



**Ingalls  
Shipbuilding**

A Division of Huntington Ingalls Industries



**GENERAL DYNAMICS**  
Bath Iron Works

# Retention of Type VI Epoxy under UHS Epoxy

NSRP Surface Preparation and Coatings Panel  
5/22/18

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- Current specifications for tanks and critical spaces require a MIL-PRF-23236 Type VII Ultra High Solids (UHS) epoxy coating over bare steel
- This requires either retaining Pre Construction Primer (PCP) through the entire build process until late-stage final paint application, or to apply the first coat of a multi-coat Type VII epoxy earlier in the build
  - PCP will not provide adequate corrosion protection of the steel over long periods of weather exposure
  - UHS epoxy can be damaged or burned during construction, and is difficult and expensive to repair
- This project will develop the data needed to request Navy approval to apply a Type VII UHS epoxy over a Type VI epoxy in critical coated areas

Type VI epoxy could economically bridge this gap if it can be retained for final painting



# Project Work Breakdown Structure (WBS)

- Task 1: Identify Target Applications, Requirements, and Constraints
- Task 2: Select Candidate Systems
- Task 3: Finalize Applications and Test Requirements
- Task 4: Develop Test Plan
- Task 5: Fabricate Test Articles
- Task 6: Perform Testing
- Task 7: Issue Final Report

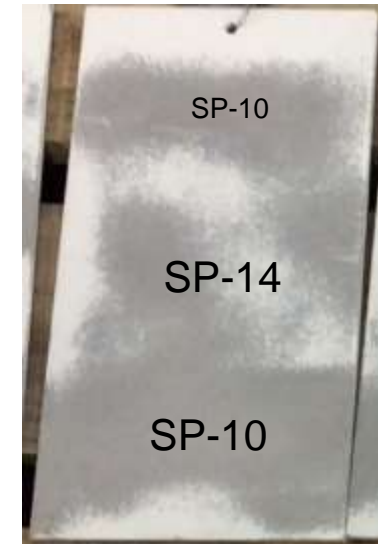


- 6"x12"x1/8" steel panels
- Apply initial coat
- Simulate burn/weld defects
  - For adhesion & salt fog panels
- Age & weather for 7 months
- Secondary surface prep
- Apply final coat
- Perform testing



- Surface Preparation Methods

- SP-3/SP-11
- SP-7/SP-10
- SP-14/SP-10



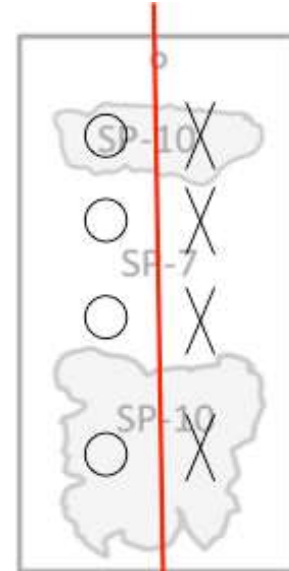
- Characterizing Secondary Surface Preparation

- Visual inspection
- Film thickness
- Surface profile
- Prepared coating surface tension
  - Dyne Pens (experimental)



# Test Methods

- Pull Off Adhesion (ASTM D4541)
- Knife Adhesion (ASTM D6677)
- Flexibility (bend test)
- Prohesion (cyclic corrosion exposure) (ASTM G85 Annex A5)
- Cathodic Disbondment (MIL-PRF-23236D)
- Condensing Humidity (ASTM D4585)



- Conduct Testing
  - Prohesion (1000 hours)
  - Cathodic Disbondment (65 days)
  - Condensing Humidity (1300 hours)
- Complete Test Reports (6/1/18)
- Submit Final Report (6/30/18)
- Pursue Navy approval







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