



RCRV: STATUS UPDATE



Fleet Renewal

Global Class Ships



Marcus G. Langseth



Sikuliaq

Ocean/Intermediate Class Ships



Kilo Moana

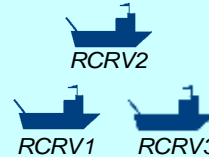


Neil Armstrong



Sally Ride

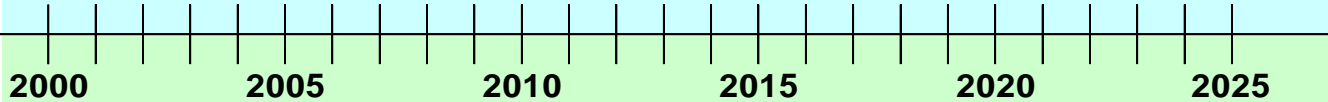
Regional Class Ships



RCRV2

RCRV1

RCRV3



Academic Research Fleet Renewal is part of long-term UNOLS community planning.

RCRVs have been envisioned for 20 years!





RCRV: The Project

- The RCRVs are being funded by NSF's Major Research Equipment and Facilities Construction (MREFC) account that supports the acquisition, construction, and commissioning of major research facilities and equipment that provide unique capabilities at the frontiers of science and engineering.
- Initial planning, design, and shipyard selection were funded through NSF's Research and Related Activities (R&RA) account (this account also supports ship operations).
- OSU selected as lead for the project in December 2012.





RCRV: The Politics

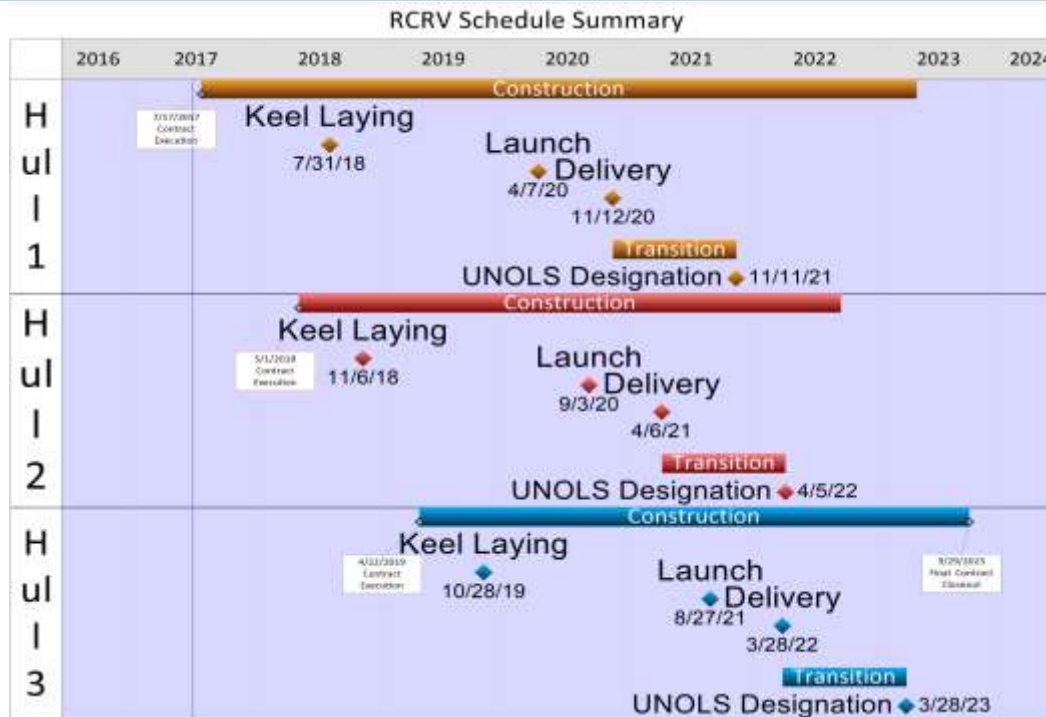
- FY17 appropriations provided \$121.88 M toward the construction of **three** new Regional Class Research Vessels, one more than requested by NSF.
- A Senate committee report argued that an additional vessel would permit NSF to more efficiently allocate resources between the Pacific, Atlantic, and Gulf coasts.
- FY18 received \$105 M increment for Hulls 2&3. Appropriations in FY19 & 20 is also required.





