



Structural Fit-up Applications

Project Snapshot



Project Lead:

Huntington Ingalls Industries-
Ingalls Shipbuilding

Project Dates:

Feb 2020 – May 2021

Objectives:

- Optimize current Ingalls shipfitting process to reduce or eliminate need for temporary attachments
- Evaluate new technologies to reduce or eliminate the need for temporary tack-welding, using magnets, clamps, and adhesives.
- Reduce the cost, man-hours, and cycle time for performing temporary attachment activities at Ingalls

Estimated Savings:

\$100K per DDG-51 Hull

\$432K per LPD-17 Hull

\$892K per LHA Hull

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The DDG-51 Program initiated in the late 1970s, with the first DDG-51 procured in 1985, is one of the longest-running shipbuilding programs in Navy history, and the DDG-51 class, in terms of number of hulls, is one of the Navy's largest classes of ships since World War II. As platform capability and complexity increase, costs for the ships have also increased as expectations and requirements for the program have grown. The DDG-51 Program Office has directed a reduction in construction costs with the DDG-51 co-build shipyards. Huntington Ingalls Industries – Ingalls Shipbuilding (Ingalls), assessed that there is opportunity for the *Structural Fit-up Applications* project to reduce cost associated with temporary attachments with technology insertion, process modification, and/or elimination of need.

The *Structural Fit-up Applications* project seeks to reduce shipfitting man-hours and re-work associated with the use of chains, angle iron, and saddles for temporary attachments on DDG-51 platforms built by Ingalls. In shipfitting, temporary attachments are needed to attach components to a weldment for bracing, handling, shipping, or other work requirements. Various temporary attachments are used in production areas as well as on the ships for a variety of purposes. A few examples of the use of temporary attachments include: attaching additional components for support in handling operations, unit support, line control, stanchions, or unit lifting and moving. A unit could have more than 150 temporary attachments and could be needed to last up to a few weeks. Shipfitters are expected to install temporary attachments with limited resources. Since temporary attachments are installed on an as-needed basis, direction for installation of these attachments are given directly by the foreman, extracted from drawings, or just known by experience. Additionally, the tools, materials, and process varies and is rarely consistent.

This two-phased, 15-month effort will phase will focus on defining functional, operational, plus health and safety requirements, and identifying temporary attachments to down select. An investigation will be conducted to identify and categorize use cases of temporary attachments and gather usage data to determine which cases are more frequently used. The project will select up to three dissimilar temporary attachment use cases will be conducted to focus future investigations towards key categories. The project will then develop a pilot test plan and execute the pilot. The pilot candidates will be tested in a shipyard environment to verify their applicability in a production environment. The Ingalls team anticipates reducing temporary attachments by 20%, a similar 20% reduction in temporary attachments installation time, and a 40% reduction in temporary attachments repair/rework time.

The Naval Shipbuilding and Advanced Manufacturing Center is a Navy ManTech Center of Excellence, chartered by the Office of Naval Research (ONR) to develop advanced manufacturing technologies and deploy them in U.S. shipyards and other industrial facilities. NSAM's primary goal is to improve manufacturing processes and ultimately reduce the cost and time required to build and repair Navy ships and other weapons platforms. For additional information on this and other NSAM projects, please visit <http://nsamcenter.org>.

