

**BY ORDER OF THE  
SECRETARY OF THE AIR FORCE**

**AIR FORCE INSTRUCTION 32-1054**

**7 NOVEMBER 2014**

**Civil Engineering**

**CORROSION CONTROL**



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This instruction implements Air Force Policy Directive (AFPD) 32-10, *Installations and Facilities*, and Department of Defense Instruction (DODI) 5000.67, *Prevention and Mitigation of Corrosion on DoD Military Equipment and Infrastructure*. It defines responsibilities and general requirements for the corrosion control program at major commands (MAJCOM) and installations, and applies to personnel involved in design, construction, acquisition, operations, and maintenance of real property assets and installed equipment at installations and facilities. It references Environmental Protection Agency (EPA), Department of Transportation (DOT), and Occupational Safety and Health Administration (OSHA) regulations and guidelines and follows selected industry standards published by the National Association of Corrosion Engineers (NACE) International®. Air Force Instruction (AFI) 20-114, *Air and Space Equipment Structural Management*, explains the corrosion control program for aerospace and electronic systems. This instruction applies to regular Air Force, Air Force Reserve Command (AFRC) and Air National Guard (ANG) units except where otherwise indicated. For real property and installed equipment owned or controlled by the Air Force at locations outside the United States and United States territories (i.e., in foreign countries), this instruction applies to the extent it does not conflict with requirements of whichever of the following applies: binding international agreements, country-specific Final Governing Standards (FGS), the Overseas Environmental Baseline Guidance Document (OEBGD), and environmental consideration annexes to operation plans or operation orders. This publication may be supplemented at any level, but all direct Supplements must be routed to the Office of Primary Responsibility (OPR) of this publication for coordination prior to certification approval. The authorities to waive wing/unit level requirement in this publication are identified with a Tier (“T-0, T-1, T-2, T-3”) number

following the compliance statement. See AFI 33-360, *Publications and Forms Management*, for a description of the authorities associated with the Tier numbers. Submit requests for waivers through the chain of command to the appropriate Tier waiver approval authority, or alternately, to the Publication OPR for non-tiered compliance items. Refer recommended changes and questions about this publication to the OPR using the AF Form 847, *Recommendation for Change of Publication*; route AF Forms 847 from the field through the appropriate functional chain of command. Ensure that all records created as a result of processes prescribed in this publication are maintained in accordance with Air Force Manual (AFMAN) 33-363, *Management of Records*, and disposed of in accordance with the Air Force Records Disposition Schedule (RDS) located in the Air Force Records Information Management System (AFRIMS). The use of the name or mark of any specific manufacturer, commercial product, commodity, or service in this publication does not imply endorsement by the Air Force.

### **SUMMARY OF CHANGES**

This document has been substantially revised and must be completely reviewed. Major changes include requirements incorporated from DODI 5000.67; corrosion control aspects of project programming, design, and construction; an Air Force-wide process to evaluate corrosion control effectiveness; participation by Air Force Civil Engineer Center (AFCEC) and Director of Civil Engineers in the Office of the Secretary of Defense (OSD) corrosion prevention and control integrated product team (CPC IPT); and identification of Tier waiver authorities for unit level compliance items.

**1. Objectives.** The primary goals of the corrosion control program are to develop and maintain dependable and long-lived structures, equipment, plants, and systems; conserve energy; reduce costs due to corrosion, scale, and microbiological fouling; and ensure compliance with EPA, DOT, and OSHA regulations, and other applicable regulations and guidance.

**2. Scope.** Corrosion control minimizes electrochemical and chemical effects on materials by the environment. A corrosion control program includes:

2.1. Cathodic protection to control electrochemical reactions (corrosion).

2.2. Protective coatings to reduce atmospheric corrosion or cathodic protection current requirements.

2.3. Industrial water treatment (IWT) to reduce corrosion, scale-forming deposits, and biological growths in heating and cooling systems.

