

Manufacturability Improvements to Avoid Costs in the Production of HTSDG System on Future Combatants

Status: Pending Implementation

PROBLEM / OBJECTIVE

The implementation of a High Temperature Superconducting Degaussing (HTSDG) system on a future surface combatant is currently in progress under the leadership of the Naval Ship Systems Engineering Station (NAVSSSES). The objective of this Navy Metalworking Center (NMC) project was to improve the manufacturability of this system in two key areas to enable near-term implementation for future Navy platforms. The first focus area involved the development of a soldering process for an efficient, robust, repeatable solder joint connection between an HTS wire and copper pin where joint visibility is restricted and minimal heat must be used. The second focus area consisted of defining and demonstrating a manufacturing process to bundle the HTS wire that doesn't damage the wires or wire insulation.

ACCOMPLISHMENTS / PAYOFF

Process Improvement:

The Integrated Project Team (IPT) developed and validated a customized induction heating system to solder critical joints that met all physical and functional requirements. The IPT also developed a process to bundle the uniquely shaped HTS wire that does not impart mechanical damage to any of the individual wires or impair the insulation on those wires.

Implementation and Technology Transfer:

The complete, validated soldering system and bundling line have been transferred to AMSC, the HTSDG system provider, for production use. Implementation is planned on future surface combatants as HTS degaussing system implementation is approved by the Navy.

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Improving the manufacturability of the HTSDG system for future combatants will reduce costs and improve system performance. Pictured is the induction heating soldering system developed and validated in this project.
NMC photo

Expected Benefits and Warfighter Impact:

- AMSC estimated a \$651,000 cost avoidance with the implementation of manufacturing solutions on a full HTSDG shipset order from the Navy.
- Additional benefits include increased HTSDG system reliability; reduced lead time, which mitigates schedule risk to the Navy; and increased HTSDG cable capacity.

TIME LINE / MILESTONE

Start Date:	January 2013
End Date:	November 2014

FUNDING

Navy ManTech Investment:	\$1.7M
Cost Share:	(PMS 501) \$52K (AMSC) \$308K

PARTICIPANTS

PMS 501
NAVSSSES
AMSC
NMC