National Shipbuilding Research Program (NSRP)

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The Mission

To reduce the total ownership cost (TOC) and improve the capabilities of both United States Government and U.S. Flag commercial ships.

The Method

Provide a collaborative framework to manage, focus, and share research and development and leverage best practices in shipbuilding and ship repair.

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The Consortium

The NAVSEA NSRP program team interfaces with industry via an Other Transactional Authority (OTA) contract to identify, develop, and transition technologies and capabilities in support of the NSRP charter.

Industry leads the program and provides matching cost share to GOVT on projects as part of their commitment to the program.

The articles of collaboration facilitate operation as a group without violating anti-trust rules.

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The Operations

Three project paths are available ranging from longer term development and transition efforts to ‘quick win’ projects to get technology ‘across the finish line’ that address relevant problems.

**Major Initiatives**
- Fully developed R&D proposals aligned to the NSRP mission with a clear plan ending in technology transition into one or more shipyard.
  - 50% of the FY22 Planned Investment

**Panel Projects**
- White paper proposals that facilitate execution of the NSRP mission that result in transition into one or more shipyards or maturation of needed technologies or capabilities.
  - 25% of the FY22 Planned Investment

**Rapid Adoption Projects**
- Incorporating commercial technology (TRL8) that require minor modification and/or adaptation to transition into shipbuilding.
  - Examples include minor qualification testing and documentation revision/updates.
  - 25% of the FY22 Planned Investment

Proposals are sorted by category, reviewed by the consortium, and aligned to needs defined in the Strategic Investment Plan (SIP) and Technology Investment Plan (TIP).

Projects are reviewed and overseen by subject matter experts in both industry and government and have active participation from both throughout project execution.

Successfully completed projects transition into use and can serve as the launching pad for new efforts.

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The Need

• FY22 introduces a new structure that improves alignment with the acquisition life cycle (design, build, sustain)
• This allows for technology insertion at various points throughout the life cycle
• More US Navy ships conduct major avails each year than new ships deliver over 5 years
• The largest TOC contribution is from Operation and Sustainment (O&S)

~70% of the ship’s total ownership cost is in the O&S phase (GAO-20-02)
Example Project 1 (2018-453-018)

• **Standardized Watertight Doors**
  • What it is: Development of a standard set of watertight doors in various sizes to support ship construction.
  • Why it’s important: current ships use a wide variety of doors (35+ variants on some hulls) requiring different cuts in bulkheads, different manufacturing lines, etc. leading to increased cost to maintain multiple door variants. Reduction to a standard set of doors increases commonality

• Benefits:
  • Reduces variety and associated cost
  • Simpler qualification for future vessels
  • Improved supply chain and logistics support
  • Reduced schedule (less design work needed)

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Example Project 2 (2018-455-010)

• **Laser Scan to CAD Analysis**
  • What it is: Use of 3D laser scanning systems to accurately map out the configuration of the ship throughout its life cycle to support V&V, maintenance, and modernization activities.
  • Why it’s important: The complexity of modern warships inevitably makes accurately tracking configurations an enormous challenge. A rapid means to compare the physical ship with the engineering drawings and models allows for faster and more accurate work throughout the entire ship life cycle.
• **Benefits:**
  • Rapid V&V compared with manual visual checks
  • Immediate conversion to a digital environment to compare against CAD models reducing probability of errors
  • Reduced cost and schedule associated with physical configuration audits

**Solution/ Approach**
- Utilize and integrate digital data from the Ford Class Digital Data Environment (FCDE) along with onboard ship laser scan information to provide needed 3D product-model ship-sustainment information in an environment where 2D drawings do not exist.
- Concentrate on data at the ship compartment level. Typically, ship scans are configuration-managed at the compartment level. This compartment scan data will match 3D product model partitions that are at the compartment level for in-service use.

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Example Project 3 (2019-375-001)

• Tele-Welding Remote Operation of Shipyard Welding (and other) Equipment
  • What it is: Enable welders to execute work remotely and improve welding capability in tight spaces.
  • Why it’s important: Welding is one of the most time and skill intensive processes for ship building. Reducing both the strain on the welder, improving working conditions, and expand the welding workforce is critical to growing the Fleet.

• Benefits:
  • Removal of personnel from the direct zone of welding arc and fumes
  • Keep highly skilled welders employed and working for longer
  • Improve weld quality and reduce error rate

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The Follow-Through

• Interested parties working to bring a technology forward should engage with the panel leadership (www.nsrp.org/panel-chairs-leadership/)

• Engage with the program team for more information (PM contact info on cover slide)

• Be on the lookout for the next set of solicitations in FY22
Questions?

National Shipbuilding Research Program

Novel Solutions to Relevant Problems

The NSRP booth is 110 in the Prince George’s Exhibition Hall

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