



# **White Paper Project**

## **IMPROVED RULES FOR PAINTING US NAVY SHIPS DURING NEW CONSTRUCTION AND REPAIR**

**Status Report**

**July 19, 2006**

**Jacksonville Beach, FL**



- **GOAL:** Reduce the costs and cycle time for preservation by reducing or streamlining the current requirements.
- **TEAM:** Electric Boat, NASSCO, NAVSEA 05P23
- **CONCEPT:** Have end-users perform a review of the rules from a productivity standpoint and make recommendations for changes that can reduce costs without affecting performance.



# Approach

- **Develop a consolidated list of rules (NSI 009-32 FY08).**
- **Prioritize the list on basis of impact to coating performance.**
- **Obtain input from NSRP shipyards regarding rules that impact cost and cycle time the most.**
- **Obtain recommendations from NSRP shipyards as to which non-value added requirements should be changed / deleted.**
- **Review IMO and ABS NVRs and compare to Navy rules.**
- **Compare paint manufacturer's requirements to current Navy requirements and see if / how the differences affect costs & cycle times.**
- **Determine if high impact rules can be eliminated. Determine if testing is needed to prove viability of any proposed rules.**
- **Draft proposed wording for new rules.**



## Status

- **Initial review of FY 08 009-32 completed**
  - Matrix of likely cost drivers is being developed
- **Input from 2007 SSRAC meeting will be reviewed and included in final report**
- **ABS Naval Vessel Rules and ISO ballast tank coating rules are being reviewed**
- **Paint manufacturer's recommendations being compared to current requirements**
- **Need to discern between savings that can be quantified versus intangible but likely savings**

009-32 Test / Inspection / Certification Summary FY-08 Draft

Required Certifications

Current	Paragraph	Future as presented at Mega Rust 2006	who?	level
QP-1	critical ¶ 3.9.2			
Contr. Paint	critical ¶ 3.9.1			
Contr. Blast	critical ¶ 3.9.4			
C-14 Paint (MPCAC)	critical ¶ 3.9.3			
C-7 Blast	critical ¶ 3.9.4			
NACE 1 / NBPI Inspector	critical ¶ 3.9.1			
	C:\Documents and Settings\PETEJUDT	OSHA 10 hour	all	apprentice
		ICALS level 1	painters	apprentice
		ICALS level 2	painters	journeyman
		ICALS level 3	painters	master
		Blaster apprent + 2 years	blasters	journeyman
		C-13 UHP	blasters	journeyman
Some NAVSEA Perspective on future state		Blaster Peer review	blasters	master
		NACE SCAT Inspectors	inspectors	master
		QCS	inspectors	supervisors

3.7 The following ship structural surfaces are defined as critical coated areas:

SURFACES	TYPE OF SUBSTRATE
MK41 VLS launcher top and base	All
Underwater hull surfaces (including capacitive shields)	All
Cofferdams	Steel and aluminum
Freeboard	Steel and aluminum
Hangar, flight, catapult, and vertical replenishment decks	Steel and aluminum
CV and CVN flight deck landing areas	Steel and aluminum
RAMP track trough	Steel and aluminum
Well deck overhangs	Steel and aluminum
Wet space decks (see Note 4.1)	Steel and aluminum
Surface ship bilges	Steel and aluminum
Interior surfaces of intake vent plenums, defined as combustion air intakes (gas turbine, diesel, and steam) and other vent system intake plenums with openings greater than 7 square feet	Steel and aluminum
Uptake spaces	Steel and aluminum
APFF station decks and coaming	Steel and aluminum
Tanks (including sumps and covers)	Steel and aluminum
Void	Steel and aluminum
Chain lockers	Steel and aluminum
All recesses on submarines	Steel and aluminum
Submarine hull and superstructure (Fairwater)	Steel and aluminum
Aircraft Launch and Recovery Equipment (ALRE)	Steel
System areas addressed in Table Notes (8) and (35)	Steel

4. NOTES:

4.1 Wet space decks listed in 3.7 include sanitary spaces (washrooms, water closets, and showers), food service spaces (galley, scullery, butcher shop, bakery, meat prep rooms, and food service line), and trash compactor rooms.



Existing pre FY-07:	
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New in FY-07 & / or FY-08:	
New in FY-07 & FY-08 for all non skid but existing for critical coated skid:	

