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Feature

Under Secretary of Defense Signs Groundbreaking DoD Instruction Affecting all Pentagon Offices and Military Departments

The Instruction Aims to Systematically Prevent Corrosion on America's Vast Array of Military Equipment and Infrastructure

By Cynthia Greenwood

After nearly two years of waiting, materials and maintenance experts who worked to create a clear policy on preventing corrosion on military equipment and infrastructure have achieved a great milestone. A new DoD Instruction—which establishes procedures and responsibilities on corrosion for all military branches—was signed on February 4, 2008, by John J. Young, Jr., Under Secretary of Defense for Acquisition, Technology, and Logistics (A,T&L).

The new instruction, [*Prevention and Mitigation of Corrosion on DoD Military Equipment and Infrastructure*](#), is unprecedented. Notably, it assigns specific responsibilities to the Army, Navy, Air Force, and Marine Corps to guarantee that they will manage corrosion programs on all military equipment and infrastructure across the life cycle. It also requires that each of the Services designate a Corrosion Executive who will be responsible for developing and recommending policy and guidance on preventing corrosion throughout their departments.

"This is a fine day for corrosion prevention and the genuine interests of corrosion control professionals through the United States military and industry," said Daniel J. Dunmire, leader of the Pentagon-based DoD Corrosion Policy and Oversight initiative. "This new instruction ensures that corrosion programs and techniques to preserve such assets as our aging aircraft, Navy ships, and Army weapon systems shall be put in place from the moment DoD acquires them."

"For the first time in history, the costs and labor required to maintain our military planes and ships must be systematically considered in the Department's acquisition process and not as an afterthought," said Dunmire.

The process of coordinating and approving the new DoD Instruction took less than two years. "That is swift compared to the normal approval process for this type of federal regulation," said Dunmire. "Our process of creating new DoD policy, which can be frustratingly slow, ensures that sound policy is put in place for the public trust."

Now that the DoD instruction has been signed, DoD has a viable strategic plan and corrosion program to guide other agencies and governments. "We have examples that people can adapt and build from at all levels of government, ready to export to international, federal, state, and county entities," Dunmire explained. "People in nonprofit arenas can also adapt and build their own corrosion programs using our model."

CorrDefense interviewed 10 DoD corrosion and maintenance experts who helped research, draft, and coordinate the content of the new regulation. Questions were posed about the new regulation's significance and the relevance of specific sections. Following are these experts' views in the form of a roundtable discussion:

CorrDefense: What is the importance and significance of the new DoD Instruction on corrosion, from the standpoint of the war fighter, the taxpayer, and/or the Services themselves?

- **Dr. Lewis Slotter:** The Department of Defense is a very large, diverse organization with a singular, awesome mission—securing the United States against overseas threats. It is critically important that the Department have normalizing visions, documents, and initiatives that assist in channeling its vast resources to achieve the mission. One such document is the DoD instruction. Instructions outline and summarize critical methods of approaching a problem or achieving an outcome in an executable, straightforward manner.

Instructions also help to define roles and responsibilities so participants can contribute efficiently and effectively. Within intricate subjects or organizations it is important to have well-defined lines of communication and authority/responsibility. Instructions help us to establish the specifics in a way that is not only understood but also coordinated in advance, so there are no surprises and everyone understands what is expected and why. I think that all contributors to controlling corrosion will appreciate the new instruction's specific, clear mission. The DoD understands the need to allocate taxpayer resources with discipline and efficiency. The instruction is a very important instrument in achieving this goal.

- **Greg Kilchenstein:** To those of us in the DoD materiel readiness sustainment community, we're delighted with the new DoD instruction. The instruction's real benefit is to the war fighter. From my perspective within Logistics and Materiel Readiness, corrosion prevention and control has a definite impact on the safety, reliability, maintainability and sustainment cost of our weapon systems.

Corrosion is handcuffing our ability to modernize our forces. The new requirements will help us keep an eye on DoD corrosion, estimated at \$10 to 20 billion. And under these new guidelines, there is a lot that can be returned to the taxpayer and war fighter in terms of the capacity to modernize our weapon systems. This new instruction will provide for more capability to obtain weapon systems into the future.

- **Thadd Buzan:** Infrastructure corrosion is a long-term problem often aggravated by resource constraints, decentralized decision-making at the installation level, and a focus on short-term demands. Good corrosion prevention measures can easily be sacrificed for other more urgent project requirements and to reduce initial costs.

If nothing else, the new DoD instruction requires DoD to collect relevant data and increase the awareness of decision makers on the tradeoffs associated with corrosion prevention measures in their facilities acquisition and sustainment decisions. It further formalizes the practice of life-cycle costing and decision-making. It cannot create more funding, but it should help to quantify impacts that will improve facilities criteria and lead to a more effective use of available funds over the long term.

