AFCPCO NEWS

US Air Force Corrosion Prevention and Control Office Newsletter February 2023

Corrosion Hot Spot Analysis

What is it?

Corrosion Hot Spot Analysis is a corrosion prevention and control (CPC) project investment made by Air Force Corrosion Prevention and Control Office to create a suite of interactive dashboards that visualize weapon systems maintenance data. Hot Spot Analysis dashboards assess and highlight the different parts of an aircraft that are driving high trends in corrosion repairs done on the weapon system causing significant impacts on weapon system sustainment costs, weapon system availability, and mission readiness.

How it is done?

Hot Spot Analysis dashboards achieve weapon system maintenance data visualization through a CPCO approved process. Maintenance data is pulled from authoritative Air Force databases such as REMIS. Then the data is filtered by corrosion codes and keywords found in REMIS maintenance data. Finally, the now filtered maintenance data is visualized in the program Microsoft Power BI by creating a suite of interactive dashboards.

What does it show?

Hot Spot Analysis dashboards generate a corrosion-centric view of filtered weapon system maintenance data by showing different ways of looking at the data including:

- Top 10 corrosion related aircraft parts which is also known as Work Unit Codes
- Corrosion repair frequency by base location
- Corrosion repair frequency by aircraft tail number
- Correlation of corrosion repair frequency to maintenance man hours and
- Corrosion repair record search

The data displayed is customizable depending on the requester's interest and can be filtered for a specific timeframe.

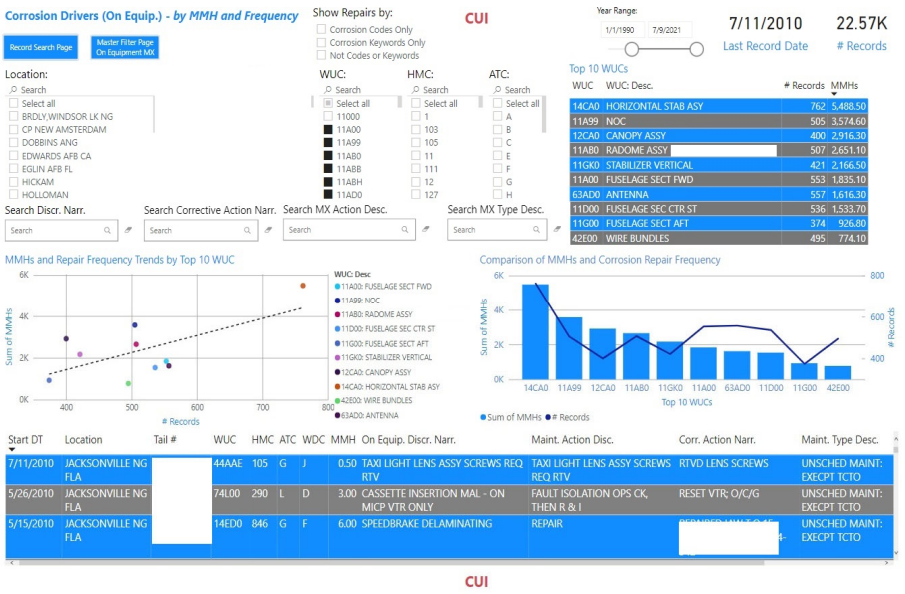

Figure 1 - Top Corrosion Drivers by Maintenance Man Hours and Repair Frequency Dashboard. Note: No controlled unclassified information displayed, markings are for reference and example only.

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What are the Benefits?

Hot Spot Analysis dashboards provide several benefits for Air Force Enterprise-wide cost savings on weapon systems and improve mission capable readiness. One example is the dashboard evaluating the correlation of corrosion repair frequency to maintenance man hours points to which aircraft parts on a weapon system are causing non-mission capable hours so special attention gets focused on said aircraft parts to correct and improve their quality to have mission capable weapon system readiness.

Hot Spot Analysis dashboards have influenced maintenance man hour expenditures and weapon system readiness on weapon systems across the Air Force Enterprise. For example, Hot Spot Analysis dashboards indicated a relationship between failures of the Navigation Light and severe corrosion failures of the Lower Intake Skin. This prompted a collaboration with the F-16 Special Program Office to review the dashboard's maintenance data and help recommend fixes for the F-16 navigation light. This resulted in an estimated maintenance man hours savings of 800 hours annually across majority of the F-16 fleet thus improving mission capable readiness.

Additionally, Hot Spot Analysis dashboards provide data pulls and dashboard screenshots for Special Program Office data discussions, Corrosion Prevention Advisory Boards, and more. Over time, the Hot Spot Analysis dashboards intent is to integrate with Air Force Digital Transformation strategy by migrating over to potential data visualization platforms such as Siemens Teamcenter or Advana.

Contact Us

Send us an email with any questions, concerns, or suggestions.

