

ARV: Antarctic Research Vessel

Project Update: 4 November 2020

- Requested Science Mission Capabilities
- Proposed Technical Capability
- MREFC Process
- Proposed Timeline

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Science Mission Requirements

- *“...growing demand for more research cruises occurring during the shoulder seasons and in winter (in both ice and open water) and the capability of working in heavier ice concentrations than heretofore possible.”*
- *“New technologies offer unprecedented sampling capabilities involving suites of acoustical devices, AUVs, ROVs, and UAVs, geotechnical drilling and seismic operations.”*
 - *“Interdisciplinary cruises usually entail a large scientific complement and more specialized gear.”*
- *“...such cruises require more storage, deck, and lab spaces, including an increase in the diversity of lab types (including the temporary use of lab vans).”*
 - *“There is also community interest in working in relatively unexplored Antarctic waters, which argues for greater vessel endurance.”*
- *“In aggregate, these interests require a vessel whose size and endurance are greater than the Nathaniel B. Palmer.”*

Requested Science Mission Capabilities

Required Vessel Characteristics

1. Ability to provide year-round access to ice-covered seas
2. Ability to collect data and samples within seasonal and multi-year ice
3. Provide a stable platform for work within and transit across the Southern Ocean

Required Capabilities

- High-resolution geophysical mapping (seismic, multibeam)
- Geological sampling (coring, dredging)
- Biological sampling (acoustically quiet, nets, trawls, etc.)
- Remotely operated and autonomous vehicle deployments
- Water sampling and water column measurements
- Long endurance vessel able to support large science parties for multidisciplinary research

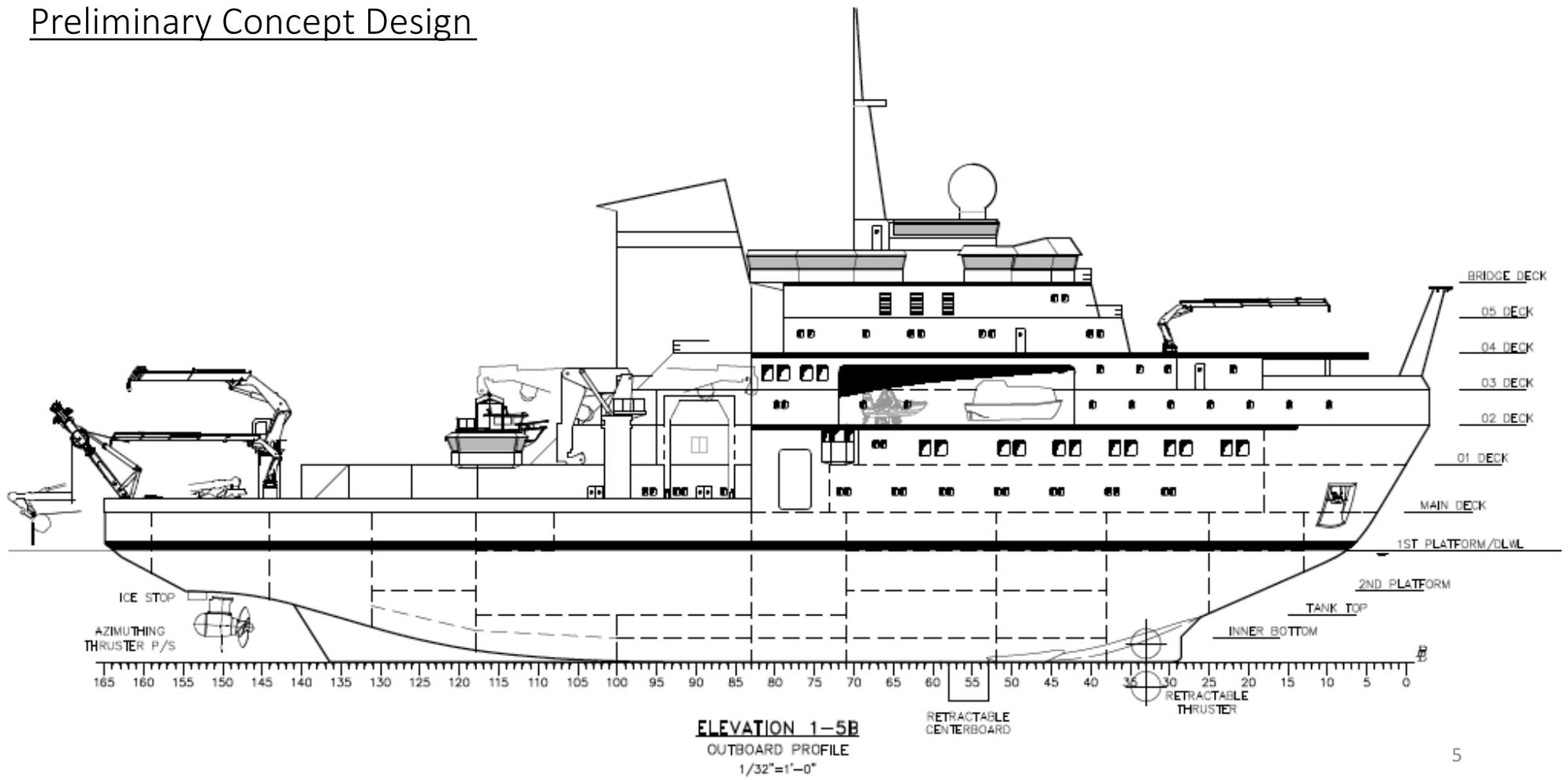
** 2019 Report of the Ad Hoc Subcommittee on the U.S. Antarctic Program's Research Vessel Procurement*