- **Rich Hays:** The DoD instruction requires that the military departments proactively and formally address corrosion in acquisition and maintenance rather than treat it reactively and in an ad hoc manner. Ultimately, its requirements will reduce costs and increase readiness and safety, since it is typically less expensive and more effective to address corrosion early in the design of assets or infrastructure.

The new instruction requires a high level of coordination among and within each of the Services. This is something that we've always struggled with. Increasing coordination and awareness can only make the DoD corrosion community more efficient.

- **Steve Spadafora:** From the standpoint of the war fighter, the new DoD instruction expands the emphasis on corrosion prevention and control throughout the life cycle of our assets. Historically, the attitude throughout the Program Managers in the Services has been along the lines of: "I'm focused on building it and buying it and I'll leave it up to the maintenance experts to deal with how to best maintain it." Traditionally, the war fighter has ended up getting the burden of the problem resulting from design trade-offs aimed at reducing production costs and they don't get consulted before the equipment they used is purchased. What the new DoD instruction will do is provide guidance so that the Services will be looking at corrosion prevention up front, specifically on Acquisition Category I programs whose budgets exceed \$365 million for research, development, testing, and evaluation or \$2.19 billion for procurement.

During the last Government Accountability Office audit, NAVAIR was recognized as a frontrunner in performing corrosion prevention and control. About 75 percent of our programs have corrosion prevention and control plans, whereas the DoD average is about 30 percent. The new DoD instruction will help continue a relatively strong approach to executing the CPC guidebook. NAVAIR will continue to make improvements, but the importance of having this directive can't be underestimated in naval aviation. To illustrate, if an ground vehicle has a failure due to corrosion, like an engine failure or a wheel or axial failure, more than likely it ends up on the side of the road. However, if you have a catastrophic failure on an aircraft, you can end up with a huge hole in the ground and a potential loss of life. The impact of a failure in the naval aviation environment is huge. If NAVAIR wasn't out in front of the pack in terms of corrosion prevention, shame on us.

To the other Services, this instruction will help make a revolutionary change in how they approach corrosion. It may be difficult for them, because it will entail a cultural change, but they'll reap a significant benefit.

- **Mark Ingle:** and **Beau Brinckerhoff:** NAVSEA has consistently found that corrosion problems increase the operations and maintenance costs of ships and decrease the availability of platforms to the war fighter. By raising the visibility of corrosion issues within the procurement and maintenance community, the new DOD instruction may help programs better allocate scarce resources to help prevent corrosion in the future. Corrosion can frequently be controlled or mitigated with very slight initial investments in the design phase or large costs once the systems are in-service, and if the instruction can provide motivation to make these small up-front investments, the war fighters will reap the dividends.
- **Major Robert Reed:** This instruction truly legitimizes the program. It is the final piece of the "Policy Puzzle," the keystone if you will that Dan Dunmire has been putting together since the inception of the program and standing-up of the Policy and Requirements WIPT (committee) in 2004. Just the coordination at the service level forced our senior leadership to ask hard questions like, "Is this what we should do, and more importantly, CAN WE and HOW?" The discussion of the new DoD instruction stimulated a lot of discussion up and down the Air Force chain of command on the topic, truly elevating the importance of corrosion prevention and control to our senior leadership.
- **Dan Zarate:** and **Tom Tehada:** The new DoD instruction provides us with guidance first on what is required to prevent corrosion, but also on what the overall DoD goal is and what we are trying to achieve. From a facilities perspective, whatever advances we make as a result of this instruction and program will have a higher probability of being transferred to the private sector, and we will have more control over advances made by the private sector. Architectural and engineering designers liable for many of our facility designs follow their comfortable private sector state-of-the-practice and are almost never state-of-the-art. With this new DoD instruction in place, we anticipate that the new state-of-the-art advances that we transition to the private sector will, in turn, become state-of-the-practice for our facilities at a more rapid rate. This process will ultimately reduce our corrosion-related costs.

CorrDefense: Please comment on any section of the new DoD instruction that you think is particularly important or relevant.

- **Dr. Lewis Slotter:** I find Section 4 on policy to be the heart of the instruction and particularly important because it succinctly emphasizes that the Department of Defense considers corrosion to be an essential aspect of acquisition. Corrosion is not the driver or arbiter for Defense utility but it will be recognized explicitly as having a seat at the table when engineering and maintenance trades are made throughout the life-cycle of weapons systems and Defense infrastructure. This is a very significant step forward in increasing the visibility of corrosion, specifically, and in considering life-cycle costs overall.
- **Kilchenstein:** Section 4 contains the gist of the entire document. It lays the groundwork for the key policy change—to get corrosion prevention clearly addressed during the process of acquiring new weapon systems. Section 4.5 ensures that the Services shall segregate the costs of corrosion prevention. Here, we're shining the light of day on the corrosion issue and holding folks accountable for reporting what they're doing about corrosion prevention and control. Section 5, which requires that the Services each designate a Corrosion Executive, also holds the Services separately accountable for corrosion prevention.

