

2012

Air Force Enterprise Corrosion Prevention and Control Strategic Plan



5/21/2012

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AIR FORCE ENTERPRISE CORROSION PREVENTION AND CONTROL STRATEGIC PLAN

Purpose and Scope

Background

In recent years, U.S. Statute and Department of Defense (DoD) policy has placed greater emphasis on recognizing, planning for, and mitigating corrosion in weapons systems, equipment, and infrastructure - all Service assets. In particular, 10 U. S. C. § Section 2228, requires DoD to designate a Director of Corrosion Policy and Oversight and implement a long-term strategy for corrosion prevention and mitigation¹. The same statute requires the Assistant Secretary of each military department with responsibility for acquisition, technology and logistics to designate a Corrosion Control and Prevention Executive (CCPE)². DoD Instruction (DoDI) 5000.67, *Prevention and Mitigation of Corrosion on DoD Military Equipment and Infrastructure* solidified the law through DoD policy which reiterates the law and further defines the responsibilities of the Assistant Secretary of each military department and the CCPE³.

Studies have been conducted by OSD to quantify the cost of corrosion to the military services. The studies indicate that DoD corrosion-related defense system maintenance costs are estimated to be \$23 billion each year or approximately 40 percent of the defense system maintenance budget which includes ships, aircraft, missiles and vehicles⁴. A 2009 LMI, Inc study estimated the annual cost related to corrosion for Air Force aircraft and missile equipment to be \$5.4 billion each year⁵. This does not include munitions or infrastructure. While these figures are estimates, the message remains the same - corrosion is a significant cost to DoD and the Air Force.

Purpose

Given the financial and operational impacts of corrosion on Air Force assets, proper planning and foresight is needed to reduce this burden. This strategic plan is a roadmap for Air Force stakeholders to utilize in tackling the near-term gaps in corrosion prevention and control policies, procedures and practices. Peter Drucker in his article "Managing Oneself" states "it is rarely possible – or even particularly fruitful- to look too far ahead. A plan can usually cover no more than 18 months and still be reasonably clear and specific⁶." This strategic plan is designed to cover 12-15 months and lay the foundation for an enduring Air Force enterprise corrosion prevention and control program. It covers the "essentials" of the AF corrosion control and prevention effort including the appointment of a CCPE, development of an organizational support structure and an outline of the actions needed to better

¹ Office of Corrosion Policy and Oversight 10 U.S.C. § 2228

² Duncan Hunter National Defense Authorization Act for Fiscal Year 2009, Pub. L. 110-417, 122 Stat. 4356 (2008)

³ Department of Defense Instruction 5000.67, *Prevention and Mitigation of Corrosion on DoD Military Equipment and Infrastructure*, 1 February 2010, 7-9.

⁴ Corrosion Policy and Oversight Office, "Department of Defense Corrosion Prevention and Mitigation Strategic Plan", February 2011, 1.

⁵ LMI, "Planning for a U.S. Air force Corrosion Mitigation Strategy", Robertson, David and Owen Thompson, Report MEC90T1, September 2009.

⁶ Drucker, Peter F. "Managing Oneself" Harvard Business Review, January 1999.

coordinate AF corrosion control and prevention resources to include funding and manpower. And, as Drucker advocates, this plan is both hard to achieve and within reach. Courses of action will flow from the objectives identified⁷. This is a living document, designed to be updated frequently to meet internal and external needs.

Scope

This strategic plan applies to all elements of the Air Force including weapons systems, munitions, missiles, vehicles, equipment, facilities, and other infrastructure. The focus of this strategic plan is the incorporation of corrosion prevention, control and mitigation in the weapon system and infrastructure life cycle. A vast number of organizations and agencies play a role in Air Force corrosion prevention and control including research and development, test and evaluation, acquisition, logistics, communication, and space. The fight against corrosion must be a collaborative effort.

Strategic Direction

Vision

A robust, enterprise-level Air Force corrosion prevention and control program that fosters interconnectivity, efficiency, and deliberate programming and budgeting throughout all Air Force functions.

Mission

Produce, deliver, and sustain assets to meet or exceed their service lives at acceptable cost and reduce the negative impacts of corrosion on operations, resources, and safety. Appropriately balance operational needs and long term sustainment of Air Force assets.

Public Law, Policy, and Guidance

Corrosion Public Law can be found in Title 10 U.S. Code Section 2228 and the National Defense Authorization Act for Fiscal Year 2012 (www.thomas.gov).

Applicable DoD policy (<http://www.dtic.mil/whs/directives/>) and AF policy (<http://www.e-publishing.af.mil/>) include the following publications: DODD 4151.18; DODD 5000.01; DODI 5000.67; DODI 5000.02; DFAR 207.105(b)(13)(ii); AFPD 63/20-1; AFI 63-101; AFI 63-1001; AFI 20-114 ; AFI 21-101.