2.4. Appropriate design and materials selection.

### **3. Responsibilities.**

#### **3.1. Air Force Director of Civil Engineers (AF/A4C):**

3.1.1. Establish policy for the corrosion control program.

**3.2. AFCEC.** The AFCEC Operations Directorate, Engineer Division (AFCEC/COS), oversees the execution of the Air Force facility corrosion control program: **(T-1)**

3.2.1. Assist Director of Civil Engineers in formulating corrosion control policy.

3.2.2. Maintain Air Force corrosion control technical publications and coordination on tri-Service technical publications; develop technical standards, criteria, and procedures with Department of Defense (DoD) staff elements and other federal agencies.

3.2.3. Provide specialized field assistance and consultation to Air Staff and MAJCOMs on special corrosion control problems, including designs, construction acceptance, and failure analysis.

3.2.4. Provide corrosion literature searches and deliver any publicly available engineering document. Through agreement between AFCEC and the Air Force Research Laboratory, Airbase and Environmental Technology Division (AFRL/MLQ), inquiries regarding documents should be directed to the Technical Information Center (TIC):

Technical Information Center  
AFRL/MLQ-TIC (FL 7050)  
139 Barnes Drive, Ste 2  
Tyndall AFB FL 32403-5323  
Defense Switching Network (DSN) 523-6285  
FAX: (850) 283-6286  
FAX: DSN 523-6286

3.2.5. Approve corrosion control methods and equipment not specified in Air Force publications.

3.2.6. AFCEC, together with Director of Civil Engineers, will:

3.2.6.1. Designate qualified representatives to the CPC IPT. **(T-1)**

3.2.6.2. Review the results and assessments from the DoD cost of corrosion baseline studies to support corrosion prevention and mitigation activities. **(T-1)**

3.2.6.3. Establish and maintain a process to collect information on the results, including costs and estimated cost avoidance, of corrosion prevention and mitigation activities, and ensure the information will be available for monitoring the effectiveness of corrosion prevention and mitigation programs. **(T-1)**

3.2.7. Support the OSD CPC IPT process by: **(T-1)**

3.2.7.1. Submitting candidate military equipment and infrastructure corrosion prevention and mitigation projects during the annual project data call. **(T-1)**

3.2.7.2. Implementing standardized OSD product qualification requirements where applicable. **(T-1)**

3.3. **Major Commands (MAJCOM).** MAJCOM civil engineers assist installations to develop and execute corrosion control programs (including aqueous, atmospheric, and underground corrosion) to ensure compliance with DoD and Air Force policies, and applicable federal, state, and local regulations (including host nation, if required by applicable international agreement, FGS, OEBGD, or annex to operational directive). MAJCOMs will:

3.3.1. Assign an OPR for cathodic protection programs.

3.3.2. Assign an OPR for protective coatings programs.

3.3.3. Assign an OPR for IWT programs.

3.3.4. For new construction or sustainment, restoration and modernization (S/R&M) projects, regardless of appropriation, ensure base civil engineers (BCE) establish a process to review and evaluate corrosion planning. Consult the DoD *Corrosion Prevention and Control Planning Guidebook* for additional guidance.

3.4. **Civil Engineer Squadrons.** BCEs will:

3.4.1. Publish a squadron operating instruction for the corrosion control program to ensure all requirements in section 4 of this AFI are met (see a sample operating instruction in Unified Facilities Criteria (UFC) 3-570-06, *O&M: Cathodic Protection Systems*, Appendix A, Part 1. NGB A7OC will provide a sample operating instruction for Air National Guard units). **(T-1)** Ensure appropriately qualified and trained personnel develop and execute a comprehensive corrosion control program, encompassing the three areas of corrosion control: cathodic protection, protective coatings, and IWT. **(T-1)**

3.4.2. Assign personnel for cathodic protection, protective coatings, and IWT programs. **(T-1)**

3.4.3. Ensure assigned cathodic protection personnel receive initial, annual, and/or refresher training and/or required certifications. **(T-1)** Key aspects of cathodic protection training include the ability to apply NACE® criteria to determine if the structure is protected and the ability to troubleshoot the system if inoperative. Special training may be required on protective coatings and industrial wastewater or as needed for special design and construction projects. Specialized training shall be documented as detailed in the squadron operating instruction. **(T-1)** For more information on available courses, see NACE International® ([www.nace.org](http://www.nace.org)), CorrConnect ([www.corrconnect.org](http://www.corrconnect.org)), and as referenced in UFC 3-570-06.