Proposed Key Performance Parameters (KPPs)

Parameter	Requirement	Threshold (minimum)	Objective (desired)
Icebreaking	The capability to independently break ice	≥ 3 ft at ≥ 3 kts (PC4)	≥ 4.5 ft at ≥ 3 kts (PC3)
Endurance	Maximum endurance without replenishment	≥ 70 days underway	≥ 90 days underway
Science & Technical Personnel	Provisions for messing, berthing, sanitation, and scientific workspaces	Crew plus ≥ 45 science and technical personnel	Crew and ≥ 55 science and technical personnel

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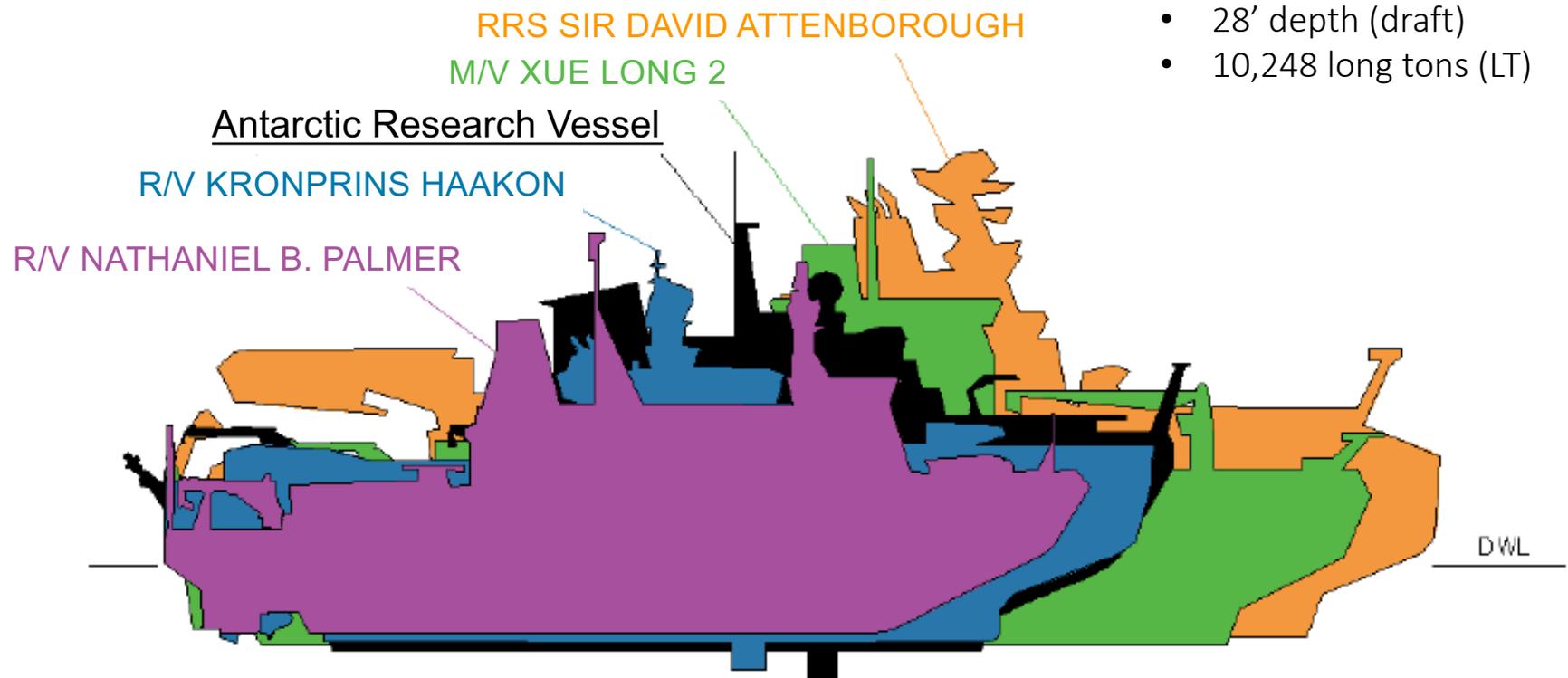
Preliminary Concept Design



