

Effective Submarine Baffle Tile Coating Will Save Life-Cycle Costs

Status: Pending Implementation

PROBLEM / OBJECTIVE

The gradual transition coating (GTC) SONAR baffle tiles installed on Seawolf and Virginia class submarines (VCS) have experienced issues with cracking and delaminating while in service. During a recent Extended Drydocking Selected Restricted Availability (EDSRA), several GTC tiles required replacement. Applying a durability coating to the tile edges will eliminate these issues and ensure that the tile lasts throughout the life of the ship. The Navy Metalworking Center (NMC) Integrated Project Team (IPT) extensively tested materials and process parameters to ensure that a coating of sufficient durability was developed for implementation. The team also verified compatibility with the tile material and longevity in this environment.

ACCOMPLISHMENTS / PAYOFF

Process Improvement:

NMC researched and identified multiple candidate materials for use as a durability coating on the GTC tile, including both roller-applied and spray-applied materials. NMC subjected the selected materials to preliminary testing prior to down-selecting to the most promising candidates. Naval Surface Warfare Center, Carderock Division (NSWCCD) conducted mid-scale cyclic mechanical compression testing to further down-select the materials. Full testing included hydrolytic stability and large-scale cyclic compression. As a result of these evaluations, NMC delivered recommendations for durability coatings to improve the survivability of the GTC tile.

Implementation and Technology Transfer:

Once PMS 392 and PMS 450 accept the project recommendations, implementation will occur in two ways. For in-service hulls, the shipyard personnel will apply the recommended coating if the tile are scheduled for removal during an EDSRA, which will initially occur at Pearl Harbor Naval Shipyard & Intermediate Maintenance Facility. The first application is expected to occur on SSN 777. For new construction, the durability coatings can be applied at the tile manufacturer or by a third-party applicator after the procurement specification is changed. The first implementation of the durability coating for new construction is expected by the end of 2017. The construction shipyard will receive the tile with coating in place, creating no impact on construction activities.



Applying a durability coating to GTC SONAR baffle tiles will increase the service life of the tiles and reduce total ownership cost. Newport News Shipbuilding photo

Expected Benefits and Warfighter Impact:

- Results will be implemented on in-service Seawolf (SSN 22 and 23) and VCS (SSN 777 through SSN 781) with an expected life-cycle cost savings of \$6.7M
- Results also will be implemented on VCS during new construction for an estimated life-cycle savings of \$5M (10 hulls over the next five years).

TIME LINE / MILESTONE

Start Date: May 2013
End Date: December 2015

FUNDING

Navy ManTech Investment: \$630K

PARTICIPANTS

PMS 392
PMS 450
NSWCCD
NMC
ONR Navy ManTech

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