Project Timeline

Hull 1:
West Coast vessel operated by OSU.
Will be proceeded by *R/V Oceanus* retirement.



Keel Laying Ceremony
November 7-8, 2018





Status

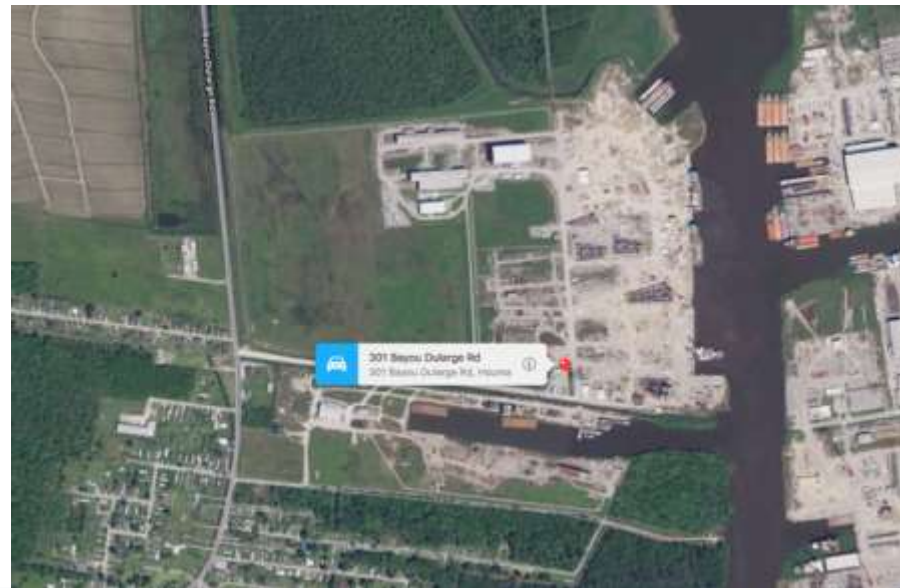
- Change Orders
 - 5 Approved, 5 Pending, 5 Contemplated
- Challenges
 - Functional Design Agent
 - EVM
 - Volume/Weight





Shipyard and Key Subcontractors

- <http://ceoas.oregonstate.edu/ships/rcrv/construction/>
- Siemens: Propulsion and Control
- Rapp: OHS
- Kongsberg: Acoustics
- Beier Systems: Integrated Bridge
- Leblanc and Associates: HVAC



Vessel Description

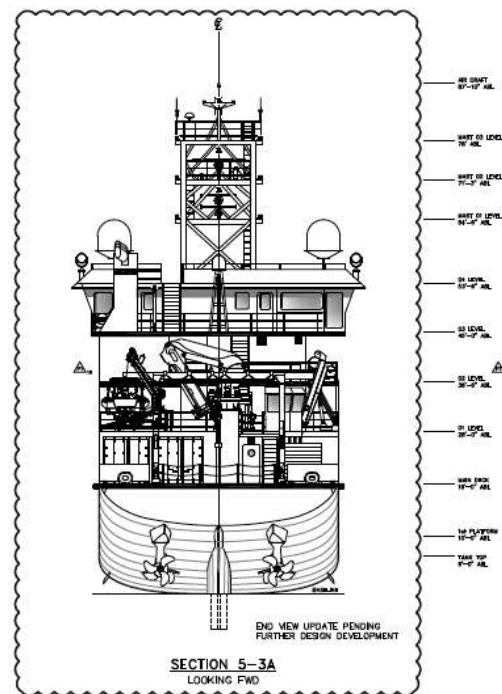


- Versatile
- Capable
- Efficient
- Desirable



Vessel Particulars

- Length Over All: 192' 10"
- Beam: 41'
- Design Draft: 12' 6"
- Science + MarTech Berths: 16
- Crew Berths: 13 (7 single, 3 double)
- Endurance: 21 days (min)
- Range: 5400 nm (min)





