Preparing Activity: USACE Superseding
UFGS-33 08 53 (February 2010)

UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated July 2023
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08/18

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ATTACHMENTS:

Attachment 1 - Equipment Tests

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-- End of Section Table of Contents --

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USACE / NAVFAC / AFCEC / NASA **UFGS-33 08 53 (August 2018)**

Preparing Activity: USACE **Superseding**
UFGS-33 08 53 (February 2010)

UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated July 2023
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SECTION 33 08 53

AVIATION FUEL DISTRIBUTION SYSTEM START-UP
08/18

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NOTE: This guide specification covers the requirements for the flushing, cleaning and performance testing of new and existing aircraft refueling systems constructed to the requirements of the DoD Type III/IV/V, and Cut and Cover Hydrant Refueling System Standards.

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).

To download the Attachments related to this section, go to
http://www.wbdg.org/ffc/dod/unified-facilities-guide-specifications-ufgs/for
****

PART 1 GENERAL

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NOTE: DoD Type III systems must conform to Standard Design AW 078-24-28 PRESSURIZED HYDRANT FUELING SYSTEM TYPE III. DoD Type IV/V systems must conform to Standard Design AW 078-24-29 PRESSURIZED HYDRANT DIRECT FUELING SYSTEM TYPE IV/V. Cut and Cover systems must conform to Standard Design AW 078-24-33 UNDERGROUND VERTICAL STORAGE TANKS CUT AND COVER.

Field fabricated ASTs must conform to AW 078-24-27 ABOVEGROUND VERTICAL STEEL TANKS WITH FIXED ROOFS.Standards can be found on the Whole Building Design Guide at the following location https://www.wbdg.org/ffc/dod/non-cos-standards.

Subject Matter Expert (SME) is defined as Service Headquarters Subject Matter Experts: Air Force - The Air Force Fuels Facilities Subject Matter Expert (HQ AFCEC/COS), Army - Headquarters, U.S. Army Corps of Engineers, POL-MCX Facilities Proponent (CECW-EC) through the Army Petroleum Center (APC), Navy/Marine Corps - NAVFAC POL Facility Subject Matter Expert (NAVFAC EXWC, CI11).

****

1.1 REFERENCES

****

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 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.

****

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

U.S. ARMY CORPS OF ENGINEERS (USACE)

ER 1110-1-8167	(2016) Engineering and Desig -- Petroleum, Oil, and Lubricants Mandatory Center Of Expertise

1.2 ADMINISTRATIVE REQUIREMENTS

****

NOTE: Insert number of days notice after consulting with SME(s).

Develop Performance Testing Plan as a function of the system layout. An example plan is provided, see Attachment 2 - Performance Testing.

****

1.2.1 System Start-up Plan

Submit a detailed written plan prepared by the System Supplier for implementation of System Start-Up. Submit the plan [60 (CONUS)][90 (OCONUS)][_____] days prior to System Start-Up. Include a list of personnel by trade, list of key personnel, safety equipment, list of miscellaneous equipment (such as two-way radios personnel transportation vehicles etc.) and detailed procedures and schedules. The Contractor and System Supplier are responsible for implementing System Start-Up in coordination with ongoing base operations.

1.3 SUBMITTALS

****

NOTE: Review submittal description (SD) definitions in Section 01 33 00 SUBMITTAL PROCEDURES and edit the following list, and corresponding submittal items in the text, to reflect only the submittals required for the project. The Guide Specification technical editors have classified 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 Army projects, fill in the empty brackets following the "G" classification, with a code of up to three characters 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.

The "S" classification indicates submittals required as proof of compliance for sustainability Guiding Principles Validation or Third Party Certification and as described in Section 01 33 00 SUBMITTAL PROCEDURES.

