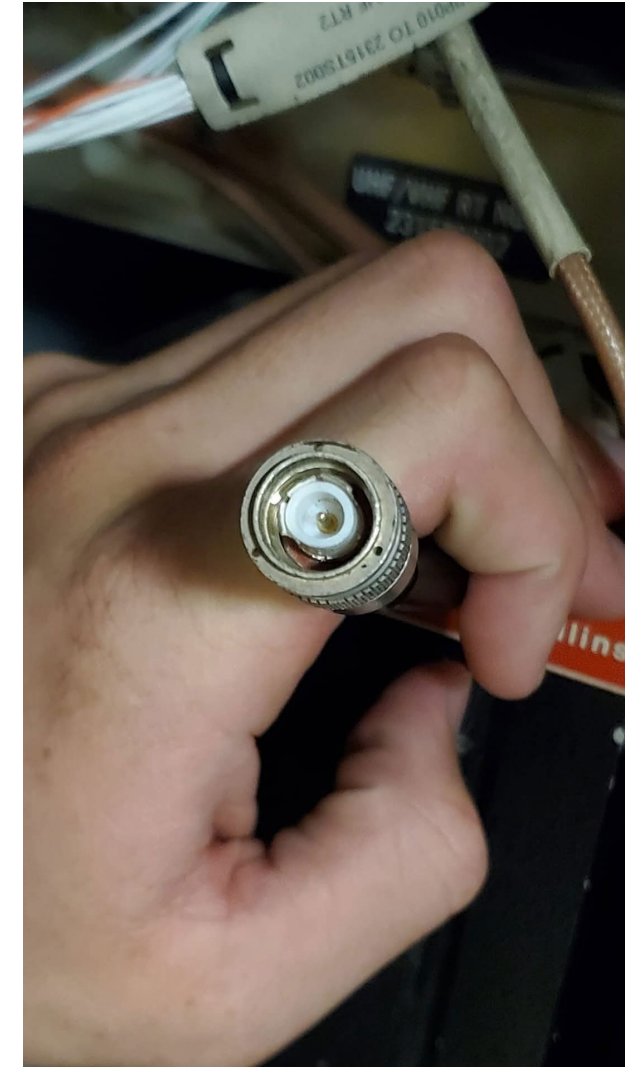


Outline

- What is Intermittent Fault Detection?
- Program Direction
- Program Description BLUF
- Program Approach
- Issues/ Constraints/ Concerns
- Way Forward
- Summary





Program Description



AFLCMC... Providing the Warfighter's Edge

Program Description: The Electronic Intermittent Fault Detection (EIFD) is a new program born from a DOW Special Interest Item to reduce the \$13 Billion of waste associated with systemic “No Fault Found” (NFF) and “No Evidence of Failure” (NEOF).

The program will deliver capabilities to detect and mitigate electrical issues across the spectrum of associated failure modes. This requires a multi-faceted “Tracked” approach aimed at separating LRU/WRAs from aircraft wiring and systems, fixing the affected area, and collecting data for training development.

MAJCOM: All

A/C Supported: All aircraft & complex vehicles – USAF mandate for Common Test Equipment

ACAT/AML Program: Non-ACAT – commercial products

Authorization:

Total Authorized: TBD

Total in Use: TBD

Lifecycle Phase: Development



Intermittent Fault Detection (IFD)

Description - BLUF

AFLCMC... Providing the Warfighter's Edge



- **Requirement:**
 - The OSD Directive highlights need to provide executable solutions regarding best practices used to curtail intermittence...a \$13B problem per year across the DoW.
 - AFMC/A4M formalized our requirement in October 2023.
 - IFD team developed Tester requirements for Field troubleshooting.
- **There is no EIFD “Silver Bullet Solution”.**
 - Requires a multi-faceted holistic approach of coordinated efforts to systematically “bend-back” the negative intermittent fault curve.
- **AF EIFD team developed a 5-Track EIFD approach that will significantly increase Electrical Wiring Interconnect System (EWIS) and Line Replaceable Unit (LRU) reliability.**
 - Approach well received at OSD/ HAF/ MAJCOM/A4's and Interservice Partners



