State of the Panel
Planning, Production Processes, and Facilities Panel

Patrick Cahill, Vice Panel Chair

CahillConsulting, L.L.C.

Planning, Production Processes, and Facilities Panel's Mission

- Discover and disseminate best practices focused on the principal manufacturing processes, equipment, planning, and facilities required to support the fabrication, assembly, and testing phases of ship production, repair and maintenance.

Panel's Purpose

1. Improve Manufacturing Processes for construction, fabrication and assembly.
2. Improve Manufacturing Processes for outfitting, installation and testing.
3. Improve shipyards sub-tier supplier performance with respect to quality, cost and schedule.
4. Increase use of Automation, Robotics and Mechanization in product fabrication, processes and testing including enablers such as standardization of design.
5. Increase knowledge and proficiency of overall workforce.
6. Develop and qualify emerging technologies.
7. Develop and implement the digitalization of shipbuilding to facilitate development or introduction of tools for improved construction and sustainment activities.
8. Investigate consolidation of standards, and improvements to Standardization, Commonalities and Modularity.
9. Improve quality, level of detail, and automation of job planning and work instructions.
10. Develop a framework for qualification and incorporation of additive manufacturing (AM) into shipbuilding and repair.
11. Develop solutions to improve installation, maintenance and efficiency of shipboard networks.
12. Develop warehousing scheduling and logistics improvements to facilitate equipment delivery.

Benefit to the Navy

- Value – Projects have varying degrees of value depending on Implementation
- Implementation – Projects have varying degrees of implementation. Many recent projects have been studies into processes (AM, lifting and handling) or attempts to implement where approval has been an insurmountable hurdle (robotic welding)
- ROI – Various degrees of ROI. Studies tend to yield during follow on projects, whereas others are adopted by the shipyard on completion

Assistance to the state of the shipbuilding and ship repair industry

- Past projects have developed methods, processes and tools that are shared amongst the industry through technology transfer events and personal networking
- Shipyard tours are an essential element of the PPPF panel, helping break the “not invented here” cycle
- Other industry tours (3M, Boeing, Toyota etc.) have provided insight to methods and processes that are similar to shipbuilding
- Vendor presentations at panel events create exposure for innovative products to the right audience
- PPPF provides an opportunity for shipyards to expose production support, planning and facilities personnel to new and innovative ides that are readily implemented in their own yards

Past and Current Projects

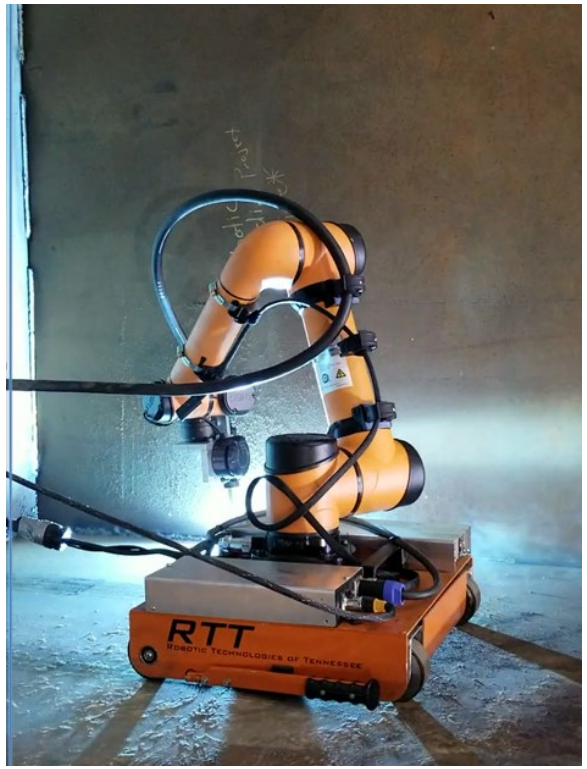
- **Rapid Adoption Project**
- **Project Team:**
- ShipConstructor Software USA, Inc (SSI USA)
- Austal USA
- Fincantieri Marinette Marine
- **NSRP ASE INVESTMENT:** $150K
- **Objective:**
- Many shipyards have equipment supporting complex compound curve forming. This equipment contains many manual processes where mistakes can occur through looking up data and interpreting data. The current process is highly inefficient and plagued with the potential for numerous human induced errors
- The overall objective is to provide a fully functional, integrated application that automates the press operator's information workflow to create compound curves on structural plates to the greatest degree of efficiency possible. The end product shall provide equipment pressure information for each location to the press operator for each specific point on the plate where the press is positioned.