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

****

Government approval is required for submittals with a "G" or "S" classification. Submittals not having a "G" or "S" classification are [for Contractor Quality Control approval.][for information only. When used, a code following the "G" classification identifies the office that will review the submittal for the Government.] Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

System Start-Up Plan; G[, [_____]]

Performance Testing Plan; G[, [____]]

SD-06 Test Reports

Equipment Tests; G[, [____]]

Final Reports; G[, [____]]

Equipment Tests; G[, [_____]]

SD-11 Closeout Submittals

Certification of Entire System

1.4 CLOSEOUT SUBMITTALS

1.4.1 Final Reports

Submit a final report which includes the final settings of the valves and switches and a copy of the strip chart graphs and excel data and charts on CDR media with an explanation of what the graph indicates and what the system is doing.

1.5 QUALITY ASSURANCE

1.5.1 Definitions

Subject Matter Expert (SME) is defined as Service Headquarters Subject Matter Experts. SME for this project is [Air Force - The Air Force Fuels Facilities Subject Matter Expert (HQ AFCEC/COS)[[Army - Headquarters, U.S. Army Corps of Engineers, POL-MCX Facilities Proponent (CECW-EC) through the Army Petroleum Center (APC)] [Navy/Marine Corps - NAVFAC POL Facility Subject Matter Expert (NAVFAC EXWC, CI11)]]].

1.5.2 Certification of Entire System

Prior to the acceptance of the newly constructed system by the Government, all installed mechanical and electrical equipment must be inspected and approved by the Contracting Officer. Provide the Contracting Officer [30][60 (overseas)][_____] days notice in order to schedule the Installation and SME for participation in the inspection, Performance Testing, and approval. Any deficiencies observed must be corrected by the Contractor without cost to the Government. ER 1110-1-8167 Engineering and Design Petroleum, Oil, and Lubricants Mandatory Center of Expertise must be followed..

PART 2 PRODUCTS

2.1 GOVERNMENT-FURNISHED MATERIAL AND EQUIPMENT

The Government will furnish the following materials, equipment and services during the performance of the work under this section.

2.1.1 Aircraft Turbine Fuel

****

NOTE: During the design process the Designer must investigate who is providing fuel to the project and identify that entity in this paragraph.
****

The Government will provide the fuel necessary for the System Start-Up. The Contractor must provide an approved copy of the System Start-Up Plan at least 60 days in advance for US locations and 90 days in advance for locations outside the Continental United States to the Government entity [(DLA)]providing fuel before any fuel is provided.

Fuel will not be delivered to the system until the Contractor has satisfactorily completed all work and, in particular, the cleaning and coating of the interior surfaces of the operating storage tanks and the removal of preservatives and foreign matter from those portions coming in contact with the fuel valves, pumps, filter separators and other such equipment.

The Contractor is responsible for reimburing the Executing Agent (EA) for any loss of fuel and contaminated fuel. The EA will reimburse DLA for lost and contaminatied fuel. The Contractor is responsible for the disposal of any contaminated fuel. Some fuel loss, 1 BBL (42 gallons), is expected during Flushing, Cleaning, Equipment Tests, and Performance Testing.

The System Start-Up Plan must specify what grade of fuel, volume (gallons), recommended delivery dates, and phase of System Start-Up (Initial Fuel Receipt, Fuel Filling and Packing, Flushing, Cleaning, Equipment Tests, and Performance Testing). Fuel used for Flushing and Cleaning will possibly become contaminated, the fuel must be isolated and is considered off-specification until the fuel sampling results are provided.

Upon satisfactory completion of the flushing and cleaning operations, the Government will supply the additional quantities of fuel required to complete the other work under this section.

An empty Operating Tank must never be filled at a velocity greater than 1 m/s 3 feet per second (fps) in the fill line until fuel is in contact with the floater (or 1 m 3 feet above the fill nozzle).

2.1.2 Tank Trucks

Refueler tank trucks and operation of same will be furnished by the Government.

2.1.3 Hydrant Hose Trucks

The Government will furnish and operate the hydrant hose trucks required for ground refueling and defueling of aircraft at hydrant pits.

2.1.4 Utilities

Electric power required for the performance of the work under this section will be furnished at no charge to the Contractor.

