



Overview

Feasibility-Level Design Study for a Polar Research Vessel

Presented to ARVOC

Arlington, VA

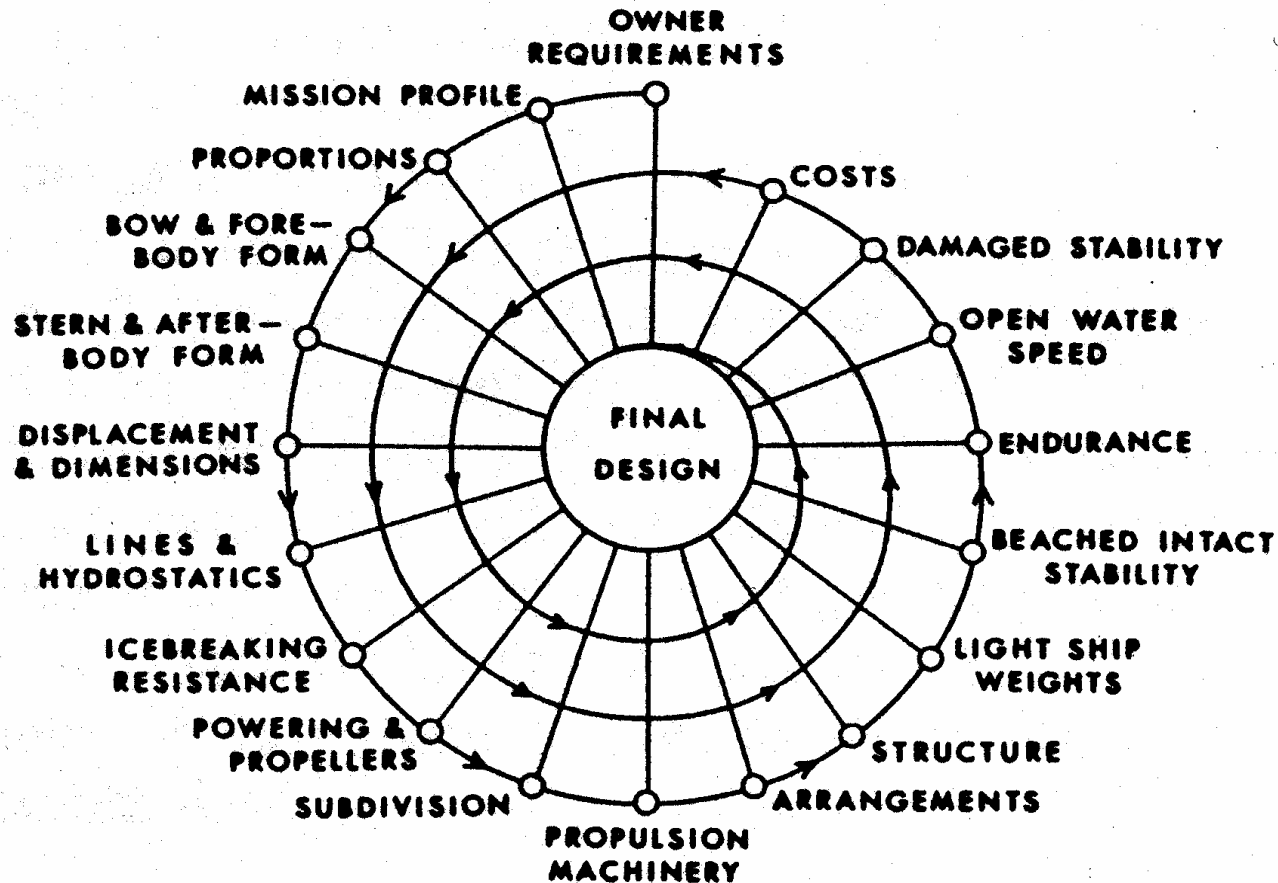
November 20, 2003



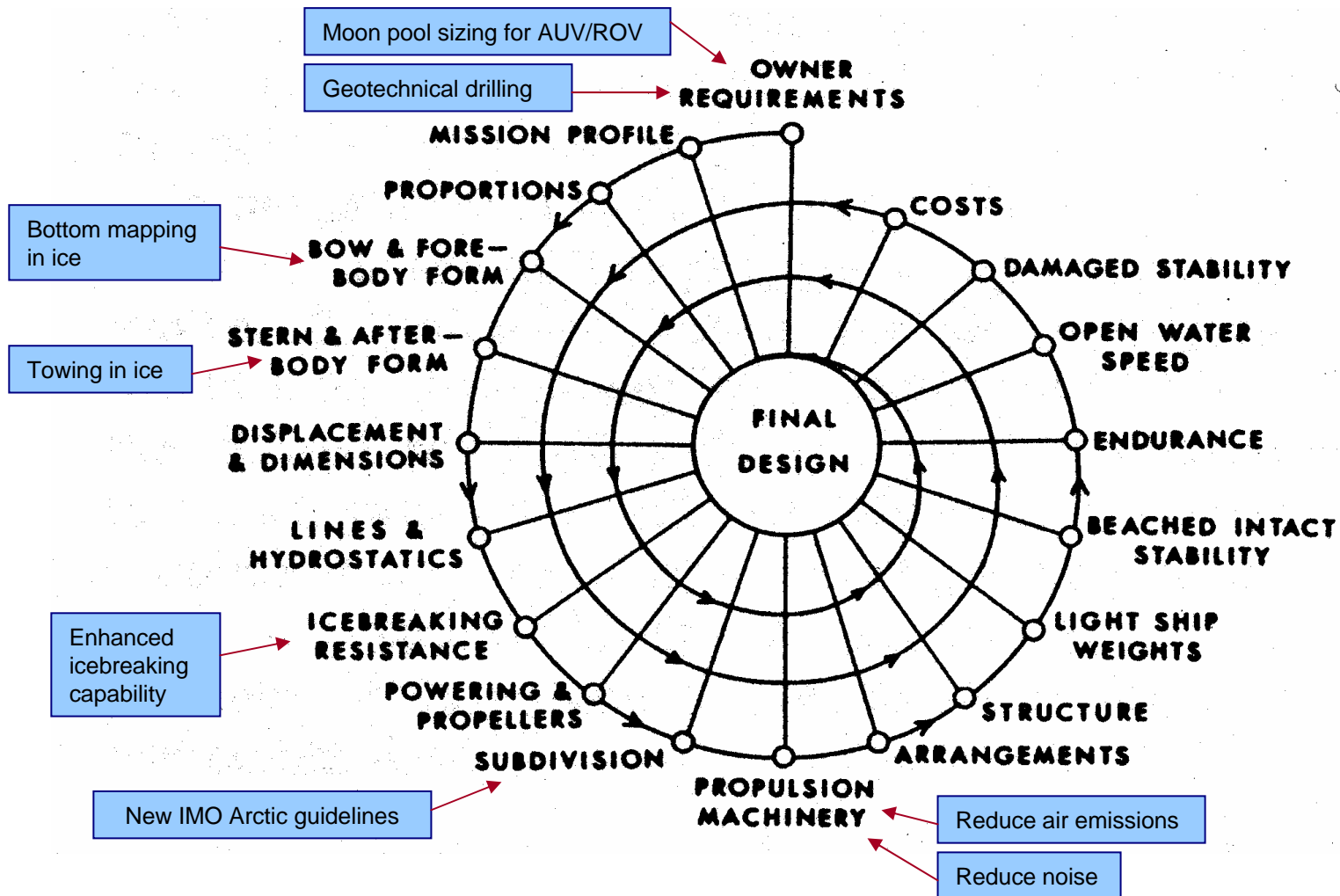
New Generation

Polar Research Vessel

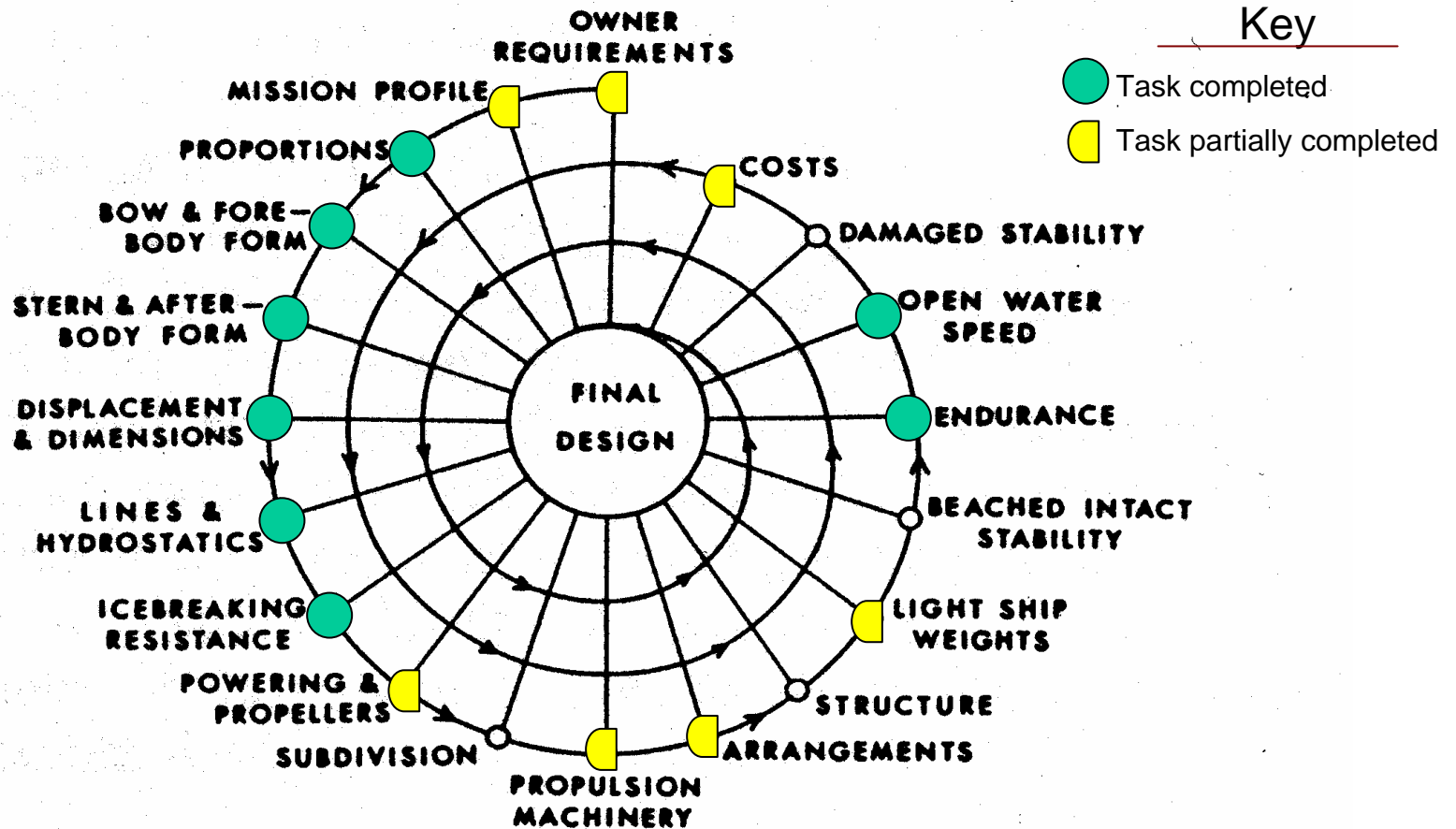
PRV Design Spiral



Special Technical Studies



