06 MAR 2020

From: Director, NAVSEA Standard Specification for Ship Repair and Alteration Committee (SSRAC)

Subj: FISCAL YEAR 2021 CH-2 NAVSEA STANDARD ITEMS

Ref: (a) COMUSFLTFORCOMINST 4790.3

(b) NAVSEAINST 9070.1

Encl:

(1) Summary of change for 009-32 Cleaning and Painting Requirements; accomplish, from SSRAC meeting JUNE 2019

(2) Summary of change from Mini SSRAC meeting FEB 2020

1. Per references (a) and (b), the Fiscal Year 2021 (FY21 CH-2) NAVSEA Standard Items (NSI) are available on the official SSRAC Web site at:
http://www.navsea.navy.mil/Home/RMC/CNRMC/OurPrograms/SSRAC.aspx

2. The ***FY-21 CH-2*** NSIs are effective for availabilities in which FY-21 Standard Items are invoked. FY-21 availabilities that are not at the 100% of D Level Maintenance Work Package Lock Milestone must be planned to incorporate ***FY-21 CH-2*** NSIs listed. ***FY-21 CH-2*** NSIs must supersede all related CSWTs, SWTs, and LWTs.

FY-21 CH-2 NSI Affected:

Enclosure (1); Summary of change for 009-32 Cleaning and Painting Requirements; accomplish, from SSRAC meeting JUNE 2019

Enclosure (2); Summary of change from Mini SSRAC meeting FEB 2020

a. 009-06	Maintaining Protection and Cleanliness from Non-Radioactive Operations; accomplish
b. 009-25	Structural Boundary Test; accomplish
c. 009-26	Deck Covering; accomplish
d. 009-32	Cleaning and Painting Requirements; accomplish
e. 009-47	Gate Valve; repair
f. 009-52	Relief Valve; repair

g. 009-53 Bolted Bonnet, Globe, Globe Angle, and Globe Stop Check Valve Shop Repair; accomplish

h. 009-55 Regulating/Reducing Valve; repair

i. 009-58 Pump and Driver Shaft Alignment; accomplish

j. 009-71 Piping System; test

k. 009-84 Threaded Fastener Requirements; accomplish

l. 009-104 Vibration Testing and Analysis; accomplish

3. SSRAC and RMC Coordinators are responsible for advising users within their command of this notice. Code 400 Contracts Department is responsible for advising Master Ship Repair (MSR) Contractors and Agreement for Boat Repair (ABR) Contractors under their cognizance of the availability of these products.

4. The requirements of this letter do not authorize any change in terms, conditions, delivery schedule, price, or amount of any Government contract. In the event you consider the requirements represent a change for which an equitable adjustment is in order, you are to advise the Contracting Officer of the particular technical or contractual requirements regarded as changed, and take no action with regard to such changed requirements until notified in writing of the Contracting Officer's response.

5. Point of Contact for further information is Mr. Aaron Simmons, Technical Director, 757-400-0020, james.a.simmons3@navy.mil.

SIMMONS.JAMES.A.13672215 22
Digitally signed by SIMMONS.JAMES.A.13672215 22
Date: 2020.03.03 14:28:31 -05'00'

James A. Simmons

Distribution:
SSRAC E-Mail

ENCLOSURE 1

Summary of FY-21 Changes to Standard Item 009-32, "Cleaning and Painting Requirements; accomplish" and Associated Technical Rationale for Each Change

The following provides the rationale for the substantive updates to FY-21 Standard Item 009-32. The specific changes discussed below appear highlighted and in ***bold/italics*** in the attached final draft, FY-21 Standard Item 009-32. Minor re-numbering changes, other typographical corrections, and minor changes to clarify existing requirements appear in the attached final draft, FY-21 Standard Item 009-32 in ***bold/italics*** and are not addressed below.

1. CHANGE: Clarified requirement for preservation of CRES and non-ferrous fasteners: Updated the FY-21, Standard Item 009-32, Note (17A) to include the phrase, "CRES and non-ferrous fasteners installed post preservation are not required to be painted."

RATIONALE: The current, FY-20, Change 1, Standard Item 009-32, Note (17A) requirements are that CRES and non-ferrous fasteners, piping, and cable pans installed in tanks before tank preservation work are considered part of the tank and therefore are required to be painted. Painting such items reduces the cathodic demand on any anodes in tanks and avoids the costs associated with masking such items before painting. However, because these items are inherently corrosion resistant, they will not corrode or adversely affect water quality in the tank even if they are not coated. The FY-21 update to Standard Item 009-32, Note (17A) creates an exemption for not requiring paint on CRES and non-ferrous fasteners installed after preservation work has been completed. For example, with the updated Note (17A) requirement, 316L stainless steel fasteners used to mount a ladder in a freshly painted reserve feedwater or potable water tank would not need to be painted. The update will reduce costs and streamline production by avoiding the time/effort required to paint such fasteners. The update will also mitigate the risk of damage to the intact, freshly installed tank coating associated with conducting surface preparation on the substrates around installed CRES/non-ferrous fasteners (i.e., damaging the painted carbon steel surface into which the fastener is installed). The update will not appreciably increase anode consumption or adversely affect water quality because the surface area of such fasteners is negligible compared with the overall coated surface area in the tank. Finally, the update will eliminate the need to wait for coatings applied to small fastener areas to cure and off-gas, resulting in a more rapid return-to-service for the tank. In addition to streamlining coating work, the update will also not adversely affect water quality because the CRES/non-ferrous materials used in the tanks are also used in the smaller-diameter pipes/fittings that are already required to remain uncoated in such tanks based on the current Notes (17) and (17A). Thus, small areas of CRES/non-ferrous metals are already known to not adversely affect water quality. In summary, the change will eliminate the time/effort currently required to coat CRES/non-ferrous fasteners in tanks without appreciably increasing the risk of tank corrosion or adversely affecting water quality.

2. CHANGE: Clarified requirement for nonskid mixing blade cleanliness: Revised the FY-21 Standard Item 009-32, paragraph 3.11.11.1 to include additional types of contaminants that are subject to visual inspection as follows: "Visually verify that nonskid mixing blade is free of previously cured coatings, contaminants, or rust."

RATIONALE: The current, FY-20, paragraph 3.11.11.1 simply required that nonskid mixing blades were to be inspected to be free of previously cured coatings to reduce the risk of contractors using mixing blades that were less effective because they were covered in multiple layers of cured nonskid. The FY-21, Standard item 009-32 update to paragraph 3.11.11.1 adds the terms, "visually" and "contaminants, or rust" to clarify that blades used to mix nonskid are to be free of cured nonskid residue (i.e., to ensure mixing effectiveness) and are not to contaminate the nonskid (i.e., rusty blades will shed iron oxides into the nonskid and oily blades will release oil into the nonskid). Thus, the FY-21, Standard Item 009-32 revision to paragraph 3.11.11.1 will reduce ambiguity by clarifying the original intent of the cleanliness requirements, will prevent contaminating of the nonskid that is being mixed, and will reduce the QA/QC "churn" at the waterfront due to misinterpretation of the FY-20, Change 1, Standard Item 009-32 blade inspection requirements.

3. CHANGE: Clarified stripe coat requirements for CRES, non-ferrous and aluminum substrates:
A new paragraph 3.2.4 was added to the FY-21, Standard Item 009-32 to streamline coating application requirements by waiving stripe coats for CRES and non-ferrous substrates, as follows:
"Stripe coats are not required when applying coatings to non-ferrous metals or corrosion resistant steels. Stripe coat aluminum in accordance with Tables One through 8."

RATIONALE: The technical rationale for a stripe coat is to add extra layers of coatings at a corner or edge of a substrate to ensure that coating shrinkage during cure does result in a final, cured coating that is too thin to prevent substrate corrosion. Because CRES/non-ferrous substrates will not corrode, the SURFMEPP proposal to create a new paragraph 3.2.4 was intended to streamline production without increasing the risk of substrate corrosion or adversely affecting water quality. However, because aluminum can corrode in some conditions, and there are stripe coat requirements for some aluminum areas (e.g., aluminum superstructure coated with MIL-PRF-24635, Type V/VI, polysiloxane topcoats), the inherently "non-ferrous" aluminum alloys are exempt from the proposed change and stripe coats are still required for aluminum in accordance with Tables One through 8. Thus, the new, FY-21, Standard Item 009-32, paragraph 3.2.4 provides a waiver for stripe coating CRES and non-ferrous substrates that will speed production by eliminating the stripe coat application and inspection process steps while mitigating the corrosion risk at aluminum corners/edges by retaining the stripe coats on aluminum substrates as specified in Tables One through 8.

4. CHANGE: Waived stripe coating on relatively smooth, hydrodynamic welds on submarine exterior hulls:
The FY-21 Standard Item 009-32, paragraph 3.2.1 was modified to waive the requirement for stripe coating flow exposed welds on submarines exterior hulls that have undergone contouring for hydrodynamic considerations by adding the following sentence to the end of the paragraph: "Flow exposed welds that have undergone contouring for hydrodynamic considerations do not require stripe coating."

RATIONALE: The current, general requirements in the FY-20, Standard Item 009-32, paragraph 3.2.1 includes stripe coatings requirements for "weld seams" and as discussed in the

Change 3 discussion above, the intent of the stripe coat is to mitigate the corrosion risk on sharp edges or corners where coating shrinkage during cure would result in inadequate final cured coating thickness. SUBMEPP noted in their proposed change to paragraph 3.2.1 that flow exposed weld seams on submarines exterior hulls that have undergone hydrodynamic contouring (i.e., as defined in NAVSEA T9074-AD-GIB-010/1688, *Requirements for Fabrication, Welding, and Inspection of Submarine Structure*) are ground essentially smooth and flush. Specifically, the NAVSEA T9074-AD-GIB-010/1688 contouring requirements allow less than 1/16 inches of smooth metal above the adjacent flat plate surface. SUBMEPP noted in their proposed change to the FY-21 paragraph 3.2.1 that requiring a stripe coat on such smooth, contoured surfaces would not appreciably change coating corrosion-control performance, but does definitely slow production by adding at least two days (i.e., one day to stripe coat and one day to inspect and cure the coat) to each hull work zone coating applciation task. SEA 05P2 concurred with SUBMEPP that stripe coats are not required on such smooth, contoured areas and rates the risk of increased hull corrosion associated with adopting the proposed change to FY-21, Standard Item 009-32, paragraph 3.2.1 as LOW.

5. CHANGE: Revised requirements for touch-up preservation on submarines:
Updated paragraph 3.6.1.1 in the FY-21, Standard Item 009-32 to align the cumulative surface area for touch-up requirements on submarines with the cumulative touch-up requirements for surface ships, but retained the current touch-up requirements for potable, reserve feedwater, and freshwater drain collecting tanks. Thus, the revised sentence in FY-21, paragraph 3.6.1.1 to address this waiver is as follows: "Except for potable, feedwater, or freshwater drain collecting tanks, touch-up is defined within this Standard Item for submarines as preservation operations on cumulative surface areas less than 10 percent of the total area being preserved, as approved by the SUPERVISOR."

