

**AH-64 Apache** 9 Oct 2018

## **Results from portable Intermittent Fault Detector (IFD) Testing of Electrical Wiring Interconnection Systems (EWIS)**

**Test Location:** [REDACTED]

**Weapon System:** AH-64 Apache

**Test Date:** 9 Oct 2018

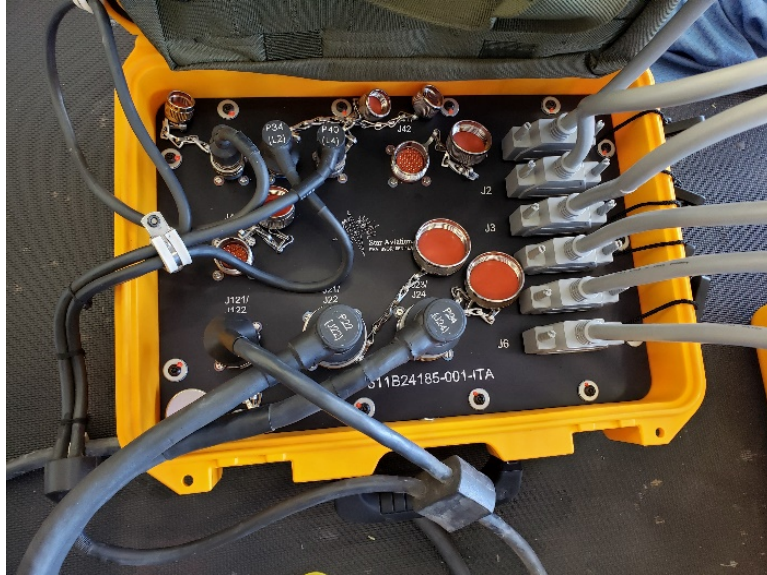


**Unit Under Test (UUT):** Black Engine Harnesses

- Left (Cable ID: W185)
- Right (Cable ID: W186)

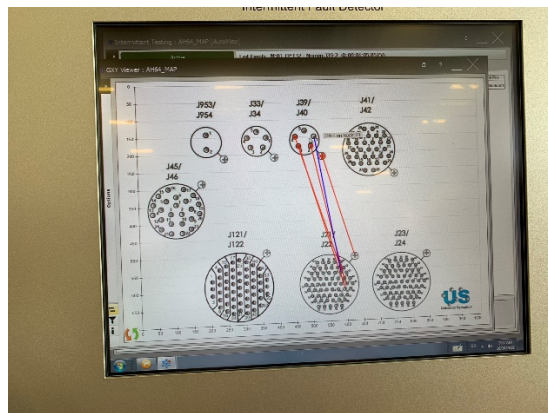
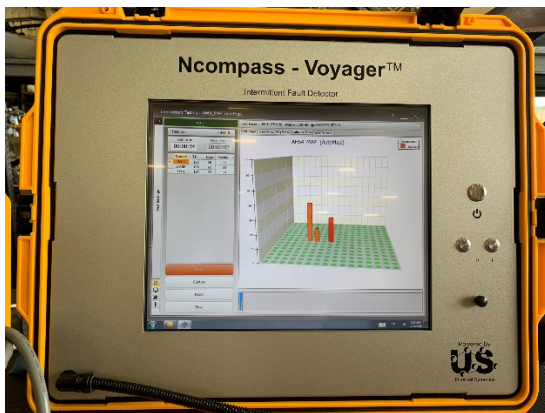
### **CONOPS:**

- Each engine harness costs roughly \$11,000
- External damage to harness results in disposal
- Internal cable issues can be repaired but is not done by contracted shop in hangar 10 – they replace with new harness
- QA with conventional / traditional continuity tests (Digital Multi-Meter (DMM)) is the current test procedure for these harnesses



### Test Procedures:

- Left (Cable ID: W185) – AutoMap™ completed
- Right (Cable ID: W186) – AutoMap™ completed – found two additional connections different than Left (Cable ID: W185)
  - Connection #1 was J121 Pin 4 to J121 Pin 10
  - Connection #2 was shield on J21
- Left (Cable ID: W185) – Continuity failed due to additional connections as described above
- Left (Cable ID: W185) – Intermittence test passed – certified intermittent free
- Right (Cable ID: W186) – Continuity passed
- Right (Cable ID: W186) – Intermittence failed on J39 2,3,4, and shield
  - Lock ring had been overtightened causing poor engagement



Fault Isolation Graphic displaying Intermittent Events on connector J39 wires 2, 3, 4 and shield



Right (Cable ID: W186) Lock Ring Overtightened

- Right (Cable ID: W186) – Intermittence failed on J39 2,3,4, and shield (cont.)
  - No Fault Found (NFF) Cycle Begins as harness passed continuity
    - Harness would have been installed on AH-64 Apache
    - Operational Conditions → intermittent in flight → operational failure
    - Pass continuity on the ground = No Evidence of Failure (NEOF)

### Results:

- Right Black Engine Harness (Cable ID: W186) would have been installed on aircraft and would have experienced an operational failure
- Intermittent Fault Detection technology detected and isolated the faults and prevented the NFF cycle

### Recommendations:

- Based on [REDACTED] CONOPS, it is recommended that all AH-64 Black Engine Harnesses be quality inspected with IFD prior to install
- Expand IFD testing to additional AH-64 EWIS