

DATA ITEM DESCRIPTION

Title: INSPECTION OF SHIPBOARD NOISE CONTROL CONSTRUCTIONS AND RECOMMENDATIONS REPORT

Number: DI-HFAC-81982

Approval Date: 20150413

AMSC Number: N9541

Limitation: N/A

DTIC Applicable: No

GIDEP Applicable: No

Preparing Activity: SH

Project Number: HFAC-2015-016

Applicable Forms:

Use/relationship: The Inspection of Shipboard Noise Control Constructions and Recommendations Report documents the results of the following surveys of noise control constructions to ensure they are properly installed in accordance with requirements defined in the contract specifications:

1. Acoustic, thermal, and fire control insulation systems and hull damping systems;
2. Survey of installed resilient mounting systems; and
3. Other acoustic constructions identified in the ship specification(s), in DI-HFAC-81202, *Noise Control Program Plan (NCPP)*, or in DI-HFAC-81278, *Airborne Noise Analysis and Control Design History Booklet*.
 - a. This Data Item Description (DID) contains the format, content, and preparation instructions for that data generated under the work task described by the applicable portions of MIL-STD-1474 or the contract statement of work.
 - b. This report aids the contracting activity in tracking the implementation of noise control designs and in evaluating the ability of actual constructions to achieve the sound attenuation characteristics defined in the contractor's submittal of DI-HFAC-81202 and DI-HFAC-81278.
 - c. This report aids the Government in deciding whether to accept the state of construction as presented, or to authorize corrective measures be undertaken by the contractor to produce constructions that are in compliance with standards referenced in the ship specification.

Requirements:

1. Reference documents. The applicable issue of the documents cited herein, including their approval dates and dates of any applicable amendments, notices, and revisions shall be as specified in the contract.
2. Format. The Inspection of Shipboard Noise Control Constructions and Recommendations Report shall be prepared in Contractor's format.

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3. Content. The report shall contain a title page identifying the following:

- a. ship hull number and name,
- b. contract number, and
- c. report date and revision number.

3.1 The report shall contain the following sections:

- a. table of contents,
- b. list of figures,
- c. list of tables,
- d. list of appendixes, if applicable,
- e. an executive summary,
- e. an introduction,
- f. the body of the report, and
- g. conclusions.

3.2. The report shall contain the most recent revision of drawing(s) for acoustic, thermal, and fire protection insulations and damping treatments for hull, bulkheads, and decks; and for ducts and trunks, drawings that describe these constructions that were installed at the time that inspections were undertaken, and shall also include:

- a. The most recent revision of drawing(s) detailing acoustic insulations that are incorporated into the ducts for heating, ventilation, and air conditioning (HVAC) systems, and drawings describing the insulation systems that were installed at the time that inspections were undertaken.
- b. The most recent revision of the resilient mount report describing resilient mounts for machinery, equipment, and mufflers, including the resilient mounts or resilient pipe hangers and sway braces that were installed, either loaded or unloaded, describing these constructions at the time that inspections were undertaken.
- c. The most recent revision of arrangement drawings and detail drawings of the intake and exhaust systems for internal combustion machinery such as diesels and gas turbines that were installed at the time that inspections were undertaken; and drawings of insulation systems installed for intake systems and exhaust systems, including mufflers and silencers.
- d. The most recent revision of arrangement drawings and detail drawings for fluid and pneumatic piping systems whose design includes flexible hose assemblies, resilient pipe hangers, mounts and sway braces, and/or Cascaded Orificial Resistive Devices (CORDS) that were installed at the time that inspections were undertaken.

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- e. The most recent pipe section flexibility and pipe section pipe hanger loading analyses report(s) for the exhaust system for each internal combustion engine, i.e., diesel and/or gas turbine, if such exhaust system(s) is required by specification to be resiliently supported.
- f. The most recent arrangement drawing and detail design drawing for each acoustic treatment, e.g., acoustic enclosure.

3.3. The report shall include, by compartment and by structural area of coverage, the date and a listing of the personnel performing the inspections.

3.3.1 The report shall identify incorrect or deficient installations, and shall recommend any proposed corrective actions.

3.3.2 If a treatment is not inspected or not present at the date of inspection, a schedule for performing and reporting such treatments shall be included.

3.3.3 Photographs shall be included, when applicable, to augment inspection results where it is helpful in conveying inspection results such as the existence of structural shorts or mounts installed incorrectly.

3.3.4 The report shall contain a description of all acoustic insulation systems (as well as those fire and thermal insulations specified as acting as acoustic insulations) and damping systems, installed in accordance with the ship design drawings and in accordance with the information included in NAVSEA drawings 804-5773932 and 803-5184182 (if referenced in the ship specification).

3.3.5 For all acoustic insulation systems, the report shall specifically address:

- a. insulation type,
- b. area of coverage,
- c. facing,
- d. adequacy of insulation pins,
- e. sealing at seams and edges,
- f. protection (sheathing), and
- g. painting, and if the acoustic insulations are external to any other treatments.