RATIONALE: Before the FY-08, Standard Item 009-32, (i.e., the revision of Standard Item 009-32 that SEA 00 defined as the universal paint requirements document that was applicable to submarines and surface ships), the Submarine Maintenance Standard (SMS), MS 6310-081-015 *Submarine Preservation*, defined baselines submarine coating touch-up requirements. When submarines were first incorporated into the FY-08, Standard Item 009-32, paragraph 3.6.2.2 stated, "Touch-up is defined within this Standard Item for submarines as preservation operations on cumulative surface areas less than one percent of the total area (e.g., bilge, tank, space, etc.) being preserved, with no individual area greater than 4 square feet." Conversely, surfaces ship touch-up requirements were defined in paragraph 3.6.2.1 as follows, "Touch-up is defined within this Standard Item for surface ships as preservation operations on cumulative surface areas less than one percent of the total area (e.g., bilge, tank, space, etc.) being preserved, with no individual area greater than 10 square feet." The maximum area for touch up on surface ships was increased to 10% in the FY-12, Change 1, update to Standard Item 009-32, paragraph 3.6.2.1 and that requirement has been retained to date. Thus, the different area requirements between surface ships and submarines have persisted to the current, FY-20, Change 1, Standard Item 009-32. The SUBMEPP community reviewed the requirements for submarine touch-up appearing in the SMS MS 6310-081-015 *Submarine Preservation*, Revision G, Attachment 7 and found that

the document provides requirements for determining the percentage of coating failure and type of coating failure to determine which repair process should be accomplished (i.e., would an any be touched-up or subject to full represervation). Based upon the table in Attachment 7, a coating grade B, constitutes 0.01% to <1.0% of paint failure with spot, general or pinpoint rusting and requires touch-up repair. Coating grades C and D, constitute 1.0% to 10% paint failure with either spot or general and pinpoint rusting requiring a "local decision" for corrective action based upon the specific conditions found. Thus, the SURFMEPP proposal notated that the FY-08, Standard Item 009-32, paragraph 3.6.2.2, requirement that no more than 1% of a coating area could be touched-up, which has been retained through the years as the requirement for submarines even though surfaces ships currently allowed up to 10% touch up, was actually delegated to a "local decision" at the shipyard. Thus, the current requirement in FY-20, paragraph 3.6.1.1 requiring submarine touch up areas to not exceed one percent, was not consistent with the SMS delegation of touch-up approval authority to the shipyard as a "local decision" for areas up to 10% and was also not consistent with the 10% allowable touch-up area requirement for surface ships. Thus, the intent of the SUBMEPP proposed change was to align the "local decision" for touch-up of areas in accordance with the SMS with Standard Item 009-32 requirements. It is important to note that the updated, FY-21, paragraph 3.6.1.1 includes an initial clause that excludes potable, reserve feedwater, and/or freshwater drain collecting tanks from this change and as such coating touch-up requirements for these tanks remains unchanged. It is also important to note that the updated FY-21, Standard Item 009-32, paragraph 3.6.1.1 also clarifies the term "local decision" by requiring that the "SUPERVISOR," determine if touch-up of areas greater than 1% but less than 10% is technically acceptable. In summary, the update to FY-21, Standard Item, paragraph 3.6.1.1 aligns submarine touch up requirements with the touch-up requirements in the SMS and those for surface ships that have been in use on the waterfront since 2012. SEA 05P2 does not have any examples from surface ships where touch-up coating processes did not retard corrosion for an extended period and avoid full re-preservation in a given availability. As such, aligning the successful surface ship requirements with existing submarine requirements in the SMS and defining the SUPERVISOR as the approval authority for the "local decision" will allow the submarine community to extend tank coating service life to the maximum extent possible using touch up procedures and avoid full tank re-preservation tasks for as long as possible. Finally, the update to FY-21, Standard Item 009-32, paragraph 3.6.1.1 does not alter requirements for touch-up in potable, reserve feedwater, or freshwater drain collecting tanks.

6. CHANGE: <u>Updated Paragraph 3.6.1.4 to allow for touch-up of in-service coatings with any of the authorized coating systems specified in Tables One through 8:</u>

The FY-21 Standard Item 009-32 update to paragraph 3.6.1.4 removes the term "Type IV" from the citation for MIL-DTL-24441 coatings and inserted, "specified in the applicable lines of Table One through 8" in the text. Thus, the updated paragraph 3.6.1.4 now states, "Except for potable, reserve feedwater, and freshwater drain collecting tanks on nuclear powered ships, touch-up of in-service MIL-DTL-24441 and MIL-PRF-23236 paint systems may be performed interchangeably using any of these paints specified in the applicable lines of Table One through 8."

RATIONALE: Since the FY-08, Change 1, Standard Item 009-32, MIL-DTL-24441 Type IV and MIL-PRF-23236 coatings were authorized to be used interchangeably for touch-up of coatings in most tanks (i.e., excluding potable, reserve feedwater, and freshwater drain collecting tanks) and other spaces. It is important to note that the current, FY-20 paragraph 3.6.1.4 retains these requirements, but does not cite MIL-DTL-24441, Type III coatings, but rather includes and exclusionary statement for potable, reserve feedwater, or freshwater drain collecting tanks. As such, the entire paragraph currently does not apply to potable, reserve feedwater, and freshwater drain collecting tanks. Puget Sound Naval Shipyard (PSNS), reviewed the current Table/Line requirements in FY-20, Change 1, Standard Item 009-32 and noted that for some applications like aircraft carrier potable water tanks, appearing in FY-20, Table 8, Lines 1 – 4, there are multiple coatings systems approved for these areas including the rapid-cure, single-coat MIL-PRF-23236, Type VII, Class 9/18 coatings. PSNS then noted that if touch-up of a MIL-DTL-24441, Type III potable water coating could be conducted with a MIL-PRF-23236, Type VII, Class 9/18 coating (i.e., instead of requiring touch up with a MIL-DTL-24441, Type III system), the time to apply the repair coating could be reduced by at least 80% (i.e., five coats of MIL-DTL-24441, Type III with a dry time of at least a day for each coat as compared to one coat of MIL-PRF-23236, Type VII, Class 9/18 that fully cures in less than a day). Because epoxy coatings are inherently compatible with epoxy coatings in a repair/touch-up mode (i.e., SEA 05P2 has no history of intercoat failures between properly cleaned/prepared epoxy surfaces since the FY-08, Change 1, Standard Item 009-32, paragraph 3.6.1.4 touch-up requirements were adopted), the risk of a potable water tank coated with MIL-DTL-24441, Type III being touched-up with a MIL-PRF-23236, Type VII, Class 9/18 coating performing inadequately is LOW. Thus, the change to streamline production creates a LOW risk of adversely affecting water quality or allowing ship corrosion. It is important to note that the updated FY-21, Standard Item 009-32, paragraph 3.6.1.4 update specifically cites "applicable Tables and Lines" and maintains the current exception for "potable, reserve feedwater, or freshwater drain collecting tanks" and as such the proposed change does not affect these tanks because the applicable Table and Line citations for reserve feedwater and/or freshwater drain collecting tanks only allow MIL-DTL-24441, Type III coatings and as such, these tanks must still be touched up with MIL-DTL-24441, Type III coatings.

7. CHANGE: <u>Expands use of low-temperature cure nonskid primer under peel & stick nonskid:</u> The update to FY-21, Standard Item 009-32, Table 2, Line 52, Column B includes a new citation for "ONE FULL COAT PROPRIETARY NONSKID PRIMER LISTED ON THE QPL FOR MIL-PRF-24667 TYPE I, V, VI OR VIII COMP G, 4-6 MILS" that will allow application of MIL-PRF-24667, Type VIII, Composition G nonskid primers qualified for application at a temperature of 35°F as an option for use under peel & stick nonskid systems on aluminum surfaces.

RATIONALE: There are two proposed updates to the FY-21 Standard Item 009-32 that support the FY-20, Change 1, Standard Item 009-23, paragraph 3.1.27.3 requirement to use only peel & stick nonskid on the aluminum island superstructure on LHA/LHD class ships. The FY-20, Change 1, Standard Item 009-32 update was related to the ongoing efforts by the Flight Deck Readiness Working Group to prevent conventional nonskid chips from causing aircraft engine Foreign Object Damage (FOD). The other change related

to FOD prevention appears in the update to the aluminum island superstructure coating requirements appearing below in the Change 20 discussion. The intent of the current, FY-20 requirement to apply only peel & stick nonskid on LHA/LHD island superstructures is to mitigate the risk (i.e., observed on LHA 6, LHD 2, and LHD 5 in the past) of small flakes of conventional nonskid delaminating from the island and blowing onto the flight deck where they could be ingested by aircraft engines causing aircraft engine FOD. The specific FY-21, Standard Item 009-32 change to Table 2, Line 52 expands the allowable primers that can be used under peel & stick nonskid to include MIL-PRF-24667, Type VIII nonskid primers that cure at lower temperatures. By allowing use of nonskid primers that cure at lower temperatures, and citing MIL-PRF-24667 qualified color toppings and MIL-PRF-24635, Type V/VI polysiloxane color toppings that inherently cure at lower temperatures in Column E, contractors will be able to install peel & stick nonskid during cold weather months when it is difficult to control substrate and ambient temperature without expensive environmental containments and controls. Thus, adding MIL-PRF-24667 Type VIII nonskid proprietary, low-temperature cure primers to Table 2, Line 52, Column B in the FY-21, Standard Item 009-32, Table 2, Line 52 for MIL-PRF-24667 Type XI, Composition PS peel & stick applications to aluminum exterior walk areas will reduce costs and compress schedules by eliminating the need for containment and environmental controls when working in cold weather. Because the MIL-PRF-24667, Type VIII, low-temperature cure nonskid systems were qualified on a CVN flight deck (i.e., where the nonskid is subject to impact loads from landing aircraft, heat from engine exhausts, and/or wear from rolling equipment like fork trucks and aircraft), the risk of these primers delaminating or allowing substrate corrosion when applied to the far less challenging environment of an LHA/LHD island superstructure (i.e., the island superstructure nonskid is only subject to periodic foot traffic) is LOW. As described above, Change 20 also discusses changes to FY-21, Table 2, Line 52 requirements to maximize performance of the peel & stick nonskid system on LHA/LHD aluminum island superstructures to minimize the risk of aircraft engine FOD.

8. CHANGE: <u>Included CVN 78 Class Condensate Pump Recessed Areas in the current "MACHINERY SPACES, BILGES & DISTILLING UNIT PANS" requirements to create consistent corrosion-control requirements in these areas that are subject to similar operating conditions and corrosion challenges:</u>
Updated the first column in FY-21, Standard Item 009-32, Table 3, Lines 9 - 13 to add "CVN 78 CLASS CONDENSATE PUMP RECESSED AREA (TO INCLUDE SUMP, TANK TOP, VERTICAL BULKHEADS, MANWAY COVERS AND COAMINGS, AND RAMP SURFACES)."

RATIONALE: HII-NNS submitted the Change 8 proposal because CVN 78 Class aircraft carriers do not have bilges in the sense that other surface ships and CVN 68 Class aircraft carriers have bilges. PMS 312C confirmed the change in carrier design and supported the HII-NNS proposal. HII-NNS described how the CVN 78 innerbottom tank tops serve as deck walking surfaces and that these areas have a condensate pump recess designed to collect drainage like a bilge. The current FY-20, Change 1, Standard Item 009-32 does not include a Table/Line citation for the type of coating system that would be applied to these recesses. Based on service conditions (i.e., CVN 78 class recesses will collect similar fluids to those collected in a bilge), the FY-21, Table 3, Lines 9 -13 citations

for machinery spaces, bilges and distilling pans were updated to include CVN 78 "CVN 78 CLASS CONDENSATE PUMP RECESSED AREA (TO INCLUDE SUMP, TANK TOP, VERTICAL BULKHEADS, MANWAY COVERS AND COAMINGS AND RAMP SURFACES." Thus, HII-NNS, PMS 312C, and SEA 05P2 agree that using the same types of coatings currently required in bilges on CVN 68 class ships on the CVN 78, sumps, tank tops, etc., will reduce the risk of corrosion or premature coating degradation in these areas.

