AF Corrosion Prevention & Control Office
Challenges & Transformation

Lt Col Frank Dement
Chief, AFCPCO

AFRL
THE AIR FORCE RESEARCH LABORATORY
LEAD I DISCOVER I DEVELOP I DELIVER

Who We Are

250+ years!

- **Government**
  - Lt Col Frank Dement — Office Chief
  - Carl Perazzola, DR-II — Deputy Office Chief
  - Dave Ellicks, DR-II — Sr. Materials Engineer
  - Kim Andrews, DR-II — Materials Engineer
  - CMSgt Ronald Allison — AF Corrosion Program Manager
  - SMSgt Scott Ward — AF Corrosion Program Manager
  - SMSgt Korey Baker — ALC AGE Liaison
  - Capt Daniel Doak — Mechanical Engineer
  - 2Lt David Rail — Mechanical Engineer
  - Issie Kennedy, GS-6 — Management Assistant
- **Engineering and Technical Support Contractors (S&K Technologies)**
  - Owen Jett (CMSgt Ret) — Senior Project Manager
  - Wes Barfield — Senior Materials Engineer
  - Mac McKenna (CMSgt Ret) — Senior Maintenance Analyst
  - Mark Foley (SMSgt Ret) — Senior Maintenance Analyst
  - Ruth Jett — Senior Maintenance/Data Analyst
  - Beverly Dillard — Administrative Assistant
- **Liaison contractors**
  - Jerry Powell (SMSgt Ret) — Air National Guard Liaison
  - Larry Cornwell (Cmdr Ret, USCG) — C-5 Corrosion Program Manager

USAF's Corrosion Conscience & Corporate Knowledge

What We Do

Mission

Ensure the Air Force has an effective program to prevent, detect, and control corrosion and minimize the impact of corrosion on Air Force combat capability.

Directed by HQ USAF: Manage AF Corrosion Maintenance Program

(AFI 21-105, Air and Space Equipment Structural Maintenance, Apr 03, in re-write)

- Engineering and Technical Assistance
- Engineering Responsibility for 6 Technical Orders
- Surveys of Major Commands and Weapon Systems
- Weapon System Corrosion Prevention Advisory Boards
- Host Annual USAF Corrosion Conference
- Support Corrosion Training
- Facility Requirements for Corrosion Maintenance
- Cost of Corrosion Studies
- Transition Corrosion Technologies to Users

Why It Matters …

A Sample of Corrosion Impacts -- C-5 Examples

- $534M for Crown Skin – SCC damage
- $18M for Contour Box Beam Fitting – SCC damage
  - Primary structure; 288 K hr design life, cracked at 14K hrs
- $173M for Horizontal Stabilizer Aft Tie-Box Fitting – SCC damage
  - Flight safety issue resulting in significant grounding/flight restrictions (no low-level, no mid-air refuel - until replacement)
- $460M UDLM for Cargo Under Floor End Fittings – SCC damage
- $100M add'l funds estimated in FY 07
  - Areas identified through the C-5 Corrosion Prevention and Control Program.
- Materials changes can significantly improve corrosion performance
  - C-5A to C-5B: 56% reduction in corrosion maintenance hours
- Not captured – annual dollars for paint/depaint

ROM WAG: 40% of PDM is corrosion-related

The Challenges We Face

The Burning Platform/Perfect Storm

- Old Systems Must Stay Operational Longer – KC-135 average age = 42 yrs
  - 100 Year Recapitalization Rate
- New Systems w/ Competing Req'ts – LO Capabilities vs Structural Degradation
  - Unique to Military Systems
- Ever Tighter Environmental Constraints
  - Pending OSD policy on scaling back Hex Chrome
  - Less Robust Corrosion Inhibition
- Increased Scrutiny -- Public Law/GAO audits/DSB/SAB
- Increasing Cost and Availability Impacts
- Result: A New Approach Needed

