

13 NOVEMBER 2003



Civil Engineering

STORAGE TANK COMPLIANCE

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

NOTICE: This publication is available digitally on the AFDPO WWW site at:
<http://www.e-publishing.af.mil>

OPR: HQ USAF/ILEVQ (Mr. Jayant Shah, P.E.)

Certified by: HQ USAF/ILEV
(Colonel Patrick Daly)

Supersedes AFI 32-7044, 25 April 1994

Pages: 38

Distribution: F

Air Force Instruction (AFI) 32-7044 implements Air Force Policy Directive (AFPD) 32-70, *Environmental Quality*. It provides details of the Air Force Storage Tank Compliance Program. It identifies compliance requirements for storage tanks and associated piping that store petroleum and hazardous substances except hazardous waste. It explains how to assess, attain, and sustain compliance with Federal, state and local environmental regulations, Final Governing Standards (FGS), or the Overseas Environmental Baseline Guidance Document (OEBGD), applicable international agreements, and related Department of Defense (DoD) and Air Force directives. For DoD components at installations outside the United States, its territories, and possessions, i.e. overseas, implement the applicable portions of this AFI in accordance with international agreements and the applicable FGS or Environmental Governing Standards or, in their absence, the OEBGD. Any paragraph identified with an asterisk (*) does not apply to overseas installations. See AFI 32-7006, *Environmental Program in Foreign Countries* for additional environmental guidance for overseas installations. Unless otherwise noted, the guidance and procedures outlined in this instruction apply to all Air Force installations within the United States, its territories, and in foreign countries. Additionally, this AFI applies to the Air Force Reserves, the Air National Guard, Government Owned-Contractor Operated facilities, and Direct Reporting Units (DRU) and Field Operating Agencies (FOA) not located on Air Force installations. All records created by this AFI will be maintained and disposed of in accordance with Air Force Manual (AFMAN) 37-139, *Records Disposition Schedule*. Send comments and suggested improvements on Air Force (AF) Form 847, **Recommendation for Change of Publication**, through channels, to Headquarters, United States Air Force, Deputy Chief of Staff for Installations and Logistics, Environmental Division (HQ USAF/ILEV), 1260 Air Force Pentagon, Washington, D.C. 20330-1260. Any organization may supplement this instruction. Major Commands (MAJCOM), FOA and DRU send one copy of each supplement to HQ USAF/ILEV; other commands send one copy of each supplement to the next higher headquarters. See **Attachment 1** for a glossary of references and supporting information.

SUMMARY OF REVISIONS

This document is substantially revised and must be completely reviewed.

This document revises AFI 32-7044, *Storage Tank Compliance*. This is the second publication of AFI 32-7044, and substantially revises the initial 1994 publication.

Chapter 1—INTRODUCTION 4

Section 1A Overview 4

1.1. Concept. 4

1.2. Scope. 4

1.3. Objectives. 4

1.4. Applicable Standards and Regulations. 4

Section 1B Responsibilities 6

1.5. Secretary of the Air Force (SAF). 6

1.6. Headquarters, United States Air Force (HQ USAF). 6

1.7. FOAs and MAJCOMs. 7

1.8. Installations. 9

Chapter 2—COMPLIANCE REQUIREMENTS FOR STORAGE TANKS AND ASSOCIATED PIPING 11

2.1. General Tank System Requirements. 11

2.2. Monitoring for Releases. 13

2.3. Operating and Maintaining Tanks. 14

2.4. Release Response, Cleanup, and Reporting. 15

2.5. Recordkeeping. 18

2.6. Budgeting for Tanks 19

2.7. Hydrant Fueling Systems. 19

2.8. AAFES Station Tanks. 20

2.9. Existing Petroleum and Hazardous Substance UST Systems 20

2.10. Closing USTs. 20

Attachment 1—GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION 22

Attachment 2—NATIONAL CODES AND STANDARDS 30

AFI32-7044 13 NOVEMBER 2003	3
Attachment 3—UST RISK ASSESSMENT MODEL	33
Attachment 4—UST COST ANALYSIS CONSIDERATIONS	35
Attachment 5—REFERENCE WEB SITES	36
Attachment 6—TANK SELECTION AND COST ANALYSIS CONSIDERATIONS	37

Chapter 1

INTRODUCTION

Section 1A—Overview

1.1. Concept. Inherent in the mission of the Air Force are the associated environmental responsibilities of protecting human health and the environment, and managing the natural resources whose care has been entrusted to the Air Force. The Air Force will prevent pollution by reducing the use of hazardous materials and release of pollutants into the environment to as near zero as is technically and economically feasible. This will be done first through source reduction, e.g., chemical substitution, process change, and other techniques. Where environmentally damaging materials must be used, their use will be minimized and controlled. If the use of such materials cannot be avoided, the spent material or waste will be reused or recycled whenever technically feasible and cost-effective. As a last resort, spent material or waste that cannot be reused or recycled must be treated to reduce waste volume and toxicity whenever feasible, and disposed in an environmentally safe manner, consistent with the requirements of all applicable laws. Refer to Air Force Instruction (AFI) 32-7080, *Pollution Prevention Program*, for a discussion of this environmental management hierarchy.

1.2. Scope. This AFI describes the environmental and engineering requirements for underground and aboveground storage tanks and associated piping that store petroleum and hazardous substances. This AFI does not address the storage of hazardous waste in tanks. Hazardous waste storage is addressed in AFI 32-7042, *Solid and Hazardous Waste Compliance* and Air Force Pamphlet (AFPAM) 32-7043, *Hazardous Waste Management Guide*. Consult AFI 23-204, *Organizational Fuel Tanks*, for guidelines and procedures on establishing and operating organizational fuel tanks.

1.3. Objectives. This instruction provides Major Commands (MAJCOM), Field Operating Agencies (FOA), Direct Reporting Units (DRU), and installations with a framework for complying with regulatory requirements for storage tanks and associated piping that store petroleum and hazardous substances except hazardous waste. In the United States and its territories, use this guidance with applicable Federal, state, and local standards for storage tanks. For Department of Defense (DoD) components at installations outside the United States, its territories, and possessions, implement the applicable portions of this AFI (i.e., all paragraphs except those with asterisks) in accordance with the applicable Final Governing Standards (FGS) or, in their absence, the Overseas Environmental Baseline Guidance Document (OEBGD). See AFI 32-7006, *Environmental Program in Foreign Countries*, for additional environmental guidance for overseas installations.

1.4. Applicable Standards and Regulations. The Air Force complies with applicable Federal, state, and local laws and regulations; Executive Orders (E.O.); DoD and Air Force policies; and, outside Continental United States (OCONUS), with the OEBGD, appropriate FGS, international agreements, and applicable portions of this AFI. The following description of regulations applicable to storage tanks describes only the principal requirements and is not intended to be exhaustive. Air Force personnel are expected to comply fully with the underlying regulatory requirements of Title 40, Code of Federal Regulations (CFR) Parts 112 and 280, and the related state programs. Other requirements may apply to storage tanks under the Clean Air Act (CAA), the Emergency Planning and Community Right-to-Know Act (EPCRA), other

environmental laws, Occupational Safety and Health Administration (OSHA) regulations and the national codes and standards listed in [Attachment 2](#) to this AFI.

1.4.1. Underground Storage Tanks (UST). The Resource Conservation and Recovery Act (RCRA), Title 42, United States Code (U.S.C.), Section 6901, *et seq.* regulates USTs that contain regulated substances.

1.4.1.1. Regulated substances are defined at 40 CFR Section 280.12 and include hazardous substances regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. 9601 *et seq.*, which are not otherwise regulated as RCRA hazardous waste, and petroleum and petroleum-based substances.

1.4.1.2. The Federal UST standards are found in 40 CFR Parts 280 and 281 (for approval of state UST programs.).

1.4.1.3. The Clean Water Act (CWA), 33 U.S.C. 1251 *et seq.*, Spill Prevention and Control and Countermeasures (SPCC) and Facility Response Plan (FRP) requirements, found in 40 CFR Part 112, do not apply to USTs that are regulated under 40 CFR Part 280 and 281, except that USTs need to be included in the facility diagram (as provided in 40 CFR 112.7(a)(3)) or if the Environmental Protection Agency (EPA) Regional Administrator otherwise requires the USTs to be included in the SPCC Plan (as provided in 40 CFR 112.1(f).)

1.4.1.4. The CAA requirements in 40 CFR Part 60, Subpart Kb, *Standards of Performance for Volatile Organic Liquid Storage Vessels for Which Construction, Reconstruction, or Modification Commenced after July 23, 1984*, apply to USTs as pertinent.

1.4.2. Aboveground Storage Tanks (AST). There is no single Federal standard applicable to all ASTs as of the date of this instruction. Guidance on the construction and operation of petroleum ASTs can be found in the Air Force standard design for bulk jet fuel tanks and Military Handbook (MIL-HDBK) 1022, *Petroleum Fuel Facilities*, and on the websites of the National Fire Protection Association, the American Petroleum Institute, and from other sources (including some of the national codes and standards listed in [Attachment 2](#) to this AFI.).

1.4.2.1. The SPCC and FRP requirements, discussed in paragraph [1.4.1.3.](#), generally apply to ASTs that are bulk storage containers where, due to location, a discharge could reasonably be expected to reach navigable waters (including sewer pathways), unless both: (i) the completely buried storage capacity of a facility is 42,000 gallons or less of oil; and (ii) the aggregate aboveground storage capacity of the facility is 1,320 gallons or less of oil. Note that containers of oil with a capacity of less than 55 gallons are not counted for purposes of this determination.

1.4.2.1.1. The SPCC Plan is the document required by 40 CFR 112.3 that details the equipment, workforce, procedures and steps to prevent, control, and provide adequate countermeasures to a discharge. For Air Force installations, 40 CFR 112.3 – 112.8 lists the relevant requirements for preparing a SPCC Plan.