9. CHANGE: Clarified and standardized requirements for nonskid spread rates:
The FY-21 update to Standard Item 009-32, paragraph 3.11.12 includes a new sentence requiring spray applied MIL-PRF-24667, Type IV and Type X, sprayable nonskids to achieve the minimum coverage rates required in the NAVSEA-Reviewed ASTM F718 Manufacturer Product Data Sheet as follows: "The minimum spread rate for Types IV and X (sprayed) must be in accordance with the manufacturer's NAVSEA-reviewed ASTM F718."

RATIONALE: Currently, the FY-20, Change 1, Standard Item 009-32, paragraph 3.11.12 includes only a maximum allowable spread rate for MIL-PRF-24667, Type IV and X sprayable nonskids. The requirement was considered adequate because NRL demonstration testing of spray applied nonskids indicated that workers inherently tried to cover too much area with too little nonskid to conserve material and as such a minimum spread rate was never an issue. However in 2017, contractors spray applied nonskid at rates appreciably lower than the Standard Item 009-32 maximum rate (i.e., far more nonskid was applied per unit area than the maximum allowable spread rate) on the USS MONTGOMERY (LCS 8) and the as-sprayed nonskid was observed forming puddles. The puddles exhibited non-uniform roughness that led the government QA/QC staff to express concerns that the puddled nonskid would not cure properly and would not exhibit an acceptable coefficient of friction throughout the deck life cycle. Currently, the FY-20, Change 1, Standard Item 009-32, paragraph 3.11.12 includes both minimum and maximum spread rate requirements for roller applied nonskids, MIL-PRF-24667 Types I, II, III, V, VI, VII, VIII, IX, and X to achieve the required coating system durability and performance. However, the current FY-20, Change 1, Standard Item 009-32 only states that the maximum spread rate for spray applied nonskid must not exceed 60 square feet per gallon for MIL-PRF-24667 Type IV and X sprayable nonskid coatings but does not include minimum spread requirements. Because SEA 05P2 is expanding the applications for MIL-PRF-24667, Type IV and X sprayable nonskids, establishing minimum application requirements to avoid nonskid puddles on the deck is essential. As such, the FY-21, Standard Item 009-32 update to paragraph 3.11.12 requires that applicators spray apply nonskid at the minimum spread rate defined on the ASTM F718 and to continue to achieve the established maximum spread rate requirement of 60 square feet per gallon. Thus, applicators will be required to spray apply nonskid at the coverage rates that will produce a uniformly rough surface that will provided acceptable performance throughout the life cycle. By citing the ASTM F718 as the source for minimum spread rate requirements, the inherent variations in nonskid aggregate size (i.e., which has a significant influence on the apparent roughness and coefficient of friction of nonskid sprayed in a thicker layer) between different, spray applied nonskids can be accommodated within the new paragraph 3.11.12 requirements. For example, the minimum spread rate of the AST

MS-440GLR coating will be greater than the minimum spread rate of the NCP N-9020 polysiloxane nonskid because the aggregate in the N-9020 is appreciably larger than the aggregate in the MS-440GLR. Thus, the proposed change will prevent nonskid applicators from spraying nonskid at such low spread rates as to create visible puddles and will ensure spray applied nonskid is applied at coverage rates that will ensure the nonskid cures properly with adequate roughness to support effective service throughout the entire deck coating system life cycle.

10. CHANGE: Clarified film thicknesses (DFT) required for each coat of the ICCP Sprayable Dielectric Shield coating system and cited ASTM F718 requirements:
The FY-21, Standard Item 009-32, Attachment D on spray applied dielectric shields includes new DFT range requirements for each coat in paragraphs 4, 6, and 8 as follows:
Paragraph 4 – "Apply primer at 10 – 12 mils DFT."
Paragraph 6 – "Within 5 minutes of completion of the first pass, begin applying the second pass of intermediate coat at 30 - 45 mils DFT."
Paragraph 8 – "Within 5 minutes of completion of the first pass, begin applying the second pass of topcoat at 30 – 45 mils DFT."
In addition to the added DFT range requirements, the proposed update to FY-21, Standard Item 009-32, Attachment D paragraph 4 was also modified to require the coating to be mixed and applied in accordance with the ASTM F718 requirements as follows: "Exclusive of specified DFT range, the primer must be mixed and applied in accordance with the manufacturer's NAVSEA-reviewed ASTM F718."
Finally, added additional comments to the FY-21, Standard Item 009-32, Attachment D, paragraph 19 "Note" as follows: "For dielectric shield coatings follow the NAVSEA-reviewed ASTM F718 for temperatures, cure, and recoat times, regardless of applied per coat DFT."

RATIONALE: The Sprayable Dielectric Shield coating system application procedure in Attachment D was first incorporated into the FY-19, Change 2, Standard Item 009-32. Since this time, only minimum DFT requirements for each individual coats have been provided as well as a maximum total DFT of 100 mils for the total coating system. These limited requirements have caused confusion on the waterfront that resulted in NAVSEA processing DFSs to address inadequate coating thickness and applicators having to rework areas with high total coating system DFTs. Paragraph 4 of the FY-21 Standard Item 009-32, Attachment D was updated to include an average maximum DFT while paragraphs 6 and 8 were updated to include an average maximum thickness for each coat. Thus, the Attachment D updates provide an achievable DFT range for each coat. Providing a DFT range for the individual coats of the ICCP Sprayable Dielectric Shield coating system reduces cost and reduces adverse impacts on the schedule by limiting rework due to high total coating system DFTs. In addition, the current FY-20, Change 1, Standard Item 009-32, Attachment D lacks requirements for recoat/overcoat windows. Incorporating the new requirement into the "Note" section in Attachment D of the FY-21 Standard Item 009-32 will reduce waterfront churn by providing clear requirements for recoat/overcoat windows. Thus, the proposed updates to Attachment D provide more clear, executable requirements for applying spray applied dielectric shields. Recent reports from NSWC-PD indicate that 100% of the spray applied dielectric shields applied using procedures like those describe in this

change on the USS RONALD REAGAN (CVN 76) are intact and adherent after eight years of service and as such the proposed change will extend this success throughout the Fleet.

11. CHANGE: Clarify requirement for accomplishing SSPC-SP 15 cleanliness for surface preparation on tank accesses:
The FY-21 Standard Item 009-32, paragraph 3.1.33 was updated to include "manhole cover gasket seating surfaces."

RATIONALE: Beginning with the FY-14, Change 1, Standard Item 009-32, that was published in November 2013, paragraph 3.1.33 cited the recently published SSPC-SP 15, Commercial Grade Power-Tool Cleaning requirements for surface preparation on bolting rings for tanks, voids, and vent plenums on surface ships. SSPC-SP 15 is different from the historically cited SSPC-SP 11 "Power Tool Cleaning to Bare Metal" in that SSPC-SP 15 does not require complete removal of all staining. SSPC-SP 15 was invoked on "tank, void, and vent plenum bolting rings," because the power tools used to remove all staining from such surfaces in accordance with SSPC-SP 11 requirements could remove enough metal from these surfaces to adversely affect the "flatness" of the surfaces and degrade effective gasket seating. By citing the SSPC-SP 15, that allows "random staining limited to no more than 33 percent of each unit area" to be retained, the rings are subject to less aggressive work with power tools, reducing the risk of coating applicators adversely affecting "flatness" and gasket seating. The proposed FY-21 update to Standard Item 009-32, paragraph 3.1.33 simply expands these established requirements to "manhole cover gasket seating surfaces" that also must remain flat after surface preparation to ensure effective gasket seating. SEA 05P2 has no reports of premature corrosion on bolting rings prepared to SSPC-SP 15 since 2014 and as such the change has not created a corrosion risk. As described in 2014, the inherent corrosion risk in these gasket-seating areas is inherently LOW because the gasket prevents exposure of the coated surface to the system fluid. Thus, by including "manhole cover gasket seating surfaces" in the FY-21 update to Standard Item 009-32, paragraph 3.1.33, the successful surface preparation requirements for surfaces that must remain flat are standardized across platforms and all types of surfaces that will be sealed with a gasket, streamlining waterfront production, and avoiding costly rework of surfaces subjected to excessive much power tool cleaning.

12. CHANGE: Added gravity head tank coating requirements to Note (65):
Added "gravity head tanks" to Note (65) of the FY-21 Standard Item 009-32.

RATIONALE: Historically, Standard Item 009-32 has not included coating requirements for "gravity head tanks." SURFMEPP noted that these tanks are included in many ship fuel oil service systems and that work planners were confused as to which Standard Item 009-32 Table/Line requirements apply to such tanks. During the June 2019 SSRAC meeting, SURFMEPP and the meeting attendees noted the primary issue was whether or not these gravity head tanks required coatings, or could remain uncoated like fuel oil storage, fuel oil service, and diesel service tanks. Because gravity head tanks contain the same clean, stripped fuels as the tanks referenced in the current FY-20, Change 1, Standard Item 009-32, Note (65) the addition of "gravity head tanks" to Note (65) in the FY-21 Standard Item 009-32 clarifies that these tanks also do not require coating. Thus, the proposed change will streamline waterfront work by

allowing planners to uniformly exclude gravity head tanks from Standard Item 009-32 coating requirements.

13. CHANGE: Added requirement for the coating of bilge drain wells on DDG and CG class ships with the same coating used under the AFFF system:
Revised Note (77) of the FY-21 Standard Item 009-32 to state "Bilge drain wells are to be coated with the coating systems for machinery spaces, bilges, and distilling unit pans. The MIL-PRF-32584, Type III coating system for AFFF decks (i.e., under AFFF Proportioning Units) may be applied to bilge drain wells and must be applied to bilge drain wells on DDG and CG class ships."