USAF Corrosion Prevention and Control Office
325 Richard Ray Blvd
Bldg 165
Robins AFB, GA 31098

Email us at afcorr@us.af.mil

Visit us on the web at www.afcpo.com

Prevent, Mitigate, Destroy Corrosion

Technical Order (TO) Status Corner

TO 35-1-3, Corrosion Prevention and Control, Cleaning, Painting, and Marking of USAF Support Equipment (SE), is still currently undergoing a full revision by the AFCPCO.

TO 1-1-8, Application and Removal of Organic Coatings, Aerospace and Non-aerospace Equipment, updating MIL-PRF-85285 verbiage to align with revision F of the MIL-Spec, e.g. gloss ratings, new Classes and Grades. Also adding NOTE stating the only approved single component polyurethane topcoat is Polysiloxane.

Any questions or concerns regarding the rewrite should be addressed to afcorr@us.af.mil.

2023 Air Force Corrosion Technical Interchange Meeting

The 2023 Corrosion Technical Interchange Meeting (CTIM) is scheduled 7-9 March 2023 at the Museum of Aviation in Warner Robins, GA.

This will be a great opportunity to network with Depot, MAJCOM, Engineers, Field maintainers, Corrosion Managers, and OEMs.

Registration is still OPEN until 28 February 2023. Agenda will be provided at a later time.

Registration Link:
https://secure.touchnet.com/C20221_ustores/web/store_main.jsp?STOREID=103

MIL-STD-1530 Aircraft Structural Integrity Program (ASIP) And Corrosion Prevention & Control

Did you know: Corrosion Prevention and Control (CP&C) is a key component of the USAF ASIP program

Corrosion has such large impact on structural integrity, it is deeply integrated in each of the five ASIP tasks, being called out in 14 of the ASIP elements and the word “corrosion” is found 64 times in MIL-STD-1530.

CP&C is implemented early in weapon system design/development (Task I - III) and is required to be continuously monitored/updated as part of ASIP Tasks IV and Task V.

Task I	Task II	Task III	Task IV	Task V
Design Information	**Design Analyses & Development Testing**	**Full-Scale Testing**	**Certification & Force Management Development**	**Force Management Execution**
1. ASIP Master Plan	1. Materials and Structural Allowables	1. Static Tests	1. Structural Certification	1.L/ESS Execution
2. Design Service Life & Design Usage	2. Loads Analysis	2. First Flight Verification Ground Tests	2. Strength Summary & Operating Restrictions (SSOR)	2. IAT Execution
3. Structural Design Criteria	3. Design Loads/Environment Spectra	3. Flight Tests	3. Force Structural Maintenance Plan (FSMP)	3. DADTA Updates
4. Durability & Damage Tolerance Control	4. Stress and Strength Analysis	4. Durability Tests	4. Loads/ Environment Spectra Survey (L/ESS) System Development	4. L/ESS and IAT System Updates
5. Corrosion Prevention & Control	5. Durability Analysis	5. Damage Tolerance Tests	5. Individual Aircraft Tracking (IAT) System Development	5. NDI Updates
6. Nondestructive Inspection	6. Damage Tolerance Analysis	6. Climatic Tests	6. Force Management Database Development	6. Structural Risk Analysis Updates
7. Selection of Materials, Processes, Joining Methods & Structural Concepts	7. Corrosion Assessment	7. Interpretation & Evaluation of Test Findings	7. Technical Orders	7. CPC Plan & Corrosion Assessment Updates
	8. Sonic Fatigue Analysis	8. Resolution of Test Findings		8. Analytical Condition Inspection
	9. Vibration Analysis			9. FSMP Updates
	10. Aeroelastic and Aeroservoelastic Analysis			10. Technical Orders Updates
	11. Mass Properties Analysis			11. Repairs
	12. Survivability Analysis			12. Structural Maintenance Database Execution
	13. Design Development Tests			13. Structural Certification Updates
	14. Structural Risk Analysis			14. Economic Service Life Analysis Updates
	15. Economic Service Life Analysis			15. Others as Required

ASIP Elements with Corrosion Requirements

Because of the impact on structural integrity and overall system safety, CP&C is one of six areas evaluated annually during the annual EN-EZ ASIP Reviews. Each weapon system CP&C program assessed in the following criteria/metrics:

- Corrosion Manager training/manpower
- CP&C Plan & Team
- Adherence to specifications and standards (i.e. MIL-STD-1568, MIL-STD-1587, MIL-STD-889, & MIL-STD-7179)
- Technical Orders (i.e.-23, -6 and -3)
- Corrosion Assessments/Surveys Accomplished
- Analytical Condition Inspection Corrosion Tasks
- Operational Environment(s)
- CP&C Maintenance Impacts
- Life Cycle Cost Benefit Analysis

Weapon system ASIP and Corrosion Manager must work together to ensure successful execution of these metrics to achieve and maintain Operational Safety, Suitability and Effectiveness (OSS&E) for their platforms.