3.4.4. Investigate leaks from corrosion, tuberculation, and scaling in heating and cooling systems, and premature failure of protective coatings. Take corrective action in each case, if possible, other than simple repair by replacement. **(T-1)**

3.4.5. For new construction or S/R&M projects, regardless of appropriation, establish a process to review and evaluate corrosion planning. Consult the DoD *Corrosion Prevention and Control Planning Guidebook* and the Advanced Materials, Manufacturing, and Testing Information Analysis Center® (AMMTIAC) *Corrosion Prevention and Control: A Program Management Guide for Selecting Materials* for additional guidance. **(T-1)**

3.4.6. Ensure designs, design reviews, and construction inspections are accomplished by qualified individuals. Design qualifications should include recognition by professional organizations, such as NACE International® or state registration authorities, or five years' experience in design and maintenance of the corrosion control measures under review. **(T-1)**

3.4.7. Projects shall include appropriate training for maintenance personnel and development of required maintenance plans and procedures for corrosion control systems. **(T-1)**

#### 4. Requirements.

4.1. **Cathodic Protection.** Provide both cathodic protection and protective coatings as follows:

4.1.1. All metallic fuel storage tanks or tanks containing flammable, combustible, or regulated products in contact with the soil, including underground storage tanks (UST), bottoms of above-ground storage tanks (AST), and associated buried or submerged metallic piping. **(T-1)**

4.1.2. Metallic USTs that are coated with a heavy cladding for corrosion protection and where this cladding without cathodic protection is acceptable to the governing environmental regulating authority, may omit installation of cathodic protection. Document the use of cladding in lieu of cathodic protection in the applicable UST record. **(T-1)**

4.1.3. All metallic fuel piping or piping containing flammable, combustible, or regulated products in contact with the soil. Piping shall also be coated. **(T-1)**

4.1.4. Interiors of water storage tanks and bottoms of water storage tanks in contact with the soil. Construction contracts that include coating of water storage and interior cathodic protection shall include provisions for the construction contractor to provide cathodic protection testing and maintenance for the duration of the construction project warranty period. **(T-1)**

4.1.5. For other buried utilities, provide cathodic protection and protective coatings if the soil resistivity is below 10,000 ohm-centimeters. **(T-1)** For soils at or above 10,000 ohm-centimeters, contact the MAJCOM cathodic protection OPR for direction.

4.1.6. For ductile or cast iron water piping in soils greater than 10,000 ohm-centimeters, use of polyethylene encasement is permitted in lieu of cathodic protection with approval by AFCEC/COS. **(T-1)** Polyethylene encasement shall be conducted in accordance with American Water Works Association® (AWWA) C105, *Polyethylene Encasement for Ductile-Iron Pipe Systems*. **(T-0)**

#### 4.2. Cathodic Protection Criteria.

4.2.1. Installed cathodic protection systems must provide protective potentials meeting criteria in NACE International Standard SP0169, *Control of External Corrosion on Underground or Submerged Metallic Piping Systems*, Section 6, "Criteria and Other Considerations for Cathodic Protection." **(T-1)** Structure-to-soil potentials are to be potential drop- (current times resistance) free.

4.2.2. Conduct maintenance and corrosion surveys in accordance with UFC 3-570-06. **(T-0)**

4.3. **Testing Frequencies and Recordkeeping.** Cathodic protection systems shall be inspected and tested, and records shall be kept as required per UFC 3-570-06. **(T-0)** The following inspections are required on installed systems:

4.3.1. **Galvanic Anode Check.** A galvanic anode check shall be performed annually and documented on AF Information Management Tool (IMT) 1686, *Cathodic Protection Operating Log for Sacrificial Anode System*. **(T-1)**

4.3.2. **Impressed Current System Check.** The required period for conducting the impressed current system check is within 60 days of the last close-interval survey, corrosion survey, or impressed current system check, and documented on the AF IMT 491, *Cathodic Protection Operating Log for Impressed Current Systems*. (T-1) More frequent checks may be required by public law or local regulations.