RATIONALE: In the current, FY-20, Change 1, Standard Item 009-32, Note (77) requires that: "Bilge drain wells are to be coated with the coating systems for machinery spaces, bilges & distilling unit pans. The coating system for AFFF decks (i.e., under AFFF Proportioning Units) may be applied to bilge drain wells." As shown, the note does not specifically address the bilge drain wells on DDG and CG class ships that are typically recessed into the top of a fuel tank. SURFMEPP reported that the bottom of the bilge wells on DDGs and CGs are prone to corrosion because fuel vortices at the mouth of the suction pipe inherently stress the coating. According to the 2019 AEGIS Destroyer Initial Change Proposal (ICP), erosion in DDG class bilge drain wells caused by fluid flow has worn holes in the plating and has caused fuel leaks into machinery spaces. SURFMEPP also noted that the bilge drain wells are at low points in each of the affected spaces, which collect debris that further exacerbates coating erosion in the fluid vortex. To address this issue, SHIPALT DDG-51-83111 replaces the existing carbon steel bilge well bottom plates with either corrosion resistant steel (CRES) or thicker carbon steel plate, and adds sacrificial zinc anodes in the bilge wells to retard localized galvanic corrosion between pipe and the bilge drain well. The SHIPALT includes a requirement to apply two coats of the tradename specific "Enecon Metalclad Ceramalloy CL + AC" at 12-15 mils DFT per coat in these wells. Because this Enecon coating system is qualified to the MIL-PRF-32584, Type III requirements already cited in FY-20, Change 1, Standard Item 009-32, Note (77), expanding the Note (77) text in the FY-21 Standard Item 009-32 update to include "DDG and CG class bilge drain wells" will ensure these areas are coated with MIL-PRF-32584 Type III coatings. SEA 05P2 has no data to support the citation of a tradename specific coating in SHIPALT-51-83111 and notes that all MIL-PRF-32584, Type III qualified products are high-performance epoxy coatings with high levels of ceramic/metallic fillers that inherently resist wear and satisfy the same corrosion control performance requirements. Thus, the proposed change aligns technical requirements in the DDG SHIPALT-51-83111 with the current, FY-20, Change 1, Standard Item 009-32 requirements to apply MIL-PRF-32584, Type III qualified products and avoids citation of a tradename specific coating in Standard Item 009-32. The change will improve corrosion control performance in DDG and CG bilge drain wells by installing inherently thick, wear resistant coatings in the bilge drain wells; will reduce the risk of erosion corrosion in the wells causing hazardous fuel leaks; and will avoid the high costs of weld repairs of corroded plate in these areas in the future.

14. CHANGE: Expanded allowance for retaining preconstruction primer to include MIL-PRF_23236, Type VII, Class x/18, rapid-cure, single-coat coatings:
Removed "single coat applications (MIL-PRF-23236 Type VII Class x/18)" from paragraph 3.1.5 in the FY-21 update to Standard Item 009-32.

RATIONALE: Ever since the FY-12, Change 1, Standard Item 009-32 published in January 2011 that included paragraph 3.1.5 that allowed preconstruction primers to be retained under MIL-PRF-23236, Type VII, two-coat, high-solids coatings, NAVSEA has excluded rapid-cure, single-coat, MIL-PRF-23236 Type VII Class x/18 coatings from application over preconstruction primer. The exclusion was based on earlier National Shipbuilding Research Program (NSRP) projects that simply did not include rapid-cure, single-coat systems in their text matrix and SEA 05P2 observation that the inherent viscosity of rapid-cure, single-coat paints might not penetrate the porous preconstruction primers as effectively as the two-coat, high-solids systems. It is important to note that in 2011, SEA 05P2 had no data to show whether rapid-cure, single-coat paints would, or would not, penetrate preconstruction primer and simply adopted a conservative approach in establishing requirements in FY-12, Change 1, Standard Item 009-32, paragraph 3.1.5 that cited only the two-coat, high-solids systems with demonstrable performance in the NSRP testing as the basis for the Standard Item 009-32 requirement. In March 2014, the NSRP Surface Preparation and Coatings Panel issued the report titled *Compatibility of "Single Coat" Tank Coatings with Retained Pre-construction Primer*, prepared by Elzly Technology Corporation that showed rapid-cure, single-coat paints actually did effectively penetrate preconstruction primer and the resulting system satisfied all MIL-PRF-23236, Type VII, Class x/18 corrosion control performance requirements. Based on the 2014 NSRP report, NAVSEA demonstrated application of rapid-cure, single-coat paints over retained preconstruction primer on the USS JOHN P. MURTHA (LPD 26). In 2018, SURFMEPP reviewed database reports on coating performance in the demonstration tanks on the LPD 26 and determined the rapid-cure, single-coat, paint applied over preconstruction primer, was still intact and adherent. Based on the 2014 NSRP report and the LPD 26 experience to date, the proposed change to the FY-21, Standard Item 009-32, paragraph 3.1.5 to removes "single coat applications (MIL-PRF-23236 Type VII Class x/18)" from the preconstruction primer retention exclusion requirement. It is important to note that the change still excludes retention of preconstruction primer in potable water, reserve feedwater, freshwater drain collecting tanks, and nonskid system applications. SEA 05P2 assesses the risk of premature coating delamination or degradation posed by allowing rapid-cure, single-coat paints to be applied over retained preconstruction primer as shown in the proposed FY-21, Standard Item 009-32, paragraph 3.1.5 update as LOW. By leveraging, the successful transition of NSRP research findings into Standard Item 009-32 requirements, surface preparation costs will be reduced and overall tank coating installation processes will be streamlined on all in-service ships that have new structure coated with preconstruction primer installed in tanks or well deck overheads.

15. CHANGE: Standardized requirement for specifying coating colors to include small boats and craft:
Updated the FY-21 Standard Item 009-32, Note (17) to include "or the SUPERVISOR for small boats and craft."

RATIONALE: Since the FY-01, Change 1, Standard Item 009-32 published in June 2000, the specific interior compartment colors used on each ship were to be specified by the TYCOM or the Ship's Commanding Officer (CO). Historically, the selection of interior colors has been a CO prerogative and the current NSTM 631, Table 631-1-3 also authorizes the CO or TYCOM to choose interior colors. The current, FY-20, Change 1, Standard Item 009-32 includes Note (17) that is called out for steel, aluminum, and wood interior compartments and directs the TYCOM or CO to select the colors in NSTM 631, Tables 631-8-10 and 631-8.11 for use in specific interior compartments. The FY-21, Standard Item 009-32 update to Note (17) addresses the fact that there is no "TYCOM" for small boats and craft and that some small boats are not commanded by an officer (i.e., there is no "CO"). In support of the CNRMC initiative to standardize Standard Item 009-32 requirements, like those appearing in the Note (17) across all platforms, regardless of size, the FY-21, Standard Item 009-32, Note (17) update includes the term "SUPERVISOR for small boats and craft." Thus, the proposed change supports the CNRMC goal of providing consistent, clear requirements across all platforms and allows the TYCOM or CO to continue selecting interior compartment color for ships and the SUPERVISOR to select interior colors for small boats and craft.

16. CHANGE: Expanded allowance for cold weather applications of coatings to the exterior hull of submarines:
Added MIL-DTL-24441, Type IV coatings to Note (45A) of the FY-21 Standard Item 009-32 that allows application of low-temperature cure antifouling coating systems on submarines.

RATIONALE: The current FY-20, Change 1, Standard Item 009-32, Note (45A) requirements for application of low-temperature cure MIL-PRF-24647 qualified antifouling systems to submarines were derived from surface ship requirements that have been included in Standard Item 009-32 since the FY-01, Change 1, Standard Item 009-32 published in June 2000. The allowance to use these MIL-PRF-24667 qualified, low-temperature cure antifouling coating systems was extended to submarines in the FY-18, Change 1, Standard Item 009-32 published in March 2017. Because the original surface ship, low-temperature cure antifouling coating system requirements were based on specific commercial systems, the current Note (45A) cites only commercial, MIL-PRF-24647 qualified, low-temperature cure antifouling systems. SUBMEPP correctly noted that the submarine antifouling coating system application requirements that still appear in current FY-20, Change 1, Standard Item 009-32, Table 6, Line 1, also include an option to apply MIL-PRF-24647 qualified antifouling topcoats over MIL-DTL-24441, Type IV coatings. It is important to note that historically, all commercial, MIL-PRF-24667 antifouling topcoats were required to be qualified over a commercial primer and MIL-DTL-24441 until the February 2005, MIL-PRF-24647D version of the specification that made testing over MIL-DTL-24441 optional. Because the current FY-20, Change 1, Standard Item 009-32 states that the MIL-DTL-24441, Type IV coatings cannot be applied below a temperature of 50 degrees Fahrenheit, even though

the NAVSEA-Reviewed ASTM F718 provides the data that these products are capable of being applied at lower temperatures. Incorporating MIL-DTL-24441, Type IV coatings into Note (45A) for submarines will allow these coatings to be applied at a minimum temperature of 35 degrees Fahrenheit in accordance with the NAVSEA-Reviewed ASTM F718. Thus, the proposed change does not alter the submarine-specific process of still applying MIL-PRF-24647 antifouling topcoats over MIL-DTL-24441, Type IV epoxy primers, but does allows shipyards maximum versatility to apply either commercial, low-temperature cure antifouling coating primers or MIL-DTL-24441, Type IV during cold weather months when it is difficult to control substrate and ambient temperature without environmental containment and controls. This change will reduce costs and adverse impacts on schedule by eliminating the need for containment and environmental controls during application and cure of the antifouling primers and topcoats to submarines. SEA 05P2 rates the risk of antifouling coatings applied over MIL-DTL-24441, Type IV primers delaminating or performing inadequately throughout the service life as LOW because of the historical compatibility of MIL-PRF-24647 antifouling topcoats with MIL-DTL-24441, Type IV primers.

17. CHANGE: Clarified antifouling requirements by revising terminology in Note (68):
Revised Note (68) of the FY-21 Standard Item 009-32 to state "For interior surfaces of stern tubes and extensions, strut barrels, fairwater interiors, shaft flanges (not exposed to seawater) and coupling covers, only apply two coats of anti-corrosive."

RATIONALE: The current Note (68) in the FY-20, Change 1, Standard Item 009-32 states the following: "For interior surfaces of stern tubes and extensions, strut barrels, fairwater interiors, shaft flanges (not exposed to seawater) and coupling covers, do not apply antifouling topcoat." This requirement was first adopted in 2011 as part of the FY-12, Change 1, update to Standard Item 009-32 because SURFMEPP correctly noted that antifouling topcoats are required to be applied to primers that are touch tacky, and stern tubes are small diameter, long spaces that require a worker to crawl on the primer to start applying antifouling topcoat and that workers could not crawl on the tacky surface with damaging the partially cured coating or getting stuck. Unfortunately, HII-NNS noted that the Note (68) language, that has been clear and implemented successfully since 2011, was being interpreted at HII-NNS as waiving only the last coat of antifouling and not waiving application of the previous two coats of antifouling topcoat that are required when CVN underwater hulls are recoated. To clarify the FY-21, Standard Item 009-32 requirements, Note (68) was updated to remove the discussion about not applying "antifouling topcoat" and replaced this section with the new requirement to only apply the two coats of anticorrosive included in the MIL-PRF-24647 qualified antifouling system. The proposed change does not alter the technical requirements and the SSRAC meeting group concurred that if the change will reduce confusion on the waterfront and prevent unnecessary coats of antifouling being applied to the stern tube, the change is warranted. Updating the antifouling terminology in FY-21, Standard Item 009-32, Note (68) will reduce coating application costs in some locations by clarifying existing coating application requirements.

18. CHANGE: Clarified and standardized abrasive blasting surface preparation for aluminum surfaces:
The new surface preparation standard, SSPC-SP 17 "Thorough Abrasive Blast Cleaning of Non-Ferrous Metals," was incorporated into the applicable tables and lines throughout the FY-21 Standard Item 009-32 allowing the current FY-20, Change 1, Standard Item 009-32, Note (89) that explained how to account for the inherent difference in the color/appearance of aluminum corrosion products as compared with the steel corrosion products cited in SSPC-SP 10 to be deleted.

