

10.26 Electrical Wiring Interconnect System (EWIS) Maintenance (NAMPSOP)

10.26.1 References

- a. NAVAIR 01-1A-505-1, General Series Wiring Maintenance
- b. NAVAIR 01-1A-505-4, Aircraft Fiber Optic Cabling
- c. MIL-HDBK-522, Guidelines for Inspection of Aircraft Electrical Wiring Interconnect Systems (EWIS)
- d. MIL-HDBK-525, Electrical Wiring Interconnect System (EWIS) Integrity

10.26.2 Introduction

a. Electrical Wiring Interconnect System (EWIS) is defined as any wire, electrical cabling, or fiber optic cabling, or a combination of these items, including terminations, installed in any area of the aircraft for the purpose of transmitting electrical or optical energy, signals or data between two or more electrical/optical end points.

b. COMNAVAIRSYSCOM (AIR 4.4) electrical systems engineers determined properly maintaining EWIS is a critical factor in optimal aircraft performance and reliability. The importance of thorough EWIS maintenance continues to grow with the ever-increasing technical sophistication and integration of advanced aircraft electrical systems. Accordingly, this NAMPSOP outlines EWIS procedures that more closely align with commercial aviation industry best practices.

c. All O-level naval aviation activities operating and maintaining naval aircraft will comply with the procedures of this NAMPSOP.

10.26.3 Requirements

10.26.3.1 General

a. All O-level naval aviation activities performing aircraft EWIS maintenance are responsible for adherence to the EWIS inspection, maintenance and repair procedures in T/M/S maintenance manuals and references a. through d.

b. Although not required to comply with this NAMPSOP, Depot, commercial, and other government activities performing rework or maintenance on naval aircraft are required to meet the same or equivalent standards for EWIS maintenance as defined in references a. through d.

10.26.3.2 Training. All personnel who perform on-aircraft maintenance must have a working knowledge of EWIS. Training requirements:

a. Maintenance personnel (including maintenance aircrew) not directly involved in the EWIS maintenance must complete the EWIS Wiring Awareness training course (CNATT-008-WRA-021-002-A0) at least once per calendar year. If fiber optic cabling is applicable to the aircraft, personnel will also complete the EWIS Fiber Optic Awareness (CNATT-008-FBO-021-001-A0). These courses are available on Navy e-Learning at the following link:
<https://learning.nel.navy.mil/ELIAASv2p/>.

b. Personnel (including maintenance aircrew) that inspect, maintain and repair EWIS must complete on-the-job EWIS training (OJT as defined in Appendix A and 10.1.3.4) for the specific Type/Model/Series aircraft, as it applies to the EWIS maintenance they perform. Training will include:

- (1) Review of references 10.26.1.a through 10.26.1.d.
 - (2) Review of EWIS training materials available from NAVAIR at <https://myteam.navair.navy.mil/org/jswag/>.
 - (3) EWIS cleaning and preventative maintenance, per reference (a) procedures.
 - (4) EWIS inspection and diagnostic techniques, per reference (a) procedures.
 - (5) Identification of wires, connectors, and contact pins per NA 01-1A-505, reference (a), and T/M/S aircraft technical manuals (e.g., Wire Connector Repair (WCR) and Wire Data Manual (WDM), as applicable.
 - (6) Basic EWIS repair processes to include: shielded and non-shielded splices, insertion and extraction of connector contacts, selection and termination of wiring terminal lugs and contacts. Splice training will include emphasis on splice restrictions.
 - (7) Single wire, bundle, and harness installation, routing, clamping, and protection, per reference (a) procedures.
 - (8) Operation of multimeters and other wire test equipment, such as the Advanced Wire Test Set (AWTS), per reference (a) procedures.
 - (9) Work order (WO) documentation, with emphasis on MAL Codes specific to EWIS and WUCs specific to the T/M/S aircraft EWIS.
- c. EWIS OJT will be documented in ASM or equivalent training record per paragraph 10.1.3.9.