Overview of Feasibility-Level Design Cycle

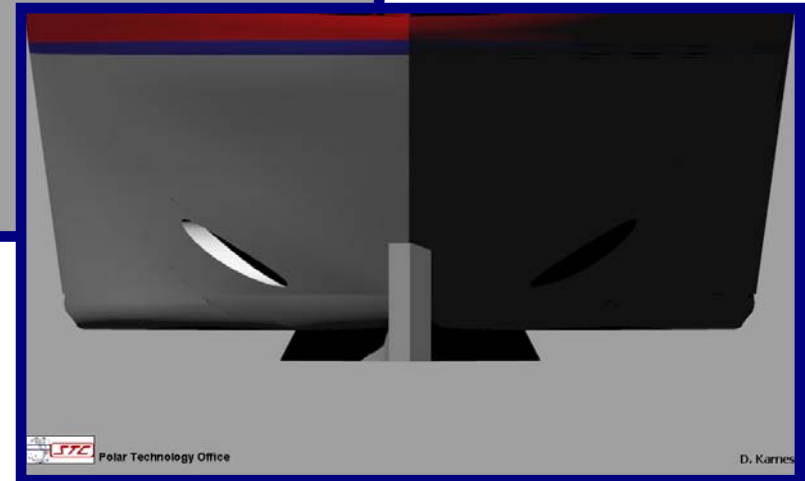
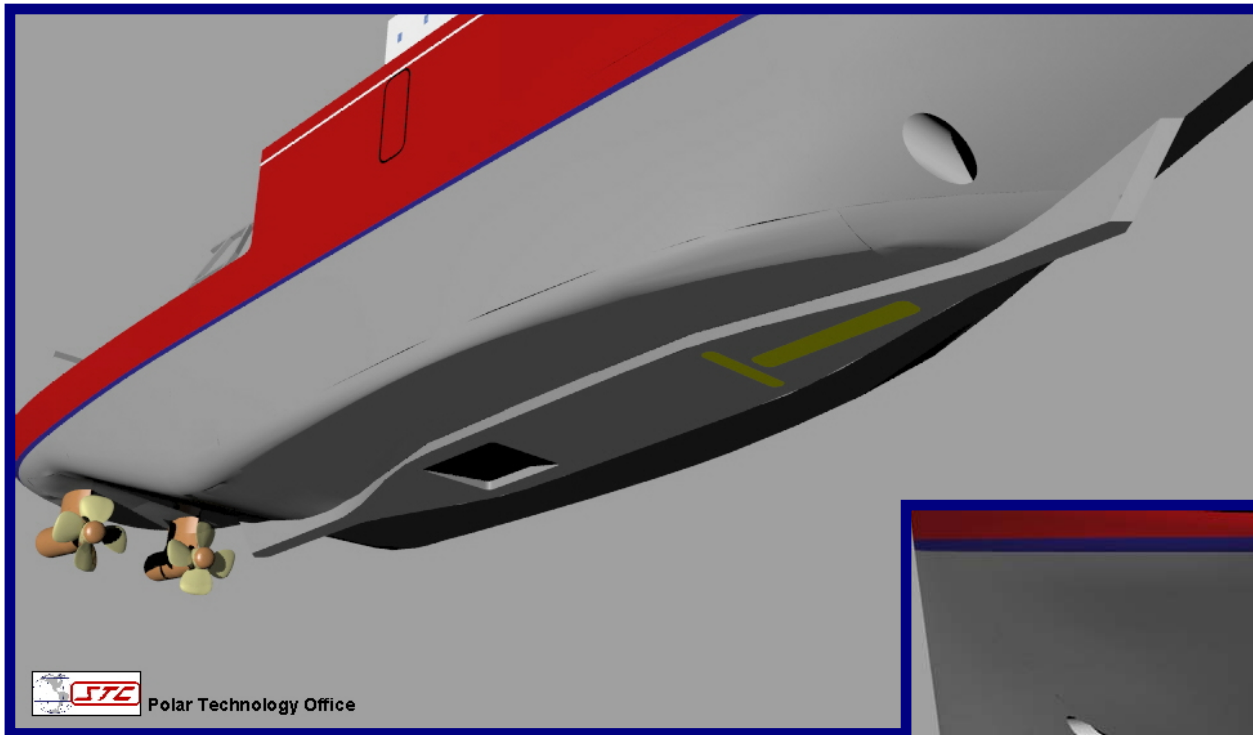


Science Features



- Bottom mapping during icebreaking
- Enclosed geotechnical drilling capability
- Moon pool (completely enclosed)
 - AUV/ROV
 - Diving
 - CTD rosette
 - Ocean-Bottom Seismograph (OBS)
- Traditional set of A-frames, winches, cranes