1.4.2.1.2. A facility shall also determine, in accordance with 40 CFR 112.20, whether, because of its location, a spill of oil could cause substantial harm to the environment by discharging oil into or on the navigable waters or adjoining shorelines.*

1.4.2.1.2.1. If the facility determines that it does not meet the substantial harm criteria, it shall complete and maintain certification that the criteria do not apply.*

1.4.2.1.2.2. If the facility determines that it does meet the substantial harm criteria, it shall prepare a FRP as provided in 40 CFR Part 112 Appendix F or as required by the EPA Regional Administrator.*

1.4.2.2. ASTs that contain **used oil**, as defined in 40 CFR 279.1, must also meet the applicable RCRA used oil management requirements of 40 CFR Part 279. ASTs storing or treating hazardous waste must meet the requirements of 40 CFR Part 264, Subparts J and CC, and Part 265, Subparts J and CC.

1.4.2.3. The CAA requirements in 40 CFR Part 60, Subpart Kb, *Standards of Performance for Volatile Organic Liquid Vessels for Which Construction, Reconstruction, or Modification Commenced after July 23, 1984* and Part 81 *Designation of Areas for Air Quality Planning Purposes* apply to ASTs as pertinent.

1.4.3. States may adopt or enact storage tank regulations as long as those regulations are at least as stringent as Federal storage tank regulations. Air Force installations must comply with state or local (a) UST regulations: and (b) AST requirements where sovereign immunity has been waived. Installations should consult with the installation Staff Judge Advocate to obtain guidance on whether state or local government can regulate installation ASTs.

1.4.4. Air Force activities in overseas locations must implement this AFI in accordance with the appropriate FGS or, in their absence, the OEBGD. AFI 32-7006, *Air Force Environmental Program in Foreign Countries* describes implementation of the Air Force environmental program in other nations. Provisions of this AFI that are subject to different treatment overseas are designated by an asterisk “*”.

Section 1B—Responsibilities

1.5. Secretary of the Air Force (SAF).

1.5.1. The Deputy Assistant Secretary of the Air Force for Environment, Safety and Occupational Health (SAF/IEE) is the principal Air Force representative on storage tank compliance-related issues with the Office of the Secretary of Defense (OSD) staff, Federal agencies, and the Congress. SAF/IEE will:

1.5.1.1. Promulgate and oversee policy for storage tank compliance.

1.5.1.2. Coordinate Air Force storage tank compliance efforts with those of other Services to identify common areas of interest and prevent duplication of effort.

1.6. Headquarters, United States Air Force (HQ USAF).

1.6.1. Civil Engineer (HQ USAF/ILE). HQ USAF/ILE formulates policy, allocates resources, and monitors execution of storage tank compliance programs throughout the Air Force. HQ USAF/ILE will:

1.6.1.1. Coordinate the Air Force storage tank compliance program with other HQ USAF offices.

1.6.1.2. Evaluate the performance of storage tank compliance programs throughout the Air Force and report results to SAF/IEE, MAJCOMs, and appropriate FOAs and DRUs.

- 1.6.1.3. Validate and support storage tank compliance requirements throughout the Air Force in the planning, programming, budgeting and execution (PPBE).
 - 1.6.1.4. Designate lead MAJCOMs or FOAs for special projects and studies on storage tank compliance.
 - 1.6.1.5. Validate storage tank research and development (R&D) requirements that MAJCOMs identify.
 - 1.6.1.6. Assign validated R&D requirements to Air Force Materiel Command (AFMC).
- 1.6.2. The Judge Advocate General (HQ USAF/JA). HQ USAF/JA will:
- 1.6.2.1. Provide legal advice and guidance on all aspects of the storage tank compliance program through the Air Force Legal Services Agency, Environmental Law and Litigation Division (AFLSA/JACE).
 - 1.6.2.2. Provide legal advice on regional storage tank compliance issues through AFLSA/JACE legal staff at each Air Force Regional Environmental Office.
- 1.6.3. The Surgeon General (HQ USAF/SG). HQ USAF/SG advises HQ USAF/ILE on health matters related to storage tanks. HQ USAF/SG will:
- 1.6.3.1. Coordinate bioenvironmental engineering support for the storage tank compliance program with HQ USAF/ILE, SAF/IEE, and MAJCOMs.
 - 1.6.3.2. Align requirements of this AFI with AFIs issued by HQ USAF/SG.
- 1.6.4. Deputy Chief of Staff, Installations and Logistics, Logistics Readiness (HQ USAF/ILG). HQ USAF/ILG is the office of primary responsibility for issues concerning the storage of bulk petroleum products on Air Force installations. HQ USAF/ILG will:
- 1.6.4.1. Coordinate bulk petroleum issues with the Defense Energy Support Center (DESC) of the Defense Logistics Agency (DLA).
 - 1.6.4.2. Issue guidelines for managing organizational fuel tanks.

1.7. FOAs and MAJCOMs.

- 1.7.1. Air Force Civil Engineer Support Agency (AFCESA). AFCESA provides technical assistance to bases regarding facilities, utilities, infrastructure, and Civil Engineer Squadron organization and maintenance management. AFCESA's responsibilities include establishment of technical standards for the construction, operation, and maintenance of ASTs and USTs.
- 1.7.2. Air Force Center for Environmental Excellence (HQ AFCEE). HQ AFCEE includes staff that provides technical, scientific, and other essential support. HQ AFCEE, including its contracting experts and Air Force Regional Environmental Offices, provides the following comprehensive storage tank compliance services to HQ USAF/ILE, MAJCOMs and installations:
- 1.7.2.1. Determine permit and variance requirements, obtain data, and complete storage tank permit applications, if requested and funded by MAJCOMs.
 - 1.7.2.2. Develop and provide required preconstruction and construction permit applications for storage tank projects using military construction funds and pay related fees from the projects' funds, as requested by MAJCOMs.

1.7.2.3. Identify compliance requirements for new storage tank construction and assist in coordinating new projects or modifications with appropriate EPA or other Federal, state, or local regulators, as requested by MAJCOMs.

1.7.2.4. Advise HQ USAF/ILE of the impacts of new requirements on Air Force operations.

1.7.2.5. Provide technical assistance to HQ USAF/ILE on implementation issues involving storage tank environmental policy.

1.7.2.6. Provide full-service execution support, including design and construction management, as requested by MAJCOMs. Activities include providing technical oversight of storage tank-related contracting, ensuring AF technical standards are met, preparing statements of work, assembling contract delivery orders, monitoring contractor progress, and reviewing contractor products if requested and funded by MAJCOMs.

1.7.2.7. Perform special projects and studies on storage tank compliance at the request of HQ USAF/ILE or MAJCOMs.

1.7.2.8. Maintain and report the compliance status of all UST violations to HQ USAF/ILE through the Air Force Regional Environmental Offices.

1.7.2.9. Identify and monitor applicable Federal and state storage tank regulations, compliance requirements, and enforcement policies.

1.7.2.10. Provide regional liaison, upon MAJCOM request, to EPA and state regulatory authorities to resolve compliance and permitting issues.

1.7.3. MAJCOMs. MAJCOMs provide execution guidance and oversee implementation of storage tank compliance programs at their installations. All references to MAJCOMs in this AFI include the Air National Guard Readiness Center (ANGRC) and other agencies designated as "MAJCOM equivalent" by HQ USAF.

1.7.3.1. MAJCOM Civil Engineer (CE). MAJCOM CEs will:

1.7.3.1.1. Write directives to implement this instruction.

1.7.3.1.2. Identify R&D requirements for storage tank compliance.

1.7.3.1.3. Provide oversight and evaluate storage tank compliance programs at their installations in their MAJCOM.

1.7.3.1.4. Validate and allocate resources for storage tank compliance at their installations.

1.7.3.1.5. Assist installations in their command to comply with applicable Federal, state, and local storage tank requirements.

1.7.3.1.6. Obtain storage tank inventory requirements from the Installation CE, and maintain and make appropriate recommendations concerning this inventory.

1.7.3.2. MAJCOM Surgeon General (SG). MAJCOM SGs will:

1.7.3.2.1. Ensure that Bioenvironmental Engineering (BEE) provides manpower to conduct occupational surveillance, health risk assessments, and sampling and analysis to support health risk assessments associated with the environmental contamination from storage tanks.

1.7.3.2.2. Review and validate health-risk based sampling, analysis, and monitoring resource requirements at their MAJCOM's installations that are needed to support storage tank compliance programs.

1.7.3.2.3. Validate and allocate resources for storage tank-related occupational health programs at their MAJCOM's installations.

1.7.3.3. MAJCOM Staff Judge Advocate (JA). MAJCOM JA will provide legal advice and guidance on all aspects of the storage tank compliance program to MAJCOM/CC, (including the MAJCOM Environmental Protection Committee or Environmental Safety and Occupational Health Committee), and JA field offices.

1.8. Installations.

1.8.1. Installation Commanders are ultimately responsible for all aspects of the installation's storage tank management programs, including approval and installation of new tanks. Installation Commanders will:

1.8.1.1. Ensure that proper storage tank management is emphasized to appropriate installation personnel.

1.8.1.2. Sign all installation storage tank permit applications, including for Army and Air Force Exchange Service (AAFES) station USTs and ASTs, and where authorized by Federal and state law, the Installation Commander may delegate this authority to appropriate personnel at the installation.*

1.8.1.3. Ensure that enforcement actions or notices of violations are promptly reported, tracked and managed as provided in AFI 32-7047, *Compliance Tracking and Reporting*.

1.8.1.4. Ensure that installation storage tanks are managed in accordance with all applicable Federal, state, and local requirements.

1.8.2. Installation Civil Engineering Environmental Flight (CEV). Installation CEV has overall management responsibility of the installation's environmental program. CEV is the installation commander's organization for ensuring that storage tank management programs are in compliance with all applicable Federal, state, and local requirements. Note that some installations may have an Environmental Management (EM) organization that performs and implements all the necessary functions as CEV. CEV will:

1.8.2.1. Act as the liaison office for storage tank compliance issues with regulatory agencies.

1.8.2.2. Identify and request environmental sampling, analysis, and monitoring requirements needed to support storage tank compliance programs at its installation, which may include storage tank repair, maintenance, calibration, and removal or replacement.