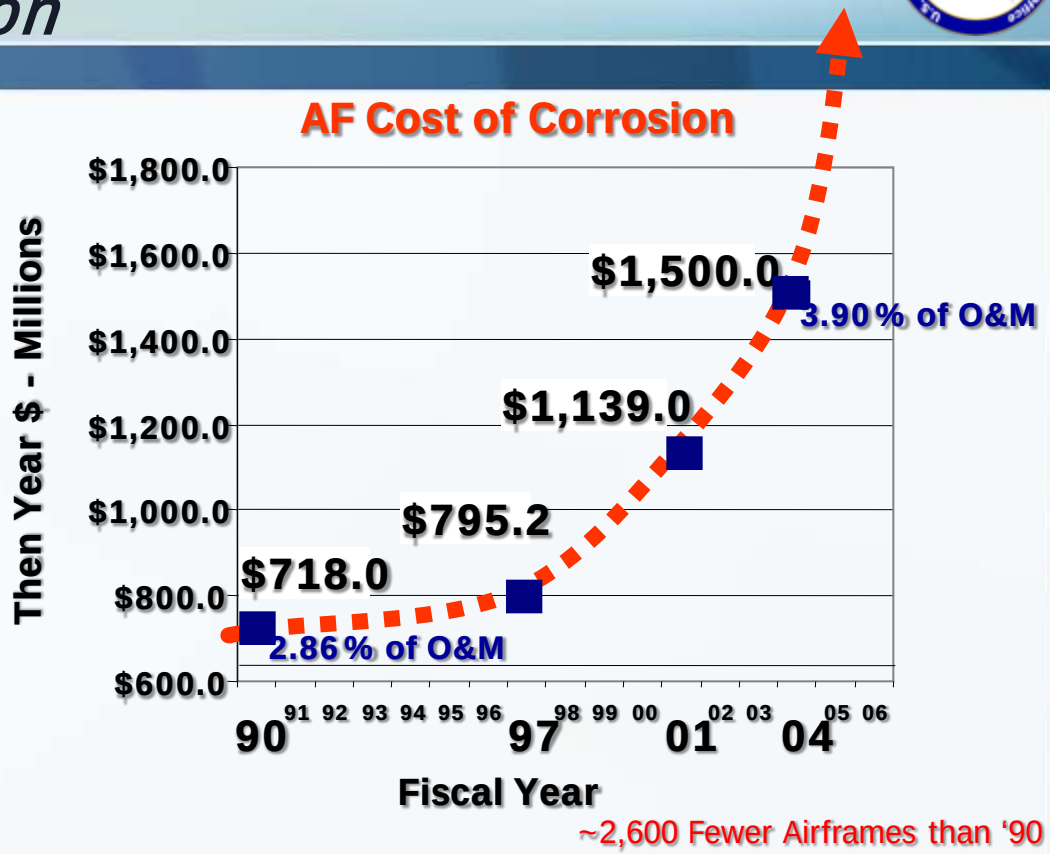
"If we keep doing what we've been doing, we'll keep getting what we've been getting … or worse."

Evidence of the Challenges

AF Cost of Corrosion

- Corrosion Costs are growing exponentially & impact all systems
- Includes Aircraft, Vehicles, Equipment, Munitions, Space Systems
- Costs Includes
  - Touch Labor
  - Mx Materiel Costs
- Doesn't include
  - Aircraft Availability Impacts
  - MILCON & Infrastructure Mx
  - Training

