JOINT SERVICES WIRING ACTION GROUP

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Announcements

The next JSWAG/JFOWG Technical Interchange Meeting is scheduled for August 13-15, 2013 in Dayton, OH. Please contact a committee chair if interested in attending or send an email to jswag@navy.mil. DCO/VTC capability should be available for those who cannot travel.

Nominations for the 2013 Lu Roberts award recipient has begun. Please visit https://jswag.navair.navy.mil/ to make your nomiation. Nominations will close August 31 for voting to begin. The winner will be announced at the 2014 Spring JSWAG/JFOWG Technical Interchange Meeting.

Training Resources

- Aircraft Wiring Systems Awareness DVD- Defense Imagery PIN #806881.
- Fiber Optic Awareness DVD- Defense Imagery PIN #806707.
- Joint Services Wiring Manual Maintenance Techniques DVD- Defense Imagery PIN #806994.
- MIL-HDBK-522- Guidelines for Inspection of Aircraft Wiring Interconnect Systems- http://quicksearch.dla.mil.

Newsletter Contact

JSWAG Coordinator

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AV-8B Automated Wire Testing Analysis

PMA-257 AV-8B Harrier Program Office in collaboration with NAVAIR 4.4.5.3 Wiring Systems Branch co-sponsored a data analysis effort focusing on the effects of wiring systems diagnostics on maintenance and aircraft readiness. The analysis was performed by Wyle Aerospace Group Reliability Center Maintenance (RCM) data analysts at Jacksonville, FL. This analysis focused on a means to:

- Identify the effectiveness of automated wiring testing
- Determine the range of the failure, and impact on aircraft maintenance
- Identify possible test modifications that increase reliability and readiness
- Determine if data collected supports continued testing

AV-8B Launch. Photo courtesy of the U.S. Navy

Ten AV-8B aircraft had the wiring systems tested starting at the beginning of June 2011 at Fleet Readiness Center (FRC) Cherry Point, NC. The testing was conducted in conjunction with the aircraft's Planned Maintenance Interval-1 (PMI-1) event. The data collected during the effort was used to develop the wiring test dataset. Maintenance data was extracted from the Naval Aviation Logistics Command Management Information (NALCOMIS) system via DECKPLATE for the same tested aircraft and for a like number of non-tested aircraft as a control group. The data contained in these databases was used in the comparative analysis of tested versus non-tested aircraft to determine the impact of automated wiring system testing.

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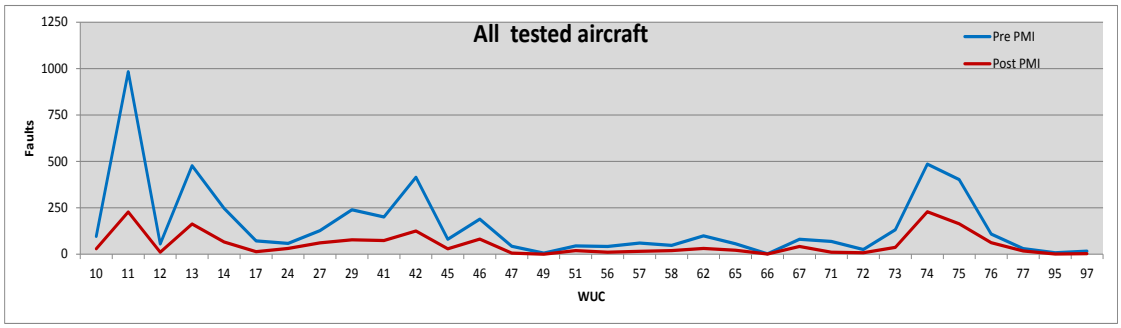
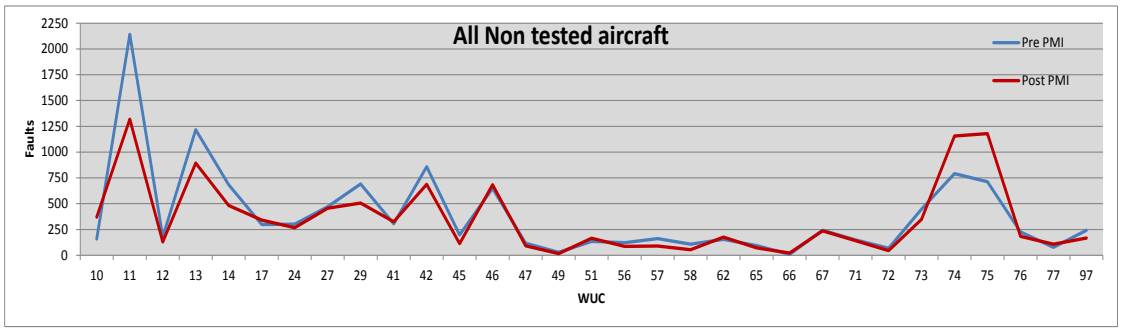
Raw test data was filtered to remove duplicate findings, incomplete records and unusable data. From there, the failures were individually researched, cataloged and separated. As a result, 775 usable wiring system faults were identified. The faults were categorized by system nomenclature, system number, component from/to connector number, connector from/to pin identifier and WUC. The results of this categorization were then compared to the pre-test maintenance history of the tested aircraft to determine the relationship of the faults found to the faults reported operationally. The data did not attempt to control factors influencing wiring longevity to include length of time the aircraft has been in service, flight/storage conditions or flight hours.





The Wilcoxon Signed Rank Test for Paired Data was used to conduct the analysis. This method was used to compare two population medians for small sample sizes. The analysis revealed sufficient evidence to support the claim that automated wiring system testing has a significant, direct impact on the number of repair actions. Analysis showed that a 51% reduction in repair actions per flight hour was achieved when compared to post PMI testing.

For the same period, the control group of aircraft (which received no wiring system testing) showed about a 13% increase in repair actions between pre and post PMI inspections.

As a group, the wiring tested aircraft, demonstrated post- PMI reductions in the rate of component removal (for the systems tested), maintenance actions per flight hour (reduced by 24.5%) and NMC time (reduced by 3%) compared to the non-tested control group of aircraft.

While the number of aircraft in this analysis was only 10, the results indicate a decrease in maintenance actions and an increase in mission capability when performing automated wiring system testing on a scheduled basis. A continuing effort is ongoing to increase the aircraft sample set to 30 aircraft and to further validate the analysis described above. Results shall be briefed at the JSWAG as part of the Data Analysis work group's efforts.

AWTS Tested Aircraft	Pre PMI	Post PMI
Total # of Aircraft Repair Actions	592	356
Total Flight Hours	858.5	1,043.3