4.3.3. **Close Interval Survey.** The survey shall be conducted every five years on all cathodic protected pipelines. (T-1) The survey shall also be conducted 30 days after a cathodic protection system is installed and properly adjusted. (T-1) Survey data can be computer-generated and shall be maintained in the cathodic protection system record. (T-1)

4.3.4. **Water Tank Calibration.** Calibration shall be conducted annually. (T-1) Calibration shall also be conducted 30 days after a cathodic protection system is installed, modified or adjusted and after one year from the last water tank calibration. Document on AF IMT 1689, *Water Tank Calibration*. (T-1)

4.3.5. **Impressed Current Anode Bed Survey.** The survey shall be performed annually and documented on AF IMT 1688, *Annual Cathodic Protection Performance Survey*. (T-1)

4.3.6. **Resistance Bond Check.** The recommended period for conducting the resistance bond check is within 60 days of the last check or immediately following failure of the cathodic protection system protecting either (or both) sides of the bond (unless immediate repair of the failure is possible). More frequent checks may be required by public law or local regulations.

4.3.7. **Other Inspections.** Other inspections and surveys shall be documented using locally developed forms and records shall be placed in the appropriate corrosion protection system folder. (T-3)

4.3.8. **Waivers, Deviations, Omissions.** Document any waivers, deviations, or omissions from standard design practices in the appropriate AST/UST record. (T-1)

#### 4.4. Protective Coatings.

4.4.1. **Lead.** Lead-containing paint is defined as having a lead content of more than 0.06 percent lead by weight (calculated as lead metal) in the total nonvolatile content of liquid paint, or in the dried film of the paint already applied. Do not use lead-containing paint on any Air Force facility. Non-lead-containing paint must pass a Toxicity Characteristic Leaching Potential Test or be handled as hazardous waste during disposal.

4.4.2. **Mercury.** Refer to AFI 32-7086, *Hazardous Materials Management*.

4.4.3. **Volatile Organic Compounds (VOC).** Refer to AFI 32-7086.

4.4.4. **Un-bonded Coatings.** Use of un-bonded coatings, such as loose polyethylene wraps, is prohibited without prior approval by AFCEC/COS for the specific application. (T-1)

4.4.4.1. Light-reflective floor coatings include chemically resistant urethane for existing hangar floors and dry-shake metallic floor topping applied to the top layer of freshly poured concrete for new floors. Ensure electrostatic discharge and slip-

resistance provisions are incorporated in the design. Include daily cleaning requirements (equipment, supplies, frequency) within the maintenance instructions provided to the using agency.

4.4.4.2. Avoid chemical strippers. If chemical strippers are specified by contract, perform effectiveness tests prior to the contract award, particularly in cases where lead-based paint will be removed from wood. Specify procedures to confirm neutralization of the alkaline paint stripper through chemical testing. Alkaline residue left on substrate is a mechanism for recurring paint failure. Consult the supporting base environmental office for proper disposition instructions of any waste residue.

4.4.5. **Recordkeeping.** Maintain records for protective coatings following UFC 3-190-06, *Protective Coatings and Paints*. **(T-0)** Use these records during evaluations of paint failures and prior to awarding a protective coatings contract. These records replace undocumented hearsay experience and allow fact-based decisions with costs and verified life expectancies of completed work to determine:

4.4.5.1. Effectiveness of a particular paint system on different surfaces or in varying environments.

4.4.5.2. Comparison of different paint systems under similar conditions.

4.4.5.3. Comparison of different equipment for surface preparation or application.

4.4.5.4. Frequency of spot painting and repainting.

#### 4.5. **Industrial Water Treatment (IWT).**

4.5.1. The primary environmental concern of IWT is the proper disposal of chemically treated water. Consult AFI 32-1067, *Water and Fuel Systems*. Consult with the base environmental office prior to selecting any IWT chemical.