Past and Current Projects

- **Advanced Development & Implementation of the High Mobility Manufacturing Robot (HMMR) (2020-303-001)**

- **Robotic Technologies of Tennessee LLC (RTT)**
  Vigor Shipyards
  Edison Welding Institute (EWI)
  Cahill Consulting Group
  Naval Surface Warfare Center-Carderock Division
- **March 2020 – March 2022**

- **INDUSTRY INVESTMENT: $725K | NSRP ASE INVESTMENT $703K**



Past and Current Projects

- **Shore-Based Additive Manufacturing in Support of Military Sealift Command (2022-329-001)**

- **American Bureau of Shipping,** Austal USA, GD-NASSCO, Old Dominion University, Penn State University Applied Research Lab, Military Sealift Command, NAVSEA
- **January 2022 – November 2023**
- **INDUSTRY INVESTMENT: $459K | NSRP INVESTMENT $457K**

- **OBJECTIVE**
- The objective of this project is to introduce additive manufacturing (AM) capability within Military Sealift Command (MSC).
-
- **SUMMARY**
- This is a technology insertion project using two specific AM applications with an attractive return on investment (ROI) case: a polymer-based AM application producing a custom hand wheel commonly used across the fleet; and a metal-based AM application producing an impeller for an aging class of pumps.
- While this project will provide immediate benefits from the specific AM applications, it will lay the foundation and roadmap for expanded, high-value use of AM by shipyards and equipment manufacturers supporting the MSC fleet
-
- **KEY DELIVERABLES / BENEFITS**
- The project will: provide MSC and shipyards with specific, practical experience in two different applications of AM for MSC ships; document an attractive ROI for follow-on production; provide a roadmap through the qualification and approval process for future AM applications; and coordinate with NAVSEA to leverage other Navy investments in additive manufacturing.

Past and Current Projects

- **Additive Manufactured Solutions in the Shipyard of Job Aids, Replacement and Part Prototypes**
- **(2018-454-011)**

- **Project Team:**
- GD NASSCO
- 2020

- **NSRP ASE INVESTMENT:** $102.9K

- **Navy Tank Study for Robotics Applications**
- **(2018-455-019)**

- **Project Team:**
- HII-Newport News Shipbuilding
- HII-Ingalls Shipbuilding
- 2020