2.1.5 Defuel Cart

****
NOTE: Select defuel cart for systems using

hydraulic pantographs.
****

The Government will provide a defuel cart for the defueling operation on systems using pantographs for these fueling and defueling operations.

2.1.6 Pantographs

The Government will provide and operate pantographs for systems not providing enough pantographs to accomplish the full flow startup.

2.2 MATERIAL AND EQUIPMENT

2.2.1 Contractor Furnished

Provide material, equipment and labor not specified to be Government-furnished and required for proper System Start-Up of the system. Equipment must include but not be limited to the following:

a. Temporary strainers.

b. Pipe spools.

c. Flow meters.

d. Pressure gages.

e. Electronic sensors and recorders for pressure and flow recording are included in the PCP, except a sensor and cable or RF will need to be provided by the Contractor for the data from the Hydrant Control Valve and plugged into the PCP. This equipment must be used to monitor and record the system during the "Equipment Test" and "Performance Testing" portions of this Specification Section. Recorded data must be used by the Contractor and equipment factory representatives to achieve final control valve and equipment adjustments. Recorded data must include:

(1) Fueling pumps discharge pressures.
(2) Supply Venturi flow rates.
(3) Hydrant Control Valve pressures.
(4) Back Pressure Control Valve upstream pressures.
(5) Back Pressure Control Valve downstream pressures.
(6) Return Venturi flow rates.

f. The Contractor must have on hand sufficient filter elements and coalescer cartridges to adequately clean the system. During cleaning operation, provide a flow versus pressure drop graph for each filter separator, as provided in Attachment 1 - Equipment Tests. Change coalescers and cartridges upon reaching a differential pressure of 100 kPa 15 psi or when pressure drop is less than previous graph or fails to increase properly. Isolate each filter separator, one at a time and use one fueling pump to obtain rated flow rate (38 L/s600 GPM). A minimum of one complete set of coalescer elements and separator cartridges for each filter separator must be turned over to the Government after new coalescer elements and separator cartridges are installed in each filter separator vessel after completion of Performance Testing.

[g. Pigging equipment and services as called out in paragraph PIPELINE

PIGGING VERIFICATION, Section 33 52 43.13 AVIATION FUELING PIPING.]

2.2.2 Design Conditions

Use temporary flushing lines and equipment that are equal in strength, stability, and materials to the associated permanent components. However, spools may be carbon steel. Additional design conditions must be as specified in Section 33 52 43.11 AVIATION FUEL MECHANICAL EQUIPMENT.

PART 3 EXECUTION

3.1 PREPARATIONS FOR FLUSHING

Upon completion of the system to the satisfaction of the Contracting Officer and the SME, make the following preparations for flushing the system.

3.1.1 Protection of Equipment

The following items must be removed from the system prior to start of flushing operations and, where applicable, replaced with spools of pipe, diameter equal to the item removed.

a. Control valves,including hydrant pit control valves if flushing outlets into tank trucks.
b. Sensors which are exposed to the fluid.
c. Coalescer and separator elements in filter separators.
d. Venturi Tubes and Pressure Indicating Transmitters.
e. Meter.

After flushing, the above items must be reinstalled in the system and the spool sections turned over to the Contracting Officer.

3.1.2 Strainers

Temporary 150 um 100 mesh cone type strainers with minimum 300 percent open area must be installed in the suction line ahead of each fueling pump and will be left in place. Any damaged strainers must be replaced by the Contractor at no additional cost to the Government.

3.1.3 Water Draw-off

Remove any accumulated water from Operating Tanks' sumps and bottoms.

3.2 FLUSHING

****
NOTE: Select permanent pantograph, portable pantograph or hydrant hose truck.
****

Flushing procedures must precede cleaning procedures. The transfer line, pump house piping, apron loop, supply and return lines to the operating tanks, hydrant laterals, product recovery lines and [permanent pantograph][portable pantograph][hydrant hose truck] lines must be flushed with fuel until the fuel being delivered is free of construction debris to the satisfaction of the Contracting Officer. Samples of fuel must be taken and tested by the designated government agency and must be free of gross contamination, maximum of 8.0 mg/gallon solids and free water not to

exceed 2 ml per quart.