RATIONALE: The FY-20, Change 1, Standard Item 009-32 and all previous versions of the Standard Item 009-32 cited general terms like "NEAR WHITE METAL BLAST USING GARNET OR ALUMINUM OXIDE, MIL-A-21380 TYPE ONE OR MIL-A-22262" as the surface preparation requirement for aluminum. It is important to note that SSPC-SP 10 was not cited in the aluminum blasting requirements because the term "rust" and the description of staining on steel is not applicable on aluminum. Specifically, SSPC-SP 10, "Near-White Metal Blast" cleanliness requirements are specific to steel and include requirements for allowable retaining stains from "rust" and "mill scale" that are shown in associated visual comparators in the characteristic dark red/brown or black color of rusted steel and as such SSPC-SP 10 is simply not applicable to aluminum substrates that exhibit white or gray corrosion products. Recently, coating applicators were misinterpreting the requirements of the FY-20, Change 1, Standard Item 009-32 for aluminum substrates to argue that flight decks were adequately cleaned even though aluminum oxide corrosion product was visibly present on the decks (i.e., SSPC-SP 10 requires removal of all corrosion products, but allows up to 5% retained staining from rust/corrosion and the argument was that the retained corrosion product was staining). Attachment A to this Brief Sheet enclosure, shows the recently published SSPC-SP 17 (i.e., dated 16 Sep 2019) standard that addresses key technical issues like color of aluminum corrosion products and includes a requirement that all oxides are removed and "Random color variations shall be limited to no more than 5% of each unit area of surface . . ." These improved aluminum surface preparation requirements essentially supersede the FY-20, Change 1, Standard Item 009-32 Note (89) that addressed aluminum surface cleanliness and allow the note to be deleted from the FY-21 Standard Item 009-32. Finally, a quick comparison of the surface cleanliness requirements in SSPC-SP 17 and SSPC-SP 10 show both require removal of all visible corrosion products, both require removal of all previously applied coatings, and both allow 5% discoloration or staining. Thus, from the coatings performance perspective, SEA 05P2 rates the risk of coatings applied over an SSPC-SP 17 prepared surface performing differently than coatings applied over surfaces prepared in accordance with the FY-20, Change 1, Standard Item 009-32, Note (89) requirements as LOW. Thus, the addition of the new standard, SSPC-SP 17 to the FY-21 Standard Item 009-32 provides clear, industry standard requirements for surface preparation cleanliness of aluminum substrates that supports the CNRMC goal of reducing waterfront confusion about requirements while reducing life cycle costs by maximizing adhesion of coatings to abrasive blasted surfaces (i.e. reduced risk of coatings applied to surfaces with retained aluminum oxide failing prematurely).

19. CHANGE: Aligned MIL-PRF-24635 coating thicknesses in Standard Item 009-32 with those on the manufacturer's ASTM F718s:
Incorporated changes throughout the FY-21 Standard Item 009-32 to standardize Dry Film Thickness (DFT) when applying MIL-PRF-24635 coatings such that MIL-PRF-24635, Type V and VI, Grade A, B and C, Composition 1 coatings are applied with 2-3 mils DFT per coat, while MIL-PRF-24635, Type V and VI, Grade A, B and C, Composition 2 coatings are applied with 5-8 mils DFT per coat.

RATIONALE: Historically, the Standard Item 009-32 citations MIL-PRF-24635 coatings were based on the DFTs for the silicone alkyd coatings that have been used for decades on Navy ships. These single-component, silicone alkyd coatings are applied in 2-3 mils per coat to release solvent and cure in accordance with the time-temperature curves in the ASTM F718 data sheets. The high-performance, two-component polysiloxane MIL-PRF-24635 Type V and VI qualified coatings were first cited in the FY-17, Change 1, Standard Item 009-32 published in May 2016. These two-component polysiloxane coatings were derived from two-pack epoxy coating chemistries that are inherently higher viscosity than the one-component silicone alkyds and cure to form a thicker film at 5-8 mils DFT. When the MIL-PRF-24635 Type V and VI coatings were added to the FY-17, Change 1, Standard Item 009-32, some of the changes did not consistently update the required DFT. For example, the FY-20, Change 1, Standard Item 009-32, Table 2, Line 46, Column E cites the MIL-PRF-24635 Type V and VI coatings, but retained the 2-3 mil DFT citation from the old silicone alkyd coatings. To address these inconsistent DFT requirements, every citation for MIL-PRF-24635 coatings was reviewed and the type-specific DFT requirements were updated. The topside topcoat DFT issue was also complicated by an interim amendment to MIL-PRF-24635 published on 12 September 2018 that included a new subcategory for "Composition" in section 1.2.4. The "Composition" requirement was added to MIL-PRF-24635 to address the recently developed, single-pack polysiloxane coatings that were successfully demonstrated on the USS ESSEX (LHD 2) in 2018. Thus, the updates to topside topcoat DFT requirements in this changes updates all the Tables of the FY-21 Standard Item 009-32 to include Composition 1 for single-component polysiloxane coatings and Composition 2 for two-component polysiloxane coatings and to align the coating thickness specified with the manufacturer's ASTM F718s. In general, MIL-PRF-24635 Type V and VI, Composition 1 qualified coatings are applied at 2-3 mils DFT and the historically specified MIL-PRF-24635 Type V and VI, Composition 2 coatings are applied at 5-8 mils. Thus, the FY-21 update to Standard Item 009-32 addresses the inherent application thickness differences between single-component and two-component polysiloxane coatings in all applications. The change addresses the CNRMC goal of providing clear, consistent, and achievable technical requirements while reducing total ownership costs.

20. CHANGE: Revised primer requirements for aluminum exterior walk areas:
The FY-21 Standard Item 009-32 update to Table 2, Line 52, Column B adds a requirement for, "ONE FULL COAT PROPRIETARY NONSKID PRIMER LISTED ON THE QPL FOR MIL-PRF-24667 TYPE I, V, VI OR VIII, COMP G, 4-6 MILS," but eliminates the requirement for a stripe coat that had appeared in the FY-20, Change 1, Standard Item 009-32 Table 2, Line 46, Column C (i.e., note that the Lines in Table 2 were renumbered in the FY-21 update).

RATIONALE: The purpose of the proposed change is to maximize the adhesion of the peel & stick nonskid nonskid system applied to aluminum structures like the walking surfaces on LHA/LHD island superstructures to minimize the risk of delaminating conventional roller-applied nonskid coatings in these areas blowing down onto the flight deck and causing aircraft engine FOD. The FY-20, Change 1, Standard Item 009-32, Table 2, Line 46 requirement (i.e., note that there was an appreciable re-numbering of Table 2 between FY-20, Change 1 and FY-21) for applying these coatings, to which the peel & stick nonskid is applied, was to install a stipe coat of epoxy primer followed by a full coat of MIL-PRF-24635, Type V/VI polysiloxane topcoat. The FY-20 requirements were based on U.S. Coast Guard coating practices for walking surfaces on boats and craft that leverage the fact that MIL-PRF-24635, Type V/VI two-component polysiloxane coatings are derived from epoxy coatings and as such exhibit the coating thickness and resistance to water permeation through the film of an epoxy and as such can serve as effective barrier coating without a primer. The application of MIL-PRF-24635, Type V/VI two-component polysiloxane coatings has been successful across the Fleet and SEA 05P2 has had no reports of such coatings systems delaminating in service. However, one manufacturer of MIL-PRF-24635, Type V/VI two-component polysiloxane coatings explained, as part of a recent topside delamination analysis (i.e., in which the polysiloxane topcoat delaminated from an epoxy primer), that their coating was more chemically similar to an acrylic than an epoxy and as such there qualified polysiloxane will not exhibit the same level of adhesion to an aluminum substrate as other qualified MIL-PRF-24635, Type V/VI two-component polysiloxane coatings. To maximize adhesion of the MIL-PRF-24635, Type V/VI two-component polysiloxane coatings used as a substrate for peel & stick nonskid in the FY-21 Standard Item 009-32 update to Table 2, Line 52, the previous requirement for applying just an epoxy stripe coat was expanded to require a complete epoxy primer coat. Thus, the high performance MIL-PRF-24635, Type V/VI, two-component polysiloxane coatings will be applied over a high performance epoxy primer to maximize overall system adhesion and mitigate the risk of coating delamination allowing peel & stick nonskid to come off the aluminum island superstructure and cause aircraft engine FOD to the greatest extent possible.

21. CHANGE: <u>Incorporated small boats and craft into Standard Item 009-32:</u>
Updated paragraph 4.11 of the FY-21 Standard Item 009-32 to state: "Unless otherwise noted, aircraft carrier and small boats and craft are considered surface ships throughout this document."

RATIONALE: The small boats and craft community have not historically utilized Standard Item 009-32 and have not participated in the annual SSRAC meeting. The Technical Warrant Holder for Small Boats and Craft reported that waterfront work planners were not citing Standard Item 009-32 with respect to surface preparation, coating systems selected, and application requirements for small boats and craft. Adding small boats and craft into paragraph 4.11 of the FY-21 Standard Item 009-32 clarifies the applicability of the requirements to all surface ship platforms, will avoid confusion on the waterfront regarding applicability of requirements, and supports achieving the CNRMC goal of providing consistent, clear requirements across all platforms.

22. CHANGE: Clarified nonskid system application requirements for submarines:
The FY-21, Standard Item 009-32 update to Table 6, Line 5, Column D includes a new citation for "ONE COAT PROPRIETARY NONSKID PRIMER LISTED ON THE QPL FOR MIL-PRF-24667 (OF TYPE TO MATCH COLUMN E)" and removes the FY-20, Change 1, Standard Item 009-32 citation for "MIL- PRF-23236, TYPE V OR VI CLASS 5 OR 7, 4 - 8 MILS --OR— ONE COAT AC MIL-PRF-24647, TYPE I OR II, 5 - 7 MILS" primer and also replaces it with "SEE LINE 5." In addition, the FY-21, Standard Item 009-32 update to Table 6, Line 5, Column E eliminates the option to use conventional "MIL-PRF-24667, TYPE I" nonskid and rather cites only "MIL-PRF-24667, TYPE X, COMP G" nonskid that has been qualified for submerged applications.