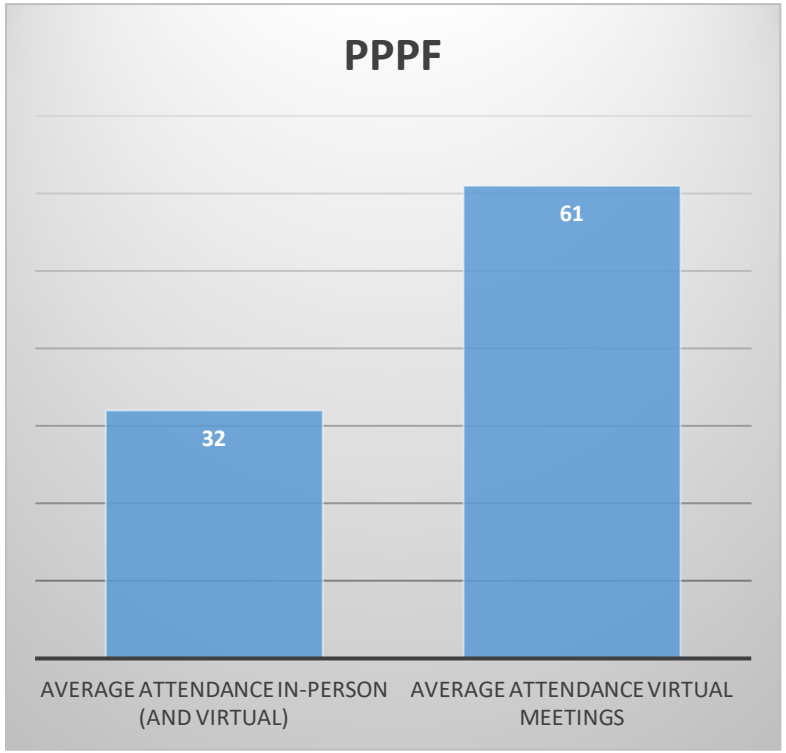
- **NSRP ASE INVESTMENT:** $113K

Past and Current Projects

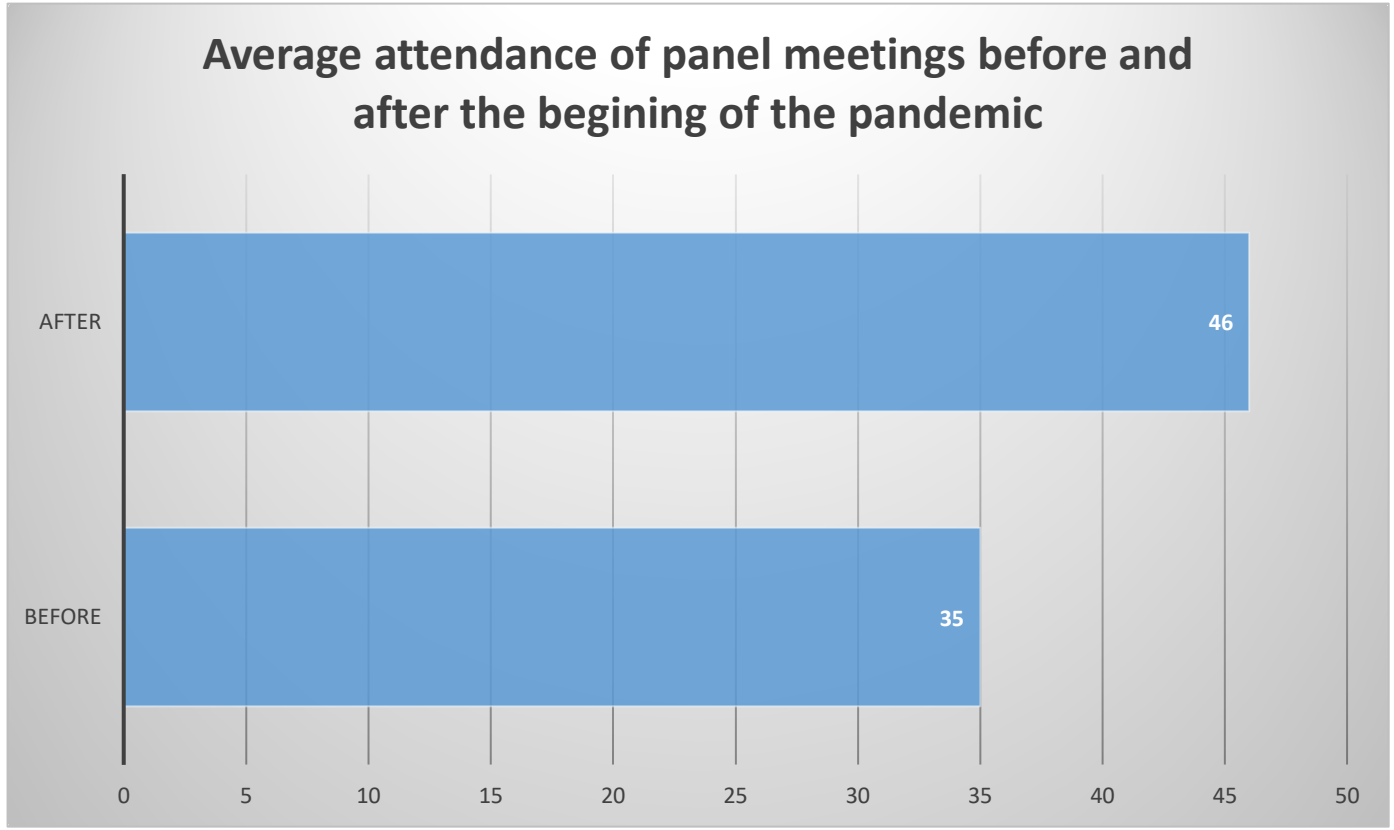
- **Quick Deploy Scaffolding**
- **(2019-479-001)**
-
- **Project Team:**
- ElectraWatch
- Austal USA
- 2020
-
- **NSRP ASE INVESTMENT:** $135K

- **Applications of Targetless Photogrammetry for Facilities and Close Range Metrology**
- **(2018-455-014)**
-
- **Project Team:**
- Huntington Ingalls Industries – Newport News Shipbuilding
- Ingalls Shipbuilding
- Photometrix
- 2020
-
- **NSRP ASE INVESTMENT:** $139K

Planning, Production Processes, and Facilities Meeting Attendance



Overall Panel Meeting Attendance



Questions?

NSRP
NATIONAL SHIPBUILDING RESEARCH PROGRAM™
Taking Shipbuilding and Repair to the Next Level