DEPARTMENT OF THE NAVY
NAVAL SEA SYSTEMS COMMAND
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IN REPLY REFER TO
4855
Ser 04Q/184
13 Nov 24

From: Commander, Naval Sea Systems Command (SEA 04Q)
To: Distribution

Subj: NAVAL SEA SYSTEMS COMMAND NONDESTRUCTIVE TESTING QUARTERLY NEWSLETTER

Ref: (a) NAVSEA ltr 4855 Ser 04Q/128 of 2 Aug 24

Encl: (1) NAVSEA NDT Quarterly – Audit Lessons Learned

1. Purpose. This letter distributes enclosure (1) to activities that perform nondestructive testing (NDT) per Naval Sea Systems Command (NAVSEA) standard requirements.

2. Background. NAVSEA Oversight and Assessment Division (SEA 04Q) issues periodic NDT newsletters to naval activities and shipbuilders, to be shared with the vendor base, communicating lessons learned as well as trending noncompliances identified during NDT audits. The newsletter also provides NDT program management fundamental philosophies and best practices, as well as NDT examiner roles and responsibilities.

3. Discussion

a. Reference (a) distributed the NAVSEA NDT Quarterly for the fourth quarter of Fiscal Year (FY) 2024.

b. Enclosure (1) is the NAVSEA NDT Quarterly for the first quarter of FY 2025. The topics covered this quarter include Rickover Principles-inspired excellence in NDT program management, ASNT SNT-TC-1A 2024 edition changes to false call and detection rate requirements, and NDT procedure-related findings identified at multiple activities in the last few years.

4. Action. NAVSEA requests addressees forward enclosure (1) to activities under their cognizance that perform and/or subcontract NDT.

5. This letter does not authorize any changes in terms, conditions, delivery schedule, price, or amount of any existing contracts.

Subj: NAVAL SEA SYSTEMS COMMAND NONDESTRUCTIVE TESTING QUARTERLY NEWSLETTER

6. The SEA 04Q point of contact is Mr. Subash B. Jayaraman, Deputy NAVSEA NDT and Welding Programs Manager, (202) 781-3360, Subash.B.Jayaraman.civ@us.navy.mil.

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NAVSEA NDT Quarterly - Audit Lessons Learned

NDT QuAL
Issue: FY25-1

NDT Program Management: Catching Excellence

The nuclear Navy came into being by the audacity of human ingenuity and several years of painstaking design and engineering work, driven by an uncompromising approach to excellence espoused by Admiral (ADM) Hyman G. Rickover, the "Father of the Nuclear Navy". As nondestructive testing (NDT) practitioners, it is our responsibility and sacred obligation to our sailors to hold ourselves to the highest standards of conduct. We must pursue perfection in our line of work so we can achieve excellence. Keen followers of the NAVSEA NDT quarterly newsletter are familiar with the words of legendary football coach Vince Lombardi on "catching excellence".

At the heart of any endeavor is the people that make it a reality. Irrespective of the fidelity of the systems and the processes, it ultimately comes down to the people and their desire to **strive for excellence** that leads to successful realization of objectives. From the NDT perspective, this would include the inspector on the deck plate, the supervisor, the instructors, the examiners, quality management, the central technical authority, and leadership. While it is imperative that the **best inspectors dedicated to excellence are selected, trained, and qualified**, it is the ecosystem around them that allows for it to be possible.

Selecting and hiring the best NDT inspector candidates is easier said than done; it requires management to make choices and decisions with long term goals in mind rather than reacting to schedule pressures and choosing the next available person. A qualified NDT inspector that strives to excel is only half the battle; the rest of the support system needs to catch excellence as well.

The activity's NDT management needs to **enforce the standards** of conduct, behavior, work ethics and compliance. A **thorough, detailed auditing process** that is self-critical, performed more **frequently** would identify areas of weaknesses and opportunities for improvement.

ADM Rickover stated the following in his congressional testimony after the Three Mile Island nuclear accident: "There have been a number of times during the course of my work that I have made decisions to stop work and redesign or rebuild equipment to provide the needed high degree of assurance or satisfactory performance. The person in charge must personally set the example in this area and require his subordinates to do likewise."

When areas of weaknesses are identified – whether it is an individual, a group, design, or process, management – at every level – needs to exemplify the attitude they are **not willing to live with deficiencies**. They must **face facts brutally** and take actions that improves their program, not just to fix the issues identified, but setting it on course for excellence.