- Enhanced towing in ice
- Accommodation for 50 scientists
- Helicopter complex (deck, hangar, elevator)
- Clear view aft from starboard pilot house control station
- Inter-deck science/cargo elevator
- Box keel sized suitable for growth in sensors

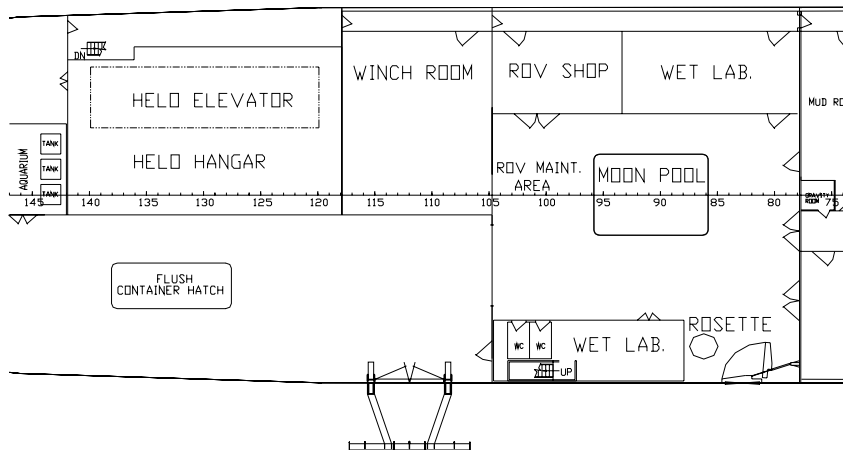
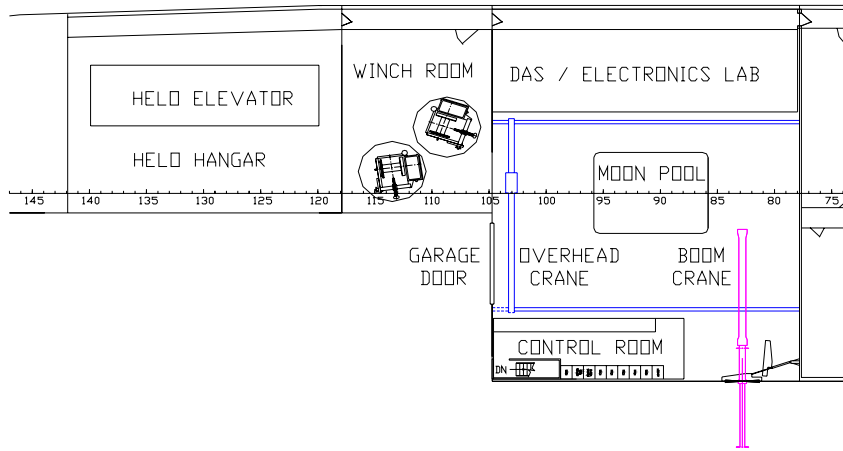
View of Box Keel



