INCH-POUND
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COMMERCIAL ITEM DESCRIPTION

TRUCK, AIRCRAFT REFUELING, HYDRANT SERVICING

1. SCOPE. This commercial item description covers the general requirements for the R-12 Hydrant Servicing Vehicle (herein referred to as HSV) used for fuel servicing both military and commercial aircraft at Government installations worldwide. The HSV is to be capable of servicing aircraft from a Type III Hydrant System utilizing ground servicing hoses at a maximum rate of 750 gallons per minute (GPM) or lift platform hoses at a maximum rate of 1,000 GPM and defuel at a maximum rate of 300 GPM. The truck is to be air transportable in type C-130, C-17, and C-5 aircraft.

2. CLASSIFICATION.

TYPE I – Lift Platform Capability

TYPE II – No Lift Platform Capability

3. SALIENT CHARACTERISTICS.

3.1 HSV description. The HSV shall be capable of transferring fuel to and from a Type III Hydrant System when servicing military and commercial aircraft at Government installations worldwide. The HSV primary functions shall include transferring aviation jet fuel utilizing ground servicing hoses at a maximum flow rate of 750 GPM or through the lift platform hoses at a maximum flow rate of 1000 GPM to the aircraft from a Type III Hydrant System.

3.2 Design and construction. The HSV shall be designed and constructed in accordance with all applicable European Union (EU) requirements in order to have the "CE" marking affixed (see 3.2.2.3). The HSV shall be designed and constructed so that no parts will work loose in service. They shall be built to withstand the strains, jars, vibrations, and other conditions incident to

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shipping, storage, installation, and service. They shall be weatherproof and designed to prevent the intrusion of water and sand into critical operating components. The HSV shall be designed to comply with all applicable requirements of SAE ARP 1247 and NFPA 407, and shall have a 12 year minimum life expectancy. All system components shall have a minimum design operating pressure rating as required to meet all requirements as specified for pumping performance or 160 psig, whichever is greater.

3.2.1 Materials, protective coatings, and finish. All materials in contact with the fuel and not specified elsewhere in this document shall be corrosion resistant and shall not be adversely affected by or affect fuels in accordance with ASTM D1655, MIL-DTL-5624, MIL-DTL-25524, MIL-DTL-83133, GOST 10227, Def Stan 91-91, Def Stan 91-87, and ASTM D6615. All components and piping downstream of the filtration system shall be of aluminum or stainless steel. All aluminum components in direct contact with fuel, except the tank, shall be anodized or chemically conversion coated. Brass components shall be minimized but accepted in hose couplings/hose reducers and drain valves. Copper components will be minimized but accepted in drain lines that render the product as sump fuel. All other material in contact with the fuel shall be free of cadmium, copper, lead, or zinc. Non-metallic materials shall not affect or be adversely affected by the fuel under any operating conditions specified for the equipment. Magnesium alloys, wood products, polyvinyl chloride (PVC), polyester, room temperature vulcanizing rubber (yielding acetic acid), or asbestos shall not be used in any component or assembly of the HSV.

3.2.1.1 Metals. All materials in contact with the fuel and not specified elsewhere in this document shall be corrosion resistant and shall not be adversely affected by or affect the fuel. All components and piping downstream of the filtration system shall be of aluminum or stainless steel. All aluminum components in direct contact with fuel shall be anodized or chemically conversion coated. Brass components shall be minimized but accepted in hose couplings/hose reducers and drain valves. Copper components will be minimized but accepted in drain lines that render the product as sump fuel. All other material in contact with the fuel shall be free of cadmium, copper, lead, or zinc. Non-metallic materials shall not affect or be adversely affected by the fuel under any operating conditions specified for the equipment.

3.2.1.2 Impregnation of castings. Aluminum castings may be impregnated to prevent weeping.

3.2.1.3 Elastomers. Elastomeric materials shall be certified compatible with all fuels specified herein.

3.2.1.4 Protective coatings. Cleaning, chemical treatments, painting, plating, and films shall be in accordance with best commercial practice. Materials that deteriorate when exposed to sunlight, weather, or operational conditions normally encountered during the service life of the item shall not be used or shall have means of protection against such deterioration that does not prevent compliance with the performance requirements specified herein. Protective coatings that chip, crack, or scale with age or extremes of climatic conditions or when exposed to heat shall not be used. Fasteners, handles, and fittings used in the assembly of the item shall also be primed and painted. Surface preparation and pretreatment shall be in accordance with the respective primer and topcoat specifications.

