

INCH-POUND

MIL-STD-2003A(SH)

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SUPERSEDING

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**DEPARTMENT OF DEFENSE
STANDARD PRACTICE
ELECTRIC PLANT INSTALLATION
STANDARD METHODS FOR
SURFACE SHIPS AND SUBMARINES**



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FOREWORD

1. This standard is approved for use by the Naval Sea Systems Command, Department of the Navy and is available for use by all Departments and Agencies of the Department of Defense.

2. This standard disseminates up-to-date information detailing requirements for standard installation methods (non-fiber optic cable) employed for submarine and surface ship electrical distribution systems. Utilize MIL-STD-2042 (Fiber Optic Cable Topology Installation Standard Methods for Naval Ships) for detailed information and guidance involving the installation of fiber optic cable on Naval surface ships and submarines.

3. These criteria apply to work on a specific ship or ships only when invoked by the Ship Specifications or similar contractual documents.

4. These criteria are for application to new construction, conversion, and alteration of existing ships.

5. Considering the magnitude of this standard, along with the changing requirements imposed on the Electric Plant, it is inevitable that changes will be required to update these criteria. Therefore, as comments arise, they should be forwarded to Naval Sea Systems Command (NAVSEA) 05Z3 to keep this standard as current as possible through subsequent revisions. Revisions will be accomplished by the issuance of additional or revised figures to be inserted in the basic standard parts. Superseded pages may be retained for reference if so desired.

6. Comments, suggestions, or questions on this document should be addressed to Commander, Naval Sea Systems Command, ATTN: SEA 05M2, 1333 Isaac Hull Avenue, SE, Stop 5160, Washington Navy Yard DC 20376-5160 or emailed to CommandStandards@navy.mil, with the subject line "Document Comment". Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at <http://assist.daps.dla.mil>.

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1. SCOPE

1.1 Scope. This standard covers shipboard installation requirements for electrical cable, equipment, penetrations, cableways, and connectors. This standard consists of this general standard and five parts as follows:

Part 1 (Cable)	Preparation and end-sealing, entry to equipment and connectors, repair and splicing.
Part 2 (Equipment)	Equipment mounting, switchboard mounting, battery equipment, casualty power, and shore power.
Part 3 (Penetrations)	Swage tubes, stuffing tubes, kickpipes, surface ships and submarines, hull penetration, and general.
Part 4 (Cableways)	General, submarine, surface ship and cable protection.
Part 5 (Connectors)	Cable and conductor preparation in accordance with MIL-C-81511, MIL-DTL-5015, MIL-DTL-26482, MIL-DTL-28840, MIL-DTL-22992, and MIL-DTL-38999 connectors.

1.2 Application. Electrical plant installation methods parts 1 through 5 are to be used by all installing activities. These parts do not identify ship or type, but do establish minimum standards of acceptance for Naval ships. It is the responsibility of the user activity to determine which part satisfies their requirements. It does not authorize relaxation of any requirement specifically invoked by new construction, conversion, overhaul, or refurbishment contracts. In instances where deviated design requirements (for example, ship type, ship class, and so forth) conflict, the requirements of this standard govern. Any deviation for electric plant installation identified in this standard is to be submitted to NAVSEA 05Z3 for resolution.

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3, 4, or 5 of this standard. This section does not include documents cited in other sections of this standard or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements of documents cited in sections 3, 4, or 5 of this standard, whether or not they are listed.

2.2 Government documents.

2.2.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

DEPARTMENT OF DEFENSE SPECIFICATIONS

MIL-DTL-5015	-	Connectors, Electrical, Circular Threaded, AN Type, General Specification for
MIL-DTL-22992	-	Connectors, Plugs and Receptacles, Electrical, Waterproof, Quick Disconnect, Heavy Duty Type, General Specification for
MIL-DTL-26482	-	Connectors, Electrical, (Circular, Miniature, Quick Disconnect, Environment Resisting), Receptacles and Plugs, General Specification for
MIL-DTL-27599	-	Connectors, Electrical, Circular, Miniature, High Density, Quick Disconnect, Environment Resistant, Solder Contacts, General Specification for
MIL-DTL-28840	-	Connectors, Electrical, Circular, Threaded, High Density, High Shock, Shipboard, Class D, General Specification for

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- MIL-DTL-38999 - Connectors, Electrical Circular, Miniature, High Density, Quick Disconnect (Bayonet, Threaded and Breech Coupling), Environment Resistant, Removable Crimp and Hermetic Solder Contacts, General Specification for
- MIL-C-81511 - Connectors, Electrical, Circular, High Density, Quick Disconnect, Environment Resisting: and Accessories General Specification for

DEPARTMENT OF DEFENSE STANDARDS

- MIL-STD-2003-1 - Electric Plant Installation Standard Methods for Surface Ships and Submarines (Cable)
- MIL-STD-2003-2 - Electric Plant Installation Standard Methods for Surface Ships and Submarines (Equipment)
- MIL-STD-2003-3 - Electric Plant Installation Standard Methods for Surface Ships and Submarines (Penetrations)
- MIL-STD-2003-4 - Electric Plant Installation Standard Methods for Surface Ships and Submarines (Cableways)
- MIL-STD-2003-5 - Electric Plant Installation Standard Methods for Surface Ships and Submarines (Connectors)

(Copies of these documents are available online at <http://assist.daps.dla.mil/quicksearch/> or from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

2.3 Order of precedence. Unless otherwise noted herein or in the contract, in the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. DEFINITIONS

This section is not applicable to this standard.