New AF Cost of Corrosion Study Underway

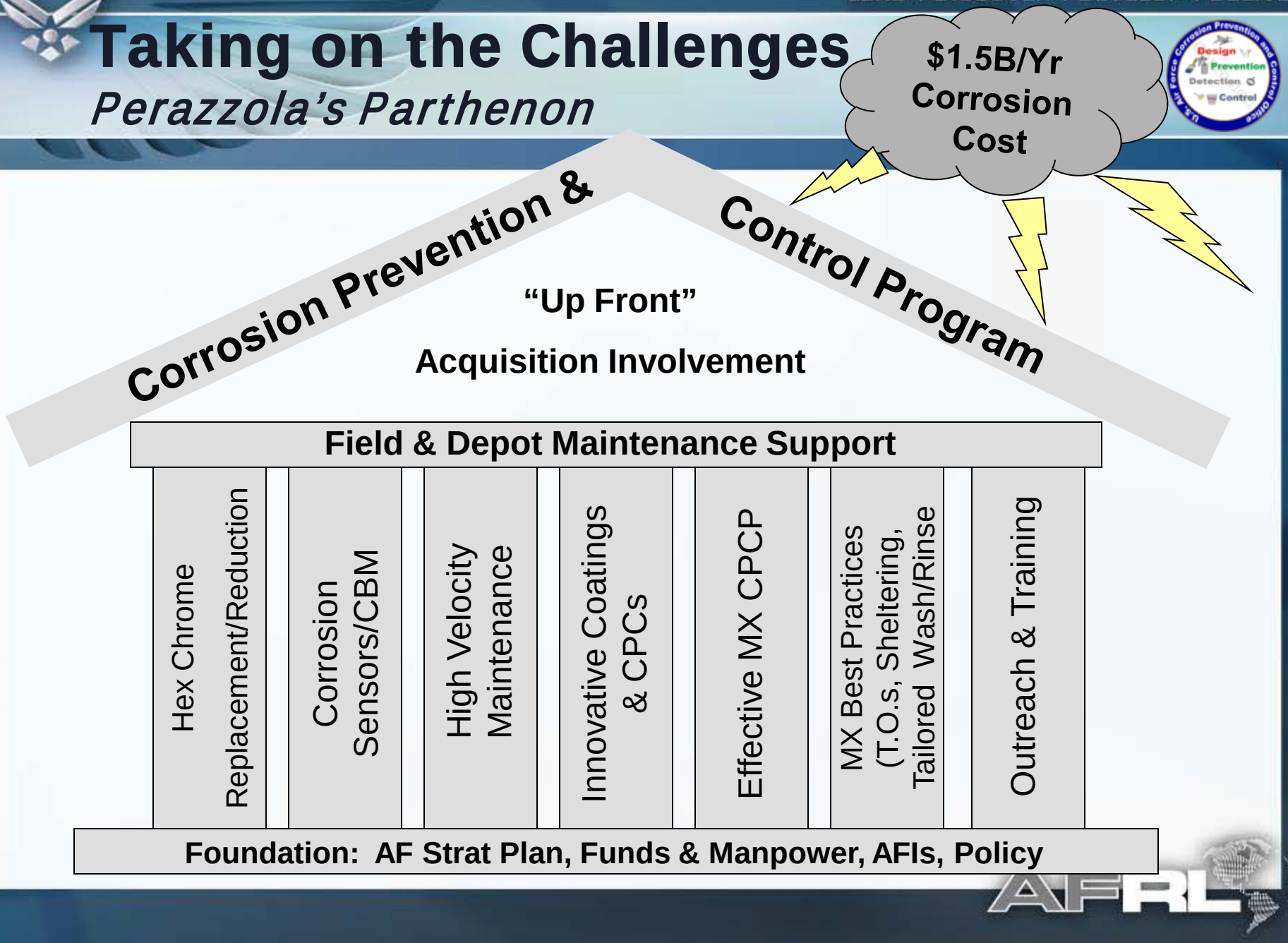


$1.5B/yr = 3.9% of O&M Budget

Aircraft Corrosion = $1.17B/yr

Taking on the Challenges

Perazzola's Parthenon



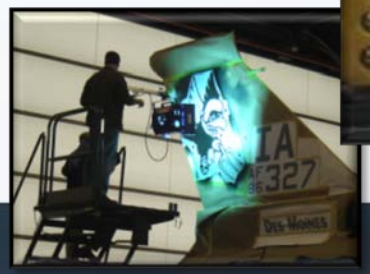
Taking on the Challenges
The Foundation

- Marching Orders from AF/A4/7
  - Better engage with Acquisition Programs ... F-22, F-35, etc. – biggest "bang for the buck"
  - Re-focus Site Surveys ... weapon systems (F-22) ... industry ... WRM ... base ...
- AF Strategic Plan for Corrosion Mitigation – attack top cost/availability drivers
  - 3 Phases ... Phase I underway ... examination of existing policies, organizational missions, etc.
  - Sidebar Meeting w/ LMI here
  - Pursuing funding paths for follow-on phases
- Potential AFI Changes ... 21-105, 21-101, 63-XXX
  - Getting the Relevant Words in the Right Spots to address Corrosion across the Lifecycle
- Assist AF Corrosion Executive w/ developing, implementing AFCPAB
  - Bring Top Corrosion Issues & Technology Opportunities to AF Senior Leadership
  - Inform/Influence Policy and Investment Decisions
  - Approval of Acquisition program CPCPs

