F-15 MECSIP OVERVIEW

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November 18th, 2024

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FDO Case # WR-24-744-XX

MECSIP – Mechanical Equipment and Subsystems Integrity Program

The following briefing contains an introduction to the USAF F-15 MECSIP program and summarizes the following MECSIP topics:

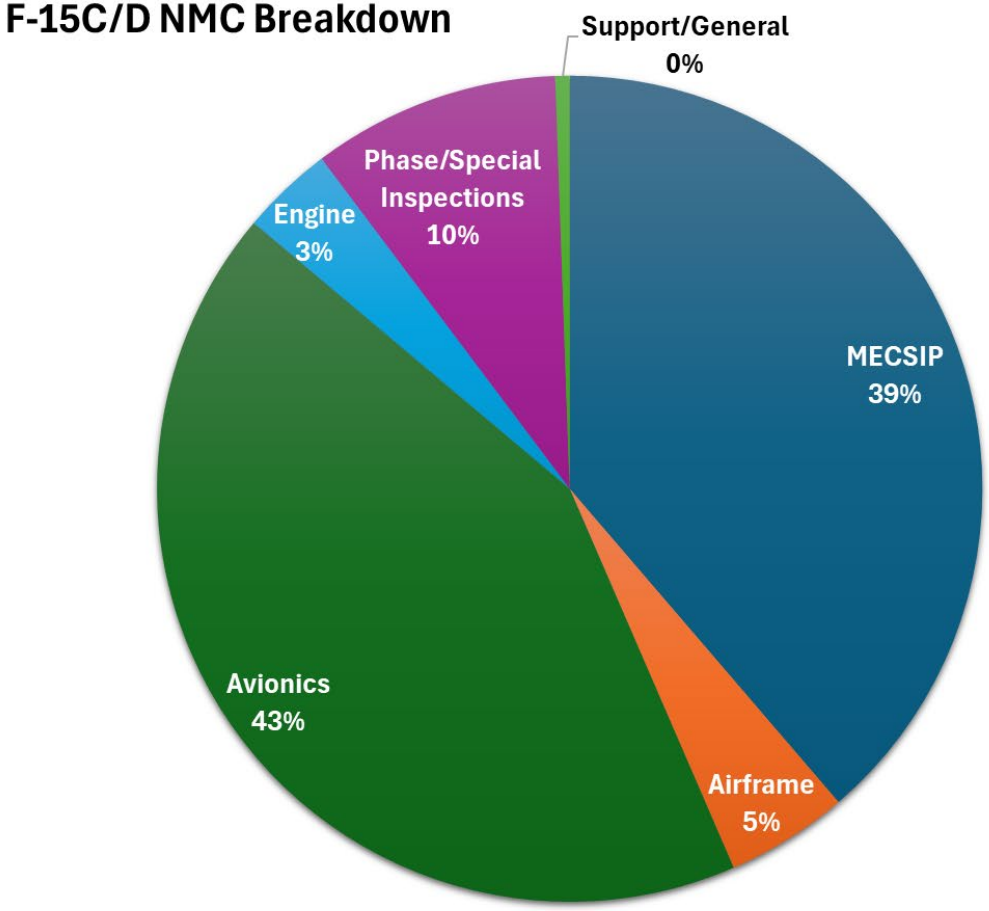
- **MECSIP Overview**
- **RCM Analysis**
- **FSID Overview**
- **Component Specific Efforts**

MECSIP Overview

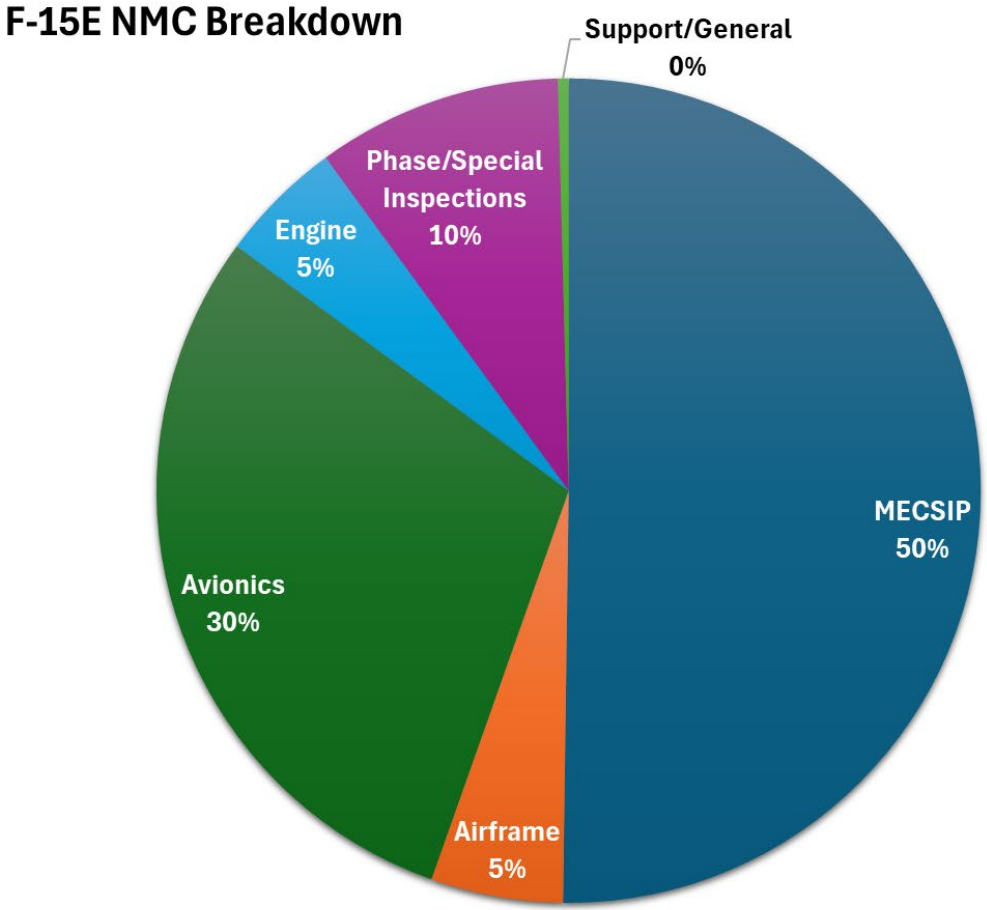
What does a MECSIP program do for you?

