025 (subject to funding approval).
- Modular Capabilities Request for Tender - Post Jun 25
  - Tender to be sent to 4 down selected manufacturers from EOI process.
  - Released post June 2025 (subject to funding approval).
- Production Contract - Aug 25 to Dec 27
- Acceptance / Operational - Dec 27

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DESIGN TEAM.

One 2 three NAVAL ARCHITECTS

- Hull form
- Stability
- Structural design

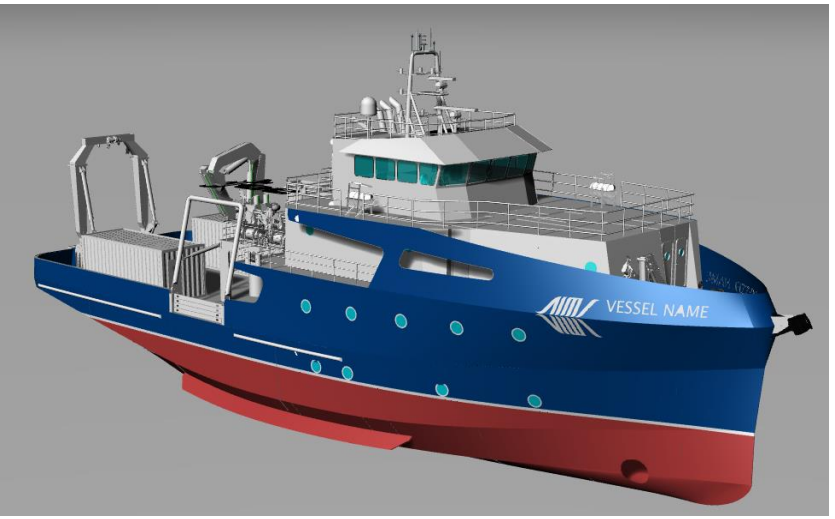
Glosten

- Science equipment and arrangements
- Mechanical
- Electrical
- Outfitting

Maritime Survey Australia

- Regulatory interface

CONCEPT EXPLORATION.