1.8.2.3. Develop and submit funding requests for storage tank requirements, regardless of fund source, consistent with the requirements of paragraphs 2.6. and 2.8. of this AFI.

1.8.2.4. Generally manage all installation storage tank-related design and construction, and monitor design and construction progress to ensure compliance with applicable Federal, state, and local requirements.

- 1.8.2.5. For AAFES station USTs and ASTs, coordinate and approve all plans and drawings, and provide project management oversight.
 - 1.8.2.6. Establish local procedures and provide technical expertise with regard to storage tank management requirements.
 - 1.8.2.7. Oversee proper programming and recordkeeping procedures, and maintain storage tank inventory requirements and provide this information to MAJCOM as necessary.
 - 1.8.2.8. Prepare, modify and obtain variances for required permits, including those for AAFES station USTs and ASTs pursuant to reimbursement procedures.*
 - 1.8.2.9. Identify compliance requirements for new storage tank construction by coordinating new projects or modifications with appropriate EPA or other Federal, state, or local regulators.
 - 1.8.2.10. Maintain information on the locations and physical characteristics of Air Force storage tanks, including key features of variances and compliance orders.
 - 1.8.2.11. Provide technical oversight of storage tank-related contracting, including establishing technical requirements, statements of work, assembling contract delivery orders, monitoring contractor progress, and reviewing contractor progress.
 - 1.8.2.12. Perform special projects and studies on storage tank compliance.
 - 1.8.2.13. Coordinate with Civil Engineering Flight (CEC) in maintenance of up-to-date and accurate records for all installation storage tanks, including as-built drawings, project files, Projects by Contract Management System (PCMS), and Tabs; complete and current set of work orders; and real property records, and to provide these records to the MAJCOM on request or where otherwise appropriate.
- 1.8.3. Hazardous Material (HAZMAT) Emergency Planning and Response Teams. Ensure adequate preparation and necessary resources for responding to emergency releases in accordance with AFI 10-2501, *Full Spectrum Threat Response (FSTR) Planning and Operations* (see Air Force Manual (AFMAN) 32-4013, *Hazardous Materials Emergency Planning and Response Guide*, for further guidance).
- 1.8.4. Chief of Safety (SE). Unit Safety Managers will ensure all storage tank management procedures comply with applicable safety requirements and installation storage tank locations have equipment that meet safety standards.
- 1.8.5. Installation Staff Judge Advocate. Installation JA will:
- 1.8.5.1. Review for legal sufficiency the installation SPCC and related documents pertaining to storage tank management and funding.
 - 1.8.5.2. Provide legal advice on local storage tank compliance issues in coordination with MAJCOM/JA.
- 1.8.6. Air Force Installation Tenants. Tenants that own or operate any UST or AST on the installation will comply with all Federal, state or local requirements that apply to the installation, and will coordinate, as appropriate, with the Installation Commander, CE, CS, SE, HAZMAT Emergency Planning and Response Teams, the Logistics Group (LG) and the installation JA.

Chapter 2

COMPLIANCE REQUIREMENTS FOR STORAGE TANKS AND ASSOCIATED PIPING

2.1. General Tank System Requirements. There is no single correct storage tank. Factors to consider when selecting the type storage tank are provided in [Attachment 6](#). Once a tank type is selected, obtain the approval of the Installation Commander. All tank systems (existing and new) that contain a regulated substance (e.g. petroleum, petroleum based product, or hazardous substance) must comply with the requirements listed in this paragraph. Overseas installations must comply with the OEBGD or FGS as well as the requirements listed below.

2.1.1. Construction. Storage tanks must be constructed to prevent releases due to leaks

2.1.1.1. USTs must have double wall construction with interstitial monitoring. See MIL-HDBK-1022, *Petroleum Fuel Facilities* (30 Jun 1997) § 2.13.6.

2.1.1.2. ASTs containing oil must have internal (self-diking) or external secondary containment and/or diversionary structures or equipment wherever required. See generally MIL-HDBK-1022 for further details. See also API Standard 650, *Welded Steel Tanks for Oil Storage-Includes Addendum 1 and 2*; API Standard 653, *Tank Inspection, Repair, Alteration, and Reconstruction-Includes Addenda 1-4*. All determinations under this paragraph need to be documented in the SPCC Plan.

2.1.1.2.1. Self-diking tanks must be capable of containing the entire capacity of the inner tank if it fails within (a) the interstitial space; (b) a secondary containment system; or (c) both. Tanks with concrete outer shells are not satisfactory for this purpose.

2.1.1.2.2. External secondary containment includes dikes, containment curbs, pits or drainage trenches that must be sufficient to hold the entire capacity of the largest single container and sufficient freeboard to contain normal annual precipitation events, in the opinion of the certifying professional engineer.

2.1.1.3. Facility tank car and tank truck loading/unloading areas without a catchment basin or treatment facility must provide a containment system that must be sufficient to hold the entire capacity of the largest single container at that area and, if there is no continuously present on-site operator, sufficient freeboard to contain normal annual precipitation events, in the opinion of the certifying professional engineer.

2.1.1.4. Facility tank car and tank truck loading/unloading storage/parking areas for vehicles operated primarily off-installation and where loading/unloading does not occur do not require a catchment basin or treatment facility.

2.1.2. Meet Performance Standards. Tank systems and piping must be installed according to applicable Federal, state and local requirements, and the appropriate national codes and standards for new tank systems as detailed in [Attachment 2](#).

2.1.2.1. Corrosion Protection for Tank Systems. Prevent corrosion by only installing tanks made of one of the following:

2.1.2.1.1. Fiberglass-reinforced plastic (for USTs and certain ASTs.)

2.1.2.1.2. Coated cathodically protected steel (for USTs and vaulted tanks.)

2.1.2.1.3. Steel-fiberglass-reinforced plastic composite (for all types of storage tanks.)

2.1.2.1.4. Coated steel (for ASTs.)

2.1.2.2. Corrosion Protection for Piping. Use fiberglass-reinforced plastic or cathodically protected, coated steel. Specialty products (i.e., double wall systems using a flexible carrier pipe for service stations) may be used. Bases that are unfamiliar with such products should consult with the MAJCOM or AFCESA before using them. See applicable state and local requirements, and [Attachment 2](#) for national codes and standards.

2.1.2.3. Release Detection for Tanks. USTs and other type tanks, where required by state or local requirements, must have at least one of the following release detection monitoring systems:

2.1.2.3.1. Automatic tank gauging.

2.1.2.3.2. Vapor monitoring.

2.1.2.3.3. New groundwater monitoring systems in areas with no known prior contamination.

2.1.2.3.4. Continuous monitoring of the interstitial space between the tank system and a secondary barrier.

2.1.2.3.5. Other effective methods that comply with environmental regulations.

2.1.2.4. Secondary containment for service stations and tank systems. Some states such as Florida and California, require complete secondary containment for tanks and lines of all UST systems. For service stations, this requires the addition of containment sumps for tank piping entries and for dispensers. Service stations with reasonably short runs of piping should always use double wall piping or other secondary containment for piping.

2.1.2.5. Release Detection for Piping. Automatic line-leak detection is to be installed with all new pressurized piping. Suction piping operating at less than atmospheric pressure that drains the contents back into the tank, with a single check valve below the suction pump, does not require release detection. Suction piping that does not have leak detection must either be subject to an appropriate line tightness test annually or monitor this piping monthly using a release detection monitoring method that detects piping leaks. Follow applicable state and local requirements, and the appropriate national codes and standards in [Attachment 2](#). Underground piping for hazardous substances must be equipped with secondary containment (e.g., trench liners, jacketing or double-walled pipe.) Automatic line leak detection for pressurized lines may not be available from all manufacturers. At some locations, only interstitial monitoring may be available for line leak detection for ASTs. Ensure that line leak detection system is installed as recommended to avoid interference with operation of AST anti-siphon device. This paragraph does not apply to pipelines carrying aircraft petroleum products (See MIL HDBK 1022).

2.1.2.6. Spill and Overfill Prevention.

2.1.2.6.1. Generally. Tank equipment must prevent spills when the transfer hose detaches. Control overfilling by using an automatic shutoff, overfill containment, containment bucket and other options such as alarms and regular observation of tank fillings.

2.1.2.6.2. ASTs. AST capacity should be adequate to ensure that a container will not overfill if pumper/gauger is delayed in making regularly scheduled rounds. See 40 CFR 112.9(b) (i).

Each tank should be engineered or updated in accordance with good engineering practice to avoid discharges and must include at least one of the devices listed in 40 CFR 112.8(c)(8).

2.1.2.7. Regulatory Agency Notification and Certification. For new USTs, the installation must:

2.1.2.7.1. Obtain proper notification and certification forms including necessary permits from the appropriate regulatory agency.

2.1.2.7.2. Where required, send state or local agencies a notice of intent to install a tank before starting construction.

2.1.2.7.3. Notify the appropriate regulatory agency of all new ASTs/USTs within 30 calendar days after use of a newly installed AST/UST commences.

2.1.2.7.4. Obtain recent certification that tank was installed according to national codes and standards, and maintain as built drawings in appropriate files.

2.1.2.7.5. Notify the regulator in advance if the installation cannot meet a regulatory deadline.

2.1.3. Anchor all parts to USTs, vaulted tanks, and cylindrical ASTs to prevent floating in floods or dislocation in earthquakes or other conditions. USTs and vaulted tanks must not be installed at a site located in a 25-year flood plain.

2.1.4. Comply with Air Force management practices for maintenance of jet fuel and other petroleum products.

2.1.5. Comply with National Fire Protection Association standards, and OSHA design, hazard communication, and confined space entry requirements.

2.2. Monitoring for Releases. Installations must periodically check tank systems for leaks.

2.2.1. USTs. During the first year following installation, check leak detection systems of new USTs every 30 days to verify proper functioning.