- Focus on mechanical systems integrity and reliability
  - Perform Reliability Centered Maintenance (RCM) Analysis
    - Review system/subsystem/component specific maintenance actions
    - Review component failure modes and failure intervals
    - Review/update preventative maintenance actions
    - Review/update repair/overhaul procedures
    - Review/update Inspection Criteria
  - Investigate & initiate component reliability improvements
  - Update and monitor a system/subsystem/component tracking database (FSID)

MECSIP Overview



MECSIP Overview



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RCM Analysis

- System deep dive analysis
  - Evaluate failure modes and reliability metrics for each component in a system
  - Scrubbed REMIS data (correcting for poor data entry)
  - System TO reviews (IPBs, FIs, JGs)
- Initiate further component investigations
- Revise maintenance strategies (phase/depot packages)
  - Data driven recommendations
- Update TO discrepancies found

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Component Tracking Database (FSID)

AIR FORCE LCMC

AFLCMC… Providing the Warfighter's Edge

- FSID pulls REMIS/GCSS data for the development of reliability metrics
  - Reliability metric formulas defined in TO 00-20-2
- Reliability metrics are available for each WUC. Can be filtered by:
  - Date Range
  - Location
  - MDS
- Access is available to TCP team
  - 2875 & CAC Required
- New features are continually rolling out
  - Component Serial Tracking
  - TCTO effectiveness

Component Specific Efforts

- Horizontal Stab Actuator Reliability Upgrade
- E model:
  - Re-designed kit items – single piece cylinder, seals, W-C-Co-Cr coated piston
  - Upgrade approved for fielding in June
  - Items will be replaced by attrition at overhaul facility
- C model:
  - Re-design of overhaul kit items – rings, seals, W-C-Co-Cr coated piston
  - Items will be replaced by attrition at overhaul facility
  - Currently being evaluated for airworthiness
- Rudder Actuator Reliability Upgrade
  - Significant component redesign effort ongoing – F-15C/D/E
  - PDR occurred in May 2019, CDR date September 2020
  - Qual testing TBD, program has experienced delays

Component Specific Efforts

- Power Generation System
  - Generator/IDG
    - Power study completed on E model with RMP and EPAWSS
      - Generators are operating within power margin with both generators operating
    - Pursuing additional flight testing to monitor loads and temperatures within system (1067 signed)
    - Conducted field inspections of failed generators to better understand failure modes – Showing signs of heat damage
  - Conducting field level evaluation of FOHE flushing cart
    - Intended to keep FOHE at high efficiency
    - Studies completed determining best flushing fluid and practices
    - Local job guide developed
    - Flushing getting positive feedback from field units
  - Exploring FOHE re-design for improved thermal efficiency (1067 signed)

Component Specific Efforts

- ETAM (Engine to Airframe Manifold) Study
  - Multiple configurations of ETAM exist in F-15 fleet
  - Evaluating two latest designs to understand service life and failure modes of each
    - Vibration testing to simulate on-aircraft fatigue
    - Evaluating damage to elbow tube and seals
    - Testing completed, awaiting final report
- Field Level Fuel Transfer Pump Current Monitor Evaluation
  - RCM Analysis revealed high costs spent on current monitors
  - No capability exists to determine which monitor is faulty
  - Prototype testers in-use at several field units
  - Preliminary results show most current monitors check good
  - Design data can be made available

Component Specific Efforts

- Central Gear Box (CGB) Reliability Upgrade
  - Redesigned and tested a new clutch and brake design – commonly referred to as the "2X Clutch and Brake"
  - New Clutch and Brake is being installed on overhauled items, replacing legacy clutch and brake by attrition
  - Monitoring installations and condemnations to confirm reliability improvements
- PTO Shaft/AMAD
  - New PTO shaft design (-6A) completed for better mating with AMAD
  - AMAD upgrade designed for better lubrication at AMAD/PTO shaft
  - Ongoing field service evaluation of new PTO Shaft
    - Initial inspections show promising results
    - One shaft has accrued over 700 hours with minimal signs of wear

Component Specific Efforts

- EWIS (Electrical Wiring Interconnect System) Integrity
  - Studied historical maintenance data to understand problematic areas
    - Ongoing task, currently 28% complete
  - Revised code and cable drawings for nine relay panels.
  - Updating TO 35CA6-11-8-1 for AWTS checkout
    - Corrected P/N's, pin outs, and references
    - Updates reflect new TCTO completion & new ops checks for RMP
  - Contract awarded to consolidate and standardize existing TPS's
  - Future EWIS efforts
    - Provide complete cable sets for standardized TPS's to field units
    - Incorporate AWTS checkouts in FI/troubleshooting processes
    - Establish WUCs for electrical wiring system
    - Review locally written AWTS programs
    - Develop and manage CPINs for fleet wide AWTS programs

QUESTIONS?