4.5.2. Do not use chromates in any IWT application.

4.5.3. Many of the chemicals used to treat industrial water may be harmful to the health of the operator and other base personnel. They range from highly toxic to mildly irritating to the persons handling them. Handle water treatment and testing chemicals with care, following guidance in OSHA directives, manufacturer's recommendations, and the safety data sheets. Install eye wash stations and safety showers according to ground safety requirements. Obtain a chemical process authorization in accordance with AFI 32-7086 for all chemicals to be used. Consult with wing safety, bioenvironmental engineering, and environmental engineering on potential safety issues and the use of less-hazardous substitutes. **(T-0)**

4.5.3.1. Provide only approved backflow prevention devices to provide makeup from a potable water system to an IWT system in accordance with AFI 32-1067, *Water and Fuel Systems*.

4.5.3.2. Chemicals added to protect condensate lines from corrosion make the steam and condensate unfit for consumption or other uses normally reserved for potable water. Do not use treated steam in direct contact with food or for any direct steam humidification, such as in a gymnasium steam room or humidity control for electronic equipment.

4.5.4. Conduct acceptance testing of new heating and cooling systems to ensure the IWT system meets design and operation parameters. Construction contracts that include heating, ventilation, and air-conditioning systems shall include provisions for the contractor to provide water treatment testing and maintenance for the duration of the construction project warranty period.

4.5.5. Indicate locations to install corrosion coupon racks following American Society for Testing and Materials® (ASTM) D2688, *Standard Test Methods for Corrosivity of Water in the Absence of Heat Transfer (Weight Loss Methods)*, Test Method B. The coupons are the best confirmation of IWT effectiveness.

4.5.6. Do not use non-chemical IWT devices on Air Force systems either regularly or on a test evaluation basis except as indicated below.

4.5.6.1. Many variables affect performance, and no criteria and standards have been developed that may be incorporated into guide specifications or statements of work. Such criteria and standards are necessary for standard Air Force contracting methods to ensure devices will perform as advertised.

4.5.6.2. Various energy services companies (ESCO) are investigating the use of these devices for energy and water conservation measures under energy savings performance contracts (ESPC). Under ESPC, the ESCO provides guaranteed savings that are validated each year to reconcile payments, using an agreed-upon measurement and verification methodology. Consult AFCEC/COS to determine measurement and verification protocols for nonchemical devices for use under ESPC. For additional guidance, refer to Engineering Technical Letter (ETL) 13-13, *Energy Savings Performance Contracts (ESPC)*.

4.5.7. IWT requires testing at a frequency that ensures the prevention of scale, corrosion, and biological formation in the heating and cooling systems. The time period between testing depends on system integrity and operations. A mechanically sound system will require less-frequent testing since less chemicals leave the system over time. Refer to UFC 3-240-13FN, *Industrial Water Treatment Operation and Maintenance*, for recommended testing frequencies.

4.5.8. Develop and post, in appropriate locations, control charts for each boiler, cooling tower, and closed system showing the treatment chemicals used, the amount to add per operating parameter, the testing required, the limits to maintain in the system, what to do if the chemical levels are above or below the limits, and any other information peculiar to the system. **(T-1)**

4.5.9. Perform periodic surveys to ensure effective IWT.

4.5.9.1. Annually check the capacity of ion exchangers. **(T-1)** Do not rely on a timed regeneration cycle.

4.5.9.2. To identify leaks at the earliest stages, test the condensate throughout the return system for possible water leakage at heat exchangers once at the start of heating season and once at the end of heating season. **(T-1)**

4.5.9.3. When adding or deleting buildings on a steam system or significantly changing IWT chemicals, perform the design acceptance tests for the boiler total



dissolved solids limit and verify the total protection of the condensate return system. **(T-1)**

4.5.10. IWT records should reflect the minimum entries needed to effectively manage the control of the IWT program and indicate the need for additional testing. The reverse of the forms explains their use. Associated recordkeeping includes the following:

4.5.10.1. Accomplish IWT operating logs based upon one log for each individually treated system (each boiler, each cooling tower bank, and each closed system). **(T-1)**