2.2.1.1. Existing USTs. Determine monitoring requirements for USTs installed before 22 December 1988 according to these categories:

2.2.1.1.1. Upgraded USTs Without Release Detection Systems. For USTs that meet the requirements in paragraph 2.1 but lack a release detection monitoring system, use monthly inventory controls and conduct tightness testing at least every 5 years until 10 years after the tank was upgraded.

2.2.1.1.2. Upgraded USTs With Release Detection Systems. Upgraded USTs must meet the monitoring standards in paragraph 2.2.1.

2.2.2. ASTs. For ASTs that contain petroleum oil, including valves or piping that are entirely within buildings:

2.2.2.1. These ASTs are subject to integrity and leak testing regularly and when material repairs are made.

2.2.2.1.1. The frequency of regular AST integrity testing must take into account container (tank) size and design and be consistent with industry standards.

2.2.2.1.2. For self-diking ASTs, check the interstitial space for leaks at least quarterly.

2.2.2.2. Small, shop-built ASTs that are not in contact with the ground, all sides are visible and are inspected at least monthly may use visual inspection for integrity testing, consistent with good engineering practice.

2.2.2.3. ASTs on the ground generally must be subject to (a) visual integrity testing and (b) another testing technique such as hydrostatic testing, radiographic testing, ultrasonic testing, acoustic emissions testing, or another system of non-destructive testing.

2.2.2.4. For self-diking ASTs, check the interstitial space at least quarterly for leaks.

2.2.2.5. Material repairs include removing the annular plate ring; replacement of the container bottom; jacking of a container shell; installation of a 12-inch or larger nozzle in the shell; a door sheet, tombstone replacement in the shell, or other shell repair; or, such repairs that might potentially change the potential for oil to be discharged from the container.

2.2.3. New and Existing Pressurized Piping. Perform a line tightness test annually or monitor this piping monthly using a release detection monitoring method that detects piping leaks.

2.2.4. New and Existing Suction Piping. Perform a line tightness test at least every 3 years or use a monthly monitoring method that detects piping leaks in single walled suction piping.

2.3. Operating and Maintaining Tanks.

2.3.1. Spill and Overfill Control. To prevent spills:

2.3.1.1. Make sure that available tank capacity exceeds the volume of the product being transferred into the tank.

2.3.1.2. Monitor the transfer operation constantly.

2.3.1.3. Overflow equipment in the tank should include:

2.3.1.3.1. A minimum 15 gallon spill bucket; and

2.3.1.3.2. A fill pipe that will:

2.3.1.3.2.1. Alert the operator by restricting flow into the tank or triggering a high level alarm before tank is 90% full; and

2.3.1.3.2.2. Automatically shuts off flow into the tank when the tank is not more than 95% full.

2.3.2. Corrosion Protection for Steel USTs and Steel ASTs in Direct Contact with Soil.

2.3.2.1. Have a qualified cathodic protection specialist (i.e., a person certified by the National Association of Corrosion Engineers (NACE)), inspect new cathodic protection systems in accordance with Air Force procedures for the maintenance and operation of cathodic protection systems or according to another reasonable time frame established by the implementing agency. (At a minimum, Federal regulations require that this occur within 6 months of installation and at least every 3 years thereafter (40 CFR 280.31(b) (1)).

2.3.2.2. Inspect impressed current cathodic protection systems every 60 calendar days and galvanic systems annually.

2.3.2.3. Check USTs quarterly, and ASTs as provided in **2.2.2.1.** for corrosion.

2.3.3. Repairs. Follow these guidelines:

2.3.3.1. Use qualified personnel licensed by state to perform repairs on all USTs, if required by state regulations, and authorized Inspectors (AI) to certify that repairs were performed on ASTs.

2.3.3.2. Perform tightness testing of USTs, including piping, within 30 calendar days or earlier of completing repairs to any UST or underground piping.

2.3.3.3. Integrity testing of a tank system must be performed on a repaired cathodic protection system before the tank system is returned to service. Thereafter, follow paragraph [2.3.2](#).

2.4. Release Response, Cleanup, and Reporting.

2.4.1. Suspected Releases

2.4.1.1. Suspected releases from USTs must be reported to the regulators within 24 hours and appropriate investigation and confirmation steps taken. The following are considered suspected releases:

2.4.1.1.1. The discovery of regulated substances at the UST site or in the surrounding area (such as free product or vapors in soils, basements, sewer and utility lines and near surface water).

2.4.1.1.2. Unusual operating conditions, such as the erratic behavior of dispensing equipment, the sudden loss of product from the system, or an unexplained loss of product from the system. (Note that mechanical automatic line leak detectors and some electronic line leak detectors signal a suspected line leak by greatly slowing down the flow of product in the distribution line. This can appear as erratic operation of dispensing equipment.) Any of these conditions are considered a suspected release unless system equipment is found to be defective but not leaking within the 24 hour period allowed for reporting suspected releases and is immediately repaired or replaced.

2.4.1.1.3. Monitoring results from a required tank or line release detection method that indicate a release may have occurred must be reported as a suspected release unless the following conditions can be met within the allowed 24-hour period. These conditions are: the monitoring device is found to be defective and is immediately repaired, recalibrated, or replaced and additional monitoring does not confirm the initial result.

2.4.1.1.4. If inventory control shows excessive variance (that is, monthly reconciliations using the EPA leak check comparison of book inventories versus tank measurements exceeds 1% of tank throughput plus 130 gallons), a suspected release must be reported and followed up if there are two consecutive months of excessive variances.

2.4.2. Responding to Releases.

2.4.2.1. If a release of a regulated substance stored in a tank system is suspected, take immediate action to investigate and confirm the release using the following steps:

2.4.2.1.1. Perform a tightness test of the system.

2.4.2.1.2. If a release is suspected because of the discovery of environmental contamination in the vicinity of the tank but a leak is not detected in the tank system, perform a site check by sampling and measuring for contamination at the tank site.

2.4.2.2. If a release from a tank system is confirmed:

2.4.2.2.1. Remove as much of the regulated substances from the tank as necessary to prevent any further release.

2.4.2.2.2. Inspect visually for evidence of any above ground or below ground releases.

2.4.2.2.3. Prevent further migration of the regulated substance release to the surrounding soils and groundwater.

2.4.2.2.4. Identify and mitigate fire, explosion, and vapor hazards.

2.4.2.2.5. Report the release as provided in paragraph 2.4.4.

2.4.3. Cleaning Up Releases. Coordinate these actions with regulatory authorities:

2.4.3.1. Corrective Action for Petroleum or Hazardous Substance Tanks. The installation must take corrective action in response to a confirmed release from a tank as follows:

2.4.3.1.1. For tanks located at installations with a RCRA hazardous waste permit take corrective action in accordance with RCRA Subtitle C requirements (40 CFR 264.101, 264.552, and 264.553), and any more stringent and applicable state hazardous waste regulations.

2.4.3.1.2. For tanks located at installations without a RCRA hazardous waste permit, take corrective action in accordance with 40 CFR Part 280 Subpart F, and any more stringent and applicable state hazardous waste regulations.

2.4.3.2. Remove Free Product. If the presence of free product outside the tank system is confirmed, as soon as possible remove this regulated substance to the maximum extent practicable.

2.4.3.3. Investigate Soil and Groundwater. Determine the extent and location of contaminated soil and groundwater. Comply with requests from the regulatory agency for additional information or a corrective action plan to clean up contaminated soil, surface water or groundwater.

2.4.3.4. Site Remediation. Remediate contaminated tank sites to protect human health and the environment.

2.4.3.4.1. In the Continental United Status (CONUS):

2.4.3.4.1.1. If the regulatory agency approves, cleanup actions may begin before the corrective action plan is completed.*

2.4.3.4.1.2. Dispose of contaminated soil, contaminated water and other cleanup waste according to applicable Federal, state, and local regulations.*

2.4.3.4.1.3. Remove free product in groundwater and dispose of it consistent with federal, state and local law. To the maximum extent appropriate, also use monitored natural attenuation, remedies that prevent further migration of the plume, source control and institutional controls consistent with regulator direction.*

2.4.3.4.2. For overseas installations, follow the remediation policy in Department of Defense Instruction (DoDI) 4715.8, *Environmental Remediation for DoD Activities Overseas*.

2.4.4. Reporting Releases.

2.4.4.1. Release Notification. Notify the regulatory agency consistent with the applicable Federal, state, or local requirements.

2.4.4.1.1. Notice of a release is generally required if:

2.4.4.1.1.1. A release is discovered from a tank system.

2.4.4.1.1.2. Unusual conditions occur, such as apparent erratic behavior of equipment, loss of product, unexplained water in tanks or product in the interstitial space.

2.4.4.1.1.3. A spill or overfill of petroleum occurs that exceeds 25 gallons or causes a sheen on nearby surface water.

2.4.4.1.1.4. A spill or overfill of a hazardous substance to the environment that equals or exceeds the reportable quantity for the spilled substance.

2.4.4.1.1.5. A spill or overfill from an UST of petroleum less than 25 gallons or of a hazardous substance that results in a release to the environment less than its reportable quantity where the cleanup cannot be accomplished within 24 hours or other time period established by the implementing agency,

2.4.4.1.2. Notice of a release is required:

2.4.4.1.2.1. For releases or discharges of oil or a hazardous substance in a reportable quantity or greater:

2.4.4.1.2.1.1. Immediately notify to the National Response Center. See 40 CFR 300.125(c).

2.4.4.1.2.1.2. Immediately notify the community emergency coordinator for the local emergency planning committee, or if there is none, notify the relevant local emergency response personnel. See 40 CFR 355.40(b)(1).

2.4.4.1.2.2. For any spill or overfill from an UST of petroleum in excess of 25 gallons or of a hazardous substance that results in a release to the environment that equals or exceeds its reportable quantity, notification also is to be provided within 24 hours or other reasonable time period to the implementing agency. See 40 CFR 280.50.