3.3.6 The report shall include a description of all damping treatments and shall also specify if the inspected damping treatments are or are not installed in accordance with the ship design drawings and in accordance with the information included in MIL-STD-2148, *Vibration, Damping Materials, Procedures for Installation, Maintenance, and Repairs*, specifically addressing type of damping material, thickness of the tile, area of coverage, constraining layer, adhesion of tiles and constraining layer, and other inspection details required in MIL-STD-2148.

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3.3.7 The report shall include a description of all insulations for HVAC system ducts by HVAC system number, HVAC drawing number, location by compartment and find number that are included in the inspection.

3.3.8 The report shall specify if the insulation systems installed with HVAC ducts are or are not installed in accordance with the ship design drawings and in accordance with NAVSEA Drawing 804-5773932 (if referenced in the ship specification), specifically addressing insulation type, area of coverage, facing, number and type of insulation pins, sealing at seams and edges, protection (sheathing), painting, and if the duct acoustic insulations are external to any other treatments.

3.3.9 The report shall specify for each mount, the date of installation and which mounts were inspected, including installed resilient pipe hangers and sway braces.

3.3.10 For each mount and pipe hanger, the report shall identify the machinery or equipment item or pipe section that the mount supported. The report shall also include the mount type and its allowable load range, the measured mount heights, and the actual load experienced by each mount as specified in NAVSEA S9073-A2-HBK-010 and NAVSEA S9078-AA-HBK-010/DIM, as well as the supplier's literature, if non-US Navy type mounts were used.

3.3.11 The report shall include the type of DIM for DIM mounts, the allowable load range, and the calculated load (lb./in.²) experienced by the mount.

3.3.12 The report shall specify if all pipe connections were in place, if the wet load was applied, and if thermal lagging was installed.

3.3.13 The report shall specify if the mount cutout hole in the mount foundation plate for the mount was correctly sized and was de-burred in accordance with NAVSEA S9073-A2-HBK-010 and NAVSEA S9078-AA-HBK-010/DIM.

3.3.14 For US Navy mounts, the report shall specify if the cone portion of the mount is loaded in compression. Specify if the mount bolting hardware are in accordance with requirements stated in NAVSEA S9073-A2-HBK-010 and NAVSEA S9078-AA-HBK-010/DIM.

3.3.15 The report shall specify if the mount is likely to experience temperatures in excess of maximum allowable service temperature, if the mount is misaligned, and if the mounted system likely to experience a sound short.

3.3.16 The report shall specify if sufficient clearance is provided to prevent the mounted unit from striking structure, adjacent fixed or resiliently mounted units, or other fixed objects during maximum deflections (during shock conditions and/or ship motions) of the unit.

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3.3.17 The report shall specify if grounding straps of braided wire and electrical connections are used, and if they are of adequate length to accommodate the maximum excursion of the mounted equipment.

3.3.18 The report shall specify if the elastomeric element mount was painted, burned, damaged, cut, exposed to oil, and if it was adequately protected during the construction phase.

3.3.19 For each machinery, equipment item, or piping system that is resiliently supported, the report shall specify if the mounting system installation needs to be reworked in order for it to comply with specified requirements.

3.3.20 The report shall specify the machine name, service, and compartment number of each machinery item that is required to be fitted with a flexible hose assembly, and a photograph or sketch of the assembly.

3.3.21 The report shall specify the service; configuration; hose type and dash number; length of each hose section as compared to the minimum allowable; the resilient mount (pipe hanger) type supporting the hose assembly at the elbow; the find numbers for the hose sections, intermediate elbow, and pipe hanger mount; and the expected load on that mount.

3.3.22 The report shall specify the actual linear sag, and the misalignment or distortion experienced by each section of hose with comparison to the allowable values.

3.3.23 The report shall identify the angular distortion experienced by each section of hose with comparison to the allowable values (see NAVSEA S6430-AE-TED-010).

3.3.24 The report shall specify if the weight of flexible hose installation includes the entrained fluid and attached fittings and laggings.

3.3.25 The report shall specify each flexible exhaust bellows, intake bellows, and expansion joint by machine that it is attached to, by find number, and by the applicable intake and exhaust system drawing number.

3.3.26 For each flexible exhaust, intake bellows, and expansion joint, the report shall specify the measured lateral and angular distortions experienced with comparison to the minimum allowable out of tolerances. The report shall also specify if the bellows or expansion joint is installed in the correct orientation when considering airflow and the internal liner, and if the convolutions are distorted or damaged in any way. The report shall specify if any bellows or expansion joint needs to be reworked in order for it to comply with specified requirements.

3.3.27 For each HVAC fan or fan coil assembly that is mounted resiliently, the report shall specify if the installation is fitted with a flexible duct connection, and the actual length of that flexible connection in comparison to the minimum allowable length. The report shall also identify any flexible duct connection that has been damaged and any flexible duct connection that needs to be reworked in order for it to comply with specified requirements.

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3.4 For other treatments such as enclosures or floating decks, the report shall specify if the installation has any acoustic or structural short circuits, covers the intended area, and is constructed to achieve the desired performance.

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