Current tests req'd. Note differences for submarines	Required by	Type. Note 009-04 reqn'ts FY-08
Ambient, substrate, RH%, dew point, SP-1, profile, surface prep, conductivity, 8502-3 dust test, paint doc., equipment doc., overcoat window doc., wft / dft test doc., paint storage doc, temps, etc.	critical ¶ 3.7.1, (Appendices) - 3.7.1.11	(I) (G) in conjunction with below
Ambient, substrate, RH%, dew point. 12 hours prior - 48 hours after - 7 days pot / fd tanks every 4 hours. Explain details.	critical ¶ 3.10.1	(I)
SP-1 prior to preparation	critical ¶ 3.10.2	(I) (G)
NOTE: If UHP is utilized & deficient profile results; re-establish profile	all ¶ 3.10.3.2	AWARENESS
Surface profile / preparation method (5 minimum; 3 tape readings = 1)	critical ¶ 3.10.5	(I) (G)
Conductivity (5 minimum)	critical ¶ 3.10.6	(I) (G)
Surface preparation	critical ¶ 3.10.7	(I) (G)
Surface cleanliness dust ISO 8502-3 (5 minimum) (U-Hull)	critical ¶ 3.10.7.1	(I) (G)
DFT measurements per coat; no stripe coats	critical ¶ 3.10.9.1	(I) (G)
Visual holiday check	critical ¶ 3.10.9.2	(I) (G)
Visual surface cleanliness	critical ¶ 3.10.9.3	(I) (G)
Visual for chloride contamination	critical ¶ 3.10.9.4	(I) (G)
WFT measurements for "lacky" coats	critical ¶ 3.10.10.1	RR
Paint documentation	critical ¶ 3.7.1.7	RR
Application equipment documentation	critical ¶ 3.7.1.8	(I) (G)
Time between coats documentation	critical ¶ 3.7.1.9	(I) (G)
Wft / dft measurements	critical ¶ 3.7.1.10	(I) (G)
Paint / non skid storage temps	critical ¶ 3.7.1.11	(I) (G)
CAPS sheet 7 days prior	critical ¶ 3.8.1	RR
NAVSEA approved ASTM F-718 / MSDS	critical ¶ 3.8.1.1	RR
Manufacturer's cert of compliance etc per Section 11 or NSTM 631	critical ¶ 3.8.2	RR & test data (tanks)
Touch up defined; surface ships and submarines; includes critical coated areas	all ¶ 3.6.2 - ¶ 3.6.2.2	(I), (V) or (G)
Ambient, substrate, RH%, dew point 6 hrs prior; 48 hrs after; record every 4 hours + manual every 12 hours except potable fd txs. Explain details	all ¶ 3.10.1 - 3.10.1.3	(V)
SP-1 prior to preparation	all ¶ 3.10.2	(I) for critical or (V) for non
SP-1; 4 hours prior to paint	all ¶ 3.10.2.1	(I) for critical or (V) for non
NOTE: If UHP is utilized & deficient profile results; re-establish profile	all ¶ 3.10.4.2	AWARENESS
Surface profile (1 per 200 ft²; 3 tape readings = 1)	all ¶ 3.10.6 - 3.10.6.6	(I) for critical or (V) for non
Conductivity (5 minimum)	CC areas ¶ 3.10.7 - 3.10.7.3	(I) for critical or (V) for non
Verify surface preparation	all ¶ 3.10.8	(I) for critical or (V) for non
ISO 8502-3 dust / tape test; Flight deck or Underwater Hull only	all ¶ 3.10.8.1	(I) for critical or (V) for non
Holidays, dft, cleanliness each coat	all ¶ 3.10.10	(I) for critical or (V) for non
Environmental readings every hour during the work process vs. during the entire pre & post time frame.	non skid ¶ 3.11.1 - 3.11.1.1	(V)
Sustained wind speed not to exceed 15 MPH for sprayed components	non skid ¶ 3.11.1.2	(V)
Application temperature limits; ambient, surface, dew point	non skid ¶ 3.11.1.3	(V)
SP-1 prior to preparation	non skid ¶ 3.11.2 - 3.11.2.2	(V) non critical; (I) (G) critical
SP-1; 4 hours prior to paint	non skid ¶ 3.11.2 to ¶ 3.10.2.1	(V) non critical; (I) (G) critical
NOTE: If UHP is utilized & deficient profile results; re-establish profile	all ¶ 3.10.3.2 (¶ 3.11.2)	AWARENESS
Surface profile	non skid ¶ 3.11.3 - 3.11.3.1	(I) non critical; (I) (G) critical
NOTE: If profile, 3 - 4.5 mils is not present; reestablish spec profile	non skid ¶ 3.11.3	AWARENESS
If profile exceeds 5 mils, use method B of ASTM 4417 to determine	non skid ¶ 3.11.3	(I) non critical; (I) (G) critical. Tool needs
Tape readings waived if UHP is used. Conflicting terms within ¶.	non skid ¶ 3.11.3	AWARENESS: potential typo
Conductivity (5 minimum)	non skid ¶ 3.11.4 to 3.10.7.2	(V) non critical; (I) (G) critical
Visual inspection within 4 hours of any application for contamination	non skid ¶ 3.11.4 to 3.10.7.1	(V) non critical; (I) (G) critical
Verify surface preparation; also in accordance NSTM 634	non skid ¶ 3.11.5	(I) non critical; (I) (G) critical
Dust tape test (Flight Deck)	non skid ¶ 3.11.5.1	(I)
Nonskid application within 36 hours of primer etc.	non skid ¶ 3.11.8 - 3.11.8.4	AWARENESS
DFT measurements per coat; no stripe coats	critical ¶ 3.11.9 to 3.10.10	(I) non critical; (I) (G) critical
Visual holiday check	critical ¶ 3.11.9 to 3.10.10.2	(I) non critical; (I) (G) critical
Visual surface cleanliness	critical ¶ 3.11.9 to ¶ 3.10.10.3	(I) non critical; (I) (G) critical
Visual for chloride contamination	critical ¶ 3.11.9 to 3.10.10.4	(I) non critical; (I) (G) critical
Non skid spread rate / holiday inspect; NSTM 634 - 3.35.6, ¶ 5	non skid ¶ 3.11.10	(I) non critical; (I) (G) critical
Inspect visual landing aids / markings	non skid ¶ 3.11.11	inspect, verify, & document. No I or G call out