2.4.4.1.2.3. For any spill or overfill from an UST of petroleum less than 25 gallons or of a hazardous substance that results in a release to the environment less than its reportable quantity where the cleanup cannot be accomplished within 24 hours or other time period established by the implementing agency, notification is to be provided immediately to the implementing agency. See 40 CFR 280.53(b).

2.4.4.2. Notification. Notification of a confirmed release is to be provided to MAJCOM and HQ USAF/ILEV according to AFI 10-2501, and AFI 32-7002, *Environmental Information Management System*.

2.4.4.3. Release Reporting. Unless the regulatory agency directs otherwise, submit a report of initial abatement actions promptly after confirming a release consistent with the applicable Federal, state, or local requirements (e.g. 40 CFR 280.62(b) requires this report to be submitted within 20 calendar days.). Submit a detailed follow-up report consistent with the applicable Federal, state, or local requirements (e.g. 40 CFR 280.63(b) requires submission within 45 calendar days) that includes:

2.4.4.3.1. Name of the installation point of contact.

2.4.4.3.2. Nature and estimated quantity of release.

- 2.4.4.3.3. Information on surrounding population, water quality, use and locations of potentially affected wells, subsurface soil conditions, locations of sewers, climatic conditions, and land use.
- 2.4.4.3.4. Results of initial site check.
- 2.4.4.3.5. Cause of release.
- 2.4.4.3.6. Results of free-product investigation.
- 2.4.4.3.7. Estimated quantity, type, and depth of any free product.
- 2.4.4.3.8. Type of recovery system.
- 2.4.4.3.9. Location of on-site or off-site discharges.
- 2.4.4.3.10. Type of treatment and effluent quality.
- 2.4.4.3.11. Steps taken to obtain the necessary permits.
- 2.4.4.3.12. Personnel methods or plan to dispose of any recovered free product, contaminated soil, or groundwater.

2.5. Recordkeeping.

2.5.1. Keep these records readily available for inspection at the installation CEV or Environmental Management Office:

2.5.1.1. Tank Inventories. MAJCOMs and installations are to use an existing information management system to develop and maintain a comprehensive list of all tank systems locations and characteristics until an applicable Air Force-wide information management system is available. This will also be used to track and report UST compliance status accurately. Refer to AFI 32-7002, *Environmental Information Management System* for general guidance.

2.5.1.1.1. Update data when tank systems are removed, replaced, or upgraded or abandoned tanks are found or removed.

2.5.1.1.2. The Civil Engineer environmental flight (CEV) or Environmental Management office maintains tank system inventory control records for environmental purposes and makes them available for inspection.

2.5.1.1.3. Tank system inventory information will be included in or accessible to the real property records for the installation.

2.5.1.2. Documentation of:

2.5.1.2.1. Corrosion protection equipment operation and inspection. CE must keep records showing performance of required inspections and tests of installation corrosion protection system.

2.5.1.2.2. Tank repairs and upgrades. CE must keep records showing that a repaired or upgraded UST system was properly repaired or upgraded. Maintain similar information for other tank types.

2.5.1.2.3. Recent compliance with release detection requirements. CE must keep records of leak detection performance and maintenance including:

- 2.5.1.2.3.1. Prior year monitoring results and the most recent tightness test.
- 2.5.1.2.3.2. Copies of performance claims, including third party certifications, provided by leak detection equipment manufacturers.
- 2.5.1.2.3.3. Records of the most recent maintenance, repairs, and calibration of on-site leak detection equipment.
- 2.5.1.2.3.4. Monthly monitoring of release detection systems in log entry or annotation on site records such as automatic tank gauging-print-out.
- 2.5.1.2.3.5. Responses to all alarms must be documented in site records.
- 2.5.1.2.3.6. Where tank leak detection is performed with an automatic tank gauge, records of monthly inventory reconciliation should be kept for at least the previous year to demonstrate compliance with 40 CFR 280.43(d)(2).
- 2.5.1.2.4. The results of the site investigation conducted during permanent closure. For at least three years after closing a UST, CE must keep records of the site assessment results required for permanent closure. It is also recommended that all tank records be maintained for 25 years or the operational life of the tank whichever is longer.
- 2.5.1.2.5. Reports of releases or suspected releases.

2.6. Budgeting for Tanks . Budgeting for tank-related costs must be consistent with this AFI, except that the budgeting for tank-related costs also must conform to:

- 2.6.1. The procedures and limitations provided in AFI 32-7001, *Environmental Budgeting*.
- 2.6.2. The DESC funding authorities.
 - 2.6.2.1. DESC funds all operation and maintenance (O&M), operational environmental permits or fees, and other environmental-related costs for tanks used to store DLA/DESC-owned petroleum, oils, and lubricants.
 - 2.6.2.2. The DESC-F Web site generally identifies the types of maintenance, repair, and environmental compliance costs that DESC funds. The DESC-F Web site is identified on [Attachment 5](#).
 - 2.6.2.3. Installations provide relevant funding requirements to DESC through their MAJCOM.
- 2.6.3. The funding authorities provided for AAFES station USTs (paragraph [2.8](#)).

2.7. Hydrant Fueling Systems. Federal regulations currently defer regulation of airport fuel distribution hydrant systems (40 CFR 280.10(c) (4)), but states may regulate these systems.

- 2.7.1. Installations should nevertheless:
 - 2.7.1.1. Leak test hydrant fueling systems periodically because of high potential for leaks and groundwater contamination.
 - 2.7.1.1.1. Use a method such as an annual operating/hydrostatic pressure test or other appropriate methods.
 - 2.7.1.1.2. Coordinate local procedures with CE Liquid Fuel Maintenance in areas under Fuels Management Team (FMT) control.

2.7.1.1.3. Consider installing automatic release detection systems on all new hydrant systems once the technology is proven.

2.7.2. Installations should contact the appropriate Air Force Regional Environmental Office for guidance concerning applicability of state or local regulation of hydrant fueling systems.

2.8. AAFES Station Tanks.

2.8.1. Installations are to support tanks at AAFES stations.

2.8.1.1. Installations need to consider obtaining funding for performance of appropriate activities with respect to AAFES-owned tanks installed after 30 September 1988. Environmental quality (EQ) Funds are not authorized to be used for any of the following and base O&M funds must be used with respect to AAFES tanks for purposes of:

2.8.1.1.1. Inspecting.

2.8.1.1.2. Maintaining.

2.8.1.1.3. Repairing.

2.8.1.1.4. Repair by replacement.

2.8.1.1.5. Clean up of releases (not caused by AAFES activity negligence).

2.8.1.1.6. Reporting spills and releases.

2.8.1.1.7. Maintaining and updating records.

2.8.1.2. Installations are responsible for obtaining and initial payment for any registrations, permits, or fees that are required for AAFES-owned tanks, subject to reimbursement by AAFES.

2.8.2. AAFES's responsibility for payment includes:

2.8.2.1. Reimbursements for costs initially paid by installations for registrations, permits, or fees required for AAFES-owned tanks.

2.8.2.2. Purchase, installation, monitoring, and repair or replacement of monitoring devices for AAFES-owned tanks.

2.8.2.3. Installation and construction of new tanks, and costs for replacement of tanks and lines to increase or decrease capacity or enhance other tank features not required by new environmental regulations.

2.9. Existing Petroleum and Hazardous Substance UST Systems . Any petroleum or regulated hazardous substance UST installed before 22 December 1988 had to meet certain UST requirements in 40 CFR 280 by 22 December 1988. If a pre-22 December 1988 petroleum or regulated hazardous substance UST at an installation is identified that was not upgraded prior to the deadline, promptly notify the appropriate Air Force Regional Environmental Office for guidance on how to proceed.

2.10. Closing USTs.

2.10.1. Temporary Closure. When a UST system is temporarily closed, installations must continue to operate and maintain corrosion protection systems and, if the UST is not empty, operation and maintenance of the release detection systems is also required. If the UST system is temporarily closed for

3 months or more, leave vent lines open and cap and secure other lines, pumps, manways, and equipment. When an UST system is temporarily closed for more than 12 months, it must undergo permanent closure unless one of the following occurs:

2.10.1.1. The UST meets the standards in paragraphs 2.1.2. and 2.2., except that spill and overflow prevention are not required.

2.10.1.2. The regulatory agency approves an extension of the 12 month temporary closure period.*

2.10.2. Permanent Closure. Notify the regulatory agency before permanently closing a UST system or effecting a change in service consistent with the applicable Federal, state, or local requirements (e.g. 40 CFR 280.71(a) requires at least 30-day advance notice). Determine if the UST system leaked by measuring for a release where contamination is most likely, unless an external release detection method reliably shows no release occurred. Basic guidance pertaining to closure procedures may be found in MIL-HDBK 1022, Section 14.*

2.10.2.1. If a release is discovered, begin corrective action as provided in paragraph 2.4.*

2.10.2.2. If no release is found, empty and clean the tank of all liquid and sludge. *

2.10.2.3. Except as provided in 2.10.2.4., no UST system shall be closed in place. A UST system that is subject to closure shall be properly removed and disposed of consistent with applicable state and local requirements and American Petroleum Institute (API) Recommended Practice 1604, *Closure of Underground Petroleum Storage Tanks*. EQ funds may not be used for this purpose, but removal and disposal may be funded by the associated project.

2.10.2.4. USTs may be permissible to be abandoned under extenuating circumstances (such as it being determined that an UST is located under a building), if regulator approval is obtained.

