

Ingalls Implements Mechanical Arm for a Man Lift Application to Save Labor and Improve Ergonomics

Status: Implemented

PROBLEM / OBJECTIVE

Shipbuilders routinely perform abrasive blasting from a man lift to remove rust, mill scale, and other surface contaminants from the hull exterior. Workers manually manipulate the air hose and nozzle to blast the surface clean with compressed air and an abrasive media. As a result of the physically demanding, repetitive operation, workers are required to take frequent breaks, increasing the overall labor to perform the operation. A Navy Metalworking Center (NMC)-led Integrated Project Team (IPT) developed an easy-to-use, motion-assisted positioning system consisting of a track-mounted mechanical arm attached to the aerial platform floor structure to reduce the effort required to abrasive blast the hull surfaces.

ACCOMPLISHMENTS / PAYOFF

Process Improvement:

The IPT performed an on-site assessment of the current abrasive blasting process at Ingalls Shipbuilding (Ingalls). The assessment results were used to develop design requirements for concept and prototype development. Several Alpha prototypes were manufactured; two were down-selected for testing in production at Ingalls. The Alpha prototype production results were used to down-select one prototype for Beta development and to identify improvements required for the Beta prototype. The Beta prototype was implemented into Ingalls production and used as the basis for future abrasive blasting arms to be purchased by Ingalls. NMC generated a drawing package of the prototype to transition the technology, capture budgetary costs, and identify potential manufacturing sources.

Implementation and Technology Transfer:

Ingalls began using the blasting arm in March 2016. The technology developed under this project can be transferred to other Navy construction programs, shipyards, and industries that perform abrasive blasting from a man lift. In addition to the drawing package, NMC identified potential sources to manufacture the system and created a [brief video](#) that demonstrates the arm in an in-house mock-up.



NMC and Ingalls developed and implemented an easy-to-use prototype mechanical arm to perform hull exterior abrasive blasting from a man lift during ship construction. Ingalls photo (left); NMC photo (right).

Expected Benefits and Warfighter Impact:

- Total \$840K five-year savings for all platforms constructed at Ingalls (DDG 51, LHA, LPD, NSC).
- Increased productivity by ~25% by allowing the craftsmen to work longer.
- Ergonomic benefits anticipated as a result of the reduced effort and exposure time.

TIME LINE / MILESTONE

Start Date:	June 2015
End Date:	March 2016

FUNDING

Navy ManTech Investment:	\$200K
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PARTICIPANTS

DDG 51 Program Office
Ingalls
NMC
ONR Navy ManTech

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