009-4 Inspection type definitions

3.7.1 (I) inspections require verification and documentation by a separate individual, other than the person who has accomplished the work, who is qualified as an inspector.

3.7.2 (V) inspections require verification and documentation by the qualified tradesperson, trade supervisor, or inspector.

3.7.3 The authority to accomplish and document (I) and (V) inspections may be delegated to qualified subcontractor personnel.

3.8 Accomplish (G)-Point (government notification) as follows:

3.8.1 (G) is a symbol inserted in a Work Item to establish a point in the sequence of accomplishment of work at which time the SUPERVISOR shall be notified to permit observation of a specific test or inspection by the government.

Miscellaneous required reports FY-08		
Heavy metals	all ¶ 3.1.1	Changed to accomplish per 1915
Blast media per Mil-A-22262, A-A-1722	blasting ¶ 3.1.3.1	RR
Recyclable ferrous blast media SSPC AB-2	blasting ¶ 3.1.3.4	RR, lab
SP-11 prep for touch up or new disturbed agreed SUPERVISOR, subs	new / dist ¶ 3.1.5	inspect, concur, document
Inaccessible areas agreed SUPERVISOR	inaccess. ¶ 3.1.5 & 3.10.6.2	inspect, concur, document
Spot, partial, or full preservation must all meet requirements	all ¶ 3.1.6	AWARENESS
Record / restore misc. painted markings	all ¶ 3.1.10	inspect, document
FME protection. <b>NOTE 009-06</b> various inspect / document	all ¶ 3.1.11	RR, (V)'s & (G)'s (3.5, 6, & 7) Collect verify; used In CAPS; <b>Computer ACCESS required</b>
Mil-PRF coatings require NAVSEA approved ASTM F-718's	all ¶ 3.1.2 & ¶ 3.10.9	
Paint storage ambient temp maintained 65° - 85° F	all ¶ 3.1.14.1	Document prove Note 631, Section 11 shelf life certs for CC areas
Non skid stored 70° - 80° F 24 hours prior to mix	non skid ¶ 3.1.14.2	Document prove Appendix
Non skid stored per NAVSEA approved ASTM F-718 prior to the 24 hrs.		
Conflict with 65 - 85 ?	non skid ¶ 3.1.14.2	Document prove Appendix
2 part coatings, mix of partial kits prohibited; require 'verified' measuring equipment	all ¶ 3.1.6	AWARENESS; tool needs
Verify / document ventilation reqm'ts pot / feed tanks	pot / feed tks ¶ 3.3.2	verify & document - prove
Complete copy of in-process docs, (appendices) within 72 hours for each separate location.	critical ¶ 3.7.2	RR (duplicate document final)
Certification statement that SUPERVISOR has been informed of all out of spec. conditions identified	critical ¶ 3.7.2.1	RR (additional specific statement)
List of contractor certified coatings inspectors	critical ¶ 3.9.1.1	RR
SP-11 in critical areas requires a 2 mil profile	critical ¶ 3.10.6.2 & 3.11.3.1	AWARENESS; labor intensity
NOTE: Went from 5 tables to 9 tables.		



## Some Likely Cost Drivers

- **Paint storage requirements that are more strict than paint manufacturers allow**
- **Mandatory training and certifications for personnel**
- **Dehumidification requirements more strict than the paint manufacturer requires (regional issue)**
- **Various record keeping requirements (e.g., CAPS)**
- **Overly stringent limits for flash rust on water jetted surfaces**
- **Inability to retain preconstruction primer in tanks and free flood spaces**
- **Non-uniform rules for surface ships versus submarines**
- **Technical requirements whose limits are too narrow (e.g., tack coats must be 1-2 mils WFT) or that were based on opinion not data (e.g., 2 hour dry time for solvent)**
- **Imprecise wording and undefined requirements that allow for various local interpretations (e.g., how many data loggers are enough, where should they be located).**



## Potential Cost Reducers from SSRAC 2007

- Reduced number of “G “ points
- Deleted roughening of ablative AF systems
- Paperless QA
- CAP sheets don’t need approval
- Others ?

**How do we estimate  
actual savings from these changes?**



# Project Plan

- **August 31 – wrap up matrix of potential costs and savings, send to shipyard reps**
- **Sept 30 – obtain all comments and write final report**
- **October 30 – submit final report to ATI**



# Questions or Comments

Contact either

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