DEPARTMENT OF THE NAVY
NAVAL SEA SYSTEMS COMMAND
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IN REPLY REFER TO
9070
Ser 05Z/248
22 May 24

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

Subj: GUIDANCE ON IDENTIFICATION AND INSTALLATION OF LOW RISK ADDITIVELY MANUFACTURED METAL COMPONENTS

Ref: (a) NAVSEA Technical Publication S9074-A4-GIB-010/AM-WIRE DED of 27 May 21
(b) NAVSEA Technical Publication S9074-A2-GIB-010/AM-PBF, Rev 1 of 19 Jan 24
(c) NAVSEA ltr 4870 Ser 05T/2018-024 of 17 Aug 18
(d) NAVSEA ltr 5100 Ser 05/098 of 12 Dec 22
(e) NAVSEA ltr 9074 Ser 05Z/223 of 8 May 24
(f) NAVSEA Technical Publication S9074-AR-GIB-010A/278, Change A of 14 Feb 13
(g) NAVSEA Technical Publication T9074-AD-GIB-010/1688 of 13 Jul 12
(h) MIL-STD-1689A of 23 Nov 90
(i) NAVSEA 0948-LP-045-7010, Revision 3 of Apr 05
(j) MIL-STD-777F of 13 Feb 18
(k) NAVSEA DWG 6983987 - NSSN Class Submarine Drawing Approval Procedure
(l) NAVSEAINST 5400.95G (Series)
(m) COMUSFLTFORCOMINST 4790.3D, Joint Fleet Maintenance Manual, Change 2 of 31 Mar 22

1. Purpose

a. This letter supersedes NAVSEA ltr Ser 05Z/191 of 31 May 2023, due to the change to Distribution Statement A and clarification of Non-Destructive Test (NDT) criteria requirements, with other minor clarifying modifications.

b. This correspondence provides interim process guidance on the identification of low risk Additively Manufactured (AM) metal parts/components for use on Naval Sea Systems Command (NAVSEA) cognizant platforms. This guidance supersedes references (a) and (b) and portions of reference (c), pending the revisions to align to the requirements herein. Promulgation of this correspondence shall facilitate more rapid approval and fielding of AM parts in order to reduce industrial base and logistics risks, as well as provide the enterprise with experience in AM parts of lower risk applications in order to provide a technical foundation for more extensive AM use.

2. Scope and Applicability

a. 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.

b. 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

a. Reference (c) provides guidance to NAVSEA on the use of AM. Per reference (c), the Waterfront Chief Engineer (CHENG) or the Ship's Commanding Officer can approve locally the manufacture and installation of a part or component assessed as Severity Level 7 or N/A. References (a) and (b) do not apply to Severity Level 7 or N/A parts.

b. Severity Level 7 is defined in reference (d) as "Results in injury/illness resulting in no lost workdays; or damage exceeding $25K; or minimal environmental damage, requiring no restoration."

c. Per reference (d), low risk is assigned to any Severity Level 7 with a probability of D or lower. The qualitative definition for Probability D for a specific, individual item is likely to occur infrequently in the life of an item.

d. While reference (c) and (d) provide authorization and identification of low criticality components, this letter expedites identification of low risk components (i.e., overall low risk based on criticality and probability of failure) and invokes requirements rigor accordingly.

4. NAVSEA Discussion. This letter eliminates the risk assessment requirement of reference (c) for low risk AM parts/components; NAVSEA has assessed components meeting the criteria herein as low risk AM parts/components to manufacture and install. Low risk criteria are defined herein as parts/components that meet one of the characteristics of paragraph 4a that also comply with paragraphs 4b and 4c of this letter. As a result of these parts/components being considered low risk, and consistent with references (a), (b), and (c), material and/or process qualification, part verification, and production testing specified in references (a) or (b) is not required. However, production and conformance test requirements as well as environmental qualification requirements invoked on the existing part/component per the appropriate procurement specification, drawing, or other acquisition document must be satisfied to verify the AM part meets or exceeds existing design requirements and expected performance. For example, if a component is made from wrought material with a commercial specification which includes conformance requirements for yield strength, ultimate tensile strength and minimum percent elongation, the AM component shall be verified through testing of the component itself or witness coupons to meet the drawing material requirements. Where NDT is required by procurement specification, drawing, or other acquisition document, the reference (e) acceptance criteria shall be used. For instances where the low risk part/component criteria are met and the guidance of this paragraph is followed, NAVSEA installation activities and Ship's Commanding Officers are delegated approval authority for the use/installation of these AM components.

a. Low Risk Identification Characteristics. The substitute AM component should have the same form, fit, function and interchangeable material properties as the currently approved part. One of the following characteristics and/or criteria must be met to be considered a low risk component:

(1) Reference (f) Machinery (Class M), Category C components. Non-essential items made of any product form (e.g. rolled plate, weldment, forging, wrought, etc.) (see reference (f), section 3.3.2). Includes parts of components in Categories A (safety and mission of Ship) and B (normal operation of the ship) that do not transmit the principal operating load or support any type of pressure boundary.