Program Description

The Track's
AFLCMC... Providing the Warfighter's Edge



- **Track 1** targets aircraft EWIS to separate LRU's from weapon system wiring as a fault contributor.
 - Facilitated industry event for OEMs to highlight tester capabilities against our demonstration agenda
- **Track 2** utilizes Depot ATE system to identify and track all Harness Re-engineering efforts.
 - Turn EMXG/CMXG Stakeholders into Shareholders – make them part of the No-Fault-Found (NFF), Retest okay (RETOK) and Harness tracking and repair.
- **Track 3** utilizes the Intermittent Fault Detection & Isolation System (IFDIS) to detect and locate faults within the chassis and backplanes of LRU “Bad Actors”.
 - Work with EMXG/CMXG shareholders to determine the right process to fix NFFs, RETOKs and Bad Actors using IFDIS.
- **Track 4** provides recommendation for A/C SPOs to establish EWIS and 1553 Bus preventive maintenance at the depot/heavy maintenance.
 - Work with AFSC shareholders in establishment of preventative maintenance schedules for all aircraft.
- **Track 5** using MassXR to develop EIFD into “Virtual” training available online – DOW-wide.

Program Approach

AFLCMC... Providing the Warfighter's Edge

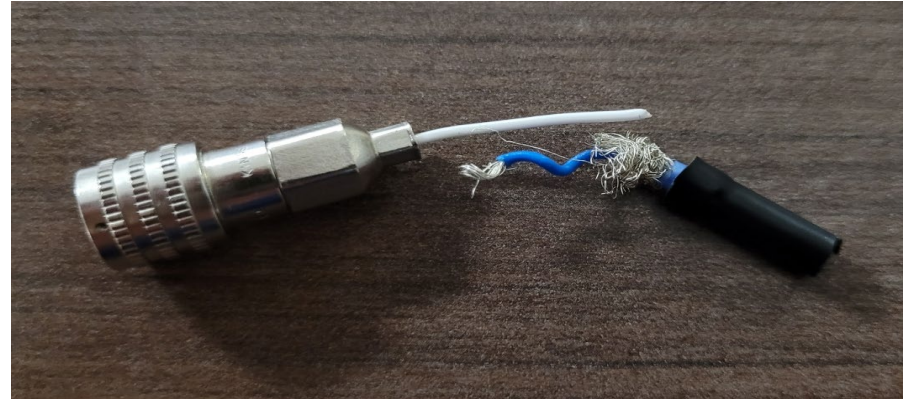
1. **A Wire is:...a wire is...a wire**
2. **A Cable is:...a cable is...a cable**
3. **A Bus is:...a bus is...a bus**

When this 5-track approach is implemented and mature, we expect a 60% reduction in cost associated with IFD along with increased aircraft reliability and AA.

For the Record...That \$7.8B in cost avoidance every year

Description - Track 1 – EWIS Tool Kits

AFLCMC... Providing the Warfighter's Edge



Problem:

- **50% of No-Fault-Found (NFF) are related to aircraft EWIS.**
 - **Targets aircraft EWIS to isolate wiring from LRU's as the contributor to an intermittent fault.**
 - **Methods used to troubleshoot.**
 - **Flightline equipment used for troubleshooting.**

Solution:

- **Established A4 working group to implement better EWIS troubleshooting methods to combat Intermittent Failures.**

Description - Track 1 – EWIS Tool Kits

AFLCMC... Providing the Warfighter's Edge

What we learned from Field units:

- No one instrument is perfect in all intermittent scenarios.
 - Not all wire/ cable/ Bus problems can be diagnosed with one instrument.
 - Each instrument has limitations and operational boundaries however they have complementary features.

Solution:

- Field a Cable/wire/bus Intermittence Set consisting of the right instruments to troubleshoot aircraft EWIS.



Track 2 – Depot Harness Re-engineering

AFLCMC... Providing the Warfighter's Edge

Requirement:

- Explore Retest Okay (RETOK), NFFs, and return to service process for Harness Re-engineering.

Solution:

- Use the PIFD-512 to focus on Quality Assurance of RETOK, NFF for return from Field Harnesses
 - Utilizes Depot ATE and PIFD to QA all harnesses before return to Field/Depot location.
 - Purpose is to validate Quality in all returning harnesses.



****NOT FOR FLIGHTLINE USE****

Description - Track 3 – Bad Actor Repair

AFLCMC... Providing the Warfighter's Edge

Problem:

- Explore current repair methodologies to ensure coverage all failure modes.

Solution:

- OSD recommendation uses the Intermittent Fault Detection and Isolation System (IFDIS) to locate intermittent failures within the chassis and backplane of LRU/WRA “Bad Actors”.
 - EMXG Shareholder defining parameters for use.
- Issue:
 - Lead Time: Purchased as “trial” in Apr 26. Install set for Nov 26. EMXG will begin using on trended RTOKs and Bad Actors.
 - EMXG shareholders are fully engaged.



Description - Track 4 – Depot EWIS Mx.