MICHAEL E. ZETTLER, Lieutenant General, USAF
DCS/Installations & Logistics

Attachment 1**GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION*****References***

29 U.S.C. 651 *et seq.*, *Occupational Safety and Health Act*

33 U.S.C. 1251 *et seq.*, *Clean Water Act*

42 U.S.C. 2011 *et seq.*, *Atomic Energy Act of 1954*

42 U.S.C. 6901 *et seq.*, *Resource Conservation and Recovery Act*

42 U.S.C. 6921 *et seq.*, *Solid Waste Disposal Act*

42 U.S.C. 7401 *et seq.*, *Clean Air Act*,

42 U.S.C. 9601 *et seq.*, *Comprehensive Environmental Response, Compensation and Liability Act*

42 U.S.C. 11001 *et seq.*, *Emergency Planning and Community Right-to-Know Act of 1986*

49 U.S.C. App. 1671, *et seq.*, *Natural Gas Pipeline Safety Act of 1968*

49 U.S.C. App. 2001, *et seq.*, *Hazardous Liquid Pipeline Safety Act of 1979*

29 CFR Part 1910, *Occupational Safety and Health Standards*

10 CFR Part 50, *Domestic Licensing of Production and Utilization Facilities*

40 CFR Part 60, Subpart Kb, *Standards of Performance for Volatile Organic Liquid Storage Vessels for Which Construction, Reconstruction, or Modification Commenced after July 23, 1984*

40 CFR Part 81, *Designation of Areas for Air Quality Planning Purposes*

40 CFR Part 110, *Discharge of Oil*

40 CFR Part 112, *Oil Pollution Prevention*, as amended by 67 Fed. Reg. 47042 (Jul 17, 2002.)

40 CFR Part 264, *Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities*

40 CFR Part 265, *Interim Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities*

40 CFR Part 279, *Standards for Management of Used Oil*

40 CFR Part 280, *Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks (USTs)*

40 CFR Part 281, *Approval of state underground storage tank programs*

40 CFR Part 300, *National Oil and Hazardous Substances Pollution Contingency Plan*

40 CFR Part 355, *Emergency Planning and Notification*

DoDI 4715.8, *Environmental Remediation for DoD Activities Overseas*

AFPD 32-70, *Environmental Quality*

AFI 10-2501, *Full Spectrum Threat Response (FSTR) Planning and Operations*

AFI 23-204, *Organizational Fuel Tanks*

AFI 32-7001, *Environmental Budgeting*

AFI 32-7002, *Environmental Information Management System*

AFI 32-7006, *Air Force Environmental Program in Foreign Countries*

AFI 32-7042, *Solid and Hazardous Waste Compliance*

AFI 32-7047, *Compliance Tracking and Reporting*

AFI 32-7080, *Pollution Prevention Program*

AFMAN 32-4013, *Hazardous Materials Emergency Planning and Response Guide*

AFMAN 37-139, *Records Disposition Schedule*

AFPAM 32-7043, *Hazardous Waste Management Guide*

AFH 32-1084, *Facility Requirements*

API Recommended Practice 1604, *Closure of Underground Petroleum Storage Tanks*

API Standard 650, *Welded Steel Tanks for Oil Storage-Includes Addendum 1 and 2*

API Standard 653, *Tank Inspection, Repair, Alteration, and Reconstruction-Includes Addenda 1-4*

MIL-HDBK-1022, *Petroleum Fuels Facilities* (30 Jun 1997)

Abbreviations and Acronyms

AAFES—Army and Air Force Exchange Service

AFCEE—Air Force Center for Environmental Excellence

AFCESA—Air Force Civil Engineer Support Agency

AFI—Air Force Instruction

AFLSA/JACE—Air Force Legal Services Agency, Environmental Law & Litigation Division

AFMAN—Air Force Manual

AFMC—Air Force Materiel Command

AFPAM—Air Force Pamphlet

AFPD—Air Force Policy Directive

AI—Authorized Inspector

ANGRC—Air National Guard Readiness Center

API—American Petroleum Institute

AST—Aboveground storage tank

BEE—Bioenvironmental Engineering

CAA—Clean Air Act

CE—Civil Engineer

CEC—Civil Engineering Flight

CONUS—Continental United States

CERCLA—Comprehensive Environmental Response, Compensation and Liability Act

CEV—Civil Engineer Environmental Flight

CFR—Code of Federal Regulations

CS—Command Surgeon

CWA—Clean Water Act

DESC—Defense Energy Support Center

DESC-F —Defense Energy Support Center - Facilities

DLA—Defense Logistics Agency

DoD—Department of Defense

DoDI—Department of Defense Instruction

DRU—Direct Reporting Unit

EM—Environmental Management

E.O.—Executive Order

EPA—Environmental Protection Agency

EPCRA—Emergency Planning and Community Right-to-Know Act

EQ—Environmental Quality

FGS—Final Governing Standards

FMT—Fuels Management Team

FOA—Field Operating Agency

FRP—Facility Response Plan

HAZMAT—Hazardous material

HQ USAF—Headquarters, United States Air Force

HQ USAF/ILE—Headquarters, United States Air Force, Civil Engineer

HQ USAF/ILEV—Headquarters, United States Air Force, Deputy Chief of Staff for Installations and Logistics, Environmental Division

HQ USAF/ILG—Headquarters, United States Air Force, Installations and Logistics, Logistics and Readiness

HQ USAF/JA—Headquarters, United States Air Force, The Judge Advocate General

HQ USAF/SG—Headquarters, United States Air Force, The Surgeon General

JA—Judge Advocate

LG—Logistics Group

MAJCOM—Major Command

MIL-HDBK—Military Handbook

NACE—National Association of Corrosion Engineers

O&M—Operation and maintenance

OCONUS—Outside Continental United States

OEBGD—Overseas Environmental Baseline Guidance Document

OSD—Office of the Secretary of Defense

OSHA—Occupational Safety and Health Administration

PCMS—Projects by Contract Management System

PPBE—Planning, programming, budgeting and execution

R&D—Research and development

RCRA—Resource Conservation and Recovery Act

SAF/IEE—Deputy Assistant Secretary of the Air Force for Environment, Safety and Occupational Health

SE—Chief of Safety

SG—Surgeon General

SPCC—Spill Prevention Control and Countermeasure

T.O.—Technical Order

U.S.C.—United States Code

UST—Underground storage tank

Terms

Aboveground Storage Tank—An unburied storage tank, such as a bulk storage tank, and includes any aboveground container containing oil, as provided in Title 40, Code of Federal Regulations (CFR) 112.1(b)(1); or bunkered tank, partially buried tank or completely buried tank containing oil, as defined in 40 CFR 112.2.

Automated Line Leak Detectors—Devices attached to the pressurized piping from a service station type dispenser for detection of 3 gallon per hour product loss. These detectors briefly restrict flow after pump start up by sensing vapor space resultant from lost product in piping during off periods.

Bulk Storage Tank—Has the same meaning here as “bulk storage container” in Title 40, Code of Federal Regulations (CFR) 112.2. An aboveground storage tank, of 55 gallons or greater capacity, used to store oil, including the storage of oil prior to use, while being used, or prior to further distribution in commerce. Oil-filled electrical, operating, or manufacturing equipment is not a bulk storage container.

Cathodic Protection—A technique for preventing corrosion of a metal surface by making the surface the cathode of an electrochemical cell. A tank system can be cathodically protected by applying either galvanic anodes or impressed current.

Change-In-Service—Continued use of an underground storage tank system to store an unregulated substance.

Existing UST—A tank system containing a regulated substance that was installed on or before 22 December 1988.

Facility Response Plan—A plan required to be prepared in accordance with Title 40, Code of Federal Regulations, Section 112.20 by an owner or operator of a non-transportation related facility that, because of its location, reasonably can be expected to cause substantial harm to the environment through the discharge of oil into or on navigable waters or adjoining shorelines.

Field Constructed Aboveground Storage Tanks—Large volume vertical cylindrical tanks constructed on-site. The bottom surface of these tanks is in contact with ground and cannot be visually inspected.

Final Governing Standards (FGS)—Country specific substantive provision concerning the environment, typically technical limitations on effluent, discharges, etc., or a specific management practice for Department of Defense (DoD) installations in specific countries.

Free Product—A regulated substance that exists as a non-aqueous phase liquid (a liquid that does not dissolve in water).

Hazardous Substance Underground Storage Tank (UST)—An UST system containing a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) hazardous substance that is not also a Resource Conservation and Recovery Act (RCRA) hazardous waste.

New Underground Storage Tank (UST)—A tank system containing a regulated substance that was installed after 22 December 1988.

Oil—has the meaning provided for “petroleum oil” in Title 40, Code of Federal Regulations (CFR) 112.2. It generally includes crude oil, fuel oil, gasoline, jet fuel, mineral oil, sludge, oil refuse, greases, oil mixed with wastes other than dredged spoil, or any other kind or form of oil. However, “oil” as used in this Air Force Instruction (AFI) does not include “animal oils” such as animal, fish or marine mammal fats, oils or greases; or “vegetable oils” such as oils from seeds, nuts, fruits, or kernels since the latter oils are not stored in tanks on Air Force installations.

Overfill Release—A release occurring when someone attempts to fill a tank beyond its capacity, resulting in discharging the regulated substance to the environment.

Overseas—A nation, territory or geographic area that is outside the United States and its territories.

Overseas Environmental Baseline Guidance Document (OEBGD)—Developed by the Department of Defense (DoD), a set of procedures and minimum criteria for environmental compliance at DoD installations in overseas locations. It is used by the Environmental Executive Agent to establish the Final Governing Standards (FGS), and in the case where no FGS exists, provides the compliance criteria.

Petroleum Aboveground Storage Tank (AST)—An AST containing petroleum or a petroleum mixture, including: motor fuels, jet fuels, distillate fuel oils, residential fuel oils, lubricants, petroleum solvents, and used oils.

Petroleum Underground Storage Tank (UST)—An UST system containing petroleum or a petroleum mixture, including: motor fuels, jet fuels, distillate fuel oils, residential fuel oils, lubricants, petroleum solvents, and used oils.

Regulated Substance—Has the meaning provided in Title 40, Code of Federal Regulations, Section

280.12 and any more protective state regulation. It generally includes:

- (1) Petroleum, including crude oil or any crude oil mixture that remains a liquid at standard temperatures and pressures. "Regulated substances" include petroleum and petroleum based substances composed of a complex blend of hydrocarbons derived from crude oil through separation, conversion, upgrading, and finishing, such as: motor fuels, jet fuels, distillate fuel oils, residual fuel oils, lubricants, petroleum solvents, and used oils.
- (2) Any hazardous substance defined in section 101(14) of the *Comprehensive Environmental Response, Compensation, and Liability Act* (CERCLA) of 1980, but not including any substance regulated as a hazardous waste under subtitle C of the *Resource Conservation and Recovery Act* (RCRA) of 1976.