4.5.10.2. Use AF Form 1457, *Water Treatment Operating Log for Cooling Tower Systems*, as a minimum. **(T-1)**

4.5.10.3. Use AF IMT 1459, *Water Treatment Operating Log for Steam and Hot Water Boilers*, as a minimum. **(T-1)**

4.5.10.4. Keep other industrial water system records on modifications of these forms or a log developed locally for the specific tests required. **(T-1)**

4.5.10.5. Keep the maintenance and history of IWT, other than that contained in the logs, in a historical record for each system. This book should contain a record (including dates) of occurrences of corrosion and scale, major maintenance and surveys performed on the system, replacement of piping and equipment, accidents, outages, changes in methods of operation and treatment used, and other pertinent data to assist troubleshooting and provide facts for management decisions on process improvements. **(T1)**

#### 4.6. Design and Material Selection.

4.6.1. Design, construction, and application of cathodic protection, IWT, and protective coatings are functional requirements for almost all projects. Designs shall achieve the minimum life cycle cost for the overall facility. Base personnel must be able to operate and maintain the final facility design, including the corrosion control systems, without extensive training or equipment investment, unless this is the best approach to achieve minimum lifecycle cost.

4.6.2. Corrosion resistance is not the only criterion for material selection. When selecting a material, investigate all aspects of its physical properties in the application environment, during both normal operation and typical system failure.

4.6.3. Construct new pipelines to enable the use of in-line inspection tools such as video cameras, acoustic devices, and smart pigs.

4.6.4. Conduct leak investigations and system failure evaluations using AF IMT 1687, *Leak/Failure Data Record*. Use the information captured on AF IMT 1687 to provide justification for system repair or replacement, for installation of corrosion control measures, and for the project narrative on DD Form 1391, *FY \_\_ Military Construction Project Data*. Consult AFI 32-1069, *Gas Supply and Distribution*; UFC 3-230-02, *Operation and Maintenance of Water Supply Systems*; and UFC 3-460-01, *Design: Petroleum Fuel Facilities*, for leak detection and survey requirements on these systems.

JUDITH A. FEDDER, Lieutenant General, USAF  
DCS/Logistics, Installations & Mission Support

## Attachment 1

## GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

*References*

AFI 20-114, *Air and Space Equipment Structural Management*, 7 June 2011

AFI 32-1066, *Backflow Prevention Program*, 8 October 2007

AFI 32-1067, *Water Systems*, 3 April 2013

AFI 32-1069, *Gas Supply and Distribution*, 31 March 1994

AFI 32-7086, *Hazardous Materials Management*, 1 November 2004

AFMAN 33-360, *Publications and Forms Management*, 25 September 2013

AFMAN 33-363, *Management of Records*, 1 March 2008

AFPD 32-10, *Installations and Facilities*, 1 March 2010

ASTM D2688, *Standard Test Methods for Corrosivity of Water in the Absence of Heat Transfer (Weight Loss Methods)*, Test Method B, 2011, <http://www.astm.org/Standards/D2688.htm>

AWWA® C105, *Polyethylene Encasement for Ductile-Iron Pipe Systems*, 2010, <http://www.awwa.org/store/productdetail.aspx?productid=6809>

AMMTIAC *Corrosion Prevention and Control: A Program Management Guide for Selecting Materials*, September 2006, [http://ammtiac.alionscience.com/pdf/Corrosion\\_Hdbk\\_S2.pdf](http://ammtiac.alionscience.com/pdf/Corrosion_Hdbk_S2.pdf)

DoD *Corrosion Prevention and Control Planning Guidebook*, December 2003, <http://www.dtic.mil/cgi-bin/GetTRDoc?Location=U2&doc=GetTRDoc.pdf&AD=ADA473147>

DoDI 5000.67, *Prevention and Mitigation of Corrosion on DoD Military Equipment and Infrastructure*, 1 February 2010, <http://www.dtic.mil/whs/directives/corres/pdf/500067p.pdf>

DoDI 4715.05-G, *Overseas Baseline Guidance Document*, 1 May 2007, <http://www.dtic.mil/whs/directives/corres/pdf/471505g.pdf>