4. GENERAL REQUIREMENTS

4.1 MIL-STD-2003-1. This part provides general requirements for the selection, use, and installation of cables aboard ships and submarines. Cable slack, bend radius, entrance into equipment, connections, and the use of watertight cable are among the topics for which requirements are established.

4.2 MIL-STD-2003-2. This part provides general requirements for electrical equipment. Mounting, welding, fasteners, batteries, battery service facilities, casualty power, shore power, and grounding are among the topics for which requirements are established.

4.3 MIL-STD-2003-3. This part provides general requirements for cable penetrations of various boundaries using stuffing tubes and multi-cable penetrations (MCPs). Topics for which requirements are established include penetration of pressure hulls; pressure-proof, shielded, ballistic bulkheads and decks; and the use of riser boxes and kickpipes.

4.4 MIL-STD-2003-4. This part provides general requirements for cable runs and cableways for protection and maximum reliability of the cables and electrical distribution system.

4.5 MIL-STD-2003-5. This part provides general requirements and procedures to be utilized by a connector assembly technician for the preparation and installation of shipboard cable connectors.

5. DETAILED REQUIREMENTS

5.1 MIL-STD-2003-1. This part includes detailed requirements for cable preparation, end sealing, entrance into equipment enclosures, repair, splicing, and protection of connectors exposed to weather.

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5.2 MIL-STD-2003-2. This part includes detailed requirements for installation and mounting of electrical equipment to various types of bulkheads and decks, switchboards, battery racks, casualty power components, and shore power components.

5.3 MIL-STD-2003-3. This part includes detailed requirements for installation of stuffing tubes in submarines, stuffing tubes and multi-cable penetrations in surface ships, kickpipes and submarine pressure hull penetrations.

5.4 MIL-STD-2003-4. This part includes detailed requirements for cables associated with slack, bend radius, battle damage, general protection, heat, moisture, hazardous locations, installation and support in hangers, handling, marking, and spacing.

5.5 MIL-STD-2003-5. This part includes detailed requirements for cable lead preparation and installation of the following connectors: MIL-DTL-5015, MIL-DTL-22992, MIL-DTL-26482, MIL-DTL-27599, MIL-DTL-28840, MIL-DTL-38999, and MIL-C-81511.

6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Intended use. This standard specifies the requirements for electric plant installation standard methods to be employed both on surface ships and submarines. Standard methods identified for electric plant installation are intended for new construction, conversion, and alteration of existing ships.

6.2 Acquisition requirements. Acquisition documents should specify the following:

a. Title, number, and date of this standard.

6.3 Designation of electric plant installation standard methods figures. Each of the parts of electric plant installation standard methods contains figures that depict standard methods that are applicable for general electric plant installation on both surface ships and submarines. The methods shown on the figures are grouped together providing similar functions. These groups are:

<u>Part</u>	<u>Group</u>	<u>Title</u>
1 (Cables)	A	Cable Preparation and End-Sealing
	B	Cable Entry to Equipment
	C	Protection of Topside Connectors
	D	Repair of Damaged Cable
	E	Cable Splicing
2 (Equipment)	A	Standard Methods for Mounting Equipment
	B	Switchboard Mounting
	C	Battery Rack Mounting
	D	Casualty Power
	E	Shore Power
3 (Penetrations)	A	Penetrations – Stuffing Tubes, Submarines
	B	Penetrations – Stuffing Tubes, Surface Ships
	C	Penetrations – Stuffing Tubes, General
	D	Penetrations – Kickpipes
	E	Penetrations – Pressure Hulls, Submarines
4 (Cableways)	A	Cableways (Submarines)
	B	Cableways (Surface Ships)

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5 (Connectors)	C	Cableways (General)
	D	Cable Protection
	A	Cable Lead Preparation
	B	MIL-C-81511 Series 1 and 2 Gang Contact Release Connector Assembly Procedure
	C	MIL-DTL-5015 Connectors
	D	MIL-DTL-26482 Connectors
	E	MIL-DTL-28840 Connectors
	F	MIL-DTL-27599 Connectors
	G	MIL-DTL-22992 Connectors
	H	MIL-DTL-38999 Connectors

6.4 Subject term (key word) listing.

Battery equipment

Cable lead preparation

Casualty power

Connection preparation

Connectors

Double banking

End-sealing

Equipment entry

Hangers

Kickpipes

Multi-cable transits

Shore power

Splicing

Stuffing tubes

Switchboard mounting

Tier

Water blocked

6.5 Changes from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extent of the changes.

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Preparing activity:

Navy – SH

(Project SESS-2006-013)

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST Online database at <http://assist.daps.dla.mil>.