

# Improved Installation Procedures to Reduce Cost of Aircraft Carrier Transparent Armor Windows

**Status:** Implemented

## PROBLEM / OBJECTIVE

Transparent armor (TA) windows on aircraft carrier island decks have experienced cracking / crazing after installation, most likely a result of issues in the installation process itself combined with exposure to humidity and chemicals. Preliminary analyses of the TA window failures indicated that the condition might be a result of residual stresses caused by uneven torquing of mounting bolts during installation combined with chemical exposure during construction, overhaul, and service. A Navy Metalworking Center (NMC) Rapid Response project investigated and developed improvements to the installation process to reduce the likelihood of cracking during installation

## ACCOMPLISHMENTS / PAYOFF

### **Process Improvement:**

The prototype fixture and associated procedures developed in this project will hold the window in place and enable uniform torquing of the mounting bolts, thereby reducing the potential for residual stresses that may result from the installation process itself.

### **Implementation and Technology Transfer:**

Newport News Shipbuilding (NNS) implemented the TA improved window installation fixture and associated procedures in December 2014 to install TA windows on CVN 78. Implementation will also occur during the overhaul of CVN 72, which is targeted for early 2016. All future TA window installations at NNS, both new construction and overhauls, will utilize the installation fixture developed under this Rapid Response project.

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New fixture and process will improve TA window installation on aircraft carriers. NNS Photo

### **Expected Benefits and Warfighter Impact:**

Implementing the project results is expected to avoid an estimated \$322K in TA window replacement costs on CVN 78 new construction and the CVN 72 overhaul that NNS is conducting. The projected cost avoidance on the remaining CVN 73 – CVN 77 Nimitz class overhauls is estimated to be \$715K.

## TIME LINE / MILESTONE

Start Date:	January 2014
End Date:	August 2014

## FUNDING

Navy ManTech Investment:	\$125K
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## PARTICIPANTS

PMS 379  
PMS 378  
NNS  
NMC