ETL 13-13, *Energy Savings Performance Contracts (ESPC)*, 15 August 2013, [http://www.wbdg.org/ccb/browse\\_cat.php?o=33&c=125](http://www.wbdg.org/ccb/browse_cat.php?o=33&c=125)

NACE® SP0169, *Control of External Corrosion on Underground or Submerged Metallic Piping Systems*, 15 March 2007, [http://www.nace.org/uploadedFiles/Corrosion\\_Central/Industries/SP016907PHMSA.pdf](http://www.nace.org/uploadedFiles/Corrosion_Central/Industries/SP016907PHMSA.pdf)

UFC 3-190-06, *Protective Coatings and Paints*, 16 January 2004, [http://www.wbdg.org/ccb/browse\\_cat.php?o=29&c=4](http://www.wbdg.org/ccb/browse_cat.php?o=29&c=4)

UFC 3-230-02, *Operations and Maintenance of Water Supply Systems*, 10 July 2001, [http://www.wbdg.org/ccb/browse\\_cat.php?o=29&c=4](http://www.wbdg.org/ccb/browse_cat.php?o=29&c=4)

UFC 3-240-13FN, *Industrial Water Treatment Operation and Maintenance*, 25 May 2005, [http://www.wbdg.org/ccb/browse\\_cat.php?o=29&c=4](http://www.wbdg.org/ccb/browse_cat.php?o=29&c=4)

UFC 3-460-01, *Design: Petroleum Fuel Facilities*, 16 August 2010,  
[http://www.wbdg.org/ccb/browse\\_cat.php?o=29&c=4](http://www.wbdg.org/ccb/browse_cat.php?o=29&c=4)

UFC 3-570-06, *Operation and Maintenance: Cathodic Protection Systems*, 31 January 2003,  
[http://www.wbdg.org/ccb/browse\\_cat.php?o=29&c=4](http://www.wbdg.org/ccb/browse_cat.php?o=29&c=4)

### ***Prescribed Forms***

AF IMT 491, *Cathodic Protection Operating Log for Impressed Current Systems*

AF Form 1457, *Water Treatment Operating Log for Cooling Tower Systems*

AF IMT 1686, *Cathodic Protection Operating Log for Sacrificial Anode System (Not LRA)*

AF IMT 1687, *Leak/Failure Data Record Resource Advocacy/Corrosion Control Metric*

AF IMT 1688, *Annual Cathodic Protection Performance Survey (Not LRA)*

AF IMT 1689, *Water Tank Calibration*

### ***Adopted Forms***

AF IMT 1459, *Water Treatment Operating Log for Steam and Hot Water Boilers*

AF Form 847, *Recommendation for Change of Publication*

DD Form 1391, *FY \_\_ Military Construction Project Data*

### ***Abbreviations and Acronyms***

**AFCEC/COS**—Air Force Civil Engineer Center, Operations Directorate, Engineer Division

**AFI**—Air Force Instruction

**AFMAN**—Air Force Manual

**AFPD**—Air Force Policy Directive

**AMMTIAC**—Advanced Materials, Manufacturing, and Testing Information Analysis Center®

**AST**—above-ground storage tank

**ASTM**—American Society for Testing and Materials

**AWWA**—American Water Works Association®

**CPC IPT**—Corrosion Prevention and Control Integrated Product Team

**DoD**—Department of Defense

**DoDI**—Department of Defense Instruction

**DOT**—Department of Transportation

**EPA**—Environmental Protection Agency

**ESCO**—Energy Services Companies

**ESPC**—Energy Savings Performance Contracting

**ETL**—Engineering Technical Letter

**IMT**—Information Management Tool

**IWT**—Industrial Water Treatment

**MAJCOM**—Major Command

**NACE**—National Association of Corrosion Engineers®

**OSD**—Office of the Secretary of Defense

**OSHA**—Occupational Safety and Health Administration

**S/R&M**—Sustainment, Restoration and Modernization

**UFC**—Unified Facilities Criteria

**UST**—underground storage tank