Preliminary Concept Design

ARV General Specifications

- 335' length overall (loa)
- 69' width (beam)
- 28' depth (draft)
- 10,248 long tons (LT)



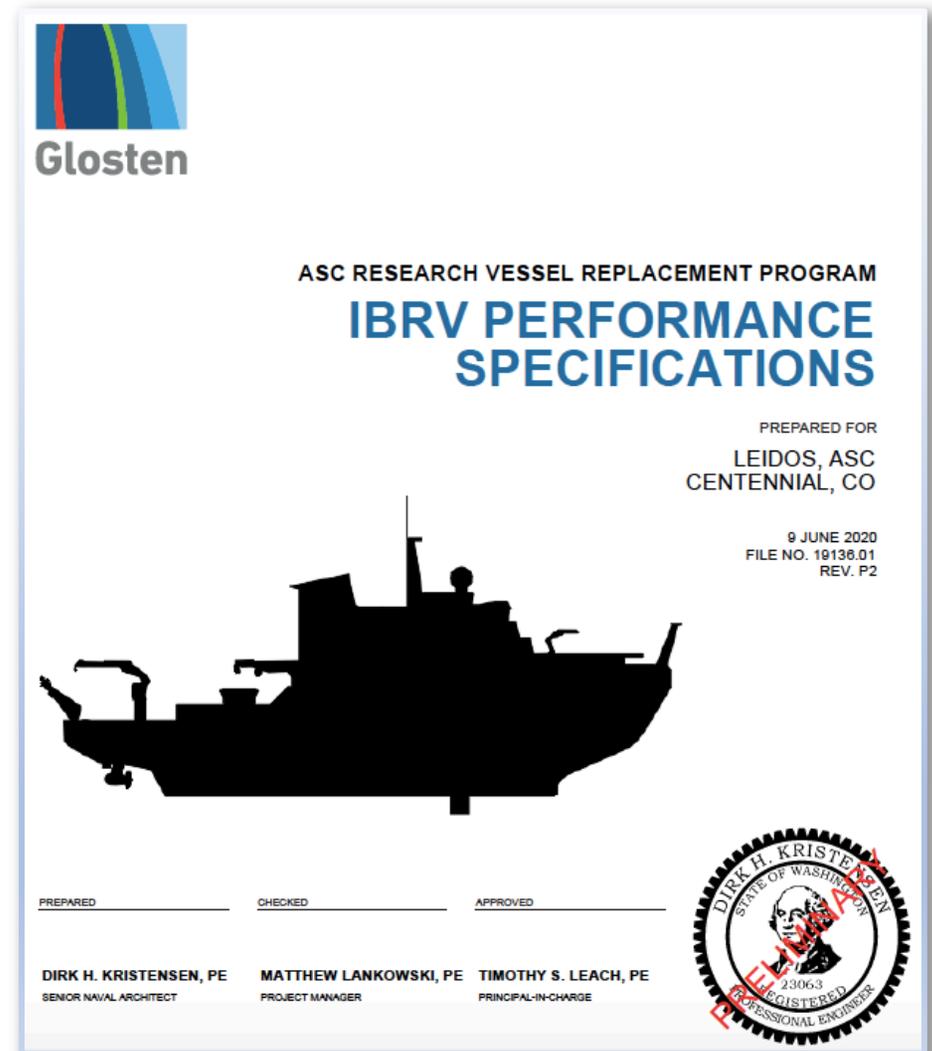
Preliminary Performance Specifications

Glosten walk-thru (*July 2020*)

- Provide Q&A for documents
- Provide input/guidance on current specifications and concept design