- Create Alignment in AFCPCO Mission, Funding, Management, Support Chains
  - Mandate for Action from ILCM-EF Action Item 44.1. AF/A4 to take the lead, working with HQ AFMC and SAF/AQR, to clearly delineate the chain of command, establish CONOPS, and resource requirements for a new Program Management Directive (PMD). The PMD may need to address Non-Destructive Inspection (NDI), coatings, as well as corrosion. (OPR: AF/A4/7, SAF/AQR, OCRs: HQ AFMC/A4 and A5S, AFRL, DSWD-CCP; Suspense: 30 Jan 09)

Taking on the Challenges
Vertical Pillars

- Outreach
  - Raising Awareness: Rachie, Aimone, Walker, Cameron, Anderson, Percell, Johnson, Marshall, Hoffman, Shackelford, Over, Butler, Payton, Lumpkins, Peyer ... not email ...
  - Reach out to customers and gather tech needs (ALCs, Product Centers, Field Units)
- Demonstrate/Transition Latest Materials & Process Technology
  - Develop Technology Roadmaps ... hex chrome, sensors, 5th gen fighters, etc. ...
  - Collaborate w/ Academia
  - Compete for tech transition funds from multiple sources
- Current Technology T&E Projects
  - Sensors for Hidden/Inaccessible Areas
  - Alternative Energy for Aircraft Dehumidification
  - Sensors for Coatings Evaluation during Flight Testing
  - Appliques for Support Equipment Touch up

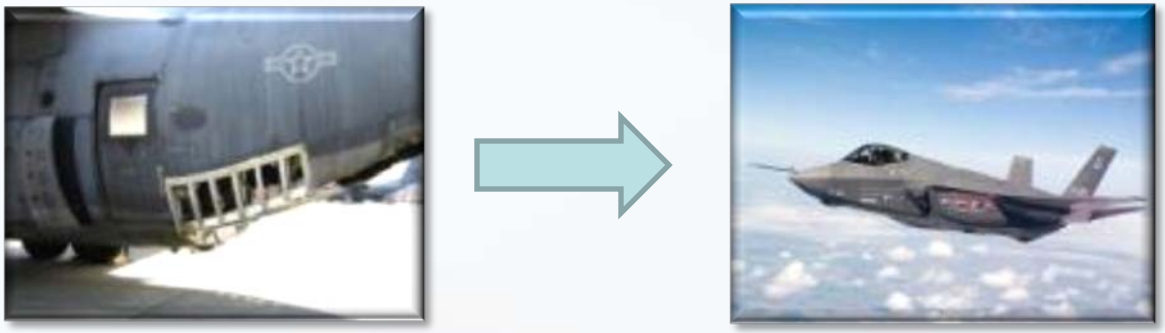


Taking on the Challenges
Vertical Pillars – Future Technology Efforts

- Next Generation Corrosion Sensors
  - Wireless communication for zero maintainer workload
  - Evolve to Corrosion Detection
  - Thin, under coating, same material as substrate
  - Coupled with other measurements to increase accuracy
- Maintenance Practices
  - Taking credit for sheltering in wash/CWR intervals
  - Evaluate potential for tailoring for individual bases and MDS
  - 5th Generation Fighter Support – Deicing, Wash, CWR, Volcanic Ash, CPC usage, etc.
- Hex Chrome Replacements ... like Mg-rich Primer
- Leverage Environmental Focus
  - "Green" Wash Rack
  - Evolution of alternative power for shelters, dehumidification
  - Study depaint approach, methods, frequency – reduction in fuel consumption
  - Reduced waste stream/sensors/energy conservation for Corrosion Control Facilities
- Improved Coatings ... Quick Cure, Quick Removal, More Durable, Etc.

What It Means to You

- Long Term Health & Stability of AFCPCO = Uninterrupted Support
- AF Strategic Plan, AFCPAB & AFI Changes = Turning the CoC Curve
- Technology Focus = Latest Materials & Processes to Fight Corrosion



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