Moon Pool Size Considerations

- Initially sized by CTD rosette and AUV, hook height, and motion criteria for the ship with about 3 ft of margin
- Maximum dimensions were taken as 5 ft width (rosette) and 10 ft length (AUV), excluding ROVs
- ROV capability was considered later, and it was assumed there would be a captured launch and recovery system and no ship motions
- Current size is 6.1 m long by 4.9 m wide (20 ft by 16 ft)
- Moon pool size considered representative and a small increase in size will have low impact on vessel design

Baltic/Moon Pool Arrangement

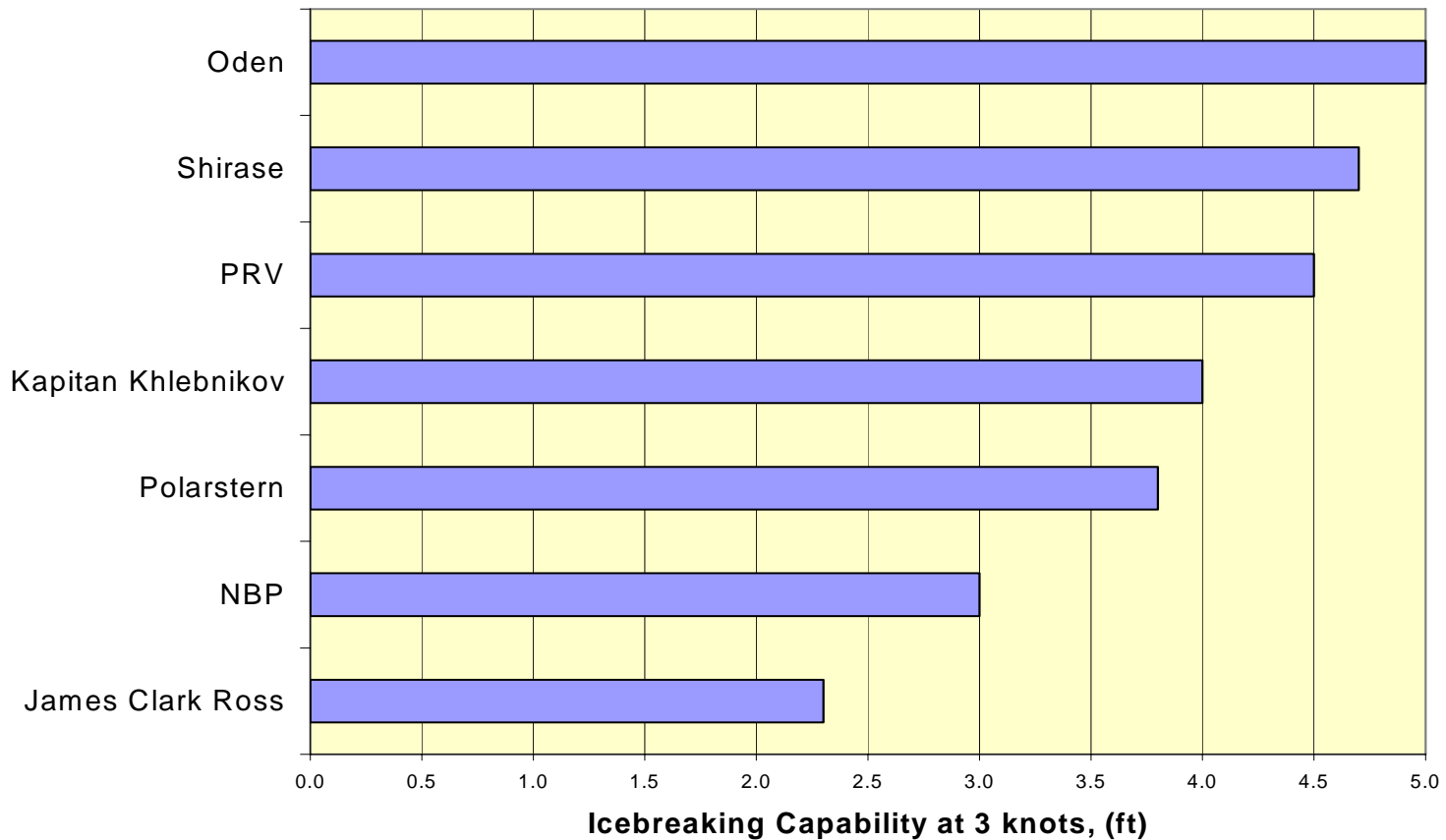


Operational Capability

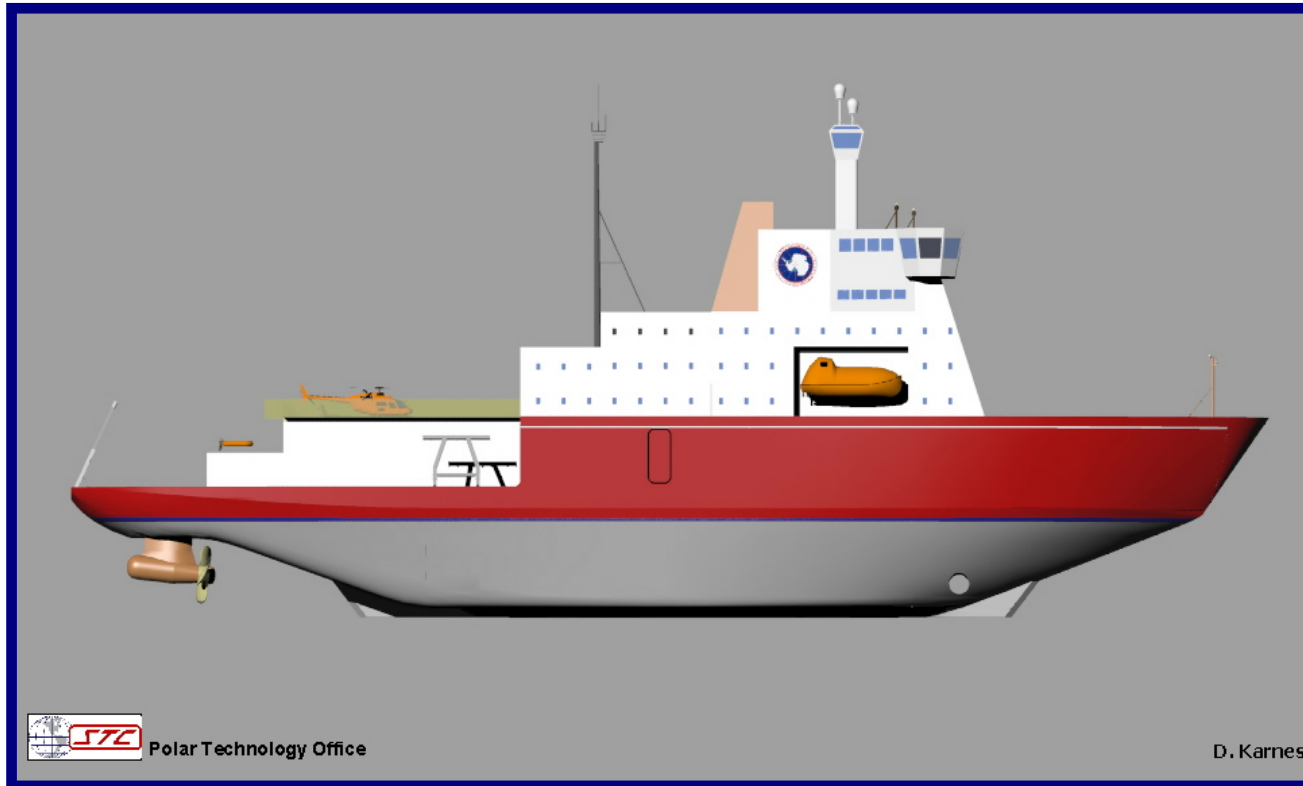


- Level Icebreaking @ 3 kts -- 4.5 ft
- Endurance at 12 kts -- 80 days/20,000 miles
- Crew -- 22
- Total Complement -- 80
- Independent operation in multiyear ice including central Arctic basin in the summer
- Podded propulsion provides added maneuverability without rudders
- Diesel exhaust emissions reduced by 90 percent compared to existing research vessels

Comparison of PRV to Other Icebreaking Research Vessels



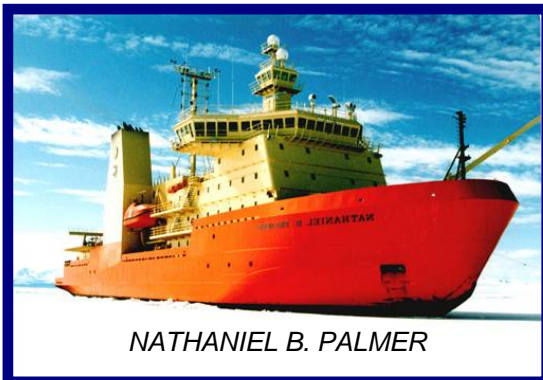
Principal Characteristics



LOA	378.4 ft	Draft	29.6 ft
LWL	340.9 ft	Displacement	11,000 LT
Beam	74.5 ft	Shaft horsepower	22,400 HP

