



CNATRAINST 4790.28E
N4
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CNATRA INSTRUCTION 4790.28E

Subj: ELECTROSTATIC DISCHARGE DAMAGE CONTROL/PROTECTION PROGRAM

- Ref: (a) COMNAVAIRFORINST 4790.2C
(b) HDBK-263A (Electrostatic Discharge Control Handbook For Protection of Electrical and Electronic Parts, Assemblies and Equipment (Excluding Electrically Initiated Explosive Devices) S/S BY MIL-HDBK-263
(c) STD-1686C (Electrostatic Discharge Control Program for Protection of Electrical and Electronic Parts, Assemblies and Equipment (Excluding Electrically Initiated Explosive Devices)) MIL-STD-1686B
(d) MIL-HDBK-773 Rev A (Electrostatic Discharge Protective Packaging)
(e) NAVAIR 01-1A-23 (Standard Maintenance Practices Electronic Assembly Manual)
(f) NAVSUP Publication 484 (Supply Afloat Fleet and Field Packaging Procedures)
(g) NAVSUP Publication 723 (Navy Inventory Integrity Procedures)

Encl: (1) Sample Training Outline

1. Purpose. To promulgate information and direction for the maintenance of the Electrostatic Discharge (ESD) Damage Control/ Protection Program.
2. Cancellation. CNATRAINST 4790.28D.
3. Scope. This instruction applies to all Aircraft Intermediate Maintenance Departments (AIMD), aircraft squadrons, and aviation supply departments at activities under the cognizance of the Chief of Naval Air Training (CNATRA).
4. Background. A necessary part of avionic/electronic maintenance is the knowledge of ESD and its effect on solid state electronic components and equipment. Electrostatic Discharge Sensitive (ESDS) components are damaged as a result of improper inspection, handling, packaging, shipping, storage, testing, installation, and maintenance techniques throughout the equipment life cycle. This damage can be catastrophic, causing the equipment not to operate, or subtly leading to a degradation of performance. Since this damage is not recognizable until after the supply/maintenance process cycle, ESD damage prevention and protection measures must be an integral part of supply and maintenance routines.
5. Responsibilities. Organizational/intermediate level maintenance and supply departments are responsible for the proper handling, packaging, and storage of ESDS items. All solid state electronic components and subassemblies containing such components (e.g., printed circuit board assemblies, modules, shop replaceable assemblies) are considered to be ESDS assemblies.
6. Action. All activities/departments handling ESDS items shall maintain an active ESD damage control/protection program following the guidelines provided herein.

a. Administration and Training. Responsible maintenance and supply officers/contractor site managers shall designate an ESD officer/agent who shall:

(1) Ensure that references (a) through (g) are held in appropriate spaces and complied with.

(2) Ensure that personnel who handle, inspect, or package ESDS items are locally trained in accordance with the ESD damage control/protection requirements identified in references (b) through (e). Enclosure (1) is a sample training outline. Local ESD training shall be conducted periodically. Contractor/agent personnel shall document this training in appropriate records.

(3) Designate an ESD control/protection coordinator for each division which handles, packages, or maintains ESDS items. The coordinator shall:

(a) Report to the ESD officer/agent.

(b) Conduct ESD control/protection training for applicable division personnel.

(c) Ensure that ESD safe work areas are established and maintained in appropriate division spaces.

(d) Conduct monthly work area reviews to ensure that minimum quantities of ESD handling/protection material are available and maintained for use.

b. ESD-Safe Work Area Requirements. All handling and maintenance of ESDS items shall be accomplished in ESD-safe work areas. These areas shall comply with the requirements identified in references (b) through (e). ESD-safe work areas shall contain, at a minimum, appropriate quantities of personnel wrist straps and conductive or static-dissipative bench mats. Each wrist strap and bench mat shall be grounded to an earth ground via a one megohm-resistor. References (d) and (e) identify typical ESD grounded work stations. Earth grounds used for ESD-safe work areas shall be verified quarterly by activity ESD control and protection coordinators.

c. Packaging Requirements for the Transport and Storage of ESDS Items. Activities shall ensure that all uninstalled ESDS items are protected from possible ESD damage in accordance with references (b), (c), (d), and (g).

(1) Approved ESD protective bags, pouches, or barrier material (e.g., "bubble wrap") as applicable, shall be used to package ESDS items for local or retrograde transport and short or long term storage. ESD protective material shall be of the type which incorporate static dissipative or anti-static properties.

(2) When hand-carrying uninstalled ESDS items from one location to another (even between test benches), ESD protective bags, pouches, or conductive tote boxes shall be used.

(3) Packaging used for returning ESDS items to supply shall meet the requirements of references (d) and (g).

CAUTION: In all instances, ESDS items shall not be placed in or removed from ESD protective packaging or containers except at an ESD-safe work area, by personnel trained in ESDS item handling procedures.

CAUTION: Packages labeled as containing electrostatic or electromagnetic-sensitive items shall not be opened to verify correct packaging or contents except at a designated ESD-safe work area, and by qualified personnel using approved handling techniques.

CAUTION: Under no circumstances shall prime static generators (polyethylene, vinyl, styrofoam, etcetera) be brought in ESD-protected areas or used to package ESD items. This especially applies to bulk styrofoam packaging, styrofoam "peanuts," white styrofoam (or other plastic) coffee cups, and plain plastic bubble wrap.

(4) An appropriate ESD caution label, as identified in reference (d) or (g), shall be affixed to the outside of all packages containing ESDS items in such a manner as to preclude opening of the packages without disturbing the ESD caution label.

(5) ESDS items received from Navy stock without appropriate packaging, as outlined by reference (f), shall be reported via a Report of Discrepancy (ROD) in accordance with reference (g).

d. ESD Control/Protective Material Acquisition. Local OFC-50 funds will be utilized to procure required ESD control/protective material.

S. B. STARKEY
Chief of Staff

Distribution:
CNATRA Website

SAMPLE TRAINING OUTLINE

1. ESD Control Program
 - a. Organization and responsibility
 - b. Program requirements
2. Principles of Static Electricity
 - a. Definition
 - b. Prime generation and causes
 - c. Electromagnetic Interference (EMI) generated by static charge/discharge
 - d. Control methods
 - (1) Grounding
 - (2) Personnel protective devices
 - (3) Test apparatus/alarms
 - (4) Humidity
 - (5) Ionized air
 - (6) Protective handling
3. ESDS Items
 - a. Definition of ESDS items
 - b. How items are degraded/destroyed
 - c. ESDS parts sensitivity levels
4. ESD Protective Materials and Handling Procedures
 - a. Antistatic (pink poly)
 - b. Metallized transparent (static shielding)
5. ESD Conditions Peculiar to the Activity's Aircraft, Work Centers and/or Supply Spaces