



NSRP SP-3 Panel 31 October 2006

Paint Task Force

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Naval Sea Systems Command

SEA 05M1



PTF Introduction/Background

- SEA 05 initiated the PTF to investigate / remedy barriers to efficient, effective execution of Navy's preservation process.
- Goal: To transform public yard painting to be more efficient and effective. Of particular interest are improvements supporting FY06 aircraft carrier availabilities (LINCOLN and GW).
 - Co-chaired by NAVSEA 05M1 (Beau Brinckerhoff), PSNS (Jim VanAntwerp), and NNS (Mark Peters).
 - Government participants: Reps from NAVSEA, Fleet, NSYs, and RMCs.
 - Industry participants: Reps from Shipbuilders Council of America, Puget Sound Ship Repair Association, Virginia Ship Repair Association, American Maritime Modernization Association, Port of San Diego Ship Repair Association, Jacksonville Ship Repair Association, paint manufacturers.

Summary of Topics

- Universal Paint Requirements Document (NSI 009-32)
- Lean Pilots (Reduced Government Oversight and Paperless QA)
- Graduated QA Working Group
- Decision Tree for Minor DFS Adjudication
- Corrosion Sensors
- Heat Induction Coating Removal
- Paint Warranty Working Group



Universal Paint Requirements Document (NSI 009-32)

- NAVSEA, Fleet and Industry agree the Navy needs a universal paint requirements document.
 - NAVSEA Standard Item 009-32 is currently the paint requirements document for contracted work on surface ships.
 - It is being expanded to be the universal paint requirements document.
 - It will include preservation work in submarines, carriers, public shipyards.
 - The FY08 version will be the first iteration of the expanded document.
 - These changes are not intended to modify the baseline requirements for nuclear space preservation (NSTM 631).



Universal Paint Requirements Document (NSI 009-32)

Steps Needed to Reach Completion

- Expansion of SI 009-32 to include carriers and submarines (for non-nuclear, non-SUBSAFE work) has been written and delivered to SSRAC.
 - Status: Awaiting release of NAVSEAINST 9070.1 rev. allowing use of NAVSEA Standard Items for non-nuclear, non-SUBSAFE work on nuclear or SUBSAFE-certified ships. ECD: 31 Aug. 06.
- 009-32 needs to be expanded to include public yards.
 - Plan: SEA 05M will coordinate with NSYs to get comments from them on current 009-32.
 - This is expected to take 6 months (pending 31 Aug 06 release). It will then take an additional 6 months to finalize the document. ECD: 31 Aug. 07.



Lean Pilot: Reduced Oversight

- A Lean pilot project was performed on USS DONALD COOK (DDG 75) by MARMC during a summer 06 availability;
 - Incorporated reduced formal government oversight;
 - Reduced some requirements during tank preservation;
 - An average savings of more than 10% was reported through process modifications and a detailed risk analysis.
- The next pilots are planned for USS STEVEN W GROVES (FFG 29) in Dec 06 and USS McFAUL (DDG-74) in Jan 07.
- We are working on a national implementation plan.

The Issue

Preservation Technical and Quality Assurance Assessment Team Findings: Deficient Quality Assurance

- Inefficient process – multiple wait points
- Labor intensive - \$\$\$\$\$
- Lots of information - Not in a manageable form; “Paper” process
- Data not used to manage process – late, ineffective use of data
- QA data cannot be easily trended or analyzed – few metrics



Lean Pilot: Paperless QA

The Solution

NAVSEA and NST Center designed a comprehensive Quality Assurance (QA) Tool Kit to assist Naval Shipyards and RMCs in managing preservation QA data.

The QA Tool Kit provides real-time preservation QA data collection, recording, storage and analysis, thus providing the process control tools for effective management of preservation in-process work.

Sponsored by:

NAVSEA 04, 05, 07, Fleet, NST Center

Demonstration/Prototype facilities:

Portsmouth Naval Shipyard (PNS)

Southwest Regional Maintenance Center (SWRMC)

Mid-Atlantic Regional Maintenance Center (MARMC)

Southeast Regional Maintenance Center (SERMC)

Direct Benefits of *QA Tools Project*

- Reduced
 - Field calculation errors;
 - Transcription errors;
 - Data time lag.
- Immediate engineering access to data
- Data analysis/metrics
- Near “error-free” final documents for certification
 - No missing readings;
 - No missing signatures;
 - No out-of-spec readings w/o adjudication;
 - No mathematical errors.

Project Status

- Developed and evaluated DFT/Environmental Demonstration Modules
 - PNS
 - SWRMC
- Oracle database developed
- RMC version beta testing conducted at MARMC; 03/06
- First "paperless" waterfront test: USS SAMUEL B ROBERTS; SERMC; 04/06
- RMC paperless pilot; USS GUNSTON HALL; MARMC; 05/06
- RMC operational testing; USS KLAKRING; SERMC; 07/06
- Revisions to Naval Shipyard and RMC versions of the software continue;

Graduated QA Working Group

- An effort to reduce formal oversight of “Good Providers” is being developed by the Graduated QA Working Group to improve efficiency of shipboard preservation processes.
- Initial efforts are focused on reduction of government oversight of contractors with a history of good performance.
- Issues include
 - Cost vs. Criticality assessment;
 - Development of contractor/NSY post-availability scorecard;
 - To determine who the “Good Providers” are;
 - Development of contractor- and government-generated metrics that justify the risk of reduced QA oversight.