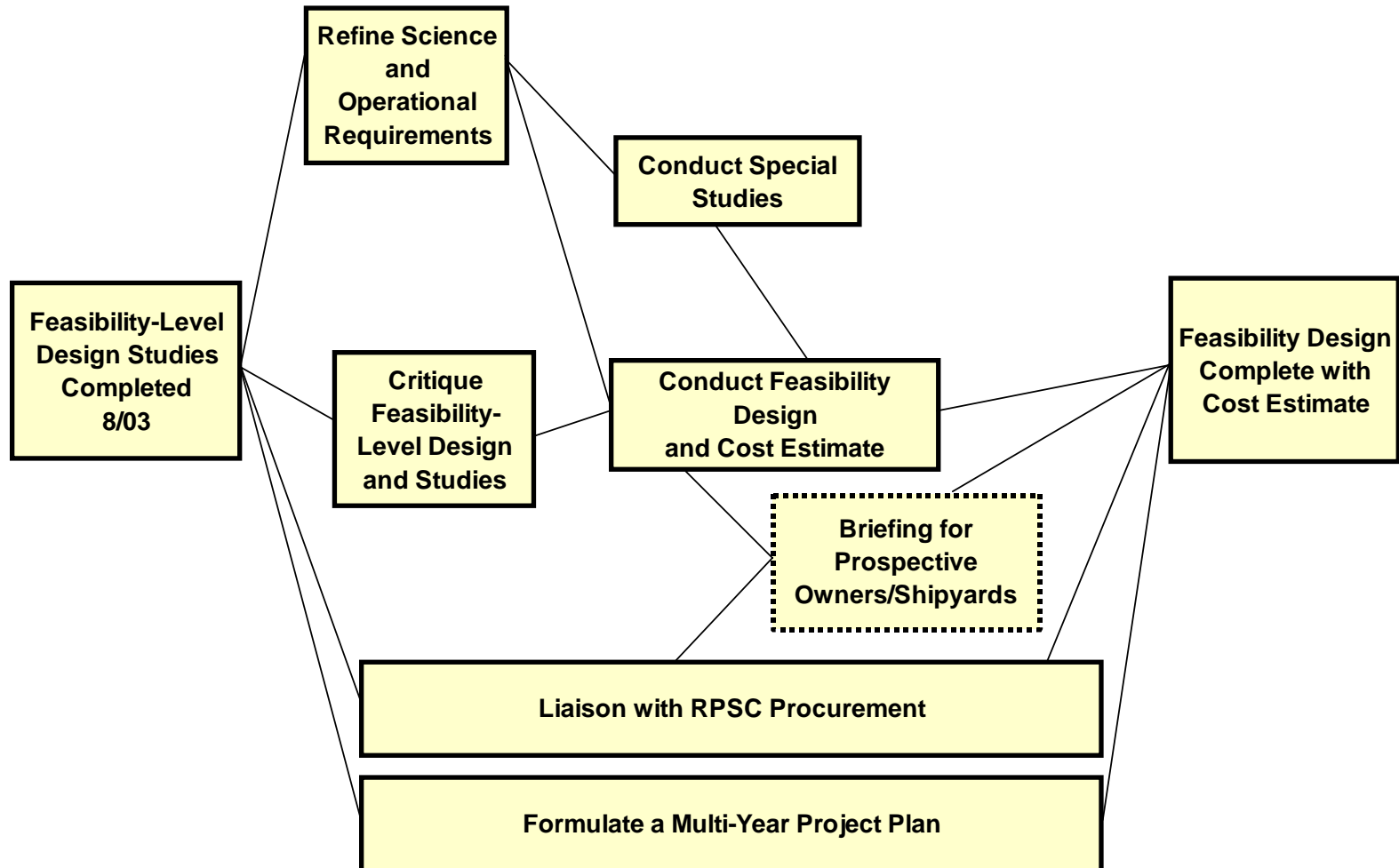
Enhanced Capability and Features of New Generation Polar Research Vessel

- 62% increase in displacement
- 79% increase in shaft power
- 50% increase in icebreaking capability
- 128% increase in space available for laboratories
- 32% increase in accommodations for scientists
- 33% increase in endurance
- 69% increase in construction cost
- 50% increase in design service life of vessel