3.2.1.5 Dissimilar metals. Dissimilar metals, as defined in MIL-STD-889, shall not be in contact with each other. Metal plating or metal spraying of dissimilar base metals to provide electromotively compatible abutting surfaces is acceptable. The use of dissimilar metals only when separated by suitable insulating material is permitted, except in systems where bridging of insulation materials by an electrically conductive fluid can occur. Sealants or gel type gasket materials shall be used between faying surfaces and butt joints.

3.2.1.6 Finish. The exterior finish color of the HSV shall be applied using the manufacturer's standard commercial paint system. The exterior surface of the HSV and the interior surfaces of compartments shall be painted with two part polyurethane paint or other type approved by the procuring activity, forest green, color number 14052 of FED-STD-595. Driveline and cab components, which are not visible during normal operations with the cab door closed, may be their original color. The finish top coat shall extend into the door jambs and hood jambs to the extent that the OEM finish color cannot be seen through the gaps between the body panels when the doors and hood are closed. Prior to the application of the finish top coat, any body or chassis component or assembly specifically manufactured by or for the HSV manufacturer, from sheet, plate, angular, or tubular steel, shall be coated with a zinc-rich primer.

3.2.1.7 Fluid traps and faying surfaces. There shall be no fluid traps on the HSV. Faying surfaces of all structural joints, except welded joints, shall be sealed to preclude fluid intrusion.

3.2.1.7.1 Ventilation. Ventilation shall be sufficient to prevent moisture retention and buildup.

3.2.1.7.2 Drainage. Drain holes shall be provided to prevent collection or entrapment of water or other unwanted fluid in areas where exclusion is impractical. All designs shall include considerations for the prevention of water or fluid entrapment and ensure that drain holes are located to effect maximum drainage of accumulated fluids. The number and location of drain holes shall be sufficient to permit drainage of all fluids when the unit is in a 10 degree incline in any plane. The minimum size of the drain holes shall be 0.25 inch.

3.2.1.8 Rustproofing. The HSV chassis and cab shall be rustproofed to a tropical level in accordance with FED-STD-297. Rustproofing shall not be applied to the first production unit until after approval of the test report.

3.2.2 Markings. All external devices which require an operational or maintenance interface shall be marked in accordance with MIL-STD-130. Markings shall be applied with decals and shall be 1-inch high block letters unless prohibited by the available space. In such cases, the markings shall be the largest size possible, but shall not be less than ½-inch high. Markings, Information/Caution shall be Lusterless Black, Color Number 37038 of FED-STD-595, and Markings, Warning/Danger shall be Lusterless Red, Color Number 31136 of FED-STD-595. The center of gravity of the HSV shall be stenciled on the unit within 1.0 inch of the calculated center of gravity. The truck shall be marked as specified by NFPA 407 in block type red reflectorized letters. In addition to the markings required by NFPA 407, "NO SMOKING WITHIN 50 FT" shall be applied in four inch block type red reflectorized letters on each cab door and on the rear of the HSV.

3.2.2.1 NO SMOKING label. A "NO SMOKING" label shall be attached in the cab in a highly visible location.

3.2.2.2 Hazardous material decals. Four DOT hazardous materials, Number 1863, shall be mounted on the HSV, one on the front, rear, left, and right side of the HSV.

3.2.2.3 Identification plate. An identification plate in accordance with MIL-STD-130 shall be securely attached to the HSV in a readily accessible location. The identification plate shall contain the following information: Nomenclature, part number, serial number, vehicle registration number, date of manufacture, date of delivery, manufacturer's name, Commercial and Government Entity (CAGE) code, date of warranty expiration, National Stock Number (NSN), and contract number. The "CE" marking shall be affixed in accordance with EU requirements on or adjacent to the identification plate.

3.2.3.2 Transportation data plate. A transportation data plate shall be securely attached to the HSV in a readily accessible location. The data plate shall include as a minimum the following information:

a. Side and rear silhouette views of the HSV.

b. Horizontal and vertical location of the center of gravity of the HSV in air transportable configuration, marked on the silhouette views.

c. Shipping weight.

d. Loading cubage.

e. Overall height, width, and length.

f. Front and rear axle loads.

g. Tie down information.

3.2.3.3 Control markings. All controls, valves, gauges, and indicators used in the operation of the HSV shall be identified by securely attached nameplates of such construction that exposure to oil, dirt, light, et cetera, will neither fade nor eradicate them. Tags or decals shall not be used.

3.2.3.4 Operating instructions and data plates. All data plates, placards, charts, instruction plates, et cetera, shall utilize anodized aluminum plates of a size and shape consistent with the information required thereon.

3.2.3.4.1 Diagrams. Schematic diagrams of the piping and electrical systems shall be provided. Each