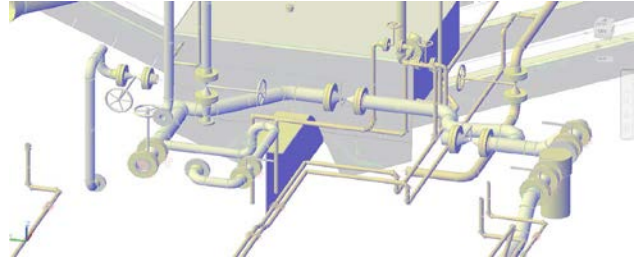


Ingalls Shipbuilding is Streamlining Drawing Detail Extraction

Status: Implemented

PROBLEM / OBJECTIVE

Once the digital product model is completed, 2D detail drawings and other construction aids must be extracted. They are used directly for construction and as deliverables. These details are the work instructions for machinists and other craftsmen, with each unique part having its own detail. The detail generation process in ShipConstructor® required significant manual “post-processing” in order to complete development in the format desired by craft and matching the material to equipment used.



Augmenting the ship design tool with scripted functionality capable of automating activities necessary for part detail drawing generation. Photo Courtesy of Huntington Ingalls Industries.

The *Automated Parts Detail Extraction* project augments Huntington Ingalls Industries, Inc. - Ingalls Shipbuilding (Ingalls) current design tool with scripted functionality capable of automating activities necessary for extracting detail drawings, specifically for extraction of pipe detail drawings. The functionality package streamlined the way designers perform the extraction, drastically reducing the manual effort when assigning labels, arranging, and formatting.

automation can, in fact, be adapted to more automated workflows. Ingalls validated that this effort reduced the labor hours required to provide instruction artifacts for fabrication, which translates into cost savings across all of Ingalls-built platforms. The listed cost savings below were identified during the toolset’s pilot task and Ingalls expects these platform-specific savings to increase as more Ingalls team members use this new technology.

ACCOMPLISHMENTS / PAYOFF

Process Improvement:

The Ingalls project team examined the standards required to be present when producing detail drawing extractions for fabrication. The team then worked with technologists to determine which elements could be automated electronically in the enterprise toolset and how this could be achieved/inserted. The technologists created the computer instructions necessary to automate application of the standard and the end-users validated the output. The craftsmen /shop side also verified the automated standard was acceptable for production.

Expected Benefits and Warfighter Impact:

| Savings | |
|---------|---------------------------------------------------|
| DDG | ~\$270K Per total vessel set of extracted details |
| LHA | ~\$675K Per total vessel set of extracted details |
| LPD | ~\$900K Per total vessel set of extracted details |
| NSC | ~\$157K Per total vessel set of extracted details |

The functionality package developed incorporated the features necessary to automate the manual activities required to prepare detail drawings for extraction in the pipe discipline. The end-user involvement throughout requirements development and release creation helped tailor the features to be as conducive as possible to detail extraction.

Implementation and Technology Transfer:

This rapid response project targeted labor reduction required to generate part details. The team implemented a mechanism to automatically populate, detail, and label parts coming from ShipConstructor® based on identified standards from the Engineering Department. The developed toolset serves as a prime example for how activities thought to be previously impervious to

TIME LINE / MILESTONES

Start Date: December 2016
End Date: July 2017

FUNDING

Current Navy ManTech Investment: \$119K

PARTICIPANTS

ONR Navy ManTech
Huntington Ingalls Industries, Inc.—Ingalls Shipbuilding
Naval Shipbuilding and Advanced Manufacturing Center