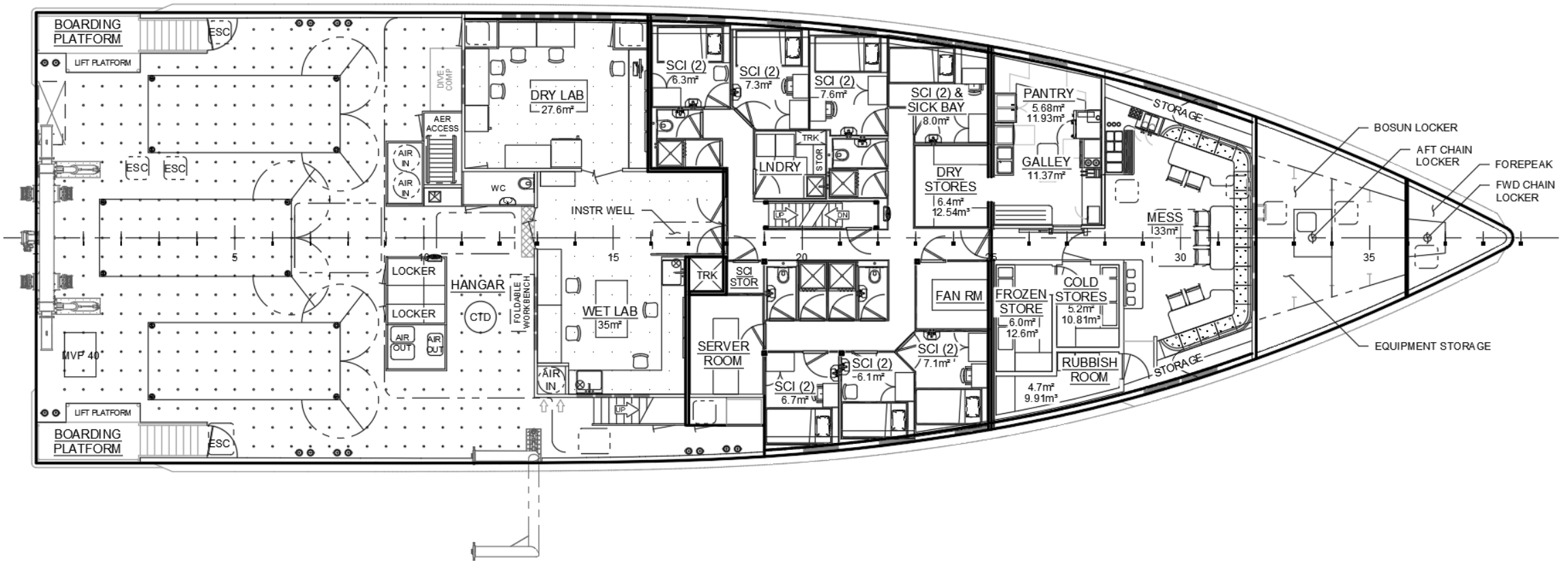
Monohull

Catamaran

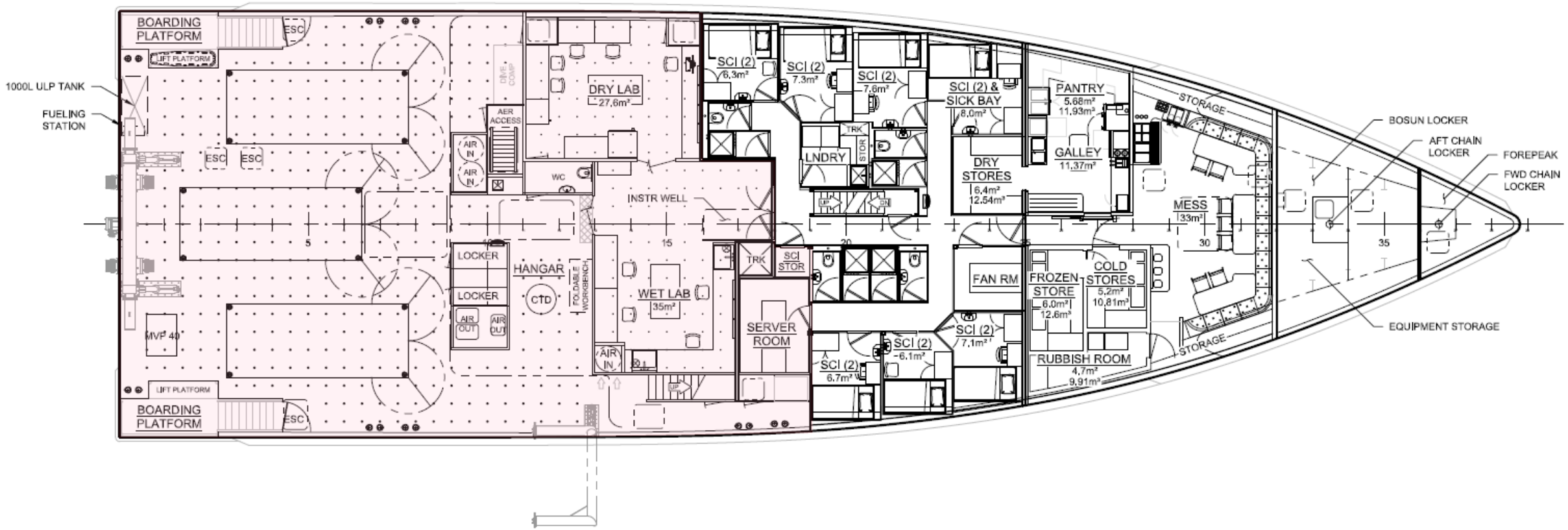
Trimaran

DESIGN STATUS.

MAIN DECK
SCIENCE LAYOUT.



