Overview

• R/V F.G. Walton Smith is approaching 19 years of service

• Propulsion Engines and Ship Service Generators are maintenance intensive and do not meet EPA emissions regulations

• The ship’s Bow Thrusters are undersized for station keeping and close maneuvering in moderate wind and/or currents

• The ship no longer has a functioning Dynamic Positioning System

• The Ship’s Service Generators have difficulty holding a stable load given the growth of electrical demands over 19 years.
Upgrades and Modifications - Propulsion

• Recapitalize the propulsion system and ship service generators into a diesel electric parallel hybrid system.
  • Improved Reliability and Redundancy
  • Improved Fuel Economy
  • Lower Emissions
  • Lower Noise

• Upgrade existing Bow Thrusters with units having increased thrust
  • Enhanced station keeping
  • Enhanced maneuverability
Upgrades and Modifications – Operations

• Recapitalize the existing hydraulic winches with electric winches.
  
  • Improved Reliability
  
  • Lower Maintenance
  
  • Lower Noise and Vibration
  
  • Improved Safety with Automatic Heave Compensation

• Improve Station Keeping and Maneuvering
  
  • Dynamic Positioning System enables sampling and casting in place
Project Overview

• Project to be conducted in four phases

• Spreads funding requirements over multiple fiscal years

• Insures proper planning done in advance including purchase of long lead-time materials

• Enables R/V F.G. Walton Smith to conduct operations as much as possible
Phase One

• Planning and Engineering
  
  • Planning
    • Assign Project Manager/Integrator who will oversee each aspect of the project
    • Creation of Work Specification
    • Source Selection of Shipyard for Refit
  
  • Engineering
    • Detailed Design and Drawings
    • Equipment and Machinery Selection
    • Electrical Wiring Diagrams
  
  • Procurement of Long Lead-Time Materials
Phase Two

• Dry-Dock Availability at Contractor Facility
  • Hull and Structural Modifications
  • Propulsion Removal and Installation
  • Bow Thruster Recapitalization
  • Sea Suction and Discharge Modifications
Phase Three

- Dock-Side Availability at Contractor Facility
  - Finish Propulsion Installation
  - Electrical Modifications
  - Control System Modifications
    - Includes Dynamic Positioning System
  - Winch Renewal
Phase Four - Dockside Work At RSMAS
Phase Four

• Dock-Side Availability at RSMAS
  • Additional Electrical and/or Piping Modifications
  • Galley Equipment Recapitalization
  • Habitability Upgrades
  • Grooming new systems as needed after partial season of operations
## Cost Estimates by Phase

<table>
<thead>
<tr>
<th>Phase</th>
<th>Description</th>
<th>Start Date</th>
<th>End Date</th>
<th>Fiscal Year</th>
<th>Estimated Cost</th>
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## Cost Estimate by Fiscal Year

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