

Preparing Activity: USACE

UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated April 2018

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SECTION 33 01 50.01

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02/10

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USACE / NAVFAC / AFCEC / NASA UFGS-33 01 50.01 (February 2010)  
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### SECTION 33 01 50.01

#### CLEANING FUEL STORAGE TANKS

02/10

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NOTE: This guide specification covers the requirements for cleaning tanks whenever a new Jet Fuel Piping system is flushed or when modifying an existing jet fuel storage tank. This specification section shall be used whenever a new jet fuel piping system is flushed or when modifying an existing jet fuel storage tank.

Adhere to UFC 1-300-02 Unified Facilities Guide Specifications (UFGS) Format Standard when editing this guide specification or preparing new project specification sections. Edit this guide specification for project specific requirements by adding, deleting, or revising text. For bracketed items, choose applicable item(s) or insert appropriate information.

Remove information and requirements not required in respective project, whether or not brackets are present.

Comments, suggestions and recommended changes for this guide specification are welcome and should be submitted as a Criteria Change Request (CCR).

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## PART 1 GENERAL

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NOTE: DoD Type III systems shall conform to Standard Design 078-24-28 PRESSURIZED HYDRANT FUELING SYSTEM (TYPE III). DoD Type IV/V systems shall conform to Standard Design 078-24-29 AIRCRAFT DIRECT FUELING SYSTEM (TYPE IV) DESIGN.

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## 1.1 SUMMARY

### 1.1.1 Government Furnished Services

#### 1.1.1.1 Fuel Removal

The base fuel officer will remove the fuel within 450 mm 18 inches of the bottom with the fixed pumping system. Remove the remaining fuel by pumping into a Government tank truck. Any fuel remaining in the tank, after the tank has been released to the Contractor, is considered contaminated and shall be disposed of by the Contractor. Remove the contaminated fuel from the base and dispose of it in a manner consistent with applicable pollution control regulations, and all[ Host Nation] local, state, and federal EPA regulations.

#### 1.1.1.2 Utilities

Water and electricity will be made available to the Contractor as described in Section [00 73 00 SPECIAL CONTRACT REQUIREMENTS] [01 50 00 TEMPORARY CONSTRUCTION FACILITIES AND CONTROLS].

#### 1.1.2 Electrical Equipment Approval

All electrical equipment and conductors used by the Contractor within 15 m 50 feet of any fuel pipes or storage tanks shall be approved for use in Class 1, Division 1, Group C, hazardous areas.

#### 1.1.3 Tank Entry Equipment

Furnish all necessary clothing and equipment required for the work and protection of personnel, regardless of whether they enter a tank or handle materials outside the tank. Before any tank cleaning work is performed, the Contractor's equipment will be inspected and approved at the job site, by the Contracting Officer, to insure that the equipment includes, but is not necessarily limited to the following:

##### 1.1.3.1 Air Movers

Air-movers, either explosion proof and electrically operated, or air driven, eductor type only. One air driven type is listed in the MSA catalog as a "Lamb Air-Mover Ventilator." Use the educing type air-movers capable of educing vapors from the tank. Air-movers blowing air into the tank are not allowed during the vapor freeing or cleaning periods of work.

##### 1.1.3.2 Combustible Gas Indicator

Provide a combustible gas indicator.

##### 1.1.3.3 Lights

Provide explosion proof portable battery powered lights (Mining Enforcement and Safety Administration approved).

##### 1.1.3.4 Miscellaneous Supplies

Provide buckets for soapy water, adequate supply of a denatured alcohol, and cotton swabs.

## 1.2 REFERENCES

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NOTE: This paragraph is used to list the publications cited in the text of the guide specification. The publications are referred to in the text by basic designation only and listed in this paragraph by organization, designation, date, and title.

Use the Reference Wizard's Check Reference feature when you add a Reference Identifier (RID) outside of the Section's Reference Article to automatically place the reference in the Reference Article. Also use the Reference Wizard's Check Reference feature to update the issue dates.

References not used in the text will automatically be deleted from this section of the project specification when you choose to reconcile references in the publish print process.