RATIONALE: Change 22 actually addresses three interrelated issues with the application requirements for nonskid on un-tiled submarine exterior surfaces subject to foot traffic. First, the change eliminates the option to use the MIL-PRF-24667, Type I conventional epoxy nonskids that have been observed to crack, chalk and fade prematurely in submarine service by requiring use of only MIL-PRF-24667, Type X nonskids that are qualified for submerged service. The only currently qualified MIL-PRF-24667, Type X nonskid is a polysiloxane based nonskid that inherently resists chalking, fading, and cracking in sunlight. Second, the change aligns nonskid application requirements on submarines with nonskid application requirements on surface ships by requiring application of the qualified, proprietary nonskid system primer under the nonskid. And finally, the change reduces the number of primer coats that had been required under nonskid to align with the amount of primer installed elsewhere on the submarine hull. Given those three technical issues, the proposed change to the current FY-20, Change 1, Standard Item 009-32, Table 6, Line 5, Column D eliminates the option to apply MIL-PRF-24667, Type I nonskid and allows only MIL-PRF-24667, Type X, Comp G nonskid to be applied. The recently qualified, color stable, MIL-PRF-24667, Type X, Comp D nonskid is based on a polysiloxane chemistry that will not chalk or fade in service and will improve overall nonskid system service life. The current, FY-20, Change 1, Standard Item 009-32, Lines 5 and 6 also required either MIL-DTL-24441, Type IV or MIL-PRF-23236, Type V or VI, Class 5 or 7, or MIL-PRF-24647, Type I or II epoxy anticorrosive coatings. These requirements are atypical in that there is not even an option to apply a proprietary MIL-PRF-24667 nonskid system primer that was qualified as part of the Type X nonskid system. To address this atypical requirement, the FY-21, Standard Item 009-32, Table 6, Lines 5 and 6, Column D is updated to cite only the qualified MIL-PRF-24667, Type X nonskid primer. Finally, the proposed change also streamlines the nonskid installation process by removing the requirement in the FY-20, Change 1, Standard Item 009-32, Table 6, Lines 5 and 6, Column E to apply a "nonskid system," (i.e., the complete "nonskid system" includes primer, a stripe coat, and a nonskid topcoat). By citing the term "nonskid system," the current, FY-20, Standard Item 009-32, Table 6, Lines 5 and 6 requirements resulted in three complete coats of primer and two stripe coats being applied underneath the nonskid topcoat. Given that the currently qualified MIL-PRF-24667, Type X nonskid system is based on a polysiloxane nonskid resin chemistry that inherently enhances overall system corrosion-control performance, there is no technical need for so many primer layers. Thus, the update to FY-21, Standard Item 009-32, Table 6, Lines 5 and 6, Column E

eliminates the term "nonskid system" and simply cites the MIL-PRF-24667, Type X, Comp G nonskid in Column E. Thus, the nonskid layer cited in Column E is required to be applied to the one coat of proprietary nonskid primer as cited in Column D, which is applied over the one stripe coat of primer cited in Column C, which is applied over the one full coat of primer cited in Column B and. In summary, these changes align the amount of primer under the nonskid with the amount of primer required on other areas of the hull (e.g., under the antifouling system); requires use of the qualified proprietary nonskid system primer; and reduces overall nonskid installation job costs by at least 33% (i.e., by eliminating one full primer coat and one stripe coat). The elimination of one primer coat and one stripe coat also reduces overall nonskid system application time by at least four days (i.e., one day to apply each coat and one day to inspect each coat). Thus, the proposed change will streamline waterfront work practices while simultaneously requiring installation of a polysiloxane nonskid that will exhibit an extended service life as compared with the currently applied epoxy nonskids.

23. CHANGE: Added requirements for coating the WSQ-9 recesses on submarines, which have not historically been cited in Standard Item 009-32:
FY-21, Standard Item 009-32, Table 8 was updated to include a new Line 37 for WSQ-9 recesses to require surface preparation to Near White Metal Blast, NACE 2/SSPC-SP 10, followed by a "Single Coat" coating system qualified to MIL-PRF-23236, Type VII, Class 7/18, 20-30 mils, which is then topcoated with commercial, white AF coats. The change also includes a new Note (48A) that states: "Foundation bearing surfaces for the bedplate or outboard transducer array assembly (OTAA) and surfaces of all through bolt mounting holes must be coated with one coat MIL-DTL-24441, Type IV, F-150 at 5 - 7 mils. These surfaces are not to be coated with single coat high solids and DFTs on these surfaces must not exceed 8 mils."

RATIONALE: The addition of Line 37 to Table 8 and Note (48A) of the FY-21 Standard Item 009-32 for WSQ-9 recesses on submarines provides requirements that have not historically been included in Standard Item 009-32. There have been instances in the past in which these recesses on submarines needed to be re-blasted due to fit up issues and had the incorrect coating systems installed and as such, Note (48A) was created to apply the solvent-based MIL-DTL-24441, Type IV coating, that is applied at an inherently thinner layer than the high-solids, rapid-cure, MIL-PRF-23236, Type VII, Class 7/18 coating specified for the other areas around the WSQ-9. SUBMEPP noted that the lack of requirements for coating the WSQ-9 in Standard Item 009-32, even though requirements for coating these areas were recently added to the SMS MS 6310-081-015, was causing confusion on the waterfront. By incorporating the requirements for coating the areas around the WSQ-9 into the FY-21 Standard Item 009-32, the requirements will align documentation and provide consistent requirements on the waterfront. Again, this change addresses the CNRMC goal of providing clear, consistent, and achievable technical requirements while reducing total ownership costs and reducing re-work.

24. CHANGE: Removed requirement for coatings applied to submarine areas requiring black or gray coatings to contain optically active pigments (OAP):
Removed Note (5A) from the FY-21 update to Standard Item 009-32, Table 8, Lines 21, 26, and 27.

RATIONALE: Currently, the areas cited in FY-20, Change 1, Standard Item 009-32, Table 8, Lines 21, 26, and 27 require "single coat" MIL-PRF-23236, Type VII, Class 7/18 coatings. The same lines call out Note (32A) which states that areas visible from above must be topcoated with either gray or black like the rest of the submarine above maximum mean beam. In addition, these lines also cite Note (5A), that requires products used as the primer or applied in a single coat must contain OAP while the touch-up coating is not required to contain OAP. By invoking Note (32A) and Note (5A) in the current FY-20, Change 1, Standard Item 009-32, coating applicators are required to apply two coats of paint, which is not the NAVSEA intent when a "single coat" system is specified. In addition, coating applicators trying to apply a single coat system would find that there are no products qualified to MIL-PRF-23236, Type VII, Class 7/18 that contain OAP in gray or black colors (i.e., all the OAP bearing products are in light pastel shades of blue, green, or white for use in tanks). Thus, the change to remove Note (5A) from Table 8, Lines 21, 26, and 27 of the FY-21 Standard Item 009-32 clarifies the requirements and avoids coatings applicators being forced to apply two coats of paint when a single coat is all that is required.

25. CHANGE: Clarified requirements for antifouling (AF) coats in free flood areas and recesses below upper boottop on submarines:
Removed "same as line 22" from Table 8, Lines 23 through 25, Column F of the FY-21 Standard Item 009-32 and replaced with "2 AF coats MIL-PRF-24647, Type I or II, 4-6 mils/coat."

RATIONALE: The current FY-20, Change 1, Standard Item 009-32, Table 8, Line 22 requires that 2 antifouling (AF) coats of MIL-PRF-24647 Type I or II in red to be applied to specific free flood areas and recesses. When these requirements were included in the FY-11 Standard Item 009-32, that was published in July 2009, the areas listed in this line required the lighter red AF to provide enhanced visibility for the divers when they are inspecting these areas. However, SUBMEPP noted that coating the areas cited in Line 23 through 25 with black AF does not impede diver inspections and will streamline submarine coating work practices. Thus, the FY-21, Standard Item 009-32 update to remove "same as line 22" from Table 8, Lines 23 through 25 are for all other free flood areas and recesses below the upper boottop that are not already listed in the Table 8. Thus, the change clarifies AF coating color requirements for free flood areas and recesses below the upper boottop on submarines and streamlines coating production by allowing black or red antifouling to be applied to these areas while the same color is applied to the surrounding hull.

26. CHANGE: Aligned the number of surface profile readings required for coating applications with nonskid applications to create consistent requirements:
The FY-21 Standard Item 009-32, paragraph 3.10.5 was updated to state; "One profile measurement must be recorded for every 100 square feet for the first 500 square feet; for each additional 1,000 square feet or less, one profile measurement must be taken." The current FY-20, Change 1, Standard Item 009-32 paragraph 3.10.5 requirement for

profile readings in tanks or other areas is as follows; "One profile measurement must be taken for every 200 square feet for the first 1,000 square feet; for each additional 500 square feet or less, one profile measurement must be taken" which is the same as the current FY-20 requirement for profile readings on flight decks shown in paragraph 3.11.4 for nonskid applications.

RATIONALE: Historically, Standard Item 009-32 requirements for coating applications and nonskid applications evolved separately based on changes submitted by different technical communities (i.e., for some reason the waterfront coating industry is segregated between companies that coat tanks/structure and companies that just apply nonskid). SUPSHIP-NNS noted the different requirements for the number of surface profile readings required per unit areas that have evolved over the years for nonskid areas and all other areas and proposed the change to streamline the training of SUPSHIP-NNS staff by creating a uniform requirement. By aligning the requirements for profile readings in the updated FY-21, Standard Item 009-32, paragraphs 3.10.5 and 3.11.4, the training for SUPSHIP-NNS staff can be streamlined by not requiring different numbers of profile readings on the flight deck (i.e., as per paragraph 3.11.4) and the surrounding ship superstructure (i.e., as per paragraph 3.10.5). SEA 05P2 determined that the most valid requirement for profile readings appeared in paragraph 3.11.4 for nonskid because such reading have been found to identify deficient contractor work practices on a regular basis on critical flight deck nonskid jobs and have frequently required the local QA staff to require additional deck surface preparation before nonskid installation. In fact, it was the historical data on high surface profiles measured on nonskid flight deck jobs that motivated the FY-18 update to Standard Item 009-32 to require that 20% of the area on all flight deck nonskid jobs be required to be abrasive blasted to restore the required profile. Since the FY-18 update to Standard Item 009-32, NAVSEA has not observed any cases of nonskid primers delaminating because of deficient surface profile. Thus, the change achieves the CNRMC goal of having consistent requirements whenever possible without appreciably altering the quantity of the surface profile data while also streamlining the training of contractor and government waterfront QA/QC staff.

27. CHANGE: <u>Created new Table/Line citation for submarine GRP surfaces above and below the upper boottop:</u>

The FY-21 Standard Item 009-32, updates Table 6 to include two new lines, (i.e., Lines 12 and 13) for "GRP surfaces above upper boottop" and "GRP surfaces below upper boottop".

RATIONALE: The current FY-20, Change 1, Standard Item 009-32 requirements for exterior areas on submarines shown in Table 6 only include steel and specific GRP surfaces (e.g., "unbooted GRP bow domes above upper boottop). SUBMEPP noted that the very specific GRP requirements in the current FY-20, Change 1, Standard Item 009-32, Table 6 do not include requirements for many of the GRP components mounted to the exterior hull of VIRGINIA-class submarines (e.g. towed array covers, fairwater covers, etc.), and proposed the more general new Lines 12 and 13 to provide coating requirements for these new GRP items on submarines. The addition of new Lines 12 and 13 in Table 6 of the FY-21 Standard Item 009-32 will provide requirements for coating any GRP surfaces using practices similar to those associated with painting unbooted GRP bow domes. Incorporating these requirements into the FY-21 Standard

Item 009-32 for GRP parts on the exterior hull of submarines minimizes risk for damaging such surfaces due to incorrect surface preparation and reduces the potential for waterfront confusion about requirements that could adversely impact the overall submarine coating schedule.

28. CHANGE: Clarified requirements for taking and documenting environmental readings:
The FY-21 Standard Item 009-32 Note (46) was updated to include the sentence "Environmental readings must be taken and documented at the (I) inspection."

RATIONALE: The current FY-20, Change 1, Standard Item 009-32, paragraph 3.10.1.7 requires environmental readings to be taken every 4 hours or at every (G)-point inspection. SUPSHIP-NNS noted that some contractors had argued in the past that the application of Sherwin Williams Fast Clad primer or International THA 787/785 in heavily pitted areas in accordance with Note (46) was not a (G) point and as such did not require environmental readings to be collected and documented. Thus, adding a sentence to the FY-21 Standard Item 009-32, Note (46) stating that environmental readings are required to be taken clarifies the existing requirements and reduces the risk of specialized, penetrating primers being applied when environmental conditions at the time of coating application did not satisfy environmental requirements.

