DEPARTMENT OF THE NAVY
NAVAL SEA SYSTEMS COMMAND
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IN REPLY REFER TO
9505
Ser 05Z/183
15 Apr 24

From: Commander, Naval Sea Systems Command (SEA 05Z)
To: Commander, Naval Sea Systems Command (SEA 05V)

Subj: LIMITED APPROVAL OF MECHANICALLY ATTACHED FITTINGS AND PRESS CONNECT FITTINGS FOR USE ON CVN 68 CLASS AND CVN 78 CLASS SHIPBOARD PIPING

Ref: (a) Mil-Std-777, Revision F - Schedule of Piping, Valves, Fittings, and Associated Piping Components for Naval Surface Ships
(b) ASTM F1387 - Performance of Piping and Tubing Mechanically Attached Fittings
(c) S9086-RK-STM-010/505, Revision 6 - Naval Ships' Technical Manual, Chapter 505 Piping Systems
(d) S9AA0-AB-GOS-010, Revision 10 - General Specifications for Overhaul of Surface Ships (GSO)
(e) ASTM F3226 - Metallic Press-Connect Fittings for Piping and Tubing Systems
(f) NAVSEA ltr 9505 Ser 05Z/181 of 14 Apr 22
(g) NAVSEA Drawing No. 802-7094322, Revision - Aircraft Carrier CVN 77 Schedule of Piping, Valves, Fittings and Associated Components
(h) NAVSEA Drawing No. 802-7094536, Revision B Aircraft Carrier CVN 78 Schedule of Piping, Valves, Fittings and Associated Components

1. Purpose. Provide limited approval for use of mechanically attached fittings (MAF) for CVN 77 and CVN 78 Class Aircraft Carriers, as well as limited approval for press connect fittings (PCF) for use on all CVN 68 and 78 Class new construction and in-service CVNs, including during Refueling and Complex Overhaul (RCOH).

2. Scope and Applicability. This document does not apply to Naval Nuclear Propulsion plant systems, equipment, and facilities under the cognizance of the Deputy Commander, Nuclear Propulsion Directorate (SEA 08). In addition, this document does not supersede or modify existing agreements between SEA 08 and SEA 05 regarding changes to non-reactor plant items in nuclear powered vessels, which require SEA 08 concurrence. Additionally, this document does not apply to Strategic Weapons Systems and Attack Weapon Systems and associated spares and repair parts under the cognizance of Strategic Systems Programs (SSP).

3. Background. MAFs and PCFs provide an effective alternative to welded piping connections for some shipboard applications. MAFs and PCFs are currently approved for use on U.S. Navy Non-Nuclear Surface Combatants for both new construction and in-service repair; additionally, MAFs are currently approved for CVN 68 through CVN 76 in service repair, including RCOH. There are limitations in place for PCFs, primarily due to press-connect fitting liabilities with respect to shock resistance, fire resistance, vibrations, flexure fatigue and axial pull-out resistance. In comparison, MAFs do not have such liabilities and are approved for a much broader use on U.S. Navy Non-Nuclear Surface Combatants and CVN 68 through CVN 76 per reference (a). CVN 77 and CVN 78 Class ships Project Peculiar Documents (PPDs) do not allow the use of MAFs. Neither CVN 68 nor CVN 78 classes have guiding documents that allow the use of PCFs.

4. Discussion

a. CVN piping repair and construction activities can benefit from strategic use of both MAFs and PCFs. Current approvals for MAFs in reference (a) are those that meet the requirements listed in reference (b) and its supplementary requirements in whole, and reference (c) for use on U.S. Navy Non-Nuclear Surface Ships and CVN 68 through CVN 76 ships. Approved MAFs can facilitate repairs and alterations as per reference (d). Current approvals for PCFs meeting the requirements of reference (e) and the supplemental testing identified in reference (b), except for supplemental tensile testing (test A7) and fire testing (test S7) of reference (b), are defined in references (a) and (f) for use on U.S. Navy Non-Nuclear Surface Ships. Reference (f) provides limited approval of the Viega Mega-Press® pipe couplings that have met the requirements in reference (e) and the supplemental testing identified in reference (b), with the exception of supplemental tensile testing (test A7) and fire testing (test S7) of

reference (b). The actions in Sections 5 and 6 will extend the guidance provided for non-nuclear surface ships to both the CVN 68 and CVN 78 classes.