3.2.1 Fueling System Piping

The flushing of apron system pipelines must be accomplished by pumping fuel from one of the operating tanks through the fueling system piping and back to another tank. Air must be bled from system high points. The procedure must be continued until the fuel being delivered into the tanks is acceptable to the Contracting Officer. After the system has been flushed to the satisfaction of the Contracting Officer, remove any water remaining in the low point drains and remove any accumulated water from Operating Tank sumps and bottoms by means of the Water Draw-off systems. Cone strainers must be kept clean in order to insure maximum flow rate. In addition, baskets from all strainers must be removed and cleaned.

3.2.1.1 Transfer Line

Flushing of the transfer line must occur during the filling operations. Samples of the incoming fuel must be taken at the point of connection with bulk storage supply line. These samples must be taken at one hour intervals and must be tested by the designated government agency and turned over to the Contracting Officer.

3.2.1.2 Pump House Piping

Remove equipment as specified in paragraph Protection of Equipment. Perform the following flushing operations by withdrawing fuel from one operating tank and returning it to another tank. Circulate a sufficient amount of fuel for each operation. Bleed air from high points.

a. Position manual valves to circulate fuel through one pump, filter separator combination.

[

b. Provide a temporary connection between the [pantograph,] [hydrant hose truck,] checkout connection and the single point receptacle. Position manual valves to circulate fuel through the checkout connection and back to the transfer line. Flush the checkout lines using one fueling pump.]

****

NOTE: Select this paragraph for type iii design.
Select pantograph or hydrant hose truck.

****

c. Position manual valves to circulate fuel through the bypass line. Flush this line using two fueling pumps.

3.2.1.3 Apron Loop Piping

Remove equipment as specified in paragraph Protection of Equipment. Position manual valves to circulate fuel through the apron loop and back to the operating tank. Begin flushing the apron loop at a flow rate of 38 L/s 600 gpm. Increase flushing flow rate one pump at a time to the maximum available number of pumps for a minimum of 8 hours.

3.2.1.4 Hydrant Outlets

****

NOTE: Delete this paragraph Type IV and V systems.

****

Position a tank truck at the hydrant outlet and flush each hydrant lateral. Sample the fuel at the connection to the truck.

3.2.1.5 Product Recovery Tank Lines

During the flushing of apron loop piping, operate all manual drain lines individually to flush their connection to the product recovery tank. Fill the tank a minimum three times, each time utilizing the fuel transfer pump to drain it by returning the fuel to storage.

3.2.1.6 Pantographs

****

NOTE: Delete this paragraph if pantographs are not required (Type III) or the first set of brackets if the specification is for a Type IV/V system.

****

Utilize the [pantograph check-out connection and single point receptacle][pantograph fueling station fueling adapter] to flush each pantograph. Sample the fuel at the pressure fueling nozzle with the kit provided for this purpose.

3.3 CLEANING

After initial flushing is completed, clean the pump house and apron loop piping in accordance with the procedure specified hereafter. Isolate Operating Tanks from the system and clean as specified in Section 33 01 50.55 CLEANING OF PETROLEUM STORAGE TANKS.

3.3.1 Preparation for Cleaning

Filter elements must be installed in the filter separators. Adjust filter separator flow control valve. Valves and equipment removed for flushing must be reinstalled. Operating Tanks must be drained, vapor freed and cleaned. Transfer the contents from one operating tank to the other for the purposes of cleaning.

3.3.2 Cleaning Requirements

****

NOTE: Select independent or DOD fuels laboratory, include in MOU. Select pantograph checkout station, pantograph fueling station, or hydrant hose truck check-out station.