Corrosion Guidance documents include: DoD Corrosion Prevention and Mitigation Strategic Plan; Corrosion Prevention and Control (CPC) Planning Guidebook; CPC: A Program Management Guide for Selecting Materials; MIL-STD-1530C; MIL- HDBK 1568/1587; and, AFPAM 63-128 (<https://www.corrdefense.org/default.aspx> and <http://www.e-publishing.af.mil/>).

Gap Analysis

In September of 2011, SAF/AQX hosted a Corrosion Gap Analysis with key stakeholders from throughout the Air Force. This facilitated, three day event resulted in identification of 169 gaps that can be loosely organized into the five categories of organization, authority and governance, resources, data/reporting, and technical⁸. Thirty four people attended representing 18 organizations.

⁷ Drucker, Peter F. "Managing Oneself" Harvard Business Review, January 1999.

⁸ SAF/AQXA, "Corrosion Gap Analysis Outbrief from Sep 20-22", (presentation 22 Sep 2011) Slide 2

SAF/AQR	SAF/IEL	AFMC/A4M	F-22	NAVAIR
SAF/AQX	AF/A4L	AMC/ASIP	KC-46	OUUSD (AT&L)/CPO
AF/TEP	AF/A7C	ASC/EN	SMC/ENE	
AFRL/RXS	AETC/TRR	ASC/WWUS	USAFA/DFEM	

The following issues are a summary of the most critical issues identified by the Corrosion Gap Analysis.

- No functioning Corrosion Control Program Executive (CCPE) as required by statute and OSD policy.
- No structured overarching corrosion governance.
- No dedicated resources (funding / manpower) identified to address corrosion issues at the HAF, and funding in the field has been reduced.
- Reduced expertise in the field and at the labs; only recently have studies begun to look at the manning and expertise issues.
- Lack of integration of the AF Facilities’ functional area into the Air Force Corrosion Prevention and Control program.
- Lack of corrosion funding priority for corrosion projects and RDT&E.
- Lack of actionable corrosion cost data to set funding priorities – Air Force is dependent on the OSD “Cost of Corrosion Study” to obtain estimates of the costs of corrosion.
- No tools to predict corrosion impacts on lifecycle costs.
- Lack of focused RDT&E on corrosion prevention, control, and mitigation.
- No overarching AF corrosion instruction across functional areas and organizations.

The gap study recommended that the AF corrosion program contain a robust CCPE organization with defined authorities and responsibilities, be influential in AF corporate processes, control its own resources, utilize effective policy and standards, have strong oversight and accurate, and timely reporting. Corrosion should be influential in program technical and execution reviews, a dynamic balance between AF advisors and program management chain should exist. The AF corrosion program requires actionable metrics, enhanced corrosion competencies, timely and influential training and education, robust science, technology, and systems engineering, and should be vigorous and influential throughout the system and infrastructure lifecycle.

This strategic plan is based on the Sep 2011 Gap Analysis as well as discussions across the corrosion prevention community over the past year and it provides a roadmap for corrosion prevention leaders particularly the CCPE. The plan is intended to be a living document – one in which the CCPE and action officers will use as a guide to accomplish the overall goal of planning and mitigating the effects of corrosion throughout the Air Force. It is also intended to be general in its wording to allow the CCPE to formulate the appropriate courses of action.

Goals

- **Goal 1:** Establish enterprise level governance for corrosion prevention and control ensuring enterprise integration of weapon systems and facilities.
- **Goal 2:** Synchronize corrosion prevention and control policies across Air Force functions while supporting public law and DoD corrosion prevention and control policies.
- **Goal 3:** Maximize Air Force corrosion prevention and control investment - funding and manpower - to ensure a robust program.
- **Goal 4:** Increase the fidelity of data (throughout all functions) and the availability of metrics, processes, and tools used to inform acquisitions, sustainment, and operational decisions regarding corrosion prevention and control.
- **Goal 5:** Capitalize on corrosion prevention and control RDT&E in the acquisition process and during sustainment.
- **Goal 6:** Integrate AF facilities and infrastructure into the AF CPC program.

Objectives and Strategies

Goal 1: Establish enterprise level governance for corrosion prevention and control ensuring enterprise integration of weapon systems and facilities.	
Objectives	Strategy to Achieve
1.1 Determine organizational location and support for the CCPE.	1.1 SAF/AQ, SAF/IE, and AF/A4/7 discuss and implement.
1.2 Solidify the organizational structure for key stakeholders to participate in the Air Force enterprise program.	1.2 CCPE under the guidance of SAF/AQ, SAF/IE, and AF/A4/7 develop the strategic as well as tactical organizational structure.
1.3 Determine baselines metrics to be used to measure future progress.	1.3 Develop metrics to measure the “as is” state of the Air Force corrosion program
1.4 Evolve the strategic plan.	1.4 Update the strategic plan once a strategic organizational structure is in place and functioning - within 12-15 months of appointment of a CCPE.