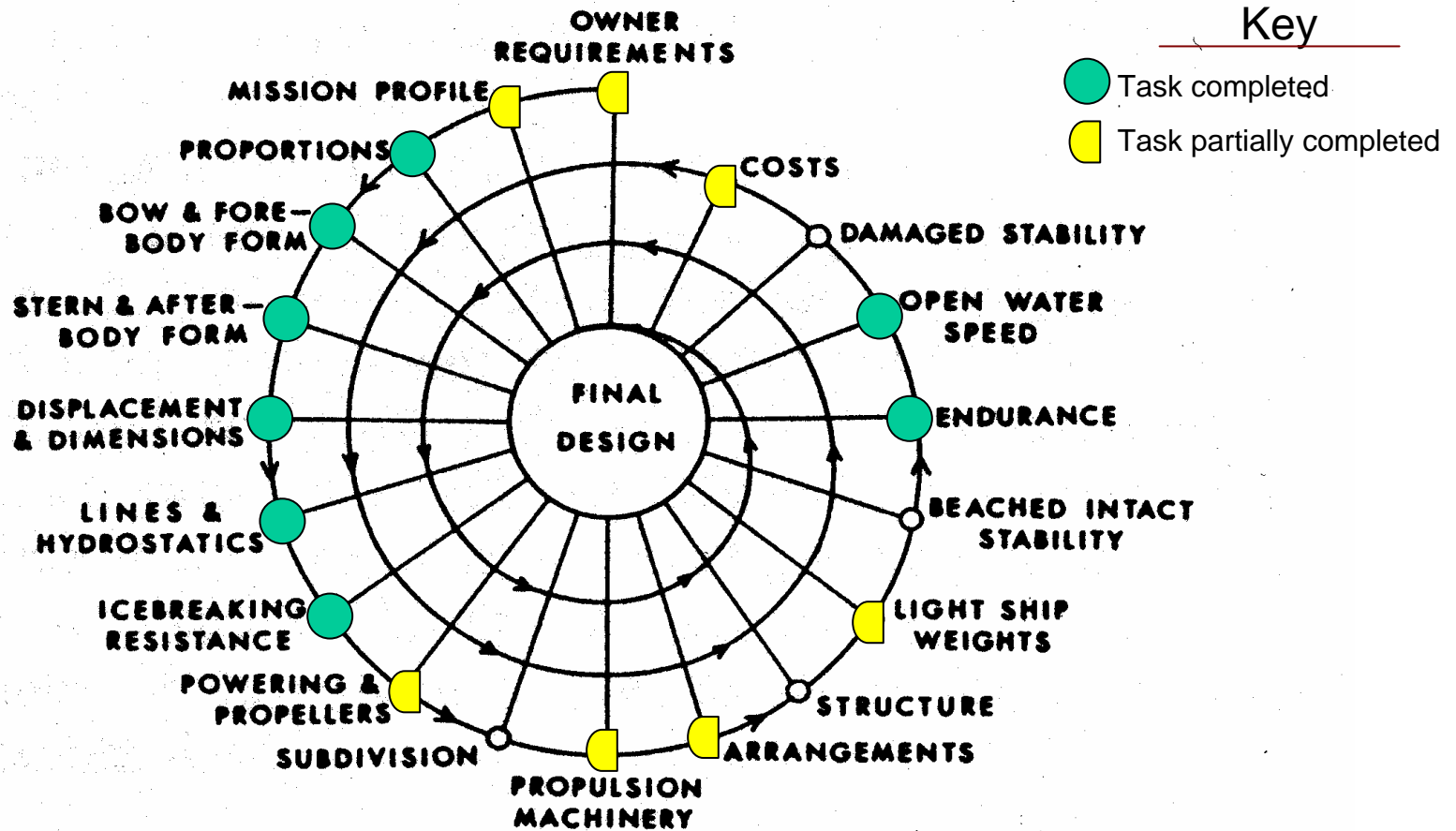


Looking Ahead

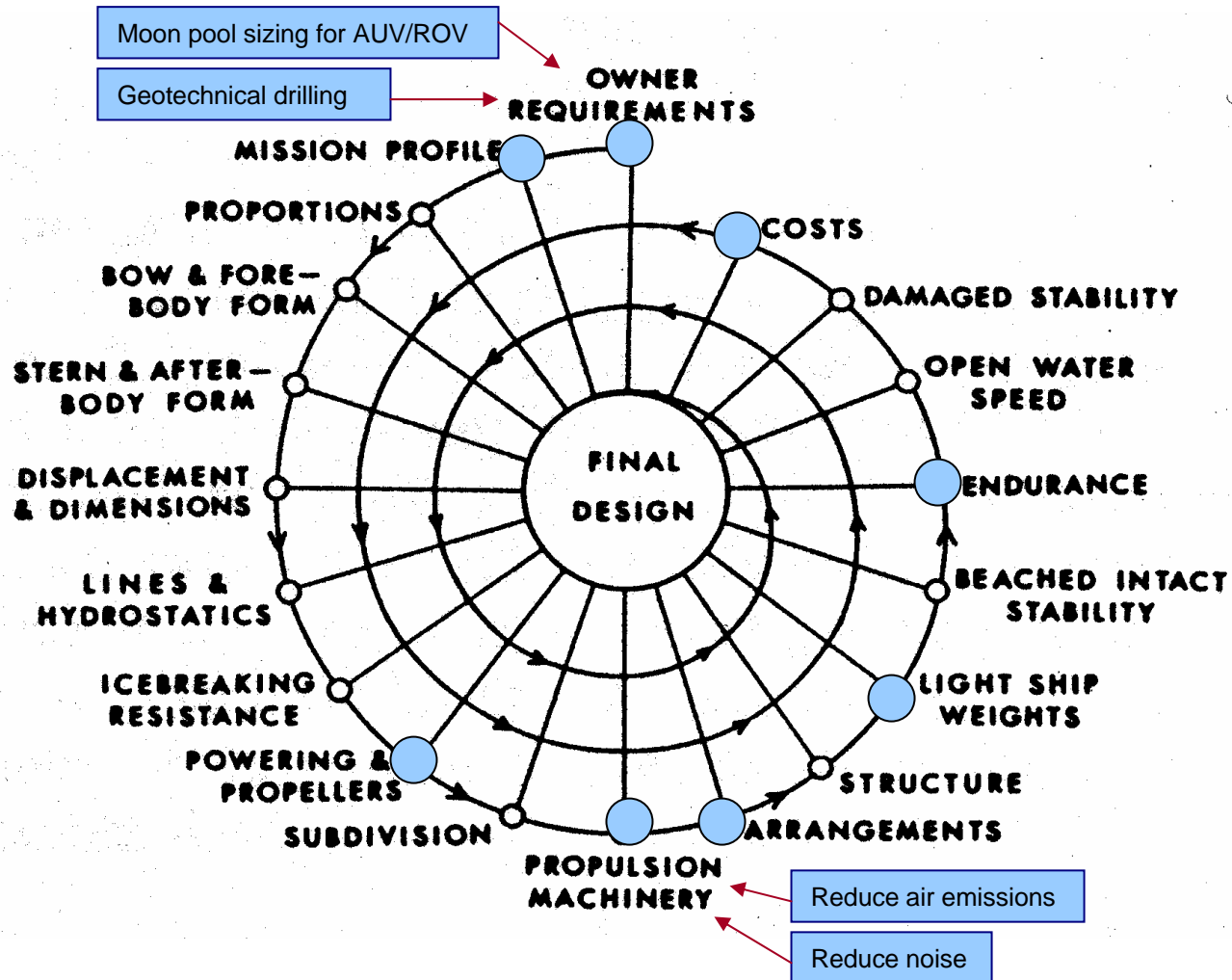
Possible Design Activities for FY04