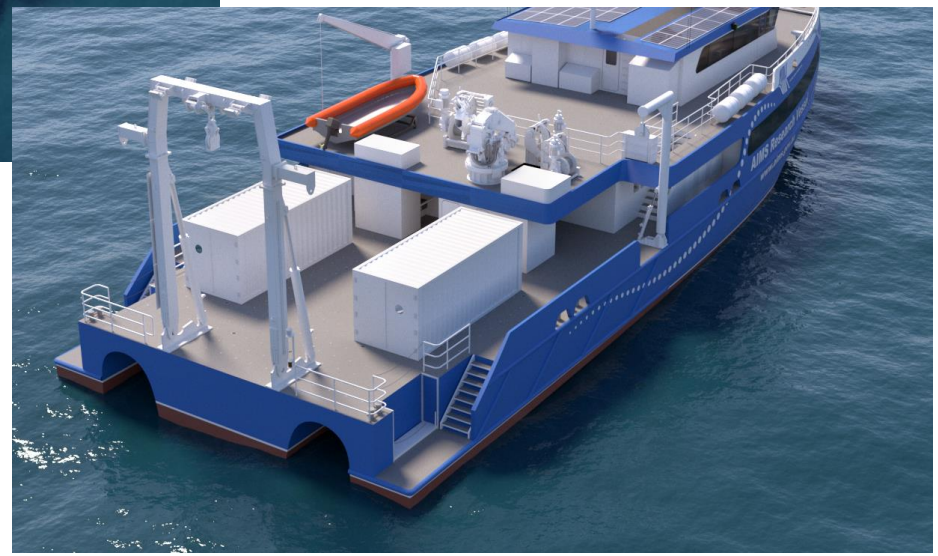
MAIN DECK
SCIENCE LAYOUT.



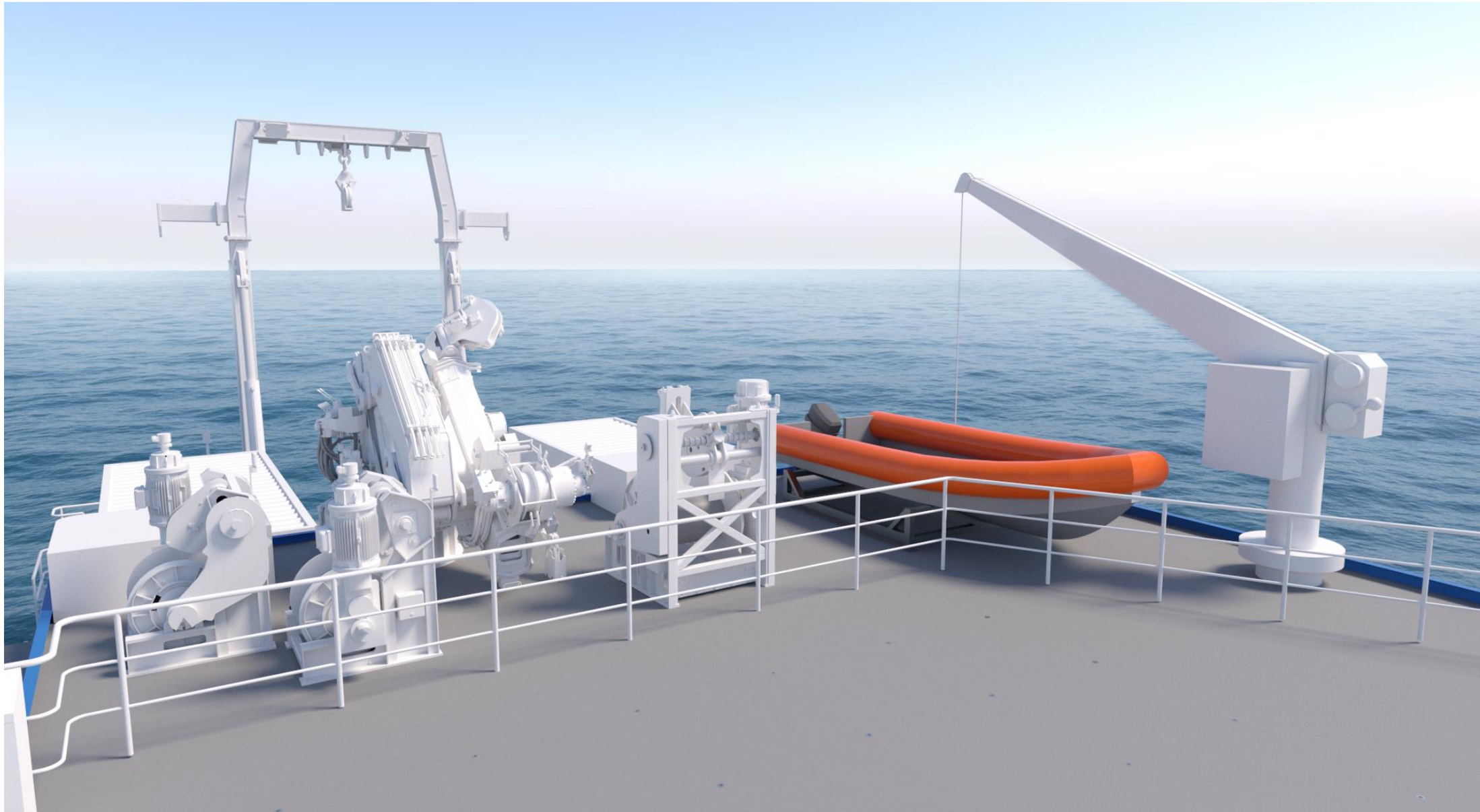
AFT DECK.