29. CHANGE: Aligned the number of conductivity or chloride readings required for coating applications with nonskid applications:
The FY-21 Standard Item 009-32, paragraph 3.10.6.3 was updated to state; "One reading must be taken for every 200 square feet for the first 1,000 square feet. One reading must be conducted for every additional 1,000 square feet or less," which aligns the number of required surface conductivity/chloride readings for nonskid shown in paragraph 3.11.5. The current FY-20, Change 1, Standard Item 009-32 paragraph 3.10.6.3 requirement for conductivity/chloride readings in tanks or other areas is as follows; "One reading must be taken for every 200 square feet for the first 1,000 square feet. One determination must be conducted for every additional 500 square feet or less."

RATIONALE: Historically, Standard Item 009-32 requirements for coating applications and nonskid applications evolved separately based on changes submitted by different technical communities (i.e., for some reason the waterfront coating industry is segregated between companies that coat tanks/structure and companies that apply nonskid). SUPSHIP-NNS noted the different requirements in these areas that have evolved over the years and proposed the change to streamline the training of SUPSHIP-NNS staff by creating a uniform requirement. By aligning the requirements for the number of conductivity/chloride readings that must be taken in the updated FY-21, Standard Item 009-32, paragraphs 3.10.6.3 and 3.11.5, the training for SUPSHIP-NNS staff can be streamlined by not requiring different numbers of conductivity/chloride readings on the flight deck (i.e., as per paragraph 3.11.5) and the surrounding ship superstructure (i.e., as per paragraph 3.10.6.3). SEA 05P2 determined that the most valid requirement for conductivity/chloride readings appeared in paragraph 3.11.5 because such readings do identify deficient contractor work practices on a regular basis on critical flight deck nonskid jobs and have frequently required the local QA staff to require additional deck cleaning before nonskid installation. In addition, NAVSEA has not observed any cases of nonskid primers delaminating because of chloride/conductivity readings in

excess of requirements (i.e., NAVSEA has not observed osmotic blisters under nonskid). Thus, the new FY-21, Change 1, Standard Item 009-32 paragraph 3.10.6.3 requirements requires one conductivity/chloride reading for every 1,000 square feet instead of the previous requirement for one reading for every 500 square feet which effectively halves the number of required readings. Thus, the proposed change will streamline training and work practices at SUPSHIP-NNS and RMCs without appreciably altering the risk of coatings being applied over surfaces with unacceptable levels of conductivity or chlorides on surfaces.

30. CHANGE: Aligned the number of surface cleanliness dust tape readings required for coating applications with nonskid applications:
The FY-21 Standard Item 009-32, paragraph 3.10.7.1 was updated to state: "One dust tape reading must be taken for every 200 square feet for the first 1,000 square feet; for each additional 1,000 square feet or less, one tape reading must be taken," which aligns the number of required surface cleanliness dust tape readings during coating applications with that during nonskid applications. For example, the current FY-20, Change 1, Standard Item 009-32 requirement for dust tape readings in tanks or other areas as shown in paragraph 3.10.7.1 is as follows; "One dust tape reading must be taken for every 200 square feet for the first 1,000 square feet; for each additional 500 square feet or less, one tape reading must be taken."

RATIONALE: Historically, Standard Item 009-32 requirements for coating applications and nonskid applications evolved separately based on changes submitted by different technical communities (i.e., for some reason the waterfront coating industry is segregated between companies that coat tanks/structure and companies that apply nonskid). SUPSHIP-NNS noted the different requirements in these areas that have evolved over the years and proposed the change to streamline the training of SUPSHIP-NNS staff by creating a uniform requirement. By aligning the requirements for the number of dust tapes that must be taken in the current FY-20, Change 1, Standard Item 009-32, paragraphs 3.10.7.1 and 3.11.6.1, the training for SUPSHIP-NNS staff can be streamlined by not requiring different numbers of dust tape readings on the flight deck (i.e., as per paragraph 3.11.6.1) and the surrounding ship superstructure (i.e., as per paragraph 3.10.7.1). SEA 05P2 determined that the most valid requirement for dust tape readings appeared in paragraph 3.11.6.1 because such data do identify deficient contractor work practices on a regular based and have frequently resulted in the local QA staff to require additional deck cleaning before nonskid installation. Because the paragraph 3.10.7.1 requirement was for two readings per every additional 1,000 square feet, and the paragraph 3.11.6.1 requirement was for one reading for each additional 1,000 square feet, the required number of dust tape readings for coatings applications in the FY-21 update to Standard Item 009-32, paragraph 3.10.7.1 is reduced while the required number of dust tapes for nonskid applications is unchanged. Thus, the proposed change will streamline training and work practices at SUPSHIP-NNS and RMCs without appreciably altering the risk of coatings being applied over dust-contaminated surfaces.

31. CHANGE: Waived stripe coats requirements during final touch-up for all tank coatings:
Updated FY-21, Standard Item 009-32, paragraph 3.2.1 of the FY-21 to include a new waiver of the stripe coat requirement during final touch-up of all tank coatings in all tanks (i.e., including potable, reserve feedwater and freshwater drain collecting tanks) as follows:
"As directed by the SUPERVISOR during final touch-up of all tank coatings including potable water, reserve feedwater, or freshwater drain collecting tanks, stripe coat requirements are waived for individual areas not greater than 1/2 inch in diameter and cumulative areas less than one square foot for each tank or tank work zone."

RATIONALE: Historically, PSNS has experienced production delays when small areas in reserve feedwater tanks were damaged during other tank work (e.g., hanger installation, scaffolding removal, etc.) and required touch up with the solvent-based MIL-DTL-24441, Type III system. Because these touch up areas are inherently small, and even if the areas were uncoated, the tank would still be considered in Excellent (i.e., less than 0.03% coating damage) condition, PSNS proposed reducing the number of coats required for the touch up process to streamline production. For example, PMS 312C, Carrier Planning Activity noted that there are currently likely to be four days built into the schedule for each reserve feedwater tank to support the installation and then the inspection of the two required stripe coats in these small touch-up areas. Thus, eliminating the stripe coat requirement could allow reserve feedwater and other tanks to be returned to service four days faster at the critical, end of the tank coating work process.

In addition to the likely schedule compression, SEA 05V1/PMS 312C also provided a number of historical DFSs, including CVN-72-1076-2017 that was submitted by SUPSHIP-NNS in 2017 that waived the stripe coat on pipe hangers added to a freshwater drain-collecting tank to show that there is precedent for waiving stripe coats in these tanks. The DFS noted that the areas were inherently small at less than 0.02% of the total tank area and that the surfaces to which the full coats were applied were abrasive blasted to ensure that all the surrounding coating was intact and adherent. There are similar stripe coat waivers in DFSs on CVN tanks as far back as a potable water tank on the CVN 72 in 2006.

Given that DFSs have been approved in the past waiving the stripe coat in reserve feedwater tanks, potable water tanks, and freshwater drain collecting tanks, and there are demonstrable adverse effects on ship schedule associated with repairing these small areas with three full coats and two stripe coats, SEA 05P2 assesses the risk of modifying paragraph 3.2.1 to waive the stripe coats in reserve feedwater and other tanks as allowing unacceptable levels of corrosion in a tank or adversely effecting water quality as LOW because:

1. The areas requiring touch up in all tanks (i.e., including potable, reserve feedwater, or freshwater drain collecting tanks on nuclear powered ships) are still going to be coated with a minimum of three coats of MIL-DTL-24441, Type III. Thus, the coating damage discovered at the final coat acceptance checkpoint will still be repaired. Because the stripe coats will not applied in these repair areas, the coatings in these small areas will be thinner than the surrounding coatings, but it will take a considerable period for water to penetrate the slightly thinner coating in the touch-up areas and cause substrate corrosion. Based on historical performance of MIL-DTL-24441, Type III coatings applied with two coats and a stripe, edge

breakdown would be likely only after between five to seven years of service. Thus, for approximately the first third of the proposed tank coating service life, the small areas that will be repaired without the stripe coat would effectively prevent corrosion and ensure negligible impact on water quality.

2. Understanding that the Corrosion Control Assessment and Maintenance Manual (CCAMM), does not apply to potable, reserve feedwater, or freshwater drain collecting tanks on nuclear powered ships; for tanks subject to CCAMM, the inherently small cumulative areas discussed in the change create a LOW risk of degrading overall tank condition to a point where recoating would be required. For example, even if the coatings applied without stripe coats failed prematurely allowing corrosion in the smallest potable water tanks in the fleet (i.e., the 800 gallon potable water tanks on a PC-Class ship), the overall tank would still be considered in Excellent or P1 tank condition (i.e., less than 0.03% of the coating being damaged) even with over two dozen small (i.e., less than ½ inch diameter) areas that were not stripe coated. In fact, even if an entire one square foot of area without stripe coats allowed corrosion in such, a tank the tank would still be rated in Good or P2 condition (i.e., less than 1% of the coating being damaged). Thus, the areas that would not be stripe coated are so small that they inherently pose a LOW risk to overall coating rating even if they areas without stripe coats failed prematurely.
3. The change still notes that the SUPERVISOR must direct the waiver of the stripe coat requirements and as such, the stripe coat will only be waived in the inherently small areas when the schedule would not support conducting repairs in accordance with requirements. Thus, the overall risk of stripe coats being waived is further mitigated by the fact that there will still be numerous jobs where the stripe coat will be applied because the work is not on the schedule critical path.

In summary, accepting the proposed change will reduce the time required to complete critical tank coating jobs without appreciably increasing the risk of the overall tank coating system failing to prevent substrate corrosion or adversely effecting water quality for the life of the tank.

32. CHANGE: Standardized application thicknesses for MIL-DTL-24441 coatings:
Standardized MIL-DTL-24441, Type IV coating thicknesses across Table/Lines at either 4 – 6 mils DFT for general applications or 5 – 7 mils DFT for antifouling applications.

RATIONALE: Historically, MIL-DTL-24441 coatings were applied to myriad surfaces on Navy ships. Currently, in the FY-20, Change 1, Standard Item 009-32, includes requirements for applying MIL-DTL-24441, Type III coatings to areas like potable water and reserve feedwater tanks at a consistent 2 – 4 mils DFT. These requirements are consistent and technically achievable and as such are not changed in the FY-21 update to Standard Item 009-32. However, there is are numerous, different coating thickness requirements for MIL-DTL-24441, Type IV coatings ranging from 2 – 4 mils DFT to 8 mils DFT in the proposed FY-21 update to Standard Item 009-32 for the WSQ-9 Note (48a). To align many of these historical variations in MIL-DTL-24441, Type IV application thicknesses, the requirements in the FY-21 update to Standard Item 009-32 were standardized on the following:

- General applications of MIL-DTL-24441, Type IV will be required to achieve a 4 – 6 mil DFT.
- Antifouling primer application of MIL-DTL-24441, Type IV will be required to achieve a 5 - 7 mil DFT.

Both of these application thickness requirements are achievable with the MIL-DTL-24441, Type IV coatings and have been successfully applied to both surface ships and submarines. The only exception to the thicknesses cited above are the "mist coats" or tie coats of MIL-DTL-24441, Type IV that are applied to address missed overcoat windows or on specific substrates like galvanized steel. These technically unique application requirements will remain at a 1 – 2 mil DFT and are known to represent specialized work practices. By correcting subtle differences in MIL-DTL-24441, Type IV coating thicknesses that had accumulated in Standard Item 009-32 over the years, coating applicator training, QA/QC staff inspection processes, and overall shipyard efficiency can be enhanced. Thus, the change achieves the CNRMC goal of creating consistent work practices that are readily achievable on the waterfront.