Decision Tree

- This decision tree does not change any technical requirements. The “Risk Threshold” indicates at what level of authority an out-of-spec condition can be approved.
 - Mitigation guidance on out-of-spec requirements does not imply that a particular out-of-specification condition will be accepted — the decision to accept or reject an out-of-spec condition will be made at the level indicated in the table.
- Minor out-of-spec conditions as described in the “Mitigation Only Required” and “Local Engineering” columns represent a low risk of premature coating failure as long as required mitigation actions are taken and the out-of-spec condition is limited with respect to the area being worked.
 - More significant out-of-spec conditions require a formal Waiver/Deviation (DFS) for adjudication of the condition.
- The “Mitigation Only Required” category must be adjudicated by the local Tech Authority (NSY or RMC engineering code) at the first occurrence of an out-of-spec condition during a particular work item after which the government QA activity/representative can apply the same mitigation guidance for the specified requirement. Recurrences of a previously mitigated condition require documentation at each occurrence.

Corrosion Sensors

- Working with NRL, NAVSEA piloted installation of MBT corrosion sensors onboard USS MINNEAPOLIS SAINT PAUL (SSN 708) in Feb 06.
 - These sensors allow a diver to download data on the condition of the tank preservation system.
 - Goals:
 - To understand the condition of ballast tanks before a submarine enters drydock;
 - To develop the capability to defer or eliminate some tank preservation based on real-time data and true condition-based assessments.
- The next installation is scheduled for late Sep 06 on USS TOPEKA (SSN 754).
- A fleet-wide implementation plan is being worked.

Heat Induction

- NAVSEA 05 tasked NRL and NSWC Philadelphia with demonstrating heat induction technology aboard submarines and aircraft carriers.
 - Fact find and fit process to the needs of the Navy
 - Modify current equipment or initiate development of new equipment to satisfy naval requirements.
 - Prove the technology is safe to use; identify associated dangers.
 - Establish 3-year transition plan so every shipyard will have at least one unit.
- Traditional paint and SHT removal process costly, dangerous, tedious, time consuming.
 - Newer, more durable coatings reduce removal rates, especially elastomeric coatings.
 - Some blasting methods promote early failure via corrosion of trapped media on flight decks.
 - Mechanical paint removal using grinders and needleguns is noisy, slow and can destroy existing profile under intact coatings.

What Does Heat Induction Replace?

- Traditional coating removal using abrasive blasting
 - High impact on workers
 - Dust, noise, ergonomics, tedious, dangerous.
 - Environmental impact
 - Large volume waste stream
 - Top-down process
 - Removes coatings from upper surface down
 - Virtually ineffective at removing elastomeric materials i.e., SHT, urethanes, polyureas that absorb kinetic energy.
- Coating removal using induction heating
 - Rapid, controlled-depth heating of substrate thermally shocks coating;
 - Bottom-up process
 - Breaks the coating/substrate bond;
 - Applicable to all coating types, hard films, elastomeric linings, urethanes, polyureas.

Heat Induction Lessons

- Nearly silent operation – tremendous reduction in noise over every other method of coating removal.
- Current design is safe to use near nuclear processes.
 - RFI, load cell measurements proved technology not a threat to warning systems placed inside shipyard.
- No hazardous vapors detected during operation. Heavy metal vapor data still in analysis.
- Substrate steel temperatures never exceeded 350°F, but can if not used properly.
- Will reduce fatigue associated with current methods of SHT and paint removal. No vibration, no noise.

Paint Warranty Working Group

- Use of paint warranties as an alternative to government oversight is being worked by Paint Warranty Working Group established at Mega Rust 2005;
- Goal: Demonstrate a meaningful / enforceable warranty that is fair to providers and a good value for the Navy.
- Common practice in commercial new construction; less common for maintenance contracts;
 - Warranties typically ineffective in other DOD procurements, but...
 - Paint may be an exception.
- No *technical* reason warranties cannot be implemented.

Current Status

- Fleet/NAVSEA seeking proposals from contractors, incl. MSMO, for warranty demo.
- Pursuing demo via SERMC using fixed price contract;
- Industry has responded with two recent warranty offers.
 - One rejected for lack of value to the Navy and risk of failure (non-skid application).
 - The other concerns USS WHIDBEY ISLAND (LSD 41) tank preservation; it is under review.
- We will continue to work with industry to demo the concept of paint warranties.



Future Events

- n PACE in Dallas – Mega-Rust Day
13 Feb 2007

- n Mega-Rust in San Diego
4-7 June 2007

- n JIINI in San Diego, Norfolk & Washington
Quarterly

- n SSRAC in Jacksonville
July 2007



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Lean Pilot: Paperless QA

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