10.26.3.3 EWIS Maintenance

a. EWIS maintenance will be performed per the procedures specified in T/M/S technical manuals and the references listed in 10.26.1a. through d., as applicable.

NOTE: The EWIS splice restrictions of reference a will be strictly observed. Conditional or temporary wire splicing in restricted areas must be performed per the Fleet Engineering Disposition (FED) process, paragraph 3.2.2.27. The FED must include wire number, harness part number, physical location and directed wire replacement interval (such as, no later than 100 flight hours, or next Phase inspection, or next Depot rework).

b. EWIS maintenance will be documented in detail in OOMA Work Orders (WO). The Corrective Action block will contain a full description of the repair, to include type of wire or fiber optic that failed and the location of the repair. If wire splicing was performed, the Corrective Action block will contain a detailed splice location to include:

- (1) Wire number (when available).

- (2) Wire Harness Reference Designator and part number (if applicable).
- (3) Associated system, for example, ALQ-126 Countermeasures Set or APG-73 Radar.
- (4) Physical location of the splice (e.g., fuselage station, rib number, panel number).

NOTE: Documenting the location of installed splices allows the T/M/S Aircraft ISSC and FST to determine whether wire segment replacement is required during future rework to restore wire harnesses to original configurations.

(5) Wiring System Malfunction Code and Action Taken Code per Appendix E will be applied.

(6) Work Unit Code (WUC) or Unified Numbering System (UNS) for the wire, cable, or harness must be assigned.

10.26.4 Responsibilities

10.26.4.1 COMNAVAIRSYSCOM

a. AIR-4.4.5 will establish all installation and performance requirements of naval aviation EWIS and EWIS components.

b. AIR-4.5 will establish all functional performance requirements of data and signals transported or conveyed through EWIS on naval aviation platforms.

c. NATEC will provide in-service support for EWIS.

d. T/M/S Aircraft ISSCs will:

(1) Identify, assess, and prioritize EWIS degraders based upon the following data (per availability of individual T/M/S):

(a) Fleet Failure and Maintenance Data (WOs, Engineering Investigations, HazReps)

(b) Aircraft Functional and Physical Hazard Assessment Data (areas containing EWIS and combustible materials, high heat areas, high vibration areas, severe wind and moisture prone (SWAMP) areas, etc.)

(c) EWIS Components Aging Assessment Data (wire insulation age degradation analysis)

(2) Establish EWIS degrader mitigation strategies and implement mitigation steps such as scheduled organizational, intermediate, and depot-level inspection, maintenance manual updates, and the replacement or upgrade of EWIS components.

(3) Develop and publish Maintenance Requirement Card (MRC) for T/M/S EWIS inspections.

(4) Coordinate with Type Wings and MAWS to raise Fleet Awareness of EWIS degraders and mitigation strategies and steps to stress the importance of protective measures when working on or around wire bundles and connectors during structural repairs, systems installations and modifications. Perform periodic re-assessment of EWIS mitigation strategies and steps to ensure desired outcomes have been achieved and maintained.

(5) Provide expertise and equipment assistance to supported activities during EWIS program actions, such as engineering analysis in support of Automatic Wire Test Systems (AWTS), and platform EWIS modifications.

10.26.4.2 Type Wings and MAWs

- a. Designate an EWIS Program Manager.
- b. Publish a Wing LCP per Appendix D on any T/M/S peculiar EWIS procedures not addressed in this NAMPSOP or applicable technical directives and instructions.
- c. Develop a Job Qualification Requirement (JQR) per the Maintenance In-Service Training NAMPSOP, paragraph 10.1.3.xx, if EWIS training is not adequately covered by a Navy Qualified and Proficient Technician (QPT) or Marine Aviation Maintenance Training and Readiness Program (AMTRP) syllabus.
- d. Incorporate EWIS training into the training syllabus for QARs, CDQARs and CDIs, per paragraph 7.3.4.1.
- e. Inspect EWIS during aircraft Material Condition Inspections (MCI). Type Wings and Marine Corps TECOM Aviation Standards Branch (ASB) will develop and publish a JQR per 10.1 to train and qualify Wing and MAW inspection personnel on general EWIS inspection requirements and techniques. The JQR will include the areas specified in paragraph 10.26.3.2.b., tailored to each T/M/S aircraft inspected.
- f. Submit inputs for additions or changes to EWIS training specified in Personnel Qualification Standards (PQS) per 10.1.4.1.b.