****

Cleaning must continue until the Contracting Officer certifies that the fuel passes the color and particle assessment method as defined in T.O. 42B-1-1 or contains 2 milligrams per gallon (mg/gallon) or less of particulate. Fuel must also contain 10 parts per million (ppm) or less of free water. Sampling must be performed by the[Government][contractor] and testing must be done by[the Air Force][a DoD regional fuels testing laboratory][an approved independent testing laboratory].[Also take fuel samples at pantograph [check out station][fueling station].][Also take samples at Hydrant Hose Truck Check-out Station and the truck fill stand.]

3.3.3 Cleaning Procedure

During cleaning procedure periodically bleed air through high point vent and drain water through low point drains.

3.3.3.1 Transfer Line

Continue to receive fuel and circulate it until fuel samples taken at the tanks meet the requirements of paragraph Cleaning Requirements above.

3.3.3.2 Pump House Piping

Pump house piping must be cleaned as follows:

a. Position manual valves so that fuel is withdrawn from one operating tank, circulated through one fueling pump and filter separator, then returned to the operating tank through the receiving filter separators.

b. Clean the piping system using one pump at a time. Alternate the fueling pumps and filter separators during the operation to clean the individual fueling pump suction and discharge lines.

[

c. Provide a temporary connection between the [pantograph] [hydrant hose truck] connection and the nozzle adaptor. Position valves to circulate fuel through the checkout connection and back to the return line. Clean the checkout lines using two fueling pumps.]

****

NOTE: Select this paragraph for Type III design. Select pantograph or hydrant hose truck checkout.

****

d. Connect truck fill station to a tank truck and clean the line.

e. Monitor pressure drop through the filter separators during each cleaning operation and provide flow vs. pressure drop graphs as specified herein before.

f. Periodically take samples from all sample connections. Cleaning must continue until the fuel meets the specified requirements.

3.3.3.3 Apron Loop Piping

Apron loop piping must be cleaned as follows:

a. Position manual valves to circulate fuel through the apron loop and back to the operating tank through the receiving filter separators.

****

NOTE: Delete if pigging launchers and receivers are not in the design. In some cases the pig launcher and receiver is not permanently installed and the specifications will need to be written to indicate the contractor will need to provide temporary units.

****

[a. First clean the pipe using pigs as called out in paragraph PIPELINE

PIGGING VERIFICATION, Section 33 52 43.13 AVIATION FUEL PIPING. During this, low point drains and high point vents must be blown clean. Monitor pressure drop through the filter separators during the cleaning operation.

b. Inspect the pipe as called out in paragraph PIPELINE PIGGING VERIFICATION, Section 33 52 43.13 AVIATION FUEL PIPING.]

c. Initially pump fuel through the apron loop at a flow rate of 38 L/s 600 gpm, then increase flow rate up to the full capacity (all pumps running) starting manually one pump at a time. When pumping at a rate greater than 75 L/s 1200 gpm, by-pass receiving filter separators.

d. Monitor pressure drop through the filter separators during the cleaning operation and provide flow vs. pressure drop graphs as specified herein before.

e. Position a tank truck at the hydrant outlet and clean each hydrant lateral, one at a time.

f. Periodically take samples from all sample connections. Continue cleaning until the fuel meets specified requirements of paragraph CLEANING REQUIREMENTS.

3.3.3.4 Product Recovery Lines

Repeat the process described under initial flushing until samples taken at the connection of the pipe line back to storage meet the requirements.

3.3.3.5 Pantographs

****
NOTE: Delete if pantographs are not used.
****

Repeat the process described under initial flushing until samples taken at the pressure fueling nozzle meet the requirements.

3.4 CONTROL VALVE[AND PANTOGRAPH] ADJUSTMENT

Check all control valve settings and field adjust from the factory settings at System Start-Up as necessary to provide a smooth operation. Check the filter separator control valves and fueling pump non-surge check valve[and needle valve on Pantograph venturi] and adjust as follows:

3.4.1 Rate of Flow Control Feature on Fueling Pump Non-Surge Check Valve

Run one pump at a time and adjust rate of flow feature (41 L/s (650 gpm).

