

NEWPORT NEWS SHIPBUILDING
NEWPORT NEWS, VIRGINIA
APPENDIX S – DoD CONTRACTS
(December 2018)

Electromagnetic Interference Qualification

Table of Contents

<u>1</u>	<u>SCOPE</u>	2
1.1	<u>Purpose</u>	2
1.2	<u>Background</u>	2
1.2.1	<u>EMI Qualification</u>	2
1.2.2	<u>EMI Deliverables</u>	2
<u>2</u>	<u>REFERENCES</u>	3
<u>3</u>	<u>DEFINITIONS</u>	3
<u>4</u>	<u>REQUIREMENTS</u>	3
4.1	<u>General</u>	3
4.2	<u>EMI Testing</u>	3
4.3	<u>EMI Deliverables</u>	4

1 SCOPE

1.1 Purpose

- 1.1.1 This appendix provides the requirements for the qualification of a component or system to Navy standards for electromagnetic interference (EMI).

1.2 Background

1.2.1 EMI Qualification

- 1.2.1.1 MIL-STD-461 establishes interface and associated verification requirements for the control of the EMI characteristics of electronic, electrical, and electromechanical equipment and subsystems designed or procured for use by activities and agencies of the Department of Defense.
- 1.2.1.2 Two documents are required for the successful qualification of a component or system to Navy standards for EMI. They are the Electromagnetic Interference Test Procedure (EMITP) and the Electromagnetic Interference Test Report (EMITR). In order to be completed, both documents require input from Newport News Shipbuilding (NNS), the Supplier, and the EMI Test Facility used by the Supplier.
- 1.2.1.3 A third document, the Electromagnetic Interference Control Procedure (EMICP), may be required for equipment that is developmental or has a potentially high EMI susceptibility or emission risk. An EMICP coded note will be invoked on the purchase order item if an EMICP is required.
- 1.2.1.4 The purchase order item's applicable revision of MIL-STD-461 and the applicable EMI tests are identified in the EMITP coded note.

1.2.2 EMI Deliverables

- 1.2.2.1 The EMICP is a deliverable that is developed by the Supplier. It provides NNS with the Supplier's design procedures and techniques so that NNS can evaluate the Supplier's ability to meet the EMI requirements of MIL-STD-461. The format, content, and delivery requirements for the EMICP are provided in the EMICP coded note if an EMICP is required.

- 1.2.2.2 The EMITP is a deliverable that is developed by the EMI Test Facility used by the Supplier. It describes the testing procedures and measurements that will be used to demonstrate that the component or system complies with the applicable EMI requirements of MIL-STD-461. The format, content, and delivery requirements for the EMITP are provided in the EMITP coded note.
- 1.2.2.3 The EMITR is a deliverable that is developed by the EMI Test Facility used by the Supplier. It provides the EMI test results and data that are necessary to verify compliance of the component or system to the applicable EMI requirements of MIL-STD-461. The format, content, and delivery requirements for the EMITR are provided in the EMITR coded note.
- 1.2.2.4 A Data Item Description (DID) accompanies MIL-STD-461 for each EMI deliverable. The DIDs provide guidance for the format and content of the EMI deliverables; however, each DID has been tailored by NNS and has been included in the corresponding EMI deliverable coded note invoked on the purchase order item.

2 REFERENCES

- (a) MIL-STD-461, "Requirements for the Control of Electromagnetic Interference Characteristics of Subsystems and Equipment"

3 DEFINITIONS

- 3.1 Electromagnetic Interference (EMI) – Any electromagnetic disturbance that interrupts, obstructs, or otherwise degrades or limits the effective performance of electronics and electrical equipment. EMI can be induced intentionally, as in some forms of electronic warfare, or unintentionally, as a result of spurious emissions and responses, intermodulation products, and the like.
- 3.2 Equipment Under Test (EUT) – The manufactured product undergoing EMI testing.
- 3.3 Supplier – The party with whom NNS is contracting.

4 REQUIREMENTS

4.1 General

- 4.1.1 The purchase order item shall be qualified by a NAVSEA approved EMITP and a NAVSEA approved EMITR.

4.2 EMI Testing

- 4.2.1 EMI testing shall be performed prior to shock and vibration testing.
- 4.2.2 The Supplier shall hire or use their own EMI Test Facility to conduct EMI testing.
- 4.2.3 The EMI Test Facility used by the Supplier shall be accredited by National Voluntary Laboratory Accreditation Program (NVLAP) or American Association for Laboratory Accreditation (A2LA).
- 4.2.4 The Supplier shall obtain NAVSEA approval for the EMITP from NNS prior to the EMI Test Facility conducting EMI testing.
- 4.2.5 The Supplier shall provide the EMI Test Facility with the following equipment necessary to conduct EMI testing:
 - a) the Equipment Under Test (EUT),
 - b) actual equipment from the platform installation with input and output interfaces to the EUT,
 - c) equipment which simulates the electrical properties present in the actual installation, and
 - d) suppression devices.
- 4.2.6 The EMI Test Facility shall conduct EMI testing in accordance with the NAVSEA approved EMITP.
- 4.2.7 The Supplier shall send a technical representative to witness EMI testing and correct equipment in the event of an EMI test failure to bring the equipment into compliance.
- 4.2.8 The Supplier shall assist the EMI Test Facility with documentation of the following for inclusion in the EMITR:
 - e) failures of the equipment or any of its components to pass any of the examinations or tests,
 - f) identified causes of failures,
 - g) details of any attempts to correct failures,
 - h) corrective actions required to bring the equipment into compliance,
 - i) standoff ranges for equipment that cannot be brought into compliance, and
 - j) rationale as to why the equipment cannot be brought into compliance.
- 4.2.9 The Supplier shall update drawings to reflect all changes made to the equipment's configuration during EMI testing.

4.3 **EMI Deliverables**

- 4.3.1 When an EMICP coded note is invoked on the purchase order item, the Supplier shall develop an EMICP.
- 4.3.2 The EMI Test Facility used by the Supplier shall develop an EMITP and EMITR.
- 4.3.3 The Supplier shall contact NNS to request any information required in the EMI deliverables that the Supplier and EMI Test Facility are not able to provide.