



Announcements

The 2020 Fall JSWAG/JAvFOWG Technical Interchange Meeting took place virtually among committee chairs. Meeting minutes have been compiled and posted to the JSWAG SharePoint site.

The Spring 2021 meeting will take place virtually. Details will be distributed as they become available.

Please email jswag@navy.mil with any questions.

Resources

- MIL-HDBK-522B Guidelines for Inspection of Aircraft Electrical Wiring Interconnect Systems https://quicksearch.dla.mil/qsDocDetails.aspx?ident_number=277535
- MIL-HDBK-525 Electrical Wiring Interconnect System (EWIS) Integrity Program https://quicksearch.dla.mil/qsDocDetails.aspx?ident_number=279725
- Need help locating information on connectors, contacts or accessories? If so, email us at jswag@navy.mil

Newsletter Contact

JSWAG Coordinator
jswag@navy.mil

Electrical Wiring Interconnect System (EWIS) Awareness

The EWIS can be considered the central nervous system of an aircraft and properly maintaining it comes with numerous challenges. The EWIS awareness event is designed with a “hands on” aircraft inspection approach. The objective is to positively impact scheduled and unscheduled maintenance practices through awareness of EWIS failure modes. From 2018-2020, approximately 85% of corrected EWIS maintenance actions on US Navy aircraft occurred during unscheduled maintenance periods. EWIS awareness events focus on the discovery of defects during scheduled maintenance inspections, prior to failure, which increases EWIS readiness to deliver power, data and signals essential to all aircraft systems. EWIS discrepancies identified and corrected during scheduled maintenance periods result in less maintenance hours compared to those corrected during unscheduled maintenance periods.

Common EWIS failure modes that degrade readiness:

- Chafe conditions to structure, lines and components
- Minimum preventative maintenance (corrosion/contaminates)
- Improper repairs/re-installations
- Mishandling/collateral damage
- Loose connections/bonding/grounding

The awareness event is tailored to the Unit/Squadron’s needs, in their spaces and on their aircraft. The event is designed to bring knowledge and techniques to the fleet while reducing cost and impact on squadron manpower and operational requirements. Events are usually completed in one day and has two segments; classroom instruction and aircraft “hands-on” inspection periods. The target audience is all maintenance rating specialties and ranks. All findings are documented in maintenance data, combined with photos of specific discrepancies for follow-on usage.

EWIS topics covered includes, but are not limited to:

- Wiring/fiber harness routing, to include primary/secondary support and clearance requirements
- Chafe prevention and protection measures
- Inspection tools and techniques
- EWIS failure modes/identification (MIL-HDBK-522)
- Maintenance action documentation accuracy (W-MAL codes)
- EWIS damage classification and reporting requirements in Joint Deficiency Reporting System (JDRS)
- NA-01-1A-505 General series, Installation and repair practices, Aircraft Electric and Electronic Wiring

The knowledge learned from these topics, when implemented by maintainers, have been proven to reduce:

- Mishaps
- Premature component failures
- Unnecessary component removals
- EWIS-related aircraft downtime
- Incorrect data entry into JDRS. Significant driver of long-term programmatic/funding issues.

Since re-instituting EWIS Awareness Events in 2016, there have been multiple recurring events across all four Marine Corps Air Wings, covering most fixed and rotary wing Type/Model/Series. The events have had over 700 attendees representing various MOS's including AVI, Airframes, Flight-line, QA and Engine Mechanics.

Targeted platform event requests have focused on the F-18's generator converter unit (GCU) wiring which directly improved the EWIS readiness. The seven squadrons trained in 2019 are showing a 111% increase in GCU reliability. Subsequent wiring assessments after training events are not finding as many discrepancies in known problem areas and there is a noticeable effort by the fleet to correct issues when found. The events primarily focus on inspection skill enhancement and development of preventative maintenance techniques. The goal is to re-calibrate maintainers' eyes with the ability to identify common EWIS conditions that lead to problems, such as chafing.

Attendee feedback has been largely positive:

“Great training especially as an up and coming CDI for AVI”

“Information what we need to know to look for to prevent future mishaps”

“Everyone in the shop will use the knowledge daily”

“Everyone in the maintenance department should know how to recognize improper wire configuration and discrepancies”

“Makes me more vigilant and help me to know what to look for”

“Flight-line Plane Captains would benefit much”

“As an Air Framer this training helped me to be more cognizant of wire harnesses in relation to my components”

Future event demand continues to be strong and is expected to continue in FY21. Other existing and on-going efforts aimed at addressing the critical capability gaps in avionics/electrical technician training pipelines are:

- Air Force Mobile Training team. Provides instruction on proper wire repair procedures and correct use of tools and maintenance procedures. For more information, contact 373d Training Squadron, MSgt Scott Gardner, DSN 736-2183.
- Center for Naval Aviation Technical Training (CNATT), just in-time wire repair course offered only at MCAS New River. Provides instruction on proper wire repair techniques. Course and scheduling information can be found at Catalog of Navy Training Courses (CANTRAC) at <https://app.prod.cetars.training.navy.mil/cantrac/vol2.html>. This course will be replaced by the official CNATT Advanced Wire Repair course (currently under-development).
- Navy / Marine Corps developed EWIS inspection and EWIS repair PQS training syllabus now required to be completed by all technicians that inspect and/or repair EWIS. See Naval Aviation Maintenance Program Standard Operating Procedures (NAMPSOP) for more information.

For more information or to schedule a EWIS awareness event at your unit or squadron, please email JSWAG@navy.mil 

Find the Answer

Current Question:

What are the 4 authorized repairs for insulation damage to single conductor wire without conductor damage?

Resource: NAVAIR 01-1A-505-1

Answer will be provided in next Newsletter publication

Previous Question:

What is a voltage drop?

Answer: Voltage drop is the amount of voltage loss that occurs through all or part of a circuit due to conductor resistance. A voltage drop may be anticipated/calculated (e.g., from the wire conductor or load resistance, etc.) or unexpected/excessive (e.g. resistance created by a loose connection or corrosion, etc.).

Source: Definition from Penn State College of Earth and Mineral Sciences. Retrieved from <https://www.e-education.psu.edu/ae868/node/967> on 15 Dec 2020.