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The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

### AMERICAN PETROLEUM INSTITUTE (API)

API Std 2015 (2018) Requirements for Safe Entry and Cleaning of Petroleum Storage Tanks

### NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70 (2017; ERTA 1-2 2017; TIA 17-1; TIA 17-2; TIA 17-3; TIA 17-4; TIA 17-5; TIA 17-6; TIA 17-7; TIA 17-8; TIA 17-9; TIA 17-10; TIA 17-11; TIA 17-12; TIA 17-13; TIA 17-14) National Electrical Code

### U.S. AIR FORCE (USAF)

AF 48-1 (2005, Change 2009) Respiratory Protection Program

AF 91-501 (2004) Air Force Consolidated Occupational Safety Standard

AFOSHSTD 91-38 (1997) Hydrocarbon Fuels - General

### U.S. Code (USC)

USC Title 42 The Public Health and Welfare

### U.S. DEPARTMENT OF DEFENSE (DOD)

UFC 3-460-03 (2003) O&M: Maintenance of Petroleum Systems

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

29 CFR 1910.28

(Nov 2016)Duty to Have Fall Protection and  
Falling Object Protection

1.3 SUBMITTALS

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NOTE: Review submittal description (SD) definitions in Section 01 33 00 SUBMITTAL PROCEDURES and edit the following list to reflect only the submittals required for the project.

The Guide Specification technical editors have designated those items that require Government approval, due to their complexity or criticality, with a "G." Generally, other submittal items can be reviewed by the Contractor's Quality Control System. Only add a "G" to an item, if the submittal is sufficiently important or complex in context of the project.

For submittals requiring Government approval on Army projects, a code of up to three characters within the submittal tags may be used following the "G" designation to indicate the approving authority. Codes for Army projects using the Resident Management System (RMS) are: "AE" for Architect-Engineer; "DO" for District Office (Engineering Division or other organization in the District Office); "AO" for Area Office; "RO" for Resident Office; and "PO" for Project Office. Codes following the "G" typically are not used for Navy, Air Force, and NASA projects.

Use the "S" classification only in SD-11 Closeout Submittals. The "S" following a submittal item indicates that the submittal is required for the Sustainability eNotebook to fulfill federally mandated sustainable requirements in accordance with Section 01 33 29 SUSTAINABILITY REPORTING.

Choose the first bracketed item for Navy, Air Force and NASA projects, or choose the second bracketed item for Army projects.

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Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for [Contractor Quality Control approval.] [information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government.] Submittals with an "S" are for inclusion in the Sustainability eNotebook, in conformance to Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-07 Certificates

Contractor's Qualification Statement; G[, [\_\_\_\_\_]]

#### 1.4 QUALITY ASSURANCE

Submit a Contractor's qualification statement similar to Appendix A.

##### 1.4.1 Qualification

To be considered qualified:

- a. Show proof of having completed similar work on three previous projects. The work falls into three categories; tank entry, coating, and petroleum system welding.
- b. Submit proof that welders are API certified.
- c. Certify that before commencing work, the supervisor on the job site is thoroughly familiar with JP-8 fuel characteristics and worker safety requirements.

##### 1.4.2 Statement

As a minimum, include the following in the Qualification Statement

- a. The name and qualifications of the Contractor's Representative who will be in charge of the work and be present at the job site when any tank work is being accomplished.
- b. A complete list of equipment, with adequate nomenclature by item, to be used or available at the job site.
- c. Plan of Operations.

#### PART 2 PRODUCTS

Not Used

#### PART 3 EXECUTION

##### 3.1 EXAMINATION

Review the drawings of the tank to be cleaned. Brief proper personnel on the location of floor pits, sumps, or other tank appurtenances considered hazardous to personnel. Work in accordance with API Std 2015, UFC 3-460-03, AF 48-1, AFOSHSTD 91-38, and AF 91-501, 29 CFR 1910.28 and USC Title 42 Chapter 82, Subchapter I, Section 6901. Whenever the information contained herein conflicts with the previously listed standards, the information here shall govern.

##### 3.2 PREPARATION

###### 3.2.1 Precautions

###### 3.2.1.1 Tank Environment

Consider all tanks being cleaned, regardless of the type of fuel stored therein, as leaded and explosive until all sludge and loosely adhering rust scale have been removed.

#### 3.2.1.2 Tank Entry Permission

Prior to entry into any tank, obtain permission from the Contracting Officer and the liquid fuels maintenance officer. This permission will be granted only when, or after:

- a. The qualified supervisor is present.
- b. Personnel have been briefed by the supervisor on what is to be done; what each employee is to do in the event of an emergency; and how long each man or cleaning crew will remain in the tank under normal conditions.
- c. All required equipment is approved and properly located.
- d. Personnel are equipped with properly fitted protective equipment.
- e. The entire area adjacent to the tank is secured.
- f. Air-movers, eductor type only, have been operating continuously for at least one hour, and will continue to operate throughout the entire period personnel are cleaning the tank. The Contracting Officer may allow air-movers to be turned off after one hour with continuous monitoring of the vapor level below 20 percent of the Lower Explosive Limit (LEL).