Goal 1 Overview

The Air Force is in the beginning stages of an enterprise approach to corrosion prevention and control. Tactical efforts are in place within functional communities to address corrosion. However, an enterprise approach is needed to maximize resources and increase asset readiness over the long term.

The most important was a decision on the organizational location of the CCPE in SAF/AQ. The requirements for this role are outlined in U.S. statute (U.S. Code Title 10, Sec 2228) and in DoDI 5000.67. In addition to supporting DoD requirements, this position facilitates the Air Force enterprise strategy. This position does not replace functional responsibilities. Other fundamental actions include developing a support organization for the CCPE and determining basic metrics for use in measuring enterprise program success.

The strategic plan should be updated again within 12-15 months to ensure the program remains responsive to DoD as well as Air Force needs.

Goal 2: Synchronize corrosion prevention and control policies across Air Force functions while supporting public law and DoD corrosion prevention and control policies.	
Objectives	Strategy to Achieve
2.1 Achieve an over-arching Air Force instruction that defines the enterprise program.	2.1 Write, coordinate, and finalize a 90-series enterprise corrosion program instruction.
2.2 Achieve synchronicity among functional AFIs to support the enterprise program.	2.2 Update, coordinate, and finalize functional AFIs to represent the new enterprise program and support the 90-series AFI.
2.3 Participate in the development of DoD corrosion instructions and policies.	2.3 Participate in the DoD Policy, Process and Procedures and Oversight Working (C3PO) Integrated Product Team.

Goal 2 Overview

Outlining the enterprise program and defining roles and responsibilities through a 90-series publication will institutionalize the program within the Air Force and across functionals. Additionally, updating functional guidance to reflect the enterprise program will be the "bottom up" actions needed to synchronize enterprise efforts.

While the Air Force defines Service policy, the AF corrosion program must coordinate with and implement the overall DoD program. The DoD Corrosion Prevention and Control Integrated Product Team (IPT), under the direction of the Director, Corrosion Policy and Oversight, established a C3PO Working Integrated Product Team that focuses on establishing DoD policy regarding corrosion prevention and control. Air Force participation in this Team is crucial to ensure DoD recognizes and supports Air Force-specific needs and constraints.

Goal 3: Maximize Air Force corrosion prevention and control investment - funding and manpower - to ensure a robust program.	
Objectives	Strategy to Achieve
3.1 Understand current resource (dollars and manpower) investments in corrosion prevention and control.	3.1 Analyze and map corrosion funding and manning across all functional organizations.
3.2 Achieve balance in resource investment and return on investment.	3.2 Determine specific gaps in funding relative to requirements. 3.2 Prioritize resource gaps. 3.2 Implement a course of action to address gaps.
3.3 Enhance corrosion prevention and control technical expertise across functional areas.	3.3 Determine current technical expertise within the Air Force. 3.3 Determine gaps in technical expertise. 3.3 Implement a course of action to strengthen technical expertise.

Goal 3 Overview

The 2009 LMI study indicates that the Air Force spends \$5.4B on corrosion annually⁹. While this estimate lacks the fidelity the Service would like, it does indicate a significant annual financial investment. The Air Force must first understand the current funding across the functional organizations. Once this is understood, analysis can be done to determine the funding gaps and also determine better ways to utilize current dollars. In addition, ensuring appropriate levels and expertise of manpower is critical. Similar to funding, understanding current manning and expertise, followed by a gap analysis will inform appropriate courses of action to strengthen the utilization of both manpower and expertise across the Air Force.

Goal 3 is a significant undertaking and may take longer than the 12-15 months this plan covers. However, collecting and analyzing the funding and manpower data is crucial to building a solid foundation for an enterprise program.

Goal 4: Increase the fidelity of data (throughout all functions) and the availability of metrics, processes, and tools used to inform acquisitions, sustainment, and operational decisions regarding corrosion prevention and control.	
Objectives	Strategy to Achieve
4.1 Determine all methods of collecting data related to corrosion prevention and control.	4.1 Coordinate with all functional areas to collect information on the systems used to collect corrosion data.
4.2 Continue to refine the fidelity of the data collected.	4.2 Analyze each functional areas data collection methods to determine gaps. 4.2 Implement a course of action to address gaps in data collection/accuracy.
4.3 Identify current metrics, processes, and tools used to inform decisions regarding corrosion prevention and control.	4.3 Coordinate with all functional areas to identify metrics, processes, and tools. 4.3 Determine how each functional area uses the currently available metrics, processes, and tools. 4.3 Assess to determine gaps.