AFLCMC... Providing the Warfighter's Edge

Problem:

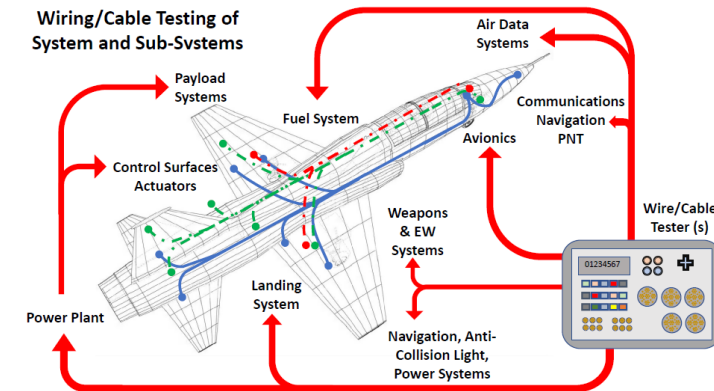
- Few SPOs have EWIS Preventive Mx program.

Solution:

- Recommends aircraft SPOs establish EWIS and Data Bus preventive maintenance at depot/heavy maintenance.
 - Potential to prevent unscheduled intermittent failures at home station using AWTs.
- Since Aircraft is down for scheduled mx., time is afforded for technicians to repair faulty EWIS/1553.
 - SPO's should develop TPS's and ITA's commiserate with their EWIS requirements.

Issue:

- Requires AFLCMC and AFSC support/ buy-in.



Description - Track 5 - Training

AFLCMC... Providing the Warfighter's Edge

Problem:

- Intermittence isn't taught during formal or informal technical courses.
 - Feedback from the field and Engineering suggests that greater emphasis needs to be placed on troubleshooting and repairing Intermittent EWIS faults at operational locations.

Solution:

- Currently, MassXR is developing courses to capture each tester's capabilities and usage
- Will graduate into Advanced Troubleshooting techniques.
- Available to all .mil/.gov emails



So the issue is...

AFLCMC... Providing the Warfighter's Edge

- Current legacy wiring, cable, and bus test sets lack the diagnostic fidelity required to detect, isolate, and characterize a multitude of intermittent conditions and complex failure modes within modern aircraft and support equipment.
- When a Line Replaceable Unit (LRU) is identified as faulty, depot-level maintenance facilities currently lack the specialized methods and test equipment necessary to fully diagnose and repair these elusive intermittent failures, frequently resulting in unresolved faults and recurring maintenance actions.



Intermittent Fault Detection (IFD)

Summary

AFLCMC... Providing the Warfighter's Edge



EIFD is a Strategic Investment: The Electronic Intermittent Fault Detection (EIFD) program represents a strategic investment designed to directly reverse the significant operational and financial losses attributed to unresolved electronic faults. By fielding **common**, advanced diagnostic capability across the enterprise, the DoW can reclaim critical resources and enhance weapon system lethality.

- **Financial Return:**

- **Direct Cost Recoupment:** EIFD directly addresses the estimated **\$3 billion** in annual sustainment costs caused by intermittent faults, yielding a significant and recurring return on investment.
- **Strategic Cost Avoidance:** The program is a primary enabler for bending back the **\$13 billion** annual cost curve associated with systemic "No Fault Found" (NFF) and "No Evidence of Failure" (NEOF) maintenance events, preventing billions in future wasted Operations & Maintenance (O&M) funding.
- **Supply Chain Savings:** By increasing the depot repair yield of Line Replaceable Units (LRUs), EIFD will reduce the need for costly new procurements and mitigate supply chain constraints.

- **Operational Return:**

- **Readiness Restoration:** EIFD is forecasted to recapture a significant portion of the 278,000 weapon system non-availability days lost annually due to intermittent faults, directly increasing Aircraft Availability (AA) and Mission Capable (MC) rates across all platforms.
- **Increased Lethality & Reliability:** By definitively identifying and enabling the repair of elusive system faults, the EIFD capability will produce more reliable weapon systems, ensuring greater operational availability and enhanced lethality for the warfighter.
- **Manpower Optimization:** The program will drastically reduce maintenance man-hours currently wasted on exhaustive, ineffective troubleshooting routines using obsolete legacy equipment, allowing skilled maintainers to focus on high-value tasks.

The EIFD program delivers an exceptional return on investment by directly converting billions of dollars in annual financial waste into tangible readiness and operational capability.

Failure to invest guarantees continued degradation of fleet readiness and an uncontrolled escalation of sustainment costs.

Questions

AFLCMC... Providing the Warfighter's Edge



Questions??