#### 3.2.1.3 Physical Contact

Avoid physical contact and take maximum care to prevent contamination of water supplies or streams. Physical contact with leaded sludge is dangerous due to the toxicity of the lead alkyl compounds, either in liquid or gaseous state.

- a. Tests for lead in the air above any sludge which is deposited on the open ground have shown that values are low at all times, even with no apparent wind. The sludge, therefore, is safe with regard to air contamination as soon as it is spread in the open. Industrial standards of 20 ppm of organic lead is the limit in the sludge that can be considered safe after sludge has been weathered. If weathering is a treatment process, it shall be done in accordance with RCRA. If this disposal method is used, take maximum care to insure that there is no runoff to contaminate water supplies or streams before the end of the weathering period.
- b. Smoking is prohibited, except in designated smoking areas; matches or cigarette lighters cannot be carried by the tank crew or other persons entering the tank area. Do not use brooms or brushes that have plastic synthetic bristles.
- c. Protect all Government equipment against dirt, water, chemical, or mechanical injury.

#### 3.2.2 Tank Ventilation

##### 3.2.2.1 Air Movers

As specified, use air-movers of the eductor type. Tank fuel vapors are heavier than air and except on hot days (25 to 45 degrees C/80 Degrees F to 110 Degrees F), accumulate in the bottom portion of the tank. Blowing air



into the tank tends to stir the vapors, requiring a long period of time before any appreciable drop in vapor-air ratio is noted. Eductor type air-movers, with flexible oil proof canvas hoses attached, inserted in the tank near the bottom will educt vapors from the tank in a short period of time. On hot days, a fog type water spray over the opening, admitting fresh air into the tank will condense vapors and facilitate removal. Keep all tank openings, except the one used to insert the oil proof flexible hose and the one admitting fresh air into the tank, closed until workmen have entered the tank.

#### 3.2.2.2 Precautions

Although eductors may be used through bottom manholes on an above ground tank, it is preferred that top manholes or vent piping be used on above ground tanks. Using eductors on top of the tank will allow for dissipation of the vapors, thus preventing them from settling in low places at ground level. Close all other manholes and tank openings closed when the tank is initially ventilated. However, open them when work is started to take advantage of the light these openings let into the tank.

#### 3.2.3 Tank Preparation for Cleaning

##### 3.2.3.1 Blind Flanges

Provide and install blind flanges or spectacle blinds on each pipeline connected to the tank, and each PRV system around the tank valves to be disconnected. When blind flanges are used, place them on the end of the pipe and not on the tank opening. If used, insert spectacle blinds between the tank valve and the flange nearest the tank. Insert gaskets on both sides of the spectacle blind.

CAUTION: Do not remove valves or disconnect piping from any tank until positively certain the line has been emptied of fuel. Do not remove blind or spectacle flanges until all interior work is complete and the system is ready to be put back into service.

##### 3.2.3.2 Tank Survey

Assure by physically surveying the area within 15 m50 feet of the tank to be entered or cleaned, that no vapors are present in pits or low places, and that unauthorized personnel are cleared from the area. Provide this area with "No Smoking" signs. All personnel entering the area shall leave all cigarettes and flame producing devices at a previously determined location.

##### 3.2.3.3 Equipment Placement

Place all equipment upwind of the tank openings. Locate equipment at the highest elevation possible; never in an area lower than the surrounding terrain. Equip internal combustion engine driven equipment with flame arresters and protected ignition systems; and position a minimum of 15 m50 feet from an open manhole.

##### 3.2.3.4 Contractor Responsibility

Review the drawings of the tank to be cleaned. Brief his personnel on the location of floor pits, sumps, or other tank appurtenances considered hazardous to personnel. Work in accordance with API Std 2015, UFC 3-460-03, AF 48-1, AFOSHSTD 91-38, and AF 91-501, 29 CFR 1910.28 and USC Title 42

Chapter 82, Subchapter I, Section 6901. Whenever the information contained herein conflicts with the previously listed standards, the information here shall govern.