- Containers mounted on interface plates
- Can accommodate up to 3 20ft iso vans
- Boarding platforms port and starboard for accessing the vessel’s tenders and ASVs

- Side J-Frame
- Main Crane can access entire aft deck.
- Aft A-Frame:
  - 4-meter clear width
  - 4-meter clear height below docking head
  - SWL 4000kg



UPPER DECK.



HANGAR.

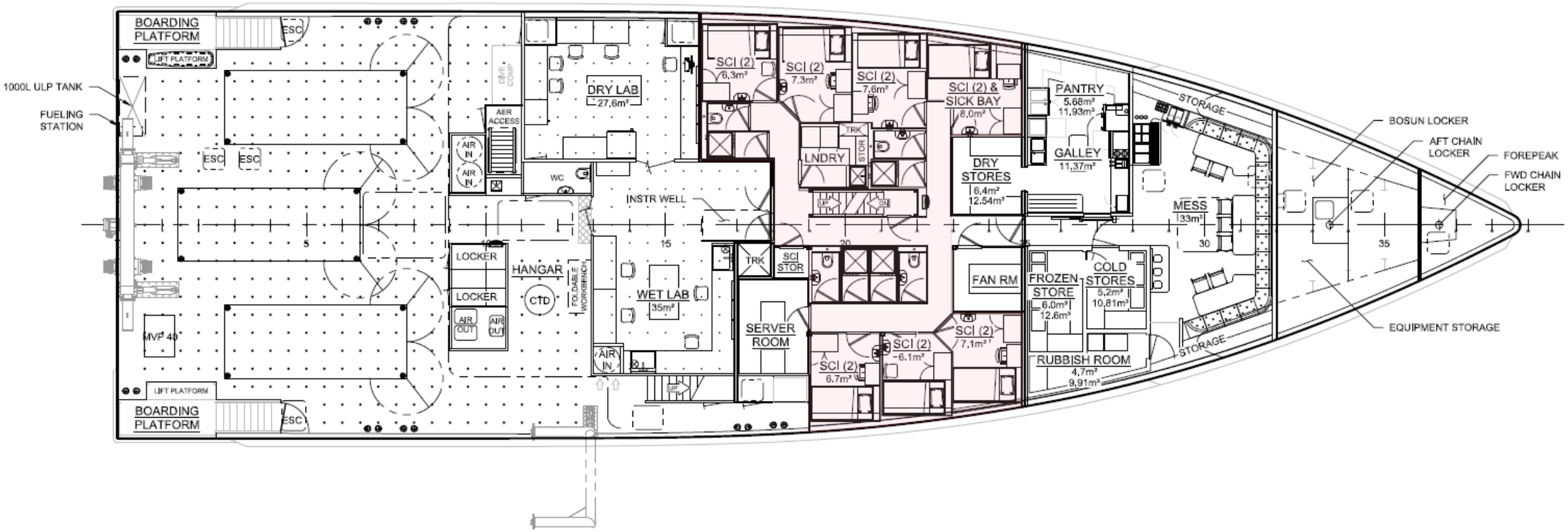
- Sink with hot/cold potable water as well as science seawater
- Fold down workbench on forward bulkhead