(2) Reference (f), Table XIII, Category 1, Sub-Category D4 non-pressure containing castings in machinery or pressure vessels: statically loaded castings other than Category 1-A, B, or C.

(3) Reference (f), Table XIV, Category 2, Sub-Category J pressure containing machinery or pressure vessel castings: castings not covered by other Category 2 application rules and where only pressure testing and Visual Testing (VT) are required.

(4) Reference (f), Table XV, Category 3, Sub-Category I pressure containing piping system castings – valves, fittings, flanges, and auxiliary equipment castings not covered by other Category 3 application rules and where only pressure testing and VT are required.

(5) Minor Structure (Submarines). Defined as structure involving materials other than High Yield and High Strength Low Alloy, the possible failure of which is remote and would not result in danger to ship personnel, shipboard components, or equipment, or other submarine structure per paragraph 3.33.3.1 of reference (g).

(6) Minor Structures (Surface Ships and Aircraft Carriers). Minor Structures, though not explicitly defined as such in reference (h), shall be considered to be those assemblies, the possible failure of which is remote and would not result in danger to the ship personnel, shipboard components, or equipment. Minor structure shall be synonymous with those items listed within 4.2 of reference (h) normally requiring no welding procedure qualification testing for welding of such assemblies.

b. Exclusions. The following attributes and systems are excluded from the low risk definition:

(1) SUBSAFE.

(2) Level I Applications per reference (i).

(3) Fly By Wire.

(4) Deep Submergence System, Scope of Certification.

(5) SEA 08 Cognizant Systems.

(6) Steam Systems.

(7) Strategic Systems Programs.

(8) Seawater systems.

(9) Lubrication oil systems.

(10) Combustible fluid systems.

(11) Fire protection systems.

(12) Components with fire-hardened fitting requirements per reference (j).

(13) Turbine, gear, and blower applications.

(14) Operating temperature greater than 200 degrees Fahrenheit.

c. Low Risk Metal AM Processes. The following AM processes must be used for an AM part to be considered low risk:

(1) Powder Bed Fusion.

(2) Wire Directed Energy Deposition (DED).

d. Private Contractor Agents. Program Offices should encourage their respective Design, Planning, or Executing Agents to consider utilizing AM for the low risk applications described in paragraphs 4a, 4b, and 4c. Design, Planning, or Executing Agents shall follow established deviation request procedures invoked by contract or specification (e.g., reference (k)). Deviation requests shall provide the applicable objective quality evidence that paragraphs 4a, 4b, and 4c of this letter are satisfied.

e. AM Part Installation Tracking. NAVSEA installation activities and Ship's Commanding Officers shall submit a (temporary or permanent) Departure from Specification (DFS), per reference (l) or (m), and select "Additive Manufacture" as the DFS Basis. Activities providing private contractor oversight shall retain any approval authority as invoked by contract. Design/Planning/Executing Agents are requested to provide the authorizing document tracking number, ship class, and hull number for all AM parts installed per the guidance of this letter to NAVSEA_AM@us.navy.mil, within two weeks of authorization.

f. Enterprise Benefit. While it is currently not possible to reliably estimate the potential benefit of this endeavor, any effort that has the potential to alleviate material and part shortages and supply base challenges must be pursued by the enterprise. Additionally, experience and lessons learned by the enterprise through this initiative will help facilitate a more sound technical foundation for utilizing AM parts and components in more critical systems. Activities are requested to leverage this guidance to maximum extent practical.

5. NAVSEA Action

a. NAVSEA technically approves the assessment of risk as Low for part/components as characterized by paragraph 4 of this letter.

b. NAVSEA waives references (a) and (b) requirements, per paragraph 4, until they are revised to align with the requirements of this letter.

c. NAVSEA supersedes reference (c), enclosure (2), paragraphs 2b, 5, 7, 9, 11d, and 11e and Figure E-1 per paragraph 4 of this letter.

d. NAVSEA delegates approval authority to NAVSEA installation activities and Ship's Commanding Officers to use/install AM components where the low risk part/component criteria are met and the guidance of paragraph 4 is followed.

6. Request for Action. Design/Planning/Executing Agents are requested to provide the authorizing document tracking number, ship class, and hull number for all AM parts installed per the guidance of this letter to NAVSEA_AM@us.navy.mil, within two weeks of authorization.

7. Active Contracts. The guidance of this letter does not authorize any change in the terms, conditions, delivery schedule, price, or amount of any other Government contract. In the event that you consider

these requirements represent a change for which you are entitled to an equitable adjustment, you are to comply with the requirements of the "Notification of Changes" clause of the contract.

8. Program Executive Officers for Ships, Attack Submarines, Strategic Submarines, Unmanned and Small Combatants, and Aircraft Carriers have concurred to this letter and have accepted the risk of installation of low risk metal AM components defined herein by NAVSEA installation activities and Ship's Commanding Officers on their platform without further review or approval required.

9. Points of Contact. NAVSEA points of contact for this letter are Dr. Justin Rettaliata, AM Technical Warrant Holder, 202-781-5312, justin.m.rettaliata.civ@us.navy.mil and Mark Massie, mark.h.massie.civ@us.navy.mil, 202-781-2425.

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