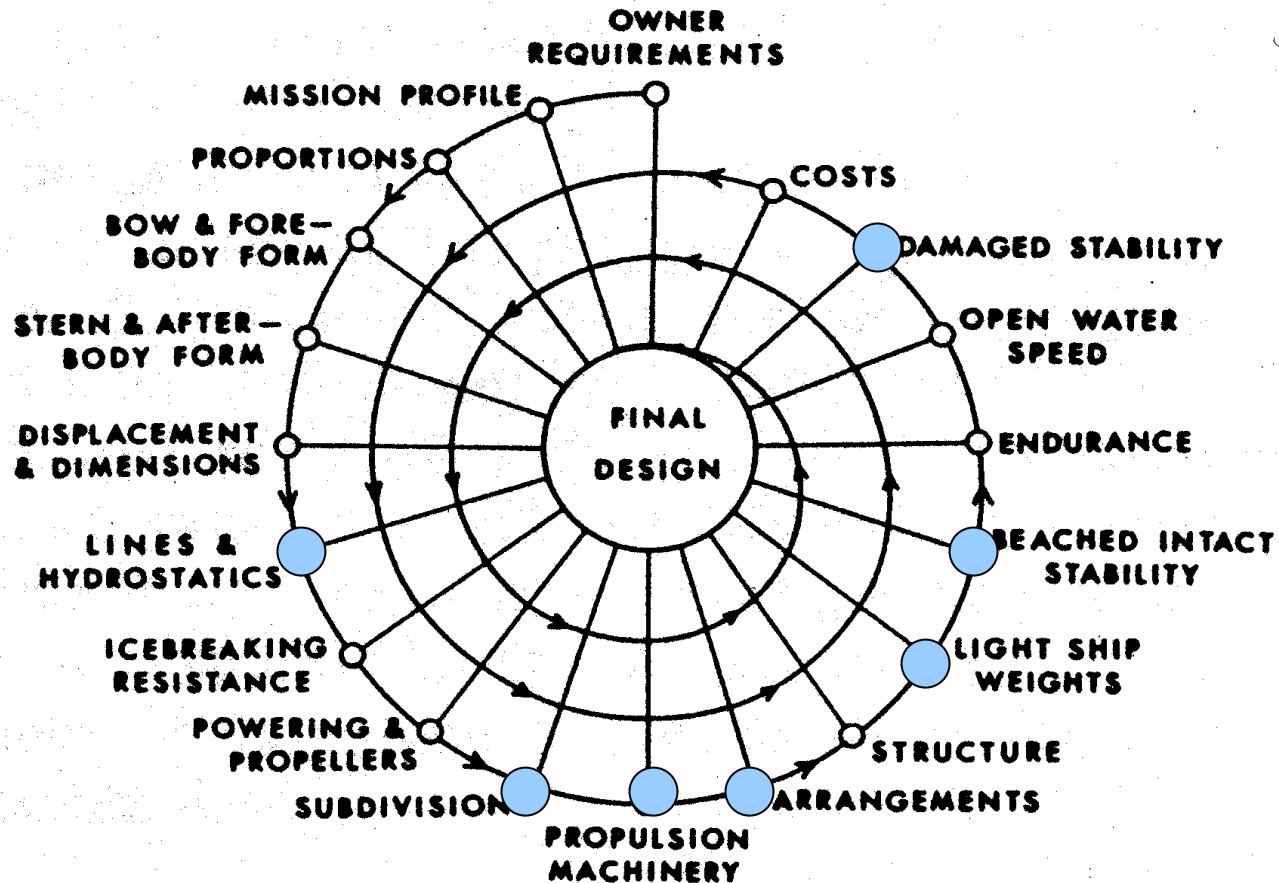
Overview of Feasibility-Level Design Cycle



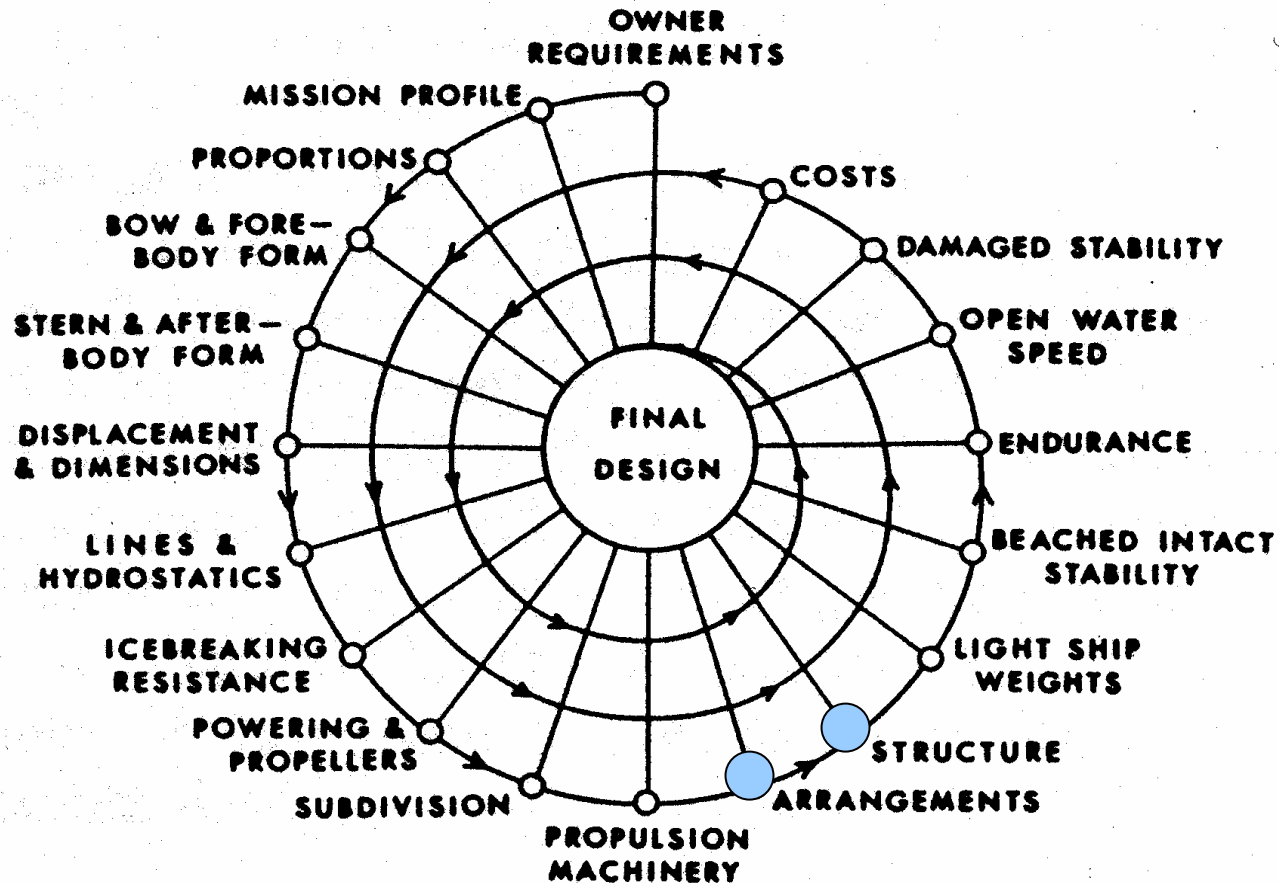
FY04 – Task 1 Technical Studies



FY04 – Task 2 Technical Studies



FY04 – Task 3 Technical Studies



Feasibility Design Cycle Completed