DRY & WET LABS.

- Unistrut/deck sockets
- Monitor wall
- Ultra-low temperature freezer
- Refrigerator
- Chest freezer with bench top

- Unistrut/deck sockets
- Modular fume ventilation
- (2) service sink locations with hot/cold potable and science seawater
- Monitor wall

MAIN DECK ACCOMMODATION LAYOUT.



MAIN DECK ACCOMMODATION LAYOUT.

MESS.

DRIVE TRAIN.

FLEXIBLE / EFFICIENT OPERATIONS

- Operational profile: on station/loitering, anchor, transit
- Combined propulsion and house power sources
- Limited crew intervention

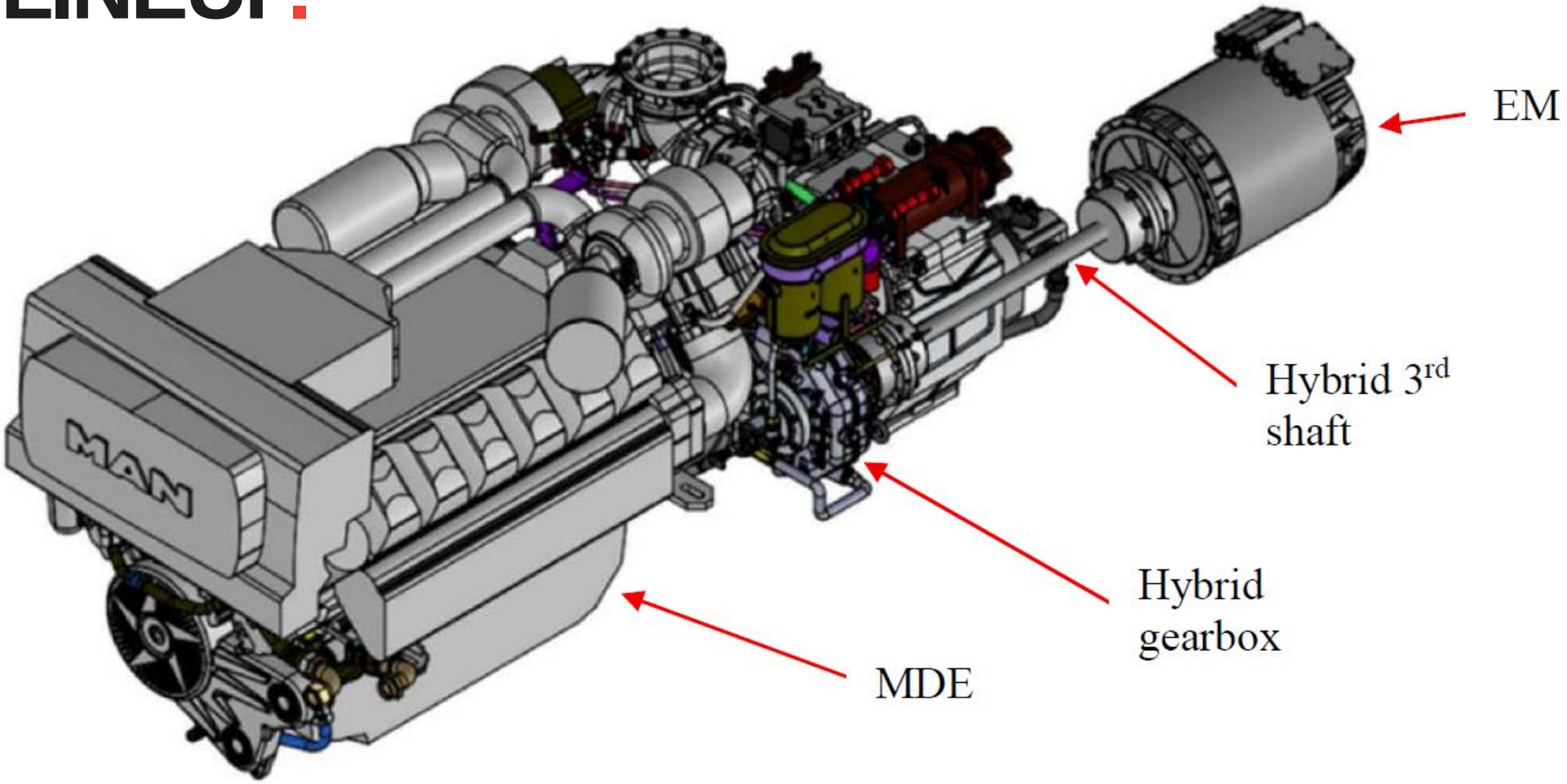
SPACE CONSTRAINTS

