



# Creating Better Methods for Detecting and Eliminating Errors at the Earliest Stage of Construction

## Project Snapshot



Photo courtesy of General Dynamics Bath Iron Works

### Project Lead:

General Dynamics Bath Iron Works

### Project Dates:

Nov 2019 – Nov 2021

### Objectives:

- Improve the Accuracy Control data management process and provide immediate benefit to downstream shipbuilding production

### Estimated Savings:

- Reduce Labor for AC Survey by Improving Efficiency for Development and Tracking of Checks
- Reduce Unit Erection Rework by Improving Upstream Quality
- Savings:
  - \$277K per DDG hull
  - \$1.66M over five years
  - ROI 1.35

The Accuracy Control (AC) plan is resolved into a process, which begins with AC Engineers determining the significant points of geometry and structural intersections of the entire ship. These points are then deconstructed into the manufacturing product structure and correspond to particular Stages of Construction (SOC). There is a need to more reliably manage the entire dataset for a hull and develop information from those data to implement into future construction. The process largely relies on paper check sheets, manual data entry, manual transcription of measured points, and is not able to fully benefit from modern measurement techniques such as laser scanners. The challenge is to optimally utilize the data that is being collected by both Shipfitters and Surveyors to detect errors immediately, prevent errors more frequently and reliably, and at the right stage of construction.

The *Digital Accuracy Control Management System (DACMS)* project will develop a system which transforms the manual, paper-driven AC check and documentation process to a fully digital environment. The project will facilitate the process of collecting AC data by Shipfitters electronically, via tablet, on the shop floor and deckplates and feed to a consolidated AC data system. Additionally, it will seamlessly integrate Survey AC data via Total Station, into the same consolidated data system. DACMS will contain the determined AC points crucial to fabrication and assembly, as well as their corresponding value within the configured design. Further, DACMS will analyze the data in regards to in/out-of-tolerance and deliver this information to AC Engineers who, in turn, will disposition the analysis within the tool and deliver back to the shop floor/deckplates, interfacing with enterprise planning for timeliness. The system will manage and maintain AC data configuration. This system will leverage the Central Data System (CDS) hub developed for ONR ManTech project S2600, *Shipyards Capacity Planning*.

The project has two phases and the first phase will focus on investigation of current state accuracy control management, future state mapping, requirements development, data system design and development, and prototype DACMS software development. The second phase will include development of automated routines for capture, translation, and management of AC data, maturation of the Digital Accuracy Control Management System, software testing at BIW, system specification development, and final reporting.

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