Release—Spilling, leaking, emitting, discharging, escaping, leaching, or disposing of a substance from an underground storage tank into groundwater, surface water, or soil.

Release Detection—Determining if an underground storage tank (UST) system has released a regulated substance into the environment or into the interstitial space between a UST system and its secondary barrier or secondary containment area. Common release detection methods include:

- (1) **Inventory Control.** A physical accounting system in which records are kept of input, output, and daily tank inventories, including:
 - (2) **Manual Tank Gauging.** Measuring a tank's liquid level at the beginning and end of a 36-hour time period and calculating the change in volume. Limited to 550-gallon or smaller USTs when manual tank gauging is used alone.
 - (3) **Tank-Tightness Testing.** One of several technologies that can measure very small changes in product volume to find a leak. Civil Engineering (CE) must adjust the results for temperature, structural deformation, trapped air, and so on.
 - (4) **Automatic Tank Gauging.** Collecting release detection and inventory information by continuously monitoring the product level.
 - (5) **Nonvolumetric Tank-Tightness Testing.** Includes a variety of methodologies that apply to piping and tanks of any size. Some involve injecting a tracer gas for monitoring the presence of a release outside the tank. Others track the sound of product or bubbles leaving the tank. In about 50% of the cases, piping leaks are the cause.
 - (6) **Secondary Containment with Interstitial Monitoring.** Detects product in the space between the wall of the tank and the secondary containment liner or wall. Applies to piping and tanks of any size.
 - (7) **Groundwater Monitoring.** Detects regulated substances in groundwater. The substance must be immiscible in water and have a specific gravity less than 1.0. Applies to piping and tanks of any size.
 - (8) **Vapor Monitoring.** Detects fuel vapors in soil above the groundwater table. This test is not always reliable. Applies to tanks of any size and piping.
 - (9) **Release Detection for Piping.** Note that automatic line leak detectors are manufactured only for small diameter piping on systems with low flow rates normally associated with submersible pumps and service station dispensers to issue ground fuels. Automatic line leak detectors are not intended for high volume pressurized piping for aviation hydrant systems or truck loading facilities. These systems are

excluded from this requirement if the flow rates exceed 10 gallons per minute. Periodic line testing or monitoring may still be required per paragraph 2.2.3.

Self-Diking Tanks or Aboveground Secondary Containment (Vaulted) Tanks—Small rectangular or horizontal cylindrical aboveground storage tanks (AST) delivered to the site fully constructed. These tanks have integral secondary containment which is sometimes filled with lightweight concrete for fire protection.

Spill Prevention, Control and Countermeasure—Means the Clean Water Act oil pollution prevention procedures provided in Title 40, Code of Federal Regulations, Part 112.

Storage Tank—A stationary device that contains an accumulation of regulated substances.

Tank in a Vault—A tank located above the floor of a subterranean vault.

Underground Storage Tank (UST)—Any tank or combination of tanks (including underground pipes connected to the tank), with a volume of at least 110 gallons, that contains an accumulation of regulated substances, where 10 percent or more of the volume (including underground pipes connected to the tank) lies beneath the ground surface. **NOTE:** The Environmental Protection Agency (EPA) has exempted, excluded, or deferred certain USTs from regulation in the continental United States (CONUS) in the following circumstances:

(a) Excluded from the EPA definition of a UST at Title 40, Code of Federal Regulations (CFR) 280.12, and therefore exempt from the Federal UST requirements, are:

(i) Farm or residential tanks of 1,100 gallons or less capacity used for storing motor fuel for non-commercial purposes.

(ii) Tanks used for storing heating oil for consumptive use on the premises where stored.

(iii) Septic tanks.

(iv) Pipeline facilities (including gathering lines) regulated under: (a) The Natural Gas Pipeline Safety Act of 1968 (49 United States Code (U.S.C.) App. 1671, *et seq.*); (b) The Hazardous Liquid Pipeline Safety Act of 1979 (49 U.S.C. App. 2001, *et seq.*); or (c) which is an intrastate pipeline facility regulated under state laws comparable to the provisions of the law referred to in this paragraph under (a) or (b).

(v) Surface impoundment pits, ponds, or lagoons.

(vi) Storm-water or wastewater collection systems.

(vii) Flow-through process tanks.

(viii) Liquid trap or associated gathering lines directly related to oil or gas production and gathering operations.

(ix) Storage tank situated in an underground area (such as a basement, cellar, mineworking, drift, shaft, or tunnel) if the storage tank is situated upon or above the surface of the floor.

(b) Excluded from the Federal UST requirements by 40 CFR 280.10(b) are:

(i) Any UST system holding hazardous wastes listed or identified under subtitle C of the Solid Waste Disposal Act, 42 U.S.C. 6921 – 6939e, or a mixture of such hazardous waste and other regulated substances.

- (ii) Any wastewater treatment tank system that is part of a wastewater treatment facility regulated under section 402 or 307(b) of the Clean Water Act, 42 U.S.C. 1342 or 1317(b).
 - (iii) Equipment or machinery that contains regulated substances for operational purposes such as hydraulic lift tanks and electrical equipment tanks.
 - (iv) Any UST system whose capacity is 110 gallons or less.
 - (v) Any UST system that contains a *de minimus* concentration of regulated substances.
 - (vi) Any emergency spill or overflow containment UST system that is expeditiously emptied after use.
- (c) Deferred from UST regulation (except for release detection and corrective action requirements) by 40 CFR 280.10(c) and (d) are:
- (i) Wastewater treatment tank systems.
 - (ii) Any UST systems containing radioactive material that are regulated under the Atomic Energy Act of 1954 (42 U.S.C. 2011 *et seq.*).
 - (iii) Any UST system that is part of an emergency generator system at nuclear power generation facilities regulated by the Nuclear Regulatory Commission under 10 CFR Part 50, Appendix A.
 - (iv) Airport hydrant fuel distribution systems.
 - (v) UST systems with field constructed tanks.
- (d) Storage tanks not regulated by EPA may still be subject to state or local regulation. Contact the Major Command (MAJCOM) or the appropriate Air Force Regional Environmental Office for identification and guidance concerning these requirements.

Underground Storage Tank (UST) System or Tank System—Generally means an underground storage tank, connected underground piping, underground ancillary equipment, and any containment system.

Attachment 2

NATIONAL CODES AND STANDARDS

A2.1. Fiberglass-Reinforced Plastic Tanks:

A2.1.1. Underwriters Laboratories: Standard 1316, *Standard for Glass Fiber Reinforced Plastic Underground Storage Tanks for Petroleum Products, Alcohols, and Alcohol-Gasoline Mixtures.*

A2.2. Corrosion Protection Systems and Interior Linings:

A2.2.1. Steel Tank Institute: *Specification for STI-P3-99, STI-P3 Specification and Manual for External Corrosion Protection of Underground Steel Storage Tanks.*

A2.2.2. Underwriters Laboratories:

A2.2.2.1. Standard 1746, *External Corrosion Protection Systems for Steel Underground Storage Tanks.*

A2.2.2.2. Standard 58, *Standards for Steel Underground Tanks for Flammable and Combustible Liquids.*

A2.2.3. National Association of Corrosion Engineers:

A2.2.3.1. Standard RP-02-85, *Corrosion Control of Underground Storage Tank Systems by Cathodic Protection.*

A2.2.3.2. Standard RP-01-69, *Control of External Corrosion on Underground or Submerged Metallic Pipe Systems.*

A2.2.4. American Petroleum Institute:

A2.2.4.1. Publication 1631, *Recommended Practice for the Interior Lining of Underground Storage Tanks.*

A2.2.4.2. Publication 1632, *Cathodic Protection of Underground Petroleum Storage Tanks and Piping Systems.*

A2.2.5. National Leak Prevention Association: Standard 631, *Spill Prevention, Minimum Ten Year Life Extension of Existing Steel Underground Tanks by Lining Without the Addition of Cathodic Protection.*

A2.3. Steel-Fiberglass-Reinforced-Plastic Composite:

A2.3.1. Underwriters Laboratories: Standard 1746, *External Corrosion Protection Systems for Steel Underground Storage Tanks.*

A2.3.2. Association for Composite Tanks: ACT-100, *Specification for the Fabrication of FRP Clad Underground Storage Tanks.*

A2.4. Fiberglass-Reinforced-Plastic Piping:

A2.4.1. Underwriters Laboratories:

A2.4.1.1. Standard 971, *Nonmetallic Underground Piping for Flammable Liquids.*

A2.4.1.2. Standard 567, *Emergency Breakaway Fittings, Swivel Connectors and Pipe-Connection Fittings for Petroleum Products and LP Gas.*

A2.5. Tank and Piping System Installation:

A2.5.1. American Petroleum Institute: Publication 1615, *Installation of Underground Petroleum Storage System.*

A2.5.2. Petroleum Equipment Institute:

A2.5.2.1. Publication RP100, *Recommended Practices for Installation of Underground Liquid Storage Systems.*

A2.5.2.2. Publication RP 200, *Recommended Practices for Installation of Aboveground Storage Systems for Motor Vehicle Fueling.*

A2.5.2.3. Publication RP 300, *Recommended Practices for Installation and Testing of Vapor Recovery Systems at Vehicle Fueling Sites.*

A2.5.3. American Society of Mechanical Engineers:

A2.5.3.1. B31.3, *Process Piping.*

A2.5.3.2. B31.4, *Pipeline Transportation Systems for Liquid Hydrocarbons and Other Liquids.*

A2.5.4. National Fire Protection Association:

A2.5.4.1. Standard 30, *Flammable and Combustible Liquids Code.*

A2.5.4.2. Standard 30A, *Motor Fuel Dispensing Facilities and Repair Garages.*

A2.6. Spill and Overfill Control:

A2.6.1. American Petroleum Institute: Publication 1621, *Recommended Practice for Bulk Liquid Stock Control at Retail Outlets.*

A2.6.2. National Fire Protection Association: Standard 30, *Flammable and Combustible Liquids Code.*

A2.7. Compatibility:

A2.7.1. American Petroleum Institute:

A2.7.1.1. Publication 1626, *Storing and Handling Ethanol and Gasoline Ethanol Blends at Distribution Terminals and Service Stations.*

A2.7.1.2. Publication 1627, *Storage and Handling of Gasoline- Methanol/Cosolvent Blends at Distribution Terminals and Service Stations.*

A2.8. Allowed Repairs:

A2.8.1. National Fire Protection Association: *Standard 30, Flammable and Combustible Liquids Code.*

A2.8.2. American Petroleum Institute:

A2.8.2.1. Publication 2200, *Repairing Crude Oil, Liquefied Petroleum Gas, and Product Pipelines*.