10.26.4.3 Maintenance Officer

- a. Designate an Avionics Division Officer as the EWIS Program Manager. Designation will be in writing, via ASM.
- b. Publish LCPs per Appendix D, if required, to address any EWIS maintenance procedures not addressed in this NAMPSOP or Wing LCP. Command LCPs will be submitted to the Wing or MAW for consideration of inclusion in the Wing LCP.

10.26.4.4 Assistant Maintenance Officer (AMO). The AMO tracks progress in achieving the training requirements of 10.26.3.2.

10.26.4.5 Maintenance Control

- a. Direct corrective action for EWIS discrepancies in a timely manner, not to exceed the next major scheduled inspection or on-site Phased Depot Maintenance event (PMI/IMC), whichever occurs first.
- b. Submit requests to defer corrective action for EWIS discrepancies beyond the next scheduled phase inspection or on-site Phased Depot Maintenance event to the Type Wing or MAW for approval. Deferral requests must include details on impact to aircraft mission capability.
- c. Verify EWIS maintenance is correctly, accurately and completely documented on all work orders (WO) per paragraph 10.26.3.3.b.

10.26.4.6 EWIS Program Manager

- a. Perform a program assessment within 30 days of designation as Program Manager and annually thereafter, per paragraph 10.7.
- b. Provide technical advice and assistance to work centers in matters pertaining to EWIS inspection and maintenance, to include coordinating NATEC assistance when required to resolve recurring EWIS related discrepancies.
- c. Provide EWIS Program NAMP indoctrination training per paragraph 10.1.
- d. Conduct a quarterly inventory to verify materials, equipment, and tools required to perform EWIS inspection and maintenance are available.
- e. Maintain an account with the Joint Services Wiring Action Group (JSWAG) (<https://myteam.navair.navy.mil/org/jswag/>) and be familiar with the contents and resources available therein. Access to JSWAG main site can be requested via the public site at <http://www.navair.navy.mil/jswag/>.

f. Maintain a program file to include:

- (1) POCs
- (2) Program related correspondence and message traffic
- (3) References or cross reference locator sheets
- (4) Most current Computerized Self Evaluation Checklist (CSEC) assessment

10.26.4.7 Quality Assurance

- a. QA Officer: Designate an EWIS maintenance QAR (AE/AT) as the EWIS Program Monitor. Designation must be in writing via ASM.
- b. QA EWIS Program Monitor: Conduct Program Monitoring per 10.7, and periodically monitor work in progress to determine compliance with EWIS inspection and maintenance requirements.

10.26.4.8 Work Center Supervisors

- a. Verify work center personnel complete EWIS Program training per paragraph 10.26.3.2.
- b. Periodically spot check work in progress to verify work center personnel are complying with EWIS installation, repair and maintenance procedures specified in technical manuals.
- c. Review WOs to verify personnel are complying with the EWIS documentation procedures of 10.26.3.3.b.
- d. Submit a Hazardous Material Report (HMR) Request for Engineering Investigation (EI) per 10.9.3.3 for repeat EWIS component failures or catastrophic wire harness or cable failure..
- e. Submit Technical Publication Deficiency Reports (TPDR) per 10.9.3.5 when deficiencies are noted in EWIS inspection and maintenance procedures.
- f. Maintain an account with the Joint Services Wiring Action Group (JSWAG) (<https://myteam.navair.navy.mil/org/jswag/>) and be familiar with the contents and resources available therein. Access to JSWAG main site can be requested via the public site at <http://www.navair.navy.mil/jswag/> or by email: jswag@navy.mil.