Next Steps

- Develop MREFC Conceptual Design Documents
 - Vessel Studies (ice/environmental conditions, green-ship alternatives, autonomous vehicles, underwater radiated noise, etc.)
- Finalize performance specification (*Feb 2021*)



Preliminary Concept Design



Timeline (near-term)

Entry into Major Research Equipment & Facilities Construction (MREFC)

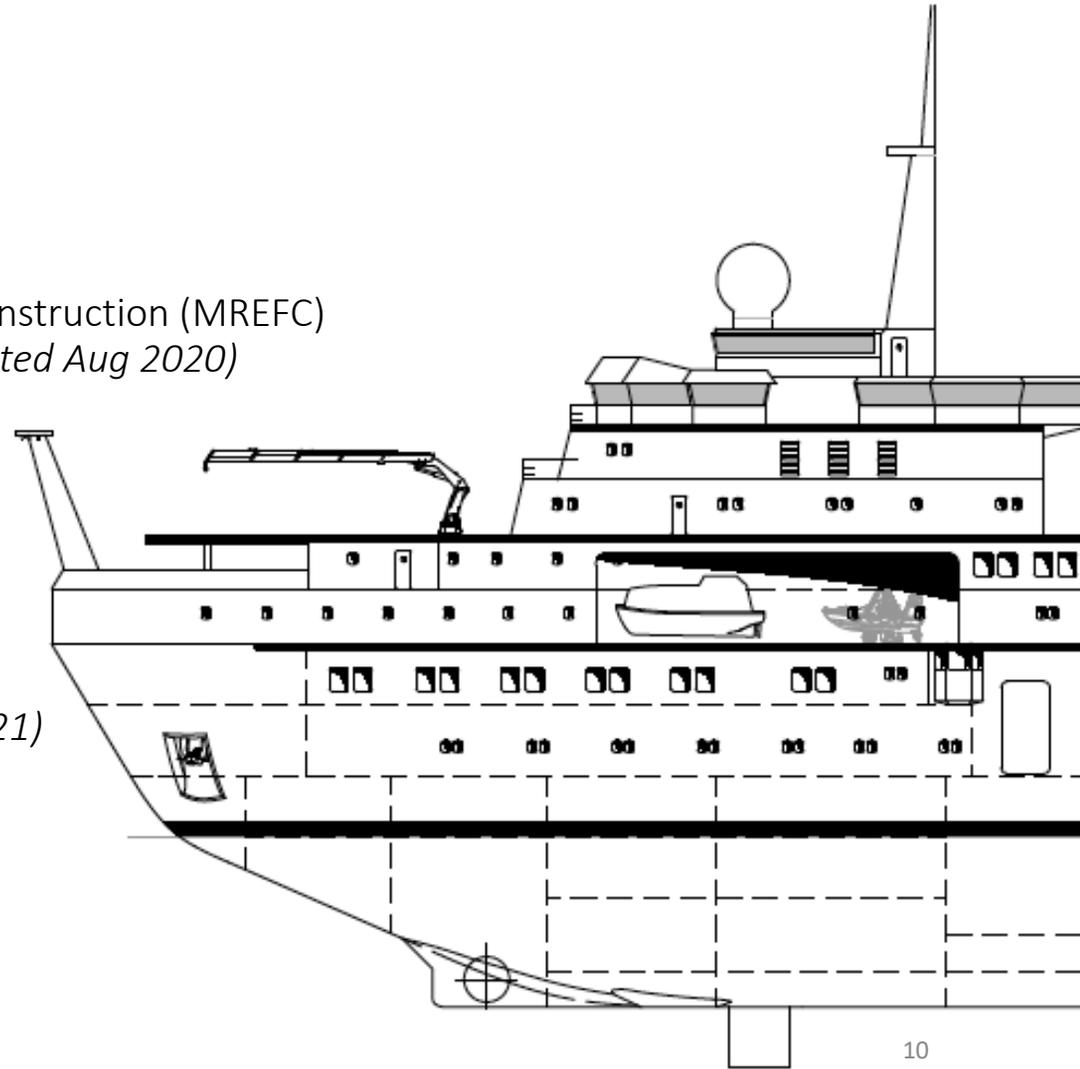
- Submit MREFC Package for CORF review (*Completed Aug 2020*)

Conceptual Design Review (CDR)

- Prepare for CDR (*in development*)
- **Conceptual Design Review** (*Mar 2021*)

Integrator Solicitation

- Prepare solicitation (*Oct 2020 – Feb 2021*)
- Compete & award Integrator (*Feb 2021 – Oct 2021*)



