

Data Item Description

Title: Mechanical Vibrations of Shipboard Equipment Measurement Test Data

Number: DI-ENVR-81647

Approval Date: 20040809

AMSC Number: N7530

Limitation: N/A

DTIC Applicable: N/A

GIDEP Applicable: N/A

Office of Primary Responsibility: SH SEA051

Applicable forms: N/A

Use/ Relationship:

This DID provides a test plan and report of the vibratory test procedure, facility, and measurement system for MIL-STD-167-1 for Type I vibration testing.

- a. This DID contains the format and content preparation instructions for that data generated under the work task described by Section 5 of MIL-STD-167-1.
- b. This DID is to be applied for each type, class, rating, and grade of equipment to be tested on each contract or order when MIL-STD-167-1 is invoked.

Requirements:

1. Reference document. 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 and Content: The Mechanical Vibrations of Shipboard Equipment Measurement Test Data shall be presented in the contractor's format and shall contain Sections I and II.

2.1 Section – I Test Plan. This section shall contain the following:

- a. Equipment to be evaluated
- b. Contract number
- c. Ship names and hull number, if known, for which the unit is being acquired
- d. Range of frequencies over which the item is to be tested with the corresponding input amplitudes
- e. Evaluation measurements to be performed
- f. Evaluating activity and test site
- g. Test date if established
- h. Driver unit horsepower (HP)
- i. Rated Electrical Characteristics, including volts, amps, phase, as applicable
- j. Rated fluid media parameters (flow rates, temperatures, pressures, etc.), as applicable

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- k. Equipment rated operational speeds (driver and driven unit revolutions per minute (r/min), etc.), as applicable
 - l. If applicable, resilient mount manufacturer and model number
 - m. Dates of manufacture of resilient mounts to be used, as applicable
 - n. Number of resilient mounts to be used, as applicable
 - o. If the use of non-Navy standard resilient mounts has been approved, mount characteristics including load rating, in pounds, and resonant frequency data of the mounts used shall be included.
 - p. All operating modes of the equipment and the rated capacity for each mode, including speed, torque, force, pressure, flow rate, voltage, current, temperatures, etc, as applicable
 - q. Equipment operating modes to be energized during testing along with the start and finish times of each operation relative to the test sequence
 - r. Planned equipment load, speed, throttling conditions, suction and discharge pressures, temperatures, etc., as applicable, during each operational mode
 - s. Planned electrical inputs, outputs, or both during all portions of the test schedule
 - t. Block diagrams and identification of make and model of measurement and analysis instrumentation used
 - u. Place and date of the latest laboratory calibration of measurement instruments, system calibration instruments (including field calibrators), and analysis instruments that will be used.
- 2.3 Drawings, sketches or photographs shall be used to provide the following for the test set up:
- a. Overall unit dimensions and orientation (vertical, horizontal, etc.) to be used during test
 - b. Identification of major components
 - c. Overall unit weight and if known the center of gravity with weights and center of gravity for major components
 - d. Center of gravity of the combination of the test equipment and the portion of the testing machine that moves at the test frequencies, for each direction of the test if necessary
 - e. Point and direction of the centroid of force application for each section of the test if necessary
 - f. Mounting fixture and/ or subbase dimensions, materials and weights, for each direction of the test if used
 - g. Resilient mount locations and dimensions, orientation (vertical, horizontal, angle), approximate load on each mount, attachment locations, for each direction of the test, if used

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- h. Planned arrangement and description of flexible pipes and ducts, test piping and fittings, electrical power leads, etc., for each direction of the test, as applicable
 - i. Planned location and description of test instrumentation used to measure r/min, flow rates, total discharge head, etc, for each direction of the test
 - j. Approximate location and orientation of all vibration measurement instrumentation relative to equipment features or mounts and method of attachment of instrumentation, for each direction of the test.
3. Section - II - Test Report. The test report shall contain Section I and contain the following:
- a. Tabular or graphic records of all vibration amplitude levels required to be measured in accordance with Section 5 of MIL-STD-167-1A and shall include both corrected and uncorrected data, along with all correction factors etc., needed to obtain absolute levels and response prominences.
 - b. Tabular or graphic records of all transmissibilities for all frequencies tested.
 - c. Listing of candidate endurance testing frequencies, and reasoning for excluding frequencies from testing.
 - d. List of endurance test frequencies and duration of testing at each frequency.
- 3.1 A description of test results at each endurance test frequency and whether a structural, functional, or no problem was found during testing at that frequency.
- 3.2 Detailed descriptions of any damage or malfunctioning incurred and at what stage in the tests it occurred. When possible, photographs of physical damage shall be included.
- 3.3 Detailed descriptions of any corrective measures taken, including changes in drawings or quality control intended for follow units.
- 3.4 Other pertinent information, such as deviations from test plan or photographs of the methods used in mounting the equipment on the test machine.
- 3.5 Media Requirements. The Mechanical Vibrations of Shipboard Equipment Measurement Test Data electronic media shall be as specified in the contract on the DD 1423.
4. End of DI-ENVR-81647