3.4.2 Control Valves on Issue Filter Separator Downstream Side

a. Position valves so that one fueling pump can pump through only one filter separator. Close the valve at the entrance of the apron loop, and open the bypass valve, allowing discharge into the circulating line.

b. Start the pump and adjust the filter separator control valve for the rated flow capacity of the filter separator (38 L/s (600 gpm).

c. Repeat above for each remaining filter separator.

3.4.3 Venturi Needle Valve

****
NOTE: Delete if pantographs are not used.
****

Venturi needle valve must be adjusted to ensure a pressure equal to nozzle pressure at maximum flow possible. After initial setting, valve must be locked in adjusted position.

3.5 EQUIPMENT TESTS

****
NOTE: Designer to edit Equipment Tests (Attachment 1) for this project and provide to the contractor. Equipment Tests can be found with the Type III Standards on the WBDG.
****

After completion of flushing, cleaning, and control valve and electrical components adjusting operations, the tests specified hereinafter must be performed. After cleaning is complete and prior to Performance Testing, Equipment Tests must be performed. Field adjustment of automatic control valves and automatic pump controls while in operation must be made only by the valve manufacturer's authorized field test engineer. For final adjustment of installed electrical control equipment provide an experienced electrical engineer, factory representative of PCP manufacturer and factory representative of PIT and DPT manufacturers. Both the mechanical and electrical components must be adjusted concurrently. Record required data necessary to prepare Equipment Tests Report.

3.5.1 Equipment Tests

System Supplier must complete and submit the Equipment Tests, see Attachment 1 - Equipment Tests. Submit Equipment Tests prior to Performance Testing (Government approval not required prior to Performance Testing.)

3.5.2 Operating Tank Low Level Alarm

Position valves to transfer fuel between operating tanks. Start one fueling pump and pump sufficient fuel out of the first operating tank to allow the low level alarm (LLA) to stop the fueling pump. This procedure must be repeated for each fueling pump and each tank until the low level alarm stops the fueling pump due to low liquid level in operating tank.

3.5.3 Fuel Delivery

****
NOTE: Select valve size and verify flow rate with SME.
****

Deliver fuel to each fueling point against a backpressure at the outlet of the hydrant control valve created by the tank trucks and hoses used during the tests.[The flow rate must be not less than [38][_____] L/s

[600][_____] gallons per minute for a 100 mm 4-inch valve.][The flow rate must be not less than [75][_____] L/s [1200][_____] gallons per minute for a 150 mm 6-inch valve]. Flow rates might be affected by aircraft capability.

3.5.4 Fueling Pump Operation

Demonstrate operation of all pressure and flow devices to start and stop the fueling pumps at the indicated pressure and flow rates in the presence of the Contracting Officer. Repeat the operating sequence with each of the pumps being selected as lead pump. For this test, measure the flow rates. Witness and record flow rates and test results.

3.5.5 Defueling Performance

To test the defueling operation in the "automatic" mode, the Government will furnish a defueling cart or a hydrant hose truck with a 19 L/s 300 gpm pump rated at 1140 kPa 165 psi to pump fuel from a government furnished tank truck or bladder back into the system. While this defueling test is in operation, operate one 38 L/s 600 gpm transfer pump providing flow into a tank truck through one hydrant control valve. Demonstrate capability of defueling into the system at the same time a fueling operation is in progress. Also test the defuel capability while in the "Flush" mode.

3.5.6 Emergency Shutdown

****
NOTE: Delete if not provided.
****

With one fueling pump circulating fuel through the system, test each "Emergency Stop" pushbutton station to verify that the pump stops [and the emergency shutoff solenoid activates and the control valve closes]. Repeat above procedure for each fueling pump and "Emergency Stop" pushbutton station. Conduct tests for both the automatic and manual modes. With all the fueling pumps circulating fuel through the system, push an "Emergency Stop" pushbutton station.

