



DEPARTMENT OF THE NAVY

NAVAL SEA SYSTEMS COMMAND
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IN REPLY REFER TO

NAVSEAINST 9460.1D
SER PMS425/8078
9 FEB 95

NAVSEA INSTRUCTION 9460.1D

From: Commander, Naval Sea Systems Command

Subj: INSTALLATION TESTING OF NAVAL SONAR TRANSDUCERS

Ref: (a) NAVSEAINST 9460.4D
(b) NAVSEAINST 9460.6C
(c) NAVSEAINST 9674.2B
(d) DOD-STD-2003-1 (NAVY), Electric Plant Installation
Standard Methods for Surface Ships and Submarines
(Cable)

1. Purpose. To reestablish the guidance for the testing of naval sonar transducers by installing activities. This instruction is a major revision to the previous version.
2. Cancellation. NAVSEAINST 9460.1C of 4 February 1987.
3. Definition. The term "transducer" refers to sonar projectors, hydrophones and resonators. It also refers to arrays of acoustic elements.
4. Background. Installation testing of sonar transducers is necessary to ensure that transducers which leave the contractor's plant or Transducer Repair Facility (TRF) as ready for issue items have not been damaged in shipment, storage, shop, or installation, and have been installed properly in accordance with approved plans. Adequate installation testing will assure that all installed transducers are in proper operational condition and ready for sonar system testing in accordance with the applicable Combat System Standardized Test Procedure (CSTP) for submarines or the specified test(s) within the Total Ship Test Program (TSTP) for surface ships.
5. Scope. This instruction applies to all activities involved in the installation of sonar transducers which are under the cognizance of PMS42524 of the Naval Sea Systems Command as identified in enclosure (1) and (2) of reference (a).
6. Action. The values and tolerances of the following required tests, are contained in the applicable CSTP for submarines or the specified tests(s) within the TSTP for surface ships.



a. Pre-Installation Inspection (Shop)

(1) Conduct visual inspection under approved shipyard test procedures. Ensure that the shelf life for each transducer does not exceed the criteria given in reference (b).

(2) Measure capacitance, dissipation, D.C. resistance and insulation resistance for TR-155/TR-317 series and AN/SQS-26/53/53A/56 transducer elements only.

b. Pre-Installation Soak Test (see Note below).

Transducers and cables shall be immersed in water at shallow depth to test for capillary leaks for a minimum of 24 hours prior to measurements. At the completion of the soak period, the following in-water measurements shall be made:

Note: TR-155/TR-317 series transducers, and AN/SQS-26/53/53A/56 transducer elements are exempt from the pre-installation soak test.

(1) Insulation and D.C. resistance

(2) Capacitance and dissipation factor

c. Post-Installation Tests (in-air measurements, ship in drydock)

Note: When testing is conducted on arrays, staves or other multiple sets of transducers for which only a partial replacement occurred, Maintenance Requirement Card (MRC) specifications will be used as pass/fail criteria for transducers which were not replaced.

(1) D.C. resistance

(2) Capacitance and dissipation factor

d. Post-Installation Tests (in-water measurements, ship in water, transducers submerged)

Note: When testing is conducted on arrays, staves or other multiple sets of transducers for which only a partial replacement occurred, MRC specifications will be used

as pass/fail criteria for transducers which were not replaced.

- (1) Insulation and D.C. resistance
- (2) Capacitance and dissipation factor
- (3) Impedance

e. Post-Deep Dive Tests (for submarines)

- (1) Insulation and D.C. resistance
- (2) Capacitance and dissipation factor
- (3) Other post-deep dive test requirements as specified in the applicable CSTP shall also be conducted.

f. Failed Transducers

(1) Transducers which fail to meet installation test criteria shall not be repaired by the installing activity. Installing activities may replace individual failed transducer elements or transducer cables where the cable is attached to the transducer element by a connector.

(2) Use of chipping hammers, abrasive wheels, grinders, or other similar devices for removal of nuts, bolts, or brackets during removal of transducers to be replaced is prohibited. Failed transducers shall be handled with care at all times. In many instances, they are repairable and shall therefore be removed with the realization that they may be restored and installed on another ship.

(3) Procedures for the disposition and reporting of failed NAVSEA transducers are specified in reference (c). Repairable transducers will be placed in the applicable reusable containers and turned into the nearest Supply activity.

(4) If it becomes apparent that the time and cost necessary to remove and replace failed transducers and cables will adversely affect the ship's schedule or the scope of the current work authorization, the installing activity shall immediately notify the appropriate activity having authority to approve changes in cost or schedule.

NAVSEAINST 9460.1D
9 Feb 95

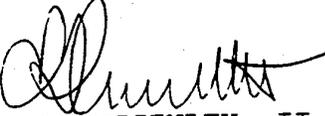
g. Transducer Cable Splicing Guidance. Transducer cable splicing is permitted with the following restrictions:

(1) Cables with six or more conductors, discounting any shield, will not be spliced. Splicing is also not permitted for cables in voids, normally inaccessible hazardous spaces (spaces requiring explosion proof enclosures), spaces subject to oil immersion or splashing or cables connected to the TR-155, 317 series transducers.

(2) During major depot availabilities, restrictions of paragraph 6.f.(1) apply. Damaged cables installed during the current availability may be spliced using the heat shrink tubing technique specified in Figures 1E19 and 1E20 of reference (d). Damaged cables not installed during the current availability are to be replaced.

(3) During non-depot availabilities, restrictions of paragraph 6.f.(1) apply. Whenever practical, damaged cables are to be replaced. However, cables may be spliced using the heat shrink tubing technique specified in Figures 1E19 and 1E20 of reference (d) as an interim repair. The Raychem splice kit MKS-002 (NSN 9G-5975-01-214-6556) is recommended for splicing DSS-3 and FSS-2 transducer cables.

h. Work Authorization. NAVSEA Ship Logistic Managers, through cognizant PERA or SUBMEPP, and the Ship Acquisition Project Managers shall ensure that when work at installing activities is authorized which causes the installation or replacement of any ship's sonar transducers, the requirements outlined in this instruction are to be included within the scope of the work authorization.


E. S. MCGINLEY, II
Commander
Acting

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