Major Research Equipment and Facilities Construction (MREFC) Proposed Timeline

- **Conceptual Design Review (CDR)**
 - Develop Project Execution Plan (PEP)
 - Conceptual Design
 - Preliminary Performance Spec
- **Preliminary Design Review (PDR)**
 - Design out for shipyard bid
 - Initiate budget request to Congress
- **Final Design Review (FDR)**
 - Finalize design
- **Construction**
- **Delivery/Trials**
 - Sea keeping, ice trials, etc.
- **Operational**

Years 1-2

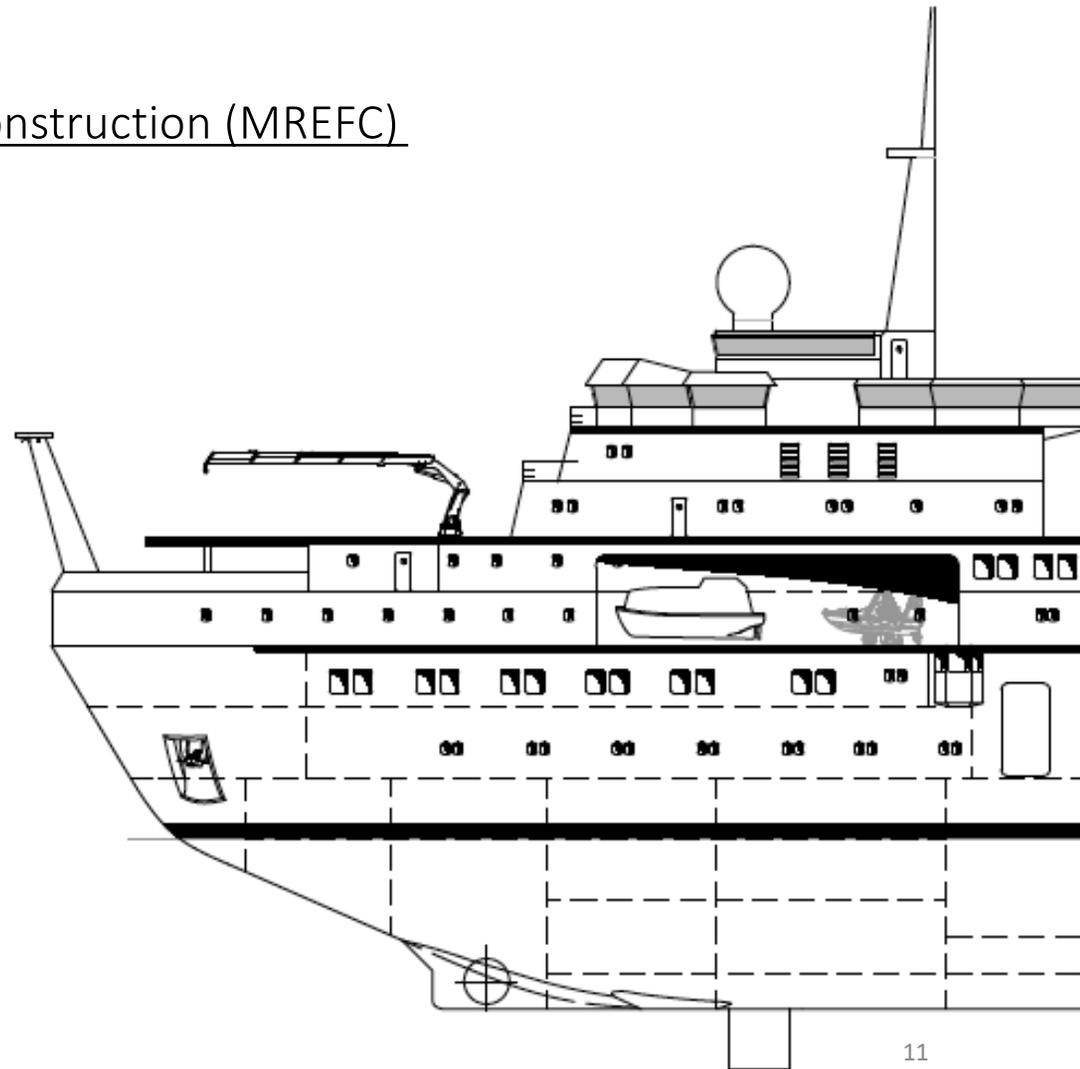
Years 3-4

Years 5-6

Years 7-8

Year 9

Year 10



Questions/Discussion?