b. MAFs and PCFs provide potential time savings and eliminate the need for hot work to install the fitting. Each type of fitting has limitations where it can be used per references (a), (c) and (f) as applicable. In addition to limitations stemming from tests and approvals, both types of fittings are limited in the extent they can be used throughout a system due to the increased weight and joint stiffness. Excessive use in a specific system can lead to the need for additional piping flexibility and hanger analysis, therefore, the Supervisor must be conscious of the number of MAFs and PCFs used during a repair or construction evolution.

c. Based on the existing approvals detailed in reference (a) for non-nuclear surface ships and CVN 68 thru CVN 76 ships, those fittings that meet the criteria of reference (b) and its supplementary requirements in whole, and further constrained by usage restrictions identified in reference (c) may be used on the following systems, that are identified by the piping categories indicated within associated brackets and defined by references (g) and (h) as applicable, for the CVN 77 and CVN 78 class, unless otherwise noted. Only approved MAFs that have passed fire test requirements of reference (b) may be used where fire-hardened fittings are required, in copper and copper-nickel piping that do not allow silver-brazed fittings, or in sewage collection, holding, and transfer systems. Approved MAFs may be used for repairs and alterations as per reference (d).

(1) Steam, steam drains and returns (only for CVN 77) [A-8 and A-10].

(2) Feed systems (only for CVN 77) [B-1].

(3) Freshwater, including chilled water, condensate, electronic freshwater cooling, potable water, and gas turbine washdown [C-1 and C-2].

(4) Seawater (excluding Firemain) [D-1, D-2, D-3, D-4 and D-5].

(5) Lubricating oil [F-1].

(6) Steam Catapult, hydraulic oil [G-1 and G-2].

(7) Hydraulic oil - other than steam catapult [G-3, G-4, G-5, G-6 and G-7].

(8) Gasoline, cleaning fluids [H-1 and H-2].

(9) Air and nitrogen [J-1, J-2, J-3, J-4, and J-5].

(10) Cooling for electronic equipment and diesel engine - ethylene and propylene glycol, freshwater and demineralized water [L-1 and L-2].

(11) Seawater-washdown countermeasure system [M-1].

(12) Contaminated drains, weather deck drains, bilge, and oily water drains [R-1].

(13) Plumbing Drains and vents, interior space deck drains, and AC condensate drains [R-3].

(14) Sewage collection, holding, and transfer (CHT), non-oily wastewater treatment [R-4].

(15) Aqueous film-forming foam (AFFF) concentrate and AFFF/SW solution [S-1].

d. Based on the existing approvals detailed in references (a) and (f) for non-nuclear surface ships, those fittings that meet the criteria of references (e) and supplemental testing identified in reference (b), with the exception of supplemental tensile testing (test A7) and fire testing (test S7) of reference (b) may be used on the following systems, that are identified by the piping categories indicated withing associated brackets and are defined by CVN

68 class ship's specification and references (g) and (h) as applicable, for the CVN 68 and CVN 78 classes, unless otherwise noted. Viega Mega-Press® PCFs are subject to further usage restrictions identified in reference (f). Also, PCFs are not approved for use where fire-hardened fittings are required, in copper-nickel piping that do not allow silver-brazed fittings, nor in sewage collection, holding, and transfer systems.

(1) Freshwater, including chilled water, condensate, electronic freshwater cooling, potable water, and gas turbine washdown [C-1 and C-2].

(2) Seawater (excluding Firemain) [D-2, D-3 and D-4].

(3) Cooling for electronic equipment and diesel engine - ethylene and propylene glycol, freshwater and demineralized water [L-1 and L-2].

(4) Seawater-washdown countermeasure system [M-1].

(5) Weather deck drains and other drains [R-1, except for contaminated drains, weather deck drains subject to fuel spillages, bilge, and oily water drains].

(6) Plumbing Drains and vents, interior space deck drains, and AC condensate drains [R-3].

5. Actions

a. SEA 05V shall update the appropriate Project Peculiar Document (PPD) for affected CVNs.

b. SEA 05Z has the action to update references (a) and (c) to allow the use of MAFs for affected CVNs.

c. SEA 05Z has the action to update references (a), (c) and (d) to allow the use of PCFs based on requirements from reference (f) on both new construction and in-service U.S. Navy Surface Combatants and affected CVNs.

6. Point of Contact. NAVSEA point of contact for this letter is Jacob Munch, jacob.j.munch2.civ@us.navy.mil, 202-781-4988.

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