- Main Engine Room
- Auxiliary Engine Room
- Switchgear

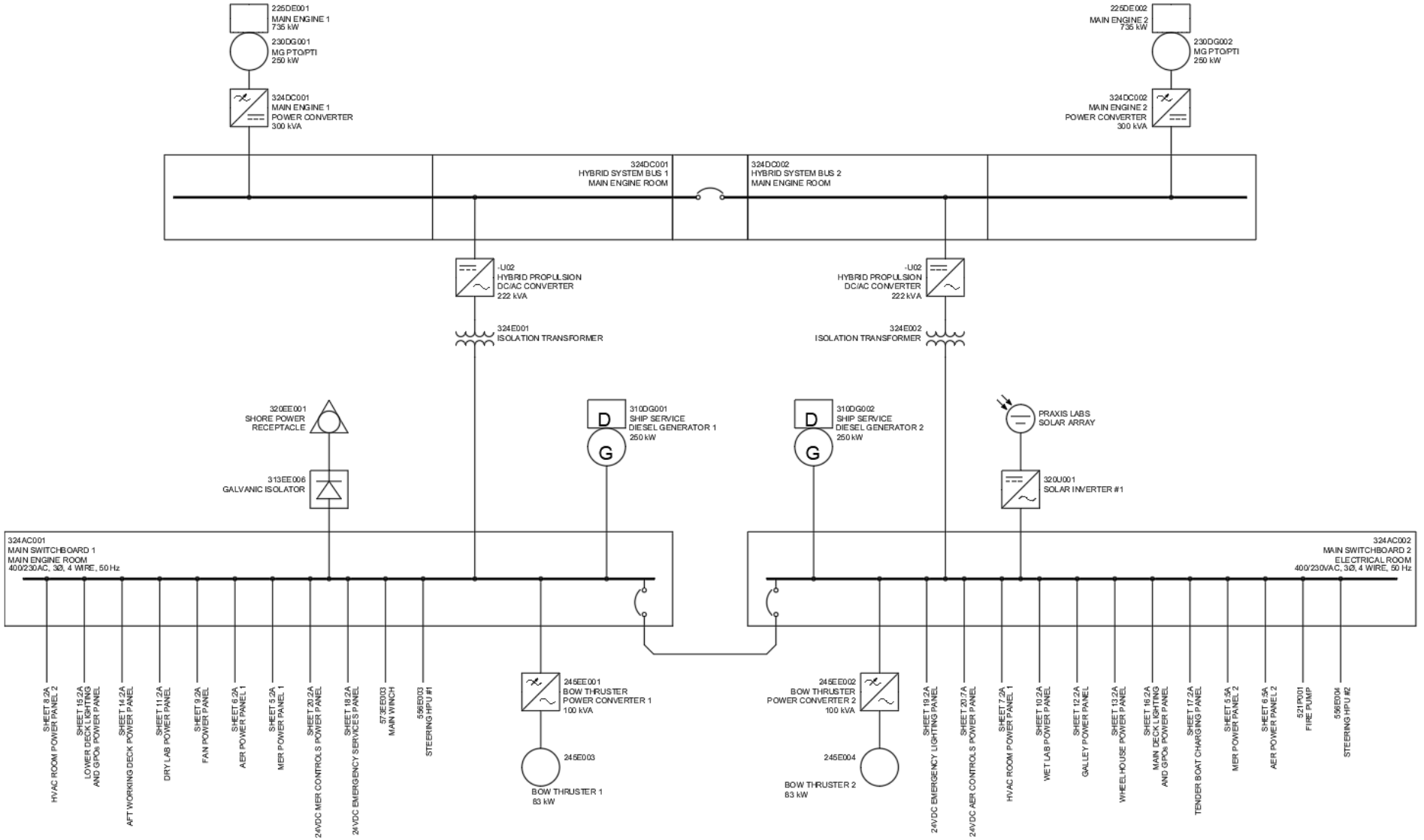
BATTERY LIMITATIONS

- Regulatory requirements for Li-on batteries
- Vessel size constraints limit capacity
- Battery lifecycle – 10 years

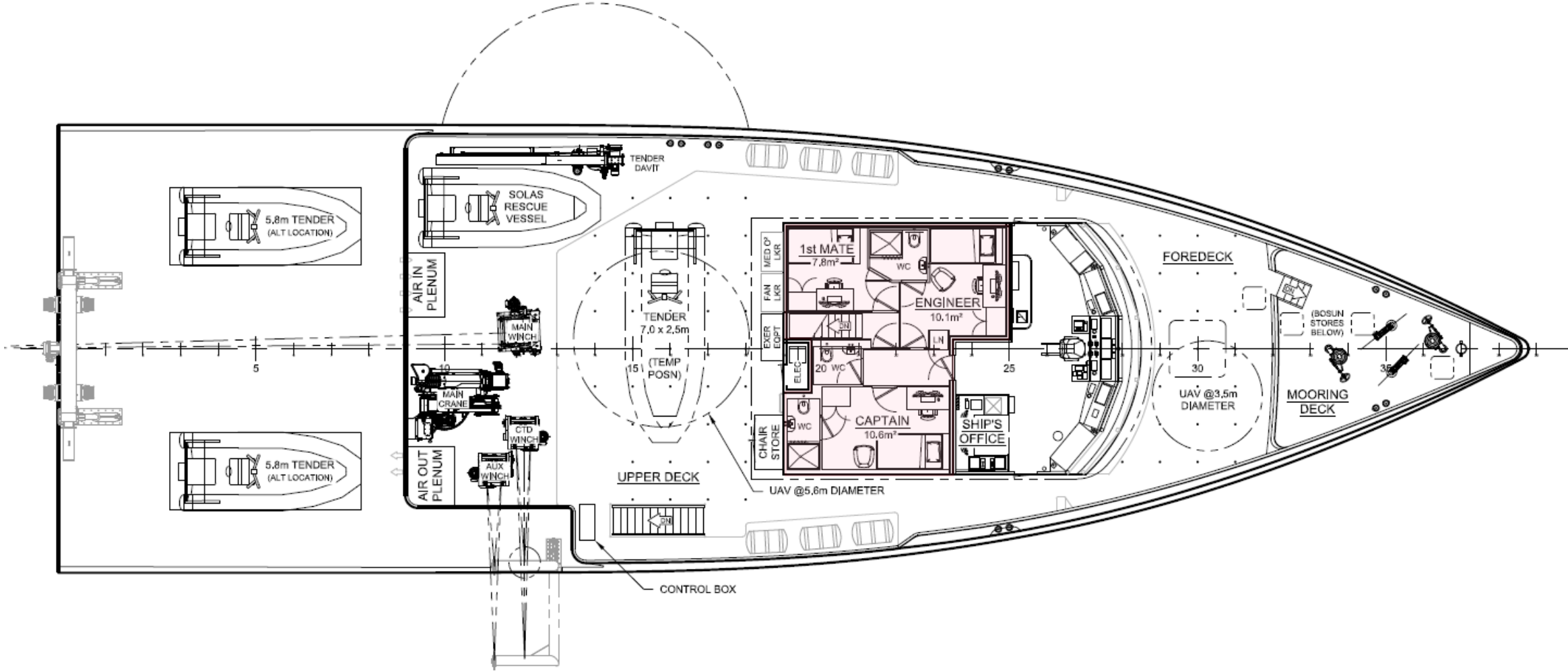
PROPULSION LINEUP.