- **Rich Hays:** Section 4 is clearly the most important. It requires that corrosion be addressed during new acquisition and during the life cycle of assets and infrastructure. These requirements are the "teeth" we need to have when trying to get corrosion control elevated to the appropriate level, where it can compete with other priorities that programs have. We (in corrosion prevention) will still be one of many priorities, but hopefully we'll at least get a fair hearing now.
- **Spadafora:** In addition to Section 4, the provisions in Section 5 address the need to make corrosion prevention more service-specific, which is very important. Section 5.2.4.1.3, which establishes a process to review and evaluate corrosion for all development, acquisition, and sustainment contracts requiring an acquisition plan, is paramount. Those of us in naval aviation are also looking closely at the provision that asks us to review the results of cost of corrosion studies to support corrosion. We in NAVAIR expect important data to be released this spring from the DoD corrosion cost study being conducted by LMI. Also, hopefully as Section 5.1.6.3 on archiving corrosion databases is implemented, better data collection will evolve that will allow us to make better decisions on where to invest our efforts to get the most "bang for the buck."
- **Ingle:** and **Brinckerhoff:** The new DoD instruction is unambiguous in its applicability across platforms and to all platforms, regardless of 'Milestones' or other points within the acquisition process. This is extremely important because of the inherently long development cycles of military equipment. By being applicable to all programs "immediately," the new instruction will start to pay dividends in improved equipment availability and reliability to the war fighter in the near term instead of many years in the future, which would have been the case if the DoD instruction had only been applicable to "new start" programs.
- **Major Reed:** I believe our best bang for the buck is in the implementation of Section 4.1 and the oversight identified in Section 4.4 for Acquisition Category I programs (whose budgets exceed \$365 million for research, development, testing, and evaluation or \$2.19 billion for procurement). Acquisition dollars are often targets during the Defense Department's annual Planning, Programming, Budgeting, Execution (PPBE) budgeting process. And, as program managers are forced to make those trade-offs in design, this forces them to keep robust corrosion prevention measures on the table until they can be justifiably traded-off. I believe this will enable us to keep corrosion prevention in the forethought versus it being an afterthought in System Development and Demonstration. The earlier it is addressed in the design process, the cheaper it is to address.
- **Zarate:** and **Tom Tehada:** As metrics are developed from the new DoD instruction, we should be able to better define the impact of corrosion prevention and control on life-cycle costs and thereby answer the bigger question: "Does lower initial cost save in the long term or is it more costly?" Ultimately, the goal to us who maintain DoD facilities is to prioritize and apply limited facilities maintenance funding to the "big-ticket" corrosion cost items in order to ultimately reduce the (repetitive) occurrence of this cost.

Editor's note: The DoD Instruction *Prevention and Mitigation of Corrosion on DoD Military Equipment and Infrastructure* is also available on the CorrDefense Web site (<http://www.corrdefense.org>) and the Defense Technology Information Center (DTIC) Web site (<http://www.dtic.mil/whs/directives/corres/pdf/500067p.pdf>).

Meet the CorrDefense Panel Members —

Dr. Lewis Sloter

Associate Director, Materials & Structures
Office of Deputy Under Secretary of Defense for Science and Technology (S & T)
Defense Research and Engineering

Greg Kilchenstein

Senior Policy Analyst, Maintenance Policy and Programs
Office of Deputy Under Secretary of Defense for Logistics and Materiel Readiness

Thadd Buzan

Senior Policy Analyst, Installations Requirements and Management
Office of Deputy Under Secretary of Defense for Installations and Environment (I & E)

Rich Hays

Head, Corrosion Research and Engineering Branch
Naval Surface Warfare Center, Carderock Division

Steve Spadafora

Director, Materials Engineering Division at NAVAIR
Patuxent River, Maryland

Mark Ingle, P.E.

Senior Engineer, NAVSEA
Engineering Directorate, Ship Integrity & Performance Directorate
Paints, Coatings and Corrosion Control Branch

Beau Brinckerhoff

NAVSEA Acting Technical Warrant Holder for Paints, Coatings, and Corrosion Control

Major Robert Reed

Chief, Air Force Corrosion Prevention and Control Office
From the Materials and Manufacturing Directorate (RX) of the Air Force Research Laboratory (AFRL)

Dan Zarate

Protective Coatings Technical Expert
Naval Facilities (NAVFAC) Engineering Service Center
Port Hueneme, California

Thomas Tehada

Cathodic Protection Technical Expert
Naval Facilities (NAVFAC) Engineering Service Center
Honolulu, Hawaii