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PHOTO CREDITS:

Cover

*The future USS RALPH JOHNSON
(DDG 114)*

**Photo Courtesy of Huntington
Ingalls Industries**

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*Streamlining task assignment and
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**Photo Courtesy of Huntington
Ingalls Shipbuilding**

*Developing new paint management
processes for upstream
organizations and downstream
applications*

**Photo Courtesy of Huntington
Ingalls Shipbuilding**

Ingalls Shipbuilding is Automating Work Assignment & Status Processes with Productivity Improvements in Mind

The recently ONR-awarded and NSAM-managed 'Enhanced Task Assignment and Progressing' project with The Huntington Ingalls Industries-Ingalls Shipbuilding (Ingalls) is creating a tool for the foremen that automates/tracks task assignment and progressing. This tool will reduce the administrative burden of individual foremen and provide the ability to assign discrete tasks, expedite progress reconciliation, and reduce progress reporting errors, each a productivity improvement opportunity.



Streamlining task assignment and progressing work by automating processes to improve productivity

Coordinating the daily tasks of ship construction for thousands of trades personnel is a challenging responsibility for the shipyard foremen. The amount of effort required to coordinate, scope, assign, and record the completion progress is extremely time-consuming, currently performed in a manner alternating between electronic record and paper dictation. On average, a large portion of an individual foreman's week is dedicated to just assigning and progressing work. This manual process is subject to error and is time-consuming, preventing the foremen from being available to their crews in the production areas, both in the shop and shipboard.

The Ingalls Team is developing a tool to streamline tasking assignment work by presenting an interface from which the individual foreman can view/select their specific accepted bills. This capability will provide access to the work/task line items they contain, along with the time required completing each line item. This pairing will allow the foreman to optimize trades personnel work allocation, driving toward full utilization throughout the work day. The individual task assignments can then be printed or transmitted for inclusion with the tradesman's normal work package (operations order, drawing, etc.).

Once implemented, Ingalls anticipates the 'Enhanced Task Assignment and Progressing' tool will increase craft hourly productivity and reduce foreman work required for assignment and progressing. This increase in efficiency is expected to reduce DDG-51 acquisition costs by an estimated \$813K per Ingalls built DDG-51 hull.

Increasing Productivity and Reducing Distortion by Employing Hybrid Laser Arc Welding

Huntington Ingalls Industries-Ingalls Shipbuilding (Ingalls) is introducing a new panel line to improve productivity in ship manufacturing. A review of joining processes used in commercial shipbuilding worldwide has identified that Hybrid Laser Arc Welding (HLAW) can reduce the welding heat input used to join metals, thus minimizing distortion and therefore rework cost. Ingalls is procuring the capability to use HLAW in the panel line and understands that its processes must be characterized and accepted by NAVSEA for shipbuilding applications. Ingalls has had extensive collaboration with NAVSEA and has approval of the HLAW weld process qualification and certification test plan, supporting post-project implementation.



HLAW Laboratory Setup

The HLAW project has two phases, where in Phase I EWI will develop HLAW process parameters and the team will evaluate the resultant weld quality. The Ingalls Team will refine the initial business case based on historical production data and Phase I test results. Phase II will begin with fatigue and dynamic load testing for the HLAW weldments and the currently qualified baseline submerged arc welding process, a similar mechanized welding process. Ingalls will use the EWI-developed parameters on the installed Ingalls HLAW panel line and validate weld quality through testing. This technology, once implemented, could potentially save an estimated \$3.06M per DDG-51 hull, \$2.75M per NSC hull and \$15.4M per LPD hull.

Ingalls Works to Streamline Short-Term Tactical Planning

The recently ONR-awarded and NSAM-managed 'Tactical Information Planning System' (TIPS) project with The Huntington Ingalls Industries-Ingalls Shipbuilding (Ingalls) is developing a digital process that will increase the front-line foreman's efficiency. With the Ingalls Pipe Shop in mind, the Ingalls Team is developing improved work package decision-making processes to enhance short-term resource planning activities. Ingalls envisions a secondary benefit, where Ingalls can increase the use and utility of mobility applications at the shop floor and deck plate levels. Mobile work capability is critical to future efficiency improvements. The proposed tool accomplishes these objectives by consolidating the needed information from the systems of record for several critical elements: Scheduling, Engineering Change, Material, Shop Status and Capacity, Job Planning, Certifications, and Personnel Availability-- with the goal being to allow tradesmen to complete jobs faster while reducing work stoppages and rework.



Typical Pipe Shop line showing Part Details clustered at workstations

The front line foreman, responsible for the safety, quality, cost and schedule performance of his crew, has more impact on production than any other member of management. The most laborious task of a foreman is planning, progressing and projecting the crew's work responsibilities covering a two-week (short-term schedule) window; typically performed away from the production area and removed from the worker. These critical but time-consuming tasks restrict the management of people, issues and quality. Experience optimizes productivity, so the foreman represents the solution to most of the problems that his crews face on a daily basis.

Once implemented, Ingalls anticipates the 'TIPS' tool/system will provide status of: short-term schedule and engineering changes; job packages; material; personnel and personnel certification, in a more expedient fashion. Ingalls estimates that the labor savings will translate into a potential cost savings of \$1.23M per DDG-51 hull.

Ingalls Shipbuilding Using 'Digital Thread' to Optimize Paint Management

The recently ONR-awarded and NSAM-managed 'Digital Paint Tool and Process Optimization' project with The Huntington Ingalls Industries-Ingalls Shipbuilding (Ingalls) looks to address a long-standing 'paint schedule' issue, a significant cost center in any shipbuilding organization. The Ingalls team is analyzing the current paint process and data, and developing an optimized and consolidated method of generating, maintaining, and executing paint data. This system will create a unified data tool to support a new optimized process developed for paint data management, thus reducing labor costs through increased process efficiency and rework reduction.



Developing new paint management processes for upstream organizations and downstream applications

Painting in the shipyard is a major undertaking, as most every part of a ship will go through some degree of painting during construction. Specifically designated, constrained areas in the shipyard are dedicated to performing major paintwork. This limitation, coupled with the requirement to paint most parts, can often create a bottleneck to the rest of the construction processes taking place both before and after painting activities. At the core of this issue is the ability of the upstream engineering and planning entities to provide the best possible data to the painters. Currently the engineering and planning paint data is stored in several different places, in multiple disparate databases, and the data format/terminology varies across each shipbuilding program. This construction discipline is ripe for change: the paint 'metadata' needs to be standardized across all ship platforms, accessible as it changes, easy to maintain, and intuitive in its user interfaces and data presentation.

The Digital Paint Tool and Process Optimization' project will leverage this new paint data epoch by creating a central data management tool instead of the current multiple federated database method. The dynamic nature of the tool will allow upstream users to quickly modify, query, and give them unprecedented ability to work with their specific data.

Once implemented, Ingalls anticipates the 'Digital Paint Tool and Process Optimization' tool will:

- reduce time required to validate paint bills,
- reduce time required to perform hull billing and change paper maintenance and
- reduce error rates resulting in paint rework.

This increase in efficiency will reduce acquisition costs by an estimated \$349K per DDG-51 hull.

NSAM Did You Know:

Where We've Been & Where We'll Be:

NSAM just returned from a successful showing at *Sea Air Space 2017*. The next *Sea Air Space* will be April 9-11, 2018 at the Gaylord National Convention Center located just outside of Washington, D.C.



NSAM will have a booth and be in attendance at *FMMS 2017* at the San Diego Convention Center in San Diego, California from August 14-16, 2017.



NSAM will be attending and be in booth #434 at the *Defense Manufacturing Conference (DMC)* from December 4-7, 2018. *DMC 2017* will be held at the Tampa Convention Center - Marriott Tampa Waterside & Embassy Suites by Hilton in Tampa, Florida.



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To date, NSAM project efforts have led to over \$500M in total savings, measured as "per hull" cost reductions across several U.S. Navy platforms.