ASNT SNT TC-1A (2024) Change

DETECTION RATE

In 2018, the American Society for Nondestructive Testing (ASNT) implemented false call and detection rate practical examination grading criteria requirements to the already established minimum percentage grade and critical performance attributes. The intent is to ensure examinees do not "game" the practical examination, in an effort to avoid examination failure by being overly conservative, indicating the presence of indications that are not truly present or rejecting acceptable indications.

In 2024, ASNT redefined "detection rate" as "expressed as a percentage, it represents the number of flaws or indications detected in a specimen compared to the number of flaws or indications that are actually in the specimen being examined." While ASNT still requires critical performance attributes which, if not performed correctly, results in automatic examination failure, this repurposing of "detection rate" replaces the familiar "critical indication" (i.e., an always detectable, always rejectable condition or indication which, if missed, results in automatic examination failure).

Practically speaking, redefining "detection rate" means the examiner must determine the minimum percentage of indications present on the examination prop that the examinee must detect to pass the examination. For example, if the examiner sets an 85 percent detection rate for a liquid penetrant testing practical examination prop containing nine indications, the examinee must detect at least eight of the indications to satisfy the detection rate grading criteria. Similarly, if the examiner sets a 75 percent detection rate for a visual testing practical examination consisting of 5 props with a total of 43 discontinuities, the examinee must detect at least 33 of the indications to satisfy the detection rate grading criteria.

To pass a practical examination, examinees: (1) must achieve a minimum score of 80 percent, (2) must complete all critical performance attributes satisfactorily, (3) must not exceed the maximum number of false calls allowed, and (4) must detect enough indications to meet the detection rate.

The new detection rate requirement further refines and improves nondestructive testing (NDT) practical examination grading criteria, increasing objectivity, to fairly and adequately assess an examinee's ability to proficiently perform the NDT method, to detect discontinuities to the extent required, and to correctly evaluate the results.

NAVSEA NDT Quarterly - Audit Lessons Learned

NDT Procedure-Related Audit Findings

Ref: (a) NAVSEA T9074-AS-GIB-010/271; Requirements for Nondestructive Testing Methods, Revision 1

The following are nondestructive testing (NDT) procedure-related findings identified during Naval Sea Systems Command (NAVSEA) NDT evaluations over the last few years:

1. Liquid Penetrant Testing (PT)
   a. Contrary to reference (a), paragraph 5.4, the Method A technique was used on welds without specific NAVSEA approval.
   b. Contrary to reference (a), paragraph 5.4.1.2, the penetrant manufacturer (brand) and type identification were not identified in PT records.
   c. Contrary to reference (a), paragraph 5.6.2.1, alternate precleaners were not qualified and approved.
   d. Contrary to reference (a), paragraph 5.6.3, the procedure's temperature range was outside the range specified by the penetrant manufacturer.
   e. Contrary to reference (a), paragraph 5.6.7.1, nonaqueous developer was to be applied by immersion.
   f. Contrary to reference (a), paragraph 5.6.8, light-emitting diode lights were not specifically approved for use by the examiner.

2. Magnetic Particle Testing (MT)
   a. Contrary to reference (a), paragraph 4.3.1.1.1, light-emitting diode lights were not specifically approved for use by the examiner.
   b. Contrary to reference (a), paragraph 4.3.1.2 (k), sketches or a chart showing the typical inspection grid to be used were not included.
   c. Contrary to reference (a), paragraph 4.3.3.3.3, yoke leg spacing used was outside the specified limits without being specifically qualified.
   d. Contrary to reference (a), paragraph 4.3.3.4.1, during MT of adjacent areas of the weld, yoke legs did not overlap the previous placement by a minimum of 1 inch.

3. Radiographic Testing
   a. Contrary to reference (a), 3.4.14 (c), orientation of location markers not included in radiograph shooting sketch.
   b. Contrary to reference (a), paragraph 3.4.6, incorrect source-to-film distance calculations used.

4. General
   a. Contrary to reference (a), paragraph 1.7.2, procedure qualification documentation data was not provided upon request.
   b. Contrary to reference (a), paragraph 1.7.3, NDT procedure was not approved by the examiner.
   c. Extraneous information unrelated to the specific NDT process, included in the procedure. For example, Method A PT requirements were included in a procedure for the Method C technique only.