3.5.7 Hydrant Control Valve

Each Hydrant Control Valve must be operated to demonstrate the following:

3.5.7.1 Surge Shut-Down Capability

Surge from shut-off of on-board aircraft fill valve can be simulated by closing a fill line valve to the tank truck or bladder, use a 3 second closure.

3.5.7.2 Pressure Control at Setpoint + 15 kPa 2 psi

Requires use of a pressure gage at the pressure fueling nozzle

3.5.8 Filter Separator Float Control Valves with Manual Tester

Using the manual float control test level on each Filter Separator, lift the weight from the float ball slowly and observe the Operation and closure of the water slug shut-off feature on the Filter Separator Control Valve.

3.5.9 Overfill Valve

Place fuel transfer pump in the "off" position. Delivery quantity of fuel to Product Recovery Tank to demonstrate capability of valve to close. Place Fuel Transfer Pump in the "Automatic" position to demonstrate capability of valve to open when fuel level drops below set point.

3.6 PERFORMANCE TESTING

Performance testing is required to occur after the Contractor has performed the Equipment Tests. Performance testing must demonstrate to the satisfaction of the Contracting Officer and SME these portions of the fueling system are working as specified. Performance testing must consist of repeating the Equipment Tests (indicated in previous paragraphs) and operating the fueling system during actual fueling and defueling operations in the presence of Government Witnesses. The maximum rated capacity of the system must be demonstrated. The Contractor must notify the Contracting Officer 30 calendar days in advance of the test to permit arrangement for the use of Government-furnished items. During the time period of performance testing, no construction activities will be allowed on the project site. The project site must be considered an operational (fuel) zone (verses a construction zone) during this performance testing period. Personnel, dressed for fuel's operation, will be present to witness testing and participate in Contractor provided training.

3.6.1 Final Performance Test

A final performance test must consist of fueling aircraft if the installation has aircraft available.

3.6.1.1 Satisfactory Performance

In the event a portion of the system or any piece of equipment fails to meet the test, make the necessary repairs or adjustments and repeat the Performance Test until satisfactory performance is obtained. The determination of satisfactory performance must be made by the Contracting Officer and the SME.

3.6.2 Performance Testing Plan

****

NOTE: Designer to edit Performance Testing Plan (Attachment 2) for this project and provide to the contractor. Performance Testing plan can be found with the Type III Standards on the WBDG.

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System Supplier must edit the example Performance Testing plan and submit for approval. An example Performance Testing plan can be found at the end of this Section as Attachment 2 - Performance Testing Plan. Submit plan a minimum of 60 days prior to performance testing.

3.6.3 Equipment Tests

System Supplier must provide 10 hard copies of the completed Equipment Tests to the SME at the start of Performance Testing for validation during Performance Testing.

3.6.4 Control Valve Tagging

After the performance testing and system acceptance, tag the control valves with their final adjustments.

3.6.5 Final Acceptance

Fill the system with fuel and operate leak-free prior for acceptance. Anything wet with fuel is considered to be leaking.

3.6.5.1 Operating Tank High Liquid Level Shut-Off Valve Test and Adjustments

During the final filling of operating tanks, check the tank automatic high liquid level shut-off valve for proper functioning at least three times by lowering the fuel level and refilling again. Adjust valve to achieve a safe fill level.

3.6.5.2 Tank Level Indicator Adjustments

Also during the final filling of operating tanks, adjust and calibrate the tank level indicators including the final setting of the high high level (HHLA) and high level (HLA) alarms. Since the HHLA is at a point higher than the High Liquid Level Shut-Off Valve float set point, an artificial method of simulating HHL must be used.

3.6.5.3 Water Draw-Off System Test

During the performance testing, fill Water Draw-off Systems from Operating Tank sump to ensure proper operation. After filling system, allow time for fuel/water mixture to separate. Verify liquid separation through system's sight glasses. Proper operation includes capability to drain separated water and capability to pump separated fuel back to a full Operating Tank.

-- End of Section --