#### 3.2.3.5 Lighting

Explosion proof battery powered safety flashlights, or safety lanterns may be used inside the tank or within 15 m50 feet of the tank during any tank cleaning operation. Explosion proof lights approved for use under Class I, Division I, Group C and D, as defined by NFPA 70, may be used inside the tank during tank coating operations.

### 3.3 APPLICATION

#### 3.3.1 Cleaning

After waste fuel has been removed from the tank, and with personnel wearing protective equipment, scrape the bottom of the tank and 1 m3 feet up on the sides until all loosely adhering rust and scale have been removed and placed with waste fuel removed from the tank. Wash the remainder of the tank sides, and all metal supports and braces, with a high pressure water hose until the water flowing or pumped out of the tank is clean. Also wash decks or tops of vertical tanks, and bottoms of the floating pans.

#### 3.3.2 Floor Drying

After the tank has been washed, the floor shall be dried.

#### 3.3.3 Potential Explosive Vapors

Pipes used for center poles, and braces, pontoons, and leaking bottoms are a potential source of explosive vapors even after then tank is cleaned. The tank may be determined to be vapor free below four percent of lower explosive limit; but after one or two hours, explosive readings may again be obtained from these sources. Because of this, take readings at least every one-half hour when working in tanks after they have been cleaned and each floating roof or pan pontoon shall be checked individually with a combustible gas indicator.

### 3.4 CLEANUP AND ACCEPTANCE

#### 3.4.1 Water Usage And Disposal

Contain water used to wash down a scraped tank. It may be channeled or pumped from the tank through a spillway into a drainage system having an oil/water separator of adequate capacity. Process the discharge effluent containing the petroleum products in this manner to prevent the fuel products from entering any above or below ground water sources. Discharge all water into the sanitary sewer or industrial waste only. Dispose of the separated petroleum products with the fuel tailings. Running or pumping waste fuel into natural waterways, sewers, storm drains, or on to ground is prohibited.

#### 3.4.2 Reinstallation

After all water and sludge materials have been removed from the tank and the Contracting Officer has inspected and accepted the tank cleaning, reinstall all valves, piping, manhole covers, etc. (removed at start of the job to facilitate ventilation), with new gasket material (resistant to

aircraft fuel) not less than the thickness of the gasket removed. The entire tank area shall be restored to its "like new" condition.

### 3.5 STENCILING TANK

At the completion of the exterior tank painting work, Contractor shall stencil the tank in 20 to 25 mm<sup>3/4</sup>- to 1-inch letters adjacent to the manhole openings with the essential information as shown in the following example:

DATE CLEANED	1/16/71
CONTRACTOR	JOHN DOE
ADDRESS	1017 CHESTNUT STREET CHICAGO, ILLINOIS

## APPENDIX A

### CONTRACTORS QUALIFICATION STATEMENT

1. Name of Firm:
2. State briefly why firm is qualified to clean strap, calibrate, repair, or coat petroleum storage tanks.
3. List the size of tank(s) the firm has successfully completed work on; also, give the location of each tank, the owner's name, and the name of a person(s) that may be contacted regarding the tank(s) listed.
4. Since gauge charts are to be individually certified by the firm, what guarantee backs the firm's certificate?
5. The Owner/Owners must furnish the following statements, signed and dated:

(NOTE: If the statements to Items a and b are positive, furnish a detailed explanation.)

  - a. I (We) \_\_\_\_\_ have (have not) has a loss of life or injury requiring hospitalization of any employee of this or any other contracting firm that I (we) have owned or managed separately or together.
  - b. I (We) \_\_\_\_\_ have (have not) been involved in a contract where a loss of property occurred under this or any other company name.
  - c. I (We) \_\_\_\_\_ have completed tank cleaning, repair, or calibration of the following Department of Defense installations. This list must be complete for the past eight (8) years.
  - d. I (have)(will obtain prior to bidding) a copy of the American Petroleum Institute - API Std 2015, Cleaning Petroleum Storage Tanks.
6. List the make and model numbers of the following pieces of equipment:
  - a. Respirators.
  - b. Safety Harness.
  - c. Combustion Gas Indicators.
  - d. Air Compressors.
  - e. Air Purifiers.
  - f. Personnel rescue device used to extract personnel from the cut and cover tank-tripod.
7. Furnish at least three (3) letters of competency from contracts accomplished within the last five (5) years.

I hereby certify the foregoing statements are true and complete.

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-- End of Section --