33. CHANGE: <u>Eliminated the option to conduct chloride or conductivity tests in paragraph 3.10.6 and throughout the document by requiring only conductivity tests:</u>
Standardized FY-21, Standard Item 009-32, paragraph 3.10.6 and follow requirements by eliminating the option to measure either chlorides or conductivity by requiring only conductivity measurements. All of the requirements for conductivity measurement processes and numerical maximum allowable conductivity levels remain unchanged.

RATIONALE: Historically, SEA 05M1 (R. Parks & Dr. Kaznoff) identified high-solids coatings as a new technology to extend coating service life in the 1990s. When the procedures for applying the coatings at that time were developed, the coatings industry used a "chloride" test to validate that abrasive blasted substrates were not contaminated with salts that would cause the applied high-solids coatings to experience osmotic blistering in service. The chloride test used the Bresle patch to collect a sample and a titration using mercury salts to measure chloride levels. Because of the inherent risks associated with using mercury salts in shipyard setting, NAVSEA rapidly identified conductivity testing that required no wet chemistry as a technically acceptable alternative process. For example, SEA 05P2s earliest Standard Item 009-32 records, from the FY-01 Standard Item 009-32 published in Sep 1999, included a specific requirement to collect both chloride and conductivity data in accordance with paragraph 3.7.2.1 as follows: "Accomplish surface chloride checks and conductivity checks using available field or laboratory test equipment on the freshly prepared surface. These chloride and conductivity checks shall be sampled and/or accomplished in close proximity to each other. These readings shall be recorded for comparison. . . ." Thus, in 1999, NAVSEA was collecting data to on both surface contamination measurement processes. Over time, conductivity readings were proven effective at identifying surfaces contaminated with a wide range of ionic surface contaminants beyond chlorides. For example, a plenum heavily contaminated with exhaust gas residue can exhibit high conductivity from sulfuric acid residue, even if chloride levels satisfy NAVSEA requirements. NAVSEA also completed a Paint Center of Excellence (PCOE) project looking at surface contamination measurement processes that showed how modern conductivity measurement equipment have streamlined data collection and eliminated many of the risks associated with the original chloride

measurement processes used in the 1990s. As such, NRL proposed eliminating the chloride measurement option from the FY-21 Standard Item 009-32 at the June 2019 SSRAC meeting. Unfortunately, during the SSRAC discussion period, some coating application contractors expressed a preference for using a commercial, chloride measurement kit and claimed the use of the kits represented the lowest cost option for the government. To resolve this issue, CNRMC (Hirschman) directed SEA 05P2 to conduct a business case to determine if the chloride measurement process represented the lowest cost to the government. Attachment B summarizes the business case analysis that shows the material costs and time required to conduct both chloride and conductivity tests using a range of kits and equipment. As shown in Attachment B, the lowest cost option to the government is difficult to assess because of the different equipment costs, but it is apparent that the highest cost to the government is associated with the chloride test kits. Thus, eliminating the option to conduct chloride tests accomplishes the following:

1. Standardizes and simplifies requirements by eliminating the option to take chloride measurements when conductivity readings were high as per the FY-20, Change 1, Standard Item 009-32, paragraph 3.10.6.4 that states:
   "If the chloride levels do not exceed the requirements in 3.10.6.3, the measurement passes the conductivity/chloride check."
2. Simplifies worker and QA/QC staff training by using simple, electrochemical tools to measure conductivity as opposed to the chloride measurement kits that still require mixing of reagents, but that contain the reagents in a glass tube similar to the glass tubes used in Draeger pumps to measure atmosphere quality. Thus, the risk of exposing workers to chemical reagents is reduced, but the kits produce sharp glass waste when the ends of the glass tubes are broken off.
3. Reduces the risk to the Navy of surfaces high in ionic contaminants (e.g., sulfuric acid, or alkaline bilge cleaners in CVNs), that would "pass" a chloride check, blistering or delaminating in service. NSWC-PD is currently conducting a PCOE project on bilge cleaners that will actually quantify the frequency at which surfaces that "pass" chloride requirements would not satisfy conductivity requirements.

Thus, the change achieves the CNRMC goal of creating consistent, simplified work practices that are readily achievable on the waterfront while also improving the service life of coating systems applied on Navy ships by mitigating the risk of premature coating failure by osmotic blistering or delamination of coatings applied over high levels of ionic contamination.

009-06 Maintaining Protection and Cleanliness from Non-Radioactive Operations; accomplish

3.2.3 Checkpoint Deleted (V)"VERIFY PROTECTIVE MEASURES"

3.2.3 Changed “All to “Ensure”

3.2.5 Added at beginning of paragraph, “Ensure”

3.5 Checkpoint Deleted (V) (G) "FINAL CONTAMINATION/DAMAGE INSPECTION"

3.5 Added for clarification, “Identify any presence of contamination or damage created by contamination producing operations”.

009-25 Structural Boundary Test; accomplish

3.1 Checkpoint Deleted (I) (G) “COMPLETION AIR TEST”

3.1.6 Checkpoint Deleted (I) “UNOBSTRUCTED FLOW”

3.1.7 Checkpoint Deleted (V) “VISUAL INSPECTION”

3.1.8 Added, 3.1.8 Submit one legible copy, in approved transferrable media, reporting the results of the test listing the requirements of 3.1 through 3.1.7 to the SUPERVISOR.

3.2 Checkpoint Deleted (I) (G) “RUNNING AIR TEST"

3.2.7 Checkpoint Deleted (I) "UNOBSTRUCTED FLOW"

3.2.8 Checkpoint Deleted (V) "VISUAL INSPECTION"

3.2.9 Added, 3.2.9 Submit one legible copy, in approved transferrable media, reporting the results of the test listing the requirements of 3.2 through 3.2.8 to the SUPERVISOR.

3.3 Checkpoint Deleted (I)(G) “AIR HOSE TEST"

3.3.4 Added, 3.3.4 Submit one legible copy, in approved transferrable media, reporting the results of the test listing the requirements of 3.3 through 3.3.3 to the SUPERVISOR.

3.4 Checkpoint Deleted (I)(G) “WATER HOSE TEST"

3.4.3 Added, 3.4.3 Submit one legible copy, in approved transferrable media, reporting the results of the test listing the requirements of 3.4 through 3.4.2 to the SUPERVISOR.

3.5 Checkpoint Deleted (I)(G) “VACUUM BOX TEST"

3.5.4 Added, 3.5.4 Submit one legible copy, in approved transferrable media, reporting the results of the test listing the requirements of 3.5 through 3.5.3.2 to the SUPERVISOR.

3.6 Checkpoint Deleted (I)(G) “COFFERDAM TEST METHOD”

3.6.6 Added, 3.6.6 Submit one legible copy, in approved transferrable media, reporting the results of the test listing the requirements of 3.6 through 3.6.5 to the SUPERVISOR.

3.7 Checkpoint Deleted (I)(G) “CHALK TEST” (SEE 4.2)

3.7.4 Added,3.7.4 Submit one legible copy, in approved transferrable media, reporting the results of the test listing the requirements of 3.7 through 3.7.3 to the SUPERVISOR.

009-26 Deck Covering; accomplish

3.8 Checkpoint Deleted (I) "VISUAL INSPECTION" (See 4.3)

3.8 Added to the end of paragraph (See 4.3)

3.9.3.3 (G) Checkpoint Deleted, Keeping the (I) and original paragraph.

009-32 Cleaning and Painting Requirements; accomplish

3.10.1 Checkpoint Deleted (V) "ENVIRONMENTAL READINGS"

3.10.1.11 Added, 3.10.1.11 Critical coated areas environmental requirements will be documented in accordance with paragraph 3.7.1.

3.11.2 Checkpoint Deleted (V) "ENVIRONMENTAL READINGS"

3.11.2.4 Added, 3.11.2.4 Environmental requirements will be documented in accordance with paragraph 3.7.1.

009-47 Gate Valve; repair

3.3.4.1 Checkpoint Deleted (I) or (V) “INSPECT CONTACT” (See 4.3)

009-52 Relief Valve; repair

3.3.2.1 Checkpoint Deleted (V) "INSPECT CONTACT"

009-53 Bolted Bonnet, Globe, Globe Angle, and Globe Stop Check Valve Shop Repair; accomplish

3.2 Added to the end of paragraph …” in accordance with Chapter 6 of 2.4.”

3.2.3 Checkpoint Deleted (I) "LIQUID PENETRANT INSPECT"

3.2.3 Delete, 3.2.3 Accomplish liquid penetrant inspection of each hard -faced seat (including back seat), and discs, in accordance with 2.2.

3.2.3.1 Deleted, 3.2.3.1 Acceptance criteria must be in accordance with Paragraph 7 of 2.3, except hairline cracks in hard faced areas of seats and discs are acceptable provided the valve does not show evidence of leakage.

3.3.4.1 Checkpoint Deleted (I) or (V) "INSPECT CONTACT” (See 4.3)

009-55 Regulating/Reducing Valve; repair

2.4 Added reference, 2.4 S9253-AD-MMM-010, Valves, Traps, and Orifices (Non-Nuclear)

3.2.1 Checkpoint Deleted (I) "LIQUID PENETRANT INSPECT"

3.2 Added at the end of paragraph,… in accordance with Chapter 6 of 2.4.

3.2.1 Deleted, 3.2.1 Accomplish liquid penetrant inspection of hard faced each metallic seat and disc in accordance with 2.1.

3.2.1.1 Deleted, 3.2.1.1 Acceptance criteria must be in accordance with Paragraph 7 of 2.2, except hairline cracks in hard faced areas of seats and discs are acceptable provided the valve does not show evidence of leakage.

3.3.4.1 Checkpoint Deleted (V) "INSPECT CONTACT"

009-58 Pump and Driver Shaft Alignment; accomplish

3.2 Checkpoint Deleted (V) "INSPECT PIPING ALIGNMENT PRIOR TO REMOVAL"

3.2.1 Added,3.2.1 Submit one legible copy, in hard copy or approved transferrable media, of a report listing results of the piping alignment check to the SUPERVISOR within 3 days of completing the disassembly alignment check.

009-71 Piping System; test

3.2 Checkpoint Deleted (V) "STATIC TEST"

3.3 Checkpoint Deleted (V) (G) "OPERATIONAL TEST"

3.4 Checkpoint Deleted (V) (G) "OPERATIONAL TEST"

3.5 Added,3.5 Submit one legible copy, in approved transferrable media, reporting the results of the test listing the requirements of 3.2 through 3.7.3, including local(s) of the new and disturbed gravity drain/new and disturbed sounding tube piping to the SUPERVISOR.

009-84 Threaded Fastener Requirements; accomplish

3.1.2 Checkpoint Deleted (V) "INSPECT FASTENER"

3.1.3 Added reference paragraph from section 2, 3.1.3 Fasteners larger than 1/2-inch nominal diameter must be retained for reuse to the maximum extent possible. Reuse existing fasteners if the acceptance criteria of Attachment A and paragraph ***075-8.2*** and 075-8.3 of 2.2 are met.

009-104 Vibration Testing and Analysis; accomplish

3.2 Checkpoint Deleted (V) (G)"TESTING AND ANALYSIS"