A2.8.2.2. Publication 1631, *Recommended Practice for the Interior Lining of Underground Storage Tanks*.

A2.8.3. National Leak Prevention Association: Standard 631, *Spill Prevention, Minimum 10 Year Life Extension of Existing Steel Underground Tanks by Lining Without the Addition of Cathodic Protection*.

A2.9. Water Level Measurement:

A2.9.1. American Petroleum Institute: Publication 1621, *Recommended Practice for Bulk Liquid Stock Control at Retail Outlets*.

A2.10. Double-Walled Tanks:

A2.10.1. Steel Tank Institute: *Standard for Dual Wall Underground Storage Tanks Cleaning and Closure Procedures*.

A2.10.2. American Petroleum Institute:

A2.10.2.1. Recommended Practice 1604, *Closure of Underground Petroleum Storage Tanks*.

A2.10.2.2. Standard 1631, *Interior Lining and Periodic Inspection of Underground Storage Tanks*.

A2.10.2.3. Publication 2015, *Cleaning Petroleum Storage Tanks*.

A2.11. Confined Space Entry:

A2.11.1. National Institute for Occupational Safety and Health (NIOSH 80-106): *Criteria for a Recommended Standard, Working in Confined Space*.

A2.11.2. AFOSH Standard 91-25, *Confined Spaces*.

A2.12. Aboveground Tank Integrity Testing

A2.12.1. American Petroleum Recommended Practice 575, *Inspection of Atmospheric and Low Pressure Storage Tanks*.

A2.12.2. Steel Tank Institute SP001-03, *Standard for Inspection of In-Service Shop Fabricated Aboveground Tanks for Storage of Combustible and Flammable Liquids*.

Attachment 3

UST RISK ASSESSMENT MODEL

Tank Number _____
 Facility Number _____
 Facility Name _____
 Product Stored _____
 Capacity (Gal) _____
 Date Installed _____
 Date Rated _____ Rater _____

POTENTIAL FOR TANK or PIPELINE LEAKAGE

FACTOR	RATING (0-3)	FACTOR MULTIPLIER	FACTOR SCORE
Age	—	4	—
Size	—	3	—
Corrosion Potential	—	5	—
Maintenance History	—	4	—
Prior Leak Testing	—	3	—
	—	Subscore	—

POTENTIAL IMPACT OF LEAK		FACTOR MULTIPLIER	FACTOR SCORE
FACTOR	RATING (0-3)		
Tank Contents	—	4	—
Depth to Groundwater	—	4	—
Distance to Potable Water Source	—	6	—
Distance to Base Boundary	—	3	—
Distance to Surface Water	—	2	—
		Subscore	—
		Total Score	—
		Max Possible	114

FACTOR	0	1	2	3
Age	0-2 yrs	2-10 yrs	10-20 yrs	+20 yrs
Size	---	<1000 gal	1000-9000 gal	>9000 gal
Corrosion Potential	Non-metallic	Protected Steel w/Cath Prot	Protected Steel w/o Cath Prot	Unprotected Steel w/o Cath Prot
Maintenance History	Good Inventory No History of Leak/Corr	Fair Inventory No History of Leak/Corr	No Inventory No Check on Leak/ Corr	No Inventory History of Leak/Corr
Prior Leak Testing	0-2 yrs No Leaks	2-5 yrs No Leaks	No Record but No Leak Suspected	No Record but Leak is Suspected
Tank Contents	---	#2-#6 Fuels	MOGAS/JP-4	Solvents/Haz Chemicals
Depth to Groundwater	>200 ft	100-200 ft	20-100 ft	<20 ft
Distance to Potable Water Source	>5000 ft	2000-5000 ft	500-2000 ft	<500 ft
Distance to Base Boundary	>5000 ft	2000-5000 ft	500-2000 ft	<500 ft
Distance to Surface Water	>2000 ft	1000-2000 ft	500-1000 ft	<500 ft

Attachment 4**UST COST ANALYSIS CONSIDERATIONS**

- A4.1.** Estimate the costs of upgrading the UST system, the recurring costs of testing and monitoring the UST system, and estimated cost of cleanup and repair in the event of a leak from the UST system.
- A4.2.** Estimate the average cost of investigating and reporting the discovery of regulated substances at the UST site or in the surrounding area or unusual leak detection or other unusual UST operating conditions.
- A4.3.** Estimate the annual state and local regulatory costs of operating the UST, including the cost of preparing or revising all necessary permits, recordkeeping costs, and registration, permit, or other fees required for the installation or operation of the UST.
- A4.4.** Consider the estimated cost of any fine that may result from noncompliance with Federal, state, or local UST requirements.
- A4.5.** Weigh the above against the estimated cost of replacing the UST system with an AST that meets environmental, fire, safety, antiterrorism, and land use requirements, and the associated Federal, state, and local regulatory costs for operation of that AST.

Attachment 5**REFERENCE WEB SITES**

A5.1. The Defense Energy Support Center (DESC) website presently can be found at:

<http://www.desc.dla.mil/default.asp>

A5.2. The Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency UST website presently can be found at:

<http://www.epa.gov/swerst1/>

Attachment 6**TANK SELECTION AND COST ANALYSIS CONSIDERATIONS**

A6.1. There is no “right” tank for every situation. When choosing a tank consider the following:

A6.1.1. ASTs.

A6.1.1.1. Leaks can be seen and easily contained.

A6.1.1.2. Piping is visible so leaks are visible.

A6.1.1.3. In general, minimal environmental actions and record keeping.

A6.1.1.4. Prone to corrosion and pipe leak problems, especially in coastal areas.

A6.1.1.5. Must be protected from being hit by vehicles.

A6.1.1.6. Subject to vandalism.

A6.1.1.7. Fuel spill potential from siphonage. May not be a good candidate for unattended operation.

A6.1.1.8. One to three cent fuel surcharge for gasoline because offload is pumped rather than gravity dropped – takes a special truck. This is not a concern for heating fuel since pumping is a standard procedure.

A6.1.1.9. Pressure fill increases spill potential – failures of hoses, pump, tank overflow device.

A6.1.1.10. In hot climates and during the summer, gasoline vapor releases to the atmosphere greater than other options.

A6.1.1.11. Hose cannot be emptied, small releases occasionally occur.

A6.1.1.12. Pressurized line leak detection with mechanical or precision electronic line leak detectors may not be available for certain AST configurations.

A6.1.2. Tanks in Vaults.

A6.1.2.1. EPA treats tanks in vaults the same as an AST. Minimal environmental actions and record keeping.

A6.1.2.2. Leaks are contained.

A6.1.2.3. Leaks may be visible.

A6.1.2.4. More familiar and simple gravity fill.

A6.1.2.5. Fuel temperature more stable thus less vapor release to the atmosphere.

A6.1.2.6. Poor choice where there is a high water table – Tank shifting, breaking pipes, spills.

A6.1.2.7. Not suitable in seismic areas – horizontal stresses.

A6.1.2.8. Special precautions needed to prevent corrosion of tank, piping, and accessories.

A6.1.2.9. Water intrusion a problem.

A6.1.2.10. Spills may not be caught immediately.

- A6.1.2.11. Can not see if overfill problems occurring.
- A6.1.2.12. Difficult to remove water.
- A6.1.2.13. Water removed usually treated as hazardous substance.
- A6.1.2.14. Difficult and costly to enter.
- A6.1.2.15. May require continuous ventilation.
- A6.1.2.16. Problems with vapor recovery systems.
- A6.1.2.17. Potential for settling.

A6.1.3. Double wall USTs.

- A6.1.3.1. Leaks into or out of interstitial space can be identified.
- A6.1.3.2. More familiar and simple gravity fill.
- A6.1.3.3. Fuel temperature more stable thus less vapor release to the atmosphere.
- A6.1.3.4. Industry choice (either single or double wall).
- A6.1.3.5. Less likely to overfill than tank in vault.
- A6.1.3.6. Large overfill could get into soil.
- A6.1.3.7. Piping in contact with the soil could corrode – need to take precautions. Note: preferred service station carrier piping does not contact soil.
- A6.1.3.8. Piping leaks could be less visible in non-service station applications.
- A6.1.3.9. Steel tanks could corrode.
- A6.1.3.10. Proper installation critical to success – use only experienced tank installer, consider expert inspector during installation.
- A6.1.3.11. Must have operating leak detection system.
- A6.1.3.12. May not be a good choice in areas with high water tables.
- A6.1.3.13. Requires environmental record keeping.

A6.2. When looking at life cycle costs, consider:

- A6.2.1. The recurring costs for testing and monitoring USTs.
- A6.2.2. The cost of monitoring piping systems, fuel dispensers, etc - applies to any system no matter what type tank is installed.
- A6.2.3. Possible repair costs for any of the types of tanks and possible clean-up costs.
- A6.2.4. Annual state and local regulatory costs, including costs of preparing permits, record keeping, and registration, permit, or other fees for the installation or operation of the tank.
- A6.2.5. Estimated cost of any fine that may result from noncompliance with Federal, state, or local requirements.
- A6.2.6. Consider that new USTs are built to different standards than those of the past and regulators and the industry do not see them as any riskier than other types of tanks.