ELECTRICAL DISTRIBUTION.



CREW ACCOMMODATIONS.



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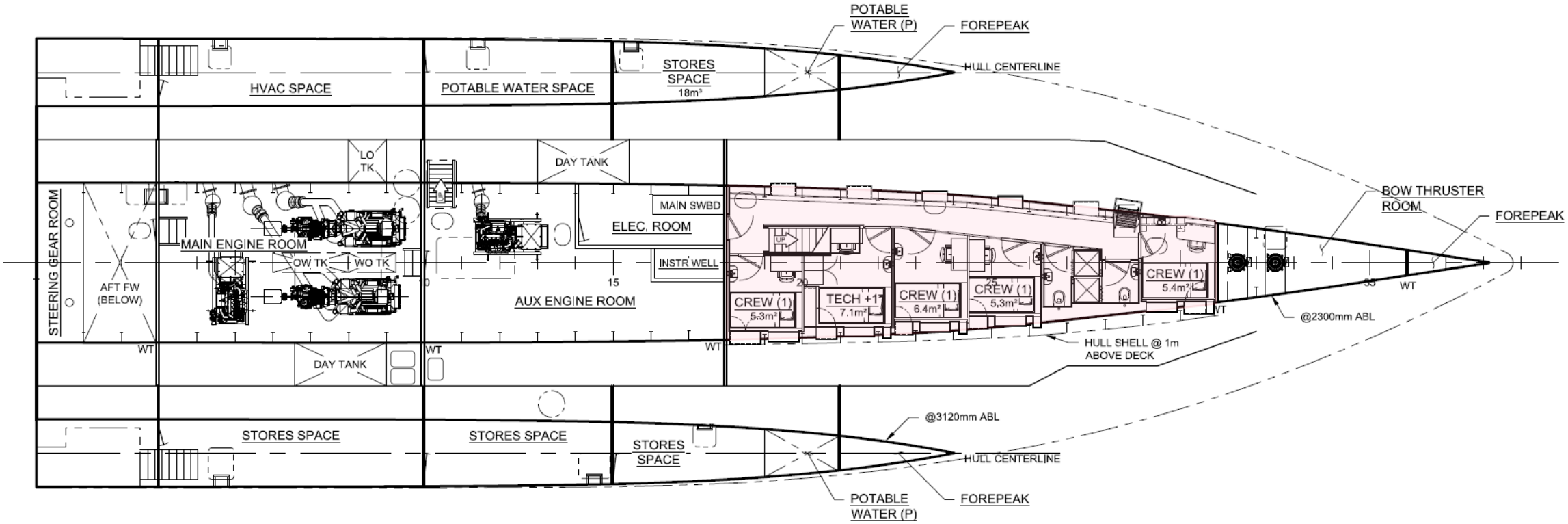

BELOW-DECK CREW ACCOMMODATIONS.

- Privacy prioritized—crew accommodations are away from science-heavy areas.
- Single staterooms with natural light.
- BUT, below the main deck.

QUESTIONS.

Peter Thurling
p.thurling@aims.gov.au
Elizabeth White, PE
eewhite@glosten.com