Goal 4 Overview

As a follow-on to Goal 3, Goal 4 tackles the issue of fidelity of data. Is the Air Force collecting the right data? Are data entries accurately representing the work that is being done? Accurate and relevant data collection will generate better information on the fiscal costs and asset readiness impacts of corrosion. Once collected, thoughtful data analysis is required which feeds into the resource decision-making process. It is imperative that the Air Force continue to refine data collection that will enable good life cycle predictive analysis, good RDT&E investment as well as good sustainment practices.

Like Goal 3, Goal 4 may go beyond 12-15 months and is also imperative to building a solid enterprise program.

⁹ LMI, "Planning for a U.S. Air force Corrosion Mitigation Strategy", Robertson, David and Owen Thompson, Report MEC90T1, September 2009

Goal 5: Capitalize on corrosion prevention and control RDT&E in the acquisition process and during sustainment.	
Objectives	Strategy to Achieve
5.1 Utilize effective RDT&E corrosion prevention and control efforts in acquisition and sustainment processes.	5.1 Identify gaps in acquisition and sustainment where corrosion prevention and control products/efforts can yield long term benefits. 5.1 Develop a course of action to address the gaps.
5.2 Reinvigorate RDT&E efforts.	5.2 Communicate the importance/cost/readiness impact of corrosion prevention and control to MAJCOM/CCs. 5.2 Support Air Force Research Laboratory (AFRL) in RDT&E efforts.
5.3 Maximize DoD program for RDT&E projects.	5.3 Establish a robust communication, awareness, planning and implementation cycle for DoD program projects. 5.3 Scrutinize submissions to ensure best possible product submitted to DoD.

Goal 5 Overview

The science and technology community has the capability to provide technology solutions to the field to enhance corrosion prevention and control activities both in acquisition and sustainment. Effective corrosion prevention and control starts during the acquisition process with deliberate decision-making with regard to long term corrosion prevention and control cost reduction. In addition, increasing investment in RDT&E to address sustainment issues could provide long term cost savings and a strong communication plan to the MAJCOMS may increase awareness of the capabilities provided by AFRL. In addition, DoD annually funds Service technology demonstration projects to assist in getting products to the field. This program requires the Services to provide matching funds. This is an excellent source of additional funding for the RDT&E community.

Goal 6: Integrate AF facilities and infrastructure into the AF CPC program.	
Objectives	Strategy to Achieve
6.1 Establish AF organizational relationships with the AF facilities and infrastructure organizations.	6.1 CCPE, A7C, AFCESA develop and integrate a facilities organizational structure into the AF CCPE corrosion program. 6.1 Establish corrosion planning and review process for facilities projects similar to those established for acquisition of systems.

Goal 6 Overview

The facilities functional area has not been integrated into the AF corrosion program. There is a need to establish the lines of communication and organizational structure and processes to ensure facilities projects have appropriate corrosion control, prevention and mitigation throughout their lifecycle.

Key Stakeholders

The Air Force enterprise corrosion prevention and control program is a collaborative effort between many Secretary, Headquarters and Major Command organizations. The role of the CCPE as the Air Force voice to DoD, a facilitator, and the Air Force advocate for corrosion prevention and control is supported by the efforts of a large number of organizations and functional communities. The overarching goal for material degradation / material integrity stakeholders is to reduce the lifecycle cost (or at a minimum slow the cost growth) and increase the safety and availability of Air Force assets. Key stakeholder organizations in this process are: The Assistant Secretary of the Air Force (Acquisition) (SAF/AQ); the Corrosion Policy and Oversight Office at OSD; the other Service's CCPEs; the Assistant Secretary of the Air Force (Installations, Environment, and Logistics (SAF/IE); Chief Warfighting Integration and Chief Information Office, (SAF/CIO A6); the Deputy Chief of Staff (DCS) of the Air Force for Logistics, Installations and Mission Support (AF/A4/7); the Implementing MAJCOMs (AFMC and AFSPC/SMC); the Air Force Research Laboratory; and the Operational MAJCOMs. Specific key organizational responsibilities and organization interactions will be further developed and included in the next update to this strategic plan.

Summary

This strategic plan is specifically designed to address immediate enterprise needs with the intention of developing a refined plan in 12-15 months. Basic areas are covered such as the appointment of a CCPE, establishment of an organizational support system, and the development of over-arching policy. These fundamental actions are paramount to establishing an enduring Air Force enterprise corrosion prevention and control program.