Noteworthy RCRV Innovations

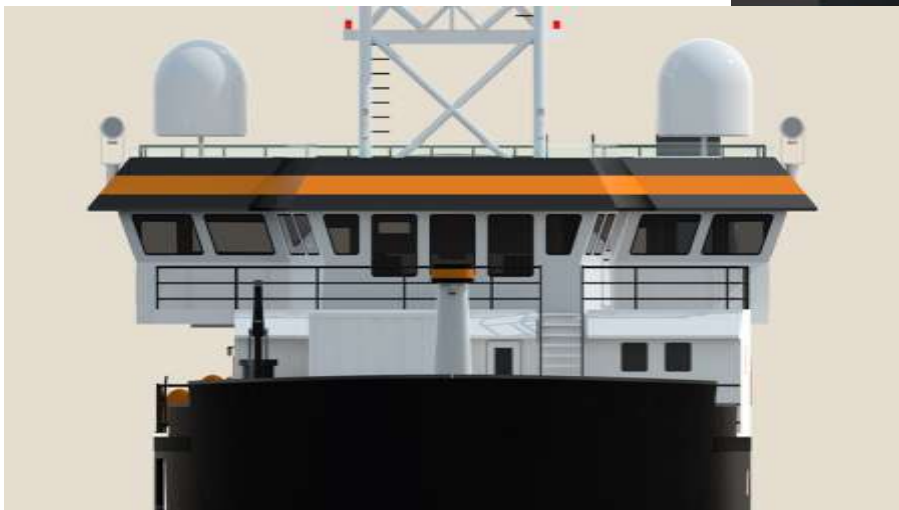
- Vessel Advancements
 - Power Generation (Siemens' Blue Drive Plus C)
 - Schottel Push/Pull Z-Drives
 - Hull Design (optimized modified bulbous bow)
 - U-Tube (stabilization)
- Science Support Advancements
 - Stern Frame and Launch and Recovery System (LARS)
 - Centerboard design
 - Data presence Concept





Bridge: Fore and Aft

- Enclosed wings
- Aft steering station
- Dynamic Positioning





Aft and Side Decks: 2160 ft² (room for 2 vans)





Centerboard (drop keel)



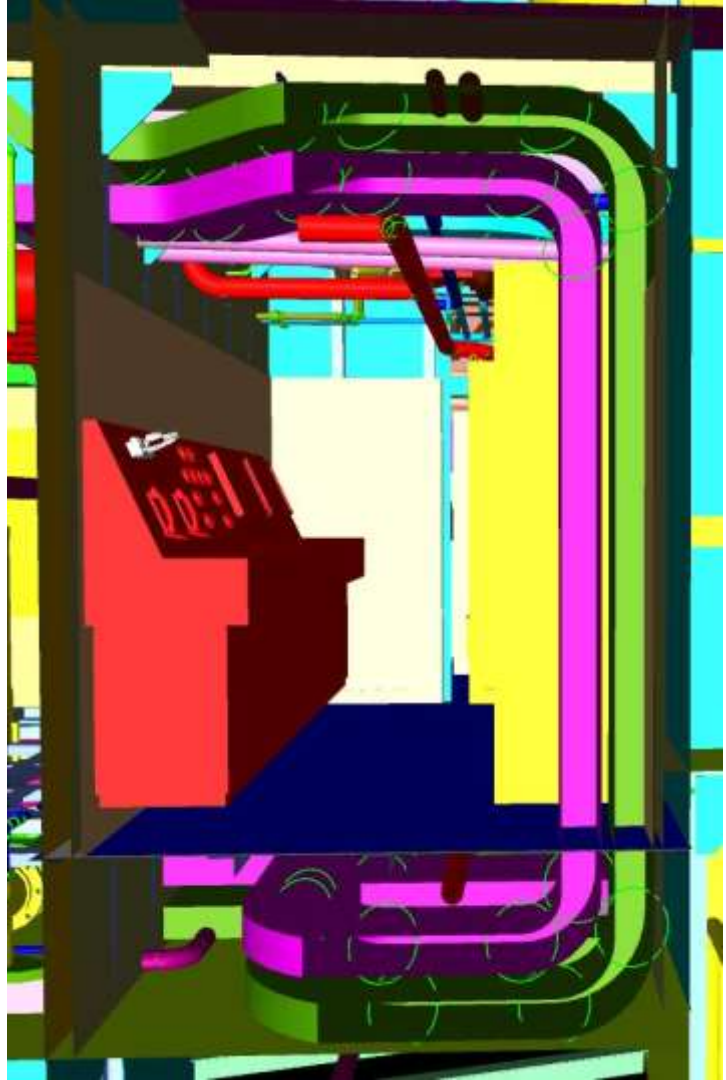
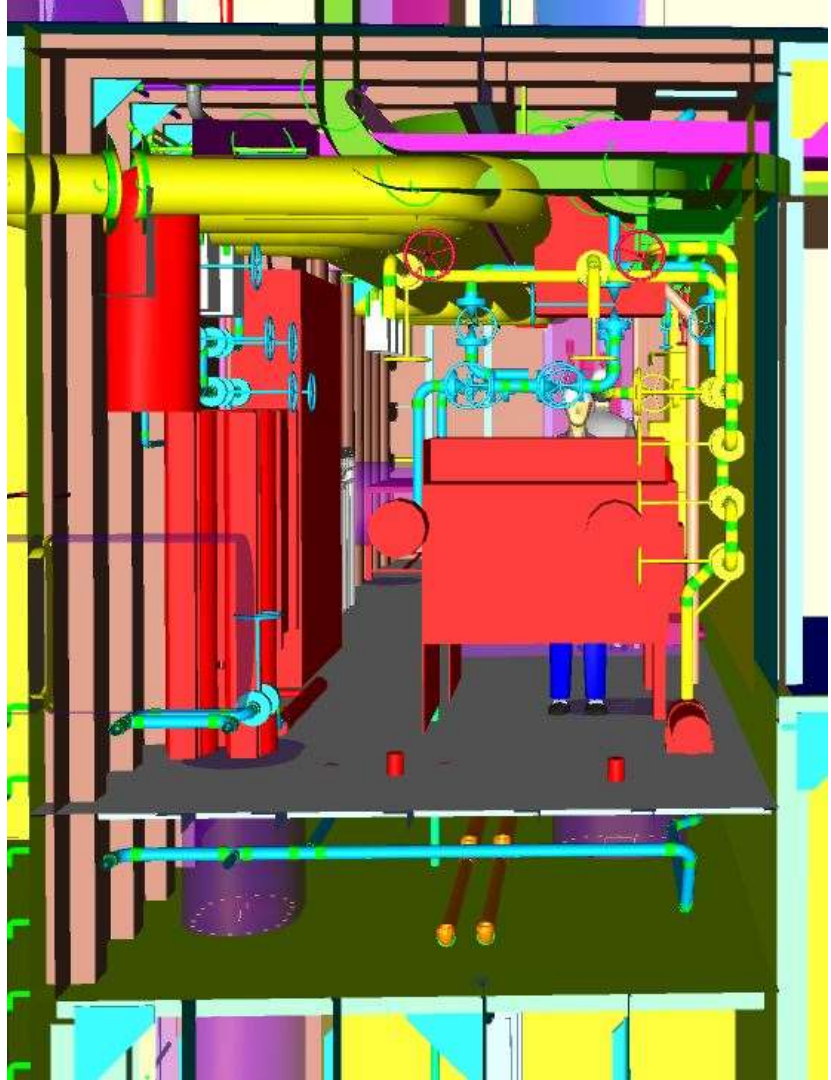
- Centerboard provides a platform for: *Evolving suites of sonars; Placing sonars below the bubble layer; Service/changeout of transducers without drydocking.*
- Incorporates removable 2-foot bottom section and interchangeable face plates to accommodate a variety of current and future sonars
- Centerboard will carry compact multibeam and ADCPs
 - These require tight repeatability in roll/pitch/yaw
OR
 - Separate, Centerboard-mounted, Position/Attitude/Time System
- RCRV will incorporate both



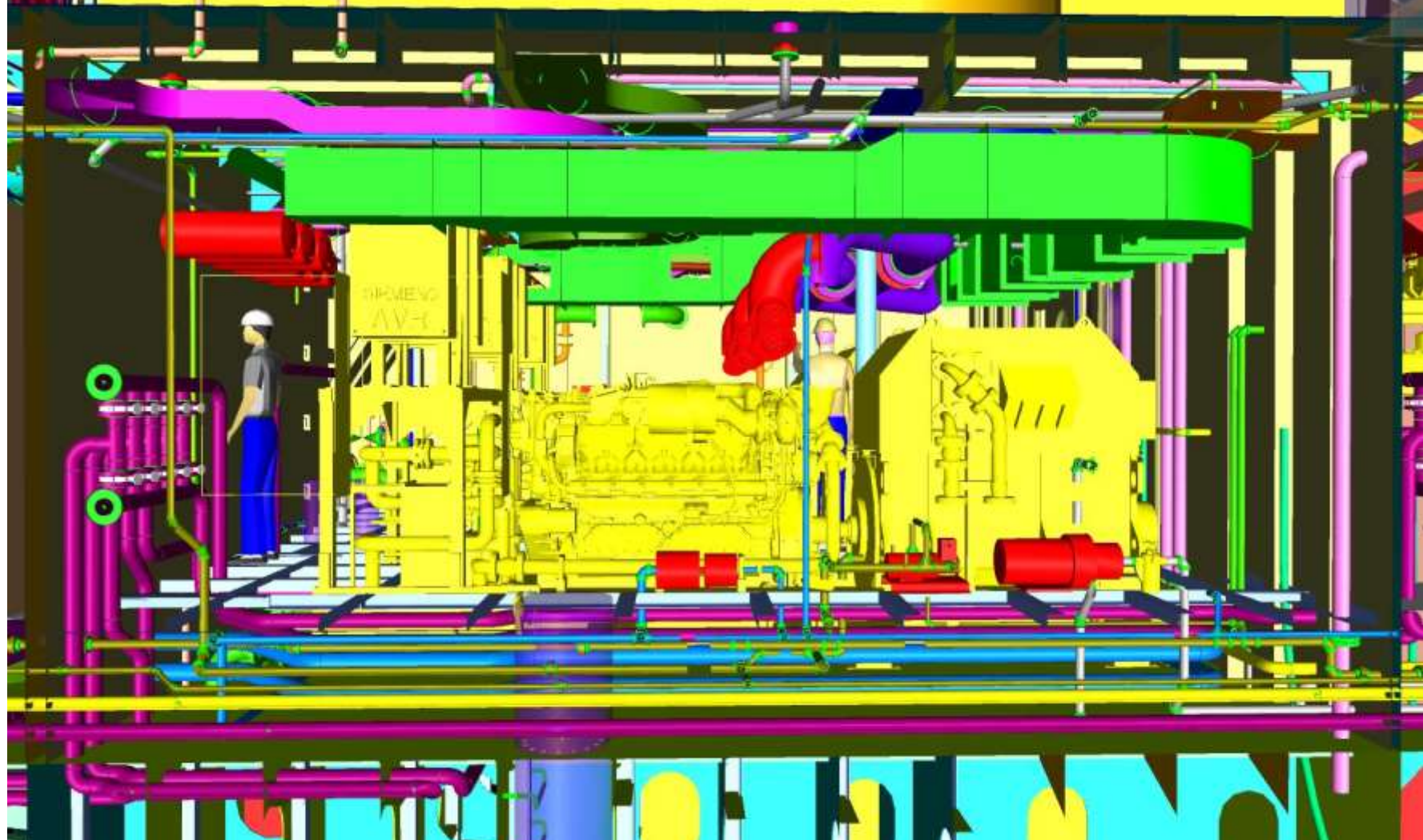
“10 Pounds in a 5 Pound Sack” -M Hawkins

- NSF Ship acquisition process is good. It leads to modern, well equipped ships. But...
 - Process inevitably leads to cramming too much into a package:
 - Users say what they want, and want
 - NSF pushes to keep the vessel as small as possible
 - Nobody asked, but here’s my thought on the next go around...

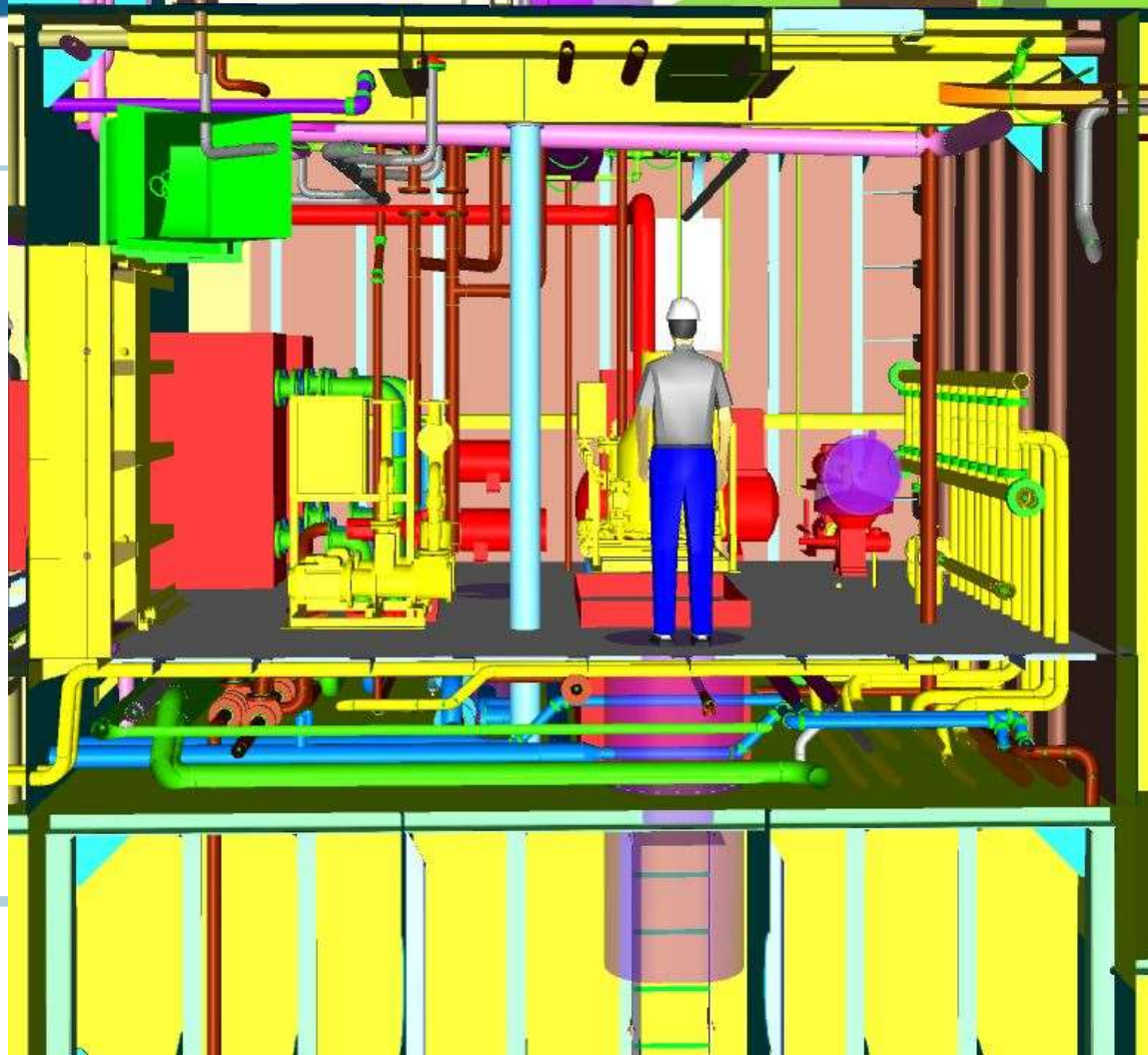












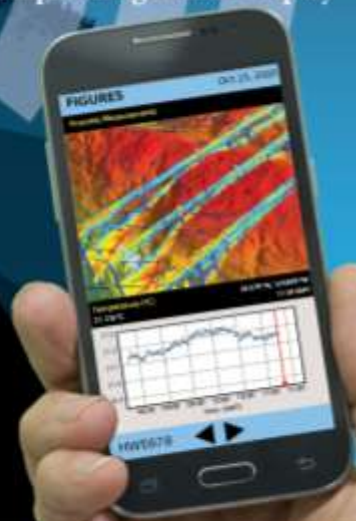
RCRV Data Presence

Integrated real-time system components:

- Flow-through Sensors
- Acoustic Sensors
- Meteorological Sensors
- M2M Telemetry Protocols
- Satellite Communications
- Shoreside Content Distribution
- Ship's Navigational Display

Enabling Remote Participation:

- Promotes situational awareness for shipboard and shoreside parties
- Facilitates turning observational data into operational information (adaptive sampling)
- Leverages shoreside support personnel and processes for real-time quality control





Conclusions: Operations 2021-2050 and beyond?

