

DATA ITEM DESCRIPTION

Title: HEMP TEST PLAN FOR FULL SHIP VERIFICATION TEST

Number: DI-EMCS-82010

Approval Date: 20160404

AMSC Number: 9604

Limitation: N/A

DTIC Applicable: Yes

GIDEP Applicable: N/A

<http://www.dtic.mil/dtic/submit/>

Office of Primary Responsibility: DTRA-DS

Applicable Forms: None

Use/relationship: The High-Altitude Electromagnetic Pulse (HEMP) Test Plan for Full Ship Verification Test will be used to perform the Ship Level Verification Test described in MIL-STD-4023, Appendix D.

This DID contains the format, content, and intended use information for the data product resulting from the work task described by Appendix D of MIL-STD-4023, and is applicable to the acquisition of military ships.

Requirements:

1. Reference documents. The applicable issuance of the documents cited herein, including their approval dates and dates of any applicable amendments, notices, and revisions, shall be as cited in the ASSIST Online at the time of the solicitation; or for non-ASSIST listed documents, as stated herein. Classification of the Test Plan for MIL-STD-4023 System Verification Test shall be determined using DTRA Security Classification Guide for DoD Electromagnetic Pulse (EMP) Programs and Activities (U) available by mail request to ATTN: J9/NT-NTSA/Rooney M., Defense Threat Reduction Agency, 8725 John J. Kingman Road, MSC 6201 Fort Belvoir, Virginia 22060-6201 and any relevant system specific classification guides.

2. Format. The Test Plan shall be in contractor's format.

3. Content. The HEMP Test Plan for Full Ship Verification Test shall be presented in the format recommended in Appendix D, Section D.4.7 of MIL-STD-4023 and as specified in the contract.

3.1 Administrative data. The Test Plan for Ship Level Verification Test shall contain an administrative section covering the following:

- a. Contract number.
- b. Authentication and certification of a qualified representative of the procuring activity for the test plan.

3.2 Test Procedures and Equipment.

3.2.1 Introduction Section. This section shall contain a brief overview of the Ship Level Verification test.

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a. It shall include a brief overview description of the Active System Test (AST), Passive System Test (PST) and Direct Drive Test (DDT).

b. It shall include a statement of test objectives with criteria for meeting these objectives for AST, PST and DDT.

3.2.2 Test Object Description Section. This section shall contain:

a. The ship identification (including hull number)

b. A physical and functional description of the ship. System and subsystem identification and descriptions (including drawings of the subsystems showing the locations of all shielded volumes and Points of Entry, equipment layouts inside the electromagnetic barriers, layout of Mission Critical Systems (MCS) outside the EM barriers, external cable interconnections, and a description of the HEMP protection measures).

c. A table summarizing the ship MCS and its MIL-STD-461 RS103, RS105 and CS116 (or equivalent), immunity data.

3.2.3 Verification Test Procedure Section. This section shall contain a detailed discussion of the test procedures and equipment used. It is suggested that it include separate sections for the AST, PST and DDT. It shall include the following information:

a. Identification of the test equipment with key performance parameters. Where applicable, the manufacturer and part numbers will be applied. This shall include the HEMP threat simulator and data acquisition equipment descriptions (including manufacturer, model and serial numbers, characteristics, and detailed calibration procedures and status). A table summarizing this data is strongly suggested. This should be presented in three tables, one for each test: AST, PST, and DDT.

b. Description of the data management (including data quality control procedures, data acceptability criteria, annotation and preservation of data records) for AST, PST and DDT.

c. Test participants.

d. Safety procedures and concerns, including electromagnetic radiation and electrical shock hazards.

e. Security procedures.

f. Schedule, including priority of measurements for AST, PST and DDT.

g. AST diagrams of the placement of ship under test in the threat simulator working volume and placement of other test elements, which are required to achieve functionality (i.e., external stimulation sources for the ship MCS), with respect to the HEMP simulator working volume. A description of how to perform the HEMP simulator field map and what data is required. This will include procedures for calibration of the equipment to be used for the field map. The reference sensor location shall also be indicated. The AST chronology shall include a

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sequence of events with ship orientation and polarization relative to the HEMP electric field. Detailed test procedures for AST (including system, subsystem, and circuit configuration requirements; equipment operating states; external stimulation requirements for the ship MCS, test configuration diagrams; functional monitoring provisions; and step-by-step procedures). [See MIL-STD-4023 Appendix D].

1. AST method for assessing upset and damage and the locations for which observations will be made. Also include an explanation for why these observation points were selected. Describe how the data will be recorded.

2. Method for monitoring the incident HEMP field during the AST and relationship to the simulator field map.

h. The PST chronology shall include a sequence of events with ship orientation and polarization relative to the HEMP electric field. Detailed test procedures for PST (including system, subsystem, and circuit configuration requirements; test configuration diagrams; functional monitoring provisions; and step-by-step procedures).

1. Describe how to calibrate all the equipment used to make the PST measurements.

2. An identification of the test points (including their selection criteria) to be used in the Passive System Test (PST) and Direct Drive Test (DDT) [see MIL-STD-4023 Appendix D], their relationship to the MCS and the MCS immunity test data, and their location in the ship. Include an explanation for the choice of test points.

3. Describe how to measure the test points (either free-field, current on a wire (bundle), or surface current) for the PST.

4. Describe in detail how the PST test data will be used to generate the DDT waveforms.

i. DDT diagrams showing the placement/use of other test elements (other MCS or external sources), which are required to achieve functionality.

1. Describe how each selected piece of MCS to be tested during DDT will be operated and how an assessment (criteria) of upset or damage will be made.

2. DDT chronology including a sequence of events with the upper-bound injection current waveforms for each test point used in the DDT. Detailed test procedures for DDT (including system, subsystem, and circuit configuration requirements; equipment operating states; external stimulation requirements for the ship MCS, test configuration diagrams; functional monitoring provisions; and step-by-step procedures).

3. Describe how to calibrate all the equipment used to make the DDT measurements. This shall include an explanation of how the DDT pulsers, current injection probes, and current probes are calibrated.

4. Describe how the DDT pulser and current probes will be connected and their performance monitored.

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