Improving Weld Joint Leak Detection Using Airborne Ultrasound Leak Detection

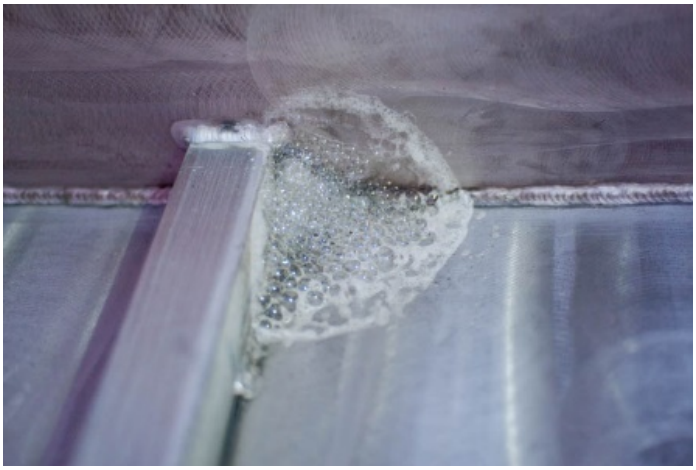
Status: Pending Implementation

PROBLEM / OBJECTIVE

The Navy ManTech Program is participating in this initiative, with specific focus on manufacturing processes for ship construction. The ManTech Center for Naval Metalworking (CNM) and Huntington Ingalls Industries - Ingalls Shipbuilding (Ingalls) identified an area that could benefit from improved manufacturing processes and technologies to continue cost reduction efforts.

Compartment construction on ships consists of joining the bulkhead, flooring, and ceiling panels with weld seams. Experience has taught the Ingalls construction crews that checking the weld seams for leaks, as a non-code integral part of the weld process, is more efficient than waiting until the final spec controlled completion pressure test of the entire compartment. The immediate checking for leaks uses a legacy technique that is awkward, dated, and prone to error.

This project evaluated candidate nondestructive testing methods to replace the legacy soap and bubble leak detection inspection of weld joints. The project team conducted open and closed trials using acoustic ultrasound, eddy current, and soap bubble inspection processes to compare inspection process performance in laboratory and shipyard environments, respectively. Acoustic ultrasound system technology was determined to be the most promising replacement. Project results support a reduction in the current amount of time it takes to perform acoustic ultrasound inspection vs. legacy soap bubble leak detection testing. This technology and process, once implemented, could potentially save an estimated 5-year combined savings (DDG, LHA, LPD, and NSC) of $640K.



TIME LINE / MILESTONES

Start Date:	Jul 2017
End Date:	May 2018

FUNDING

Current Navy ManTech Investment:	$400K
Cost Share:	N/A

PARTICIPANTS

ONR Navy ManTech
Center for Naval Metalworking
EWI
Huntington Ingalls Industries, Inc. - Ingalls Shipbuilding

ACCOMPLISHMENTS / PAYOFF

Process Improvement:

This recommended alternative has several intangible benefits including improved quality leak testing, increased schedule flexibility with alternate test locations, and decongesting of on-ship construction locations

Implementation and Technology Transfer:

Implement a new inspection technology that removes the manual application of soap and water to weld joints for leak detection.

Expected Benefits and Warfighter Impact:

$640K savings over 5 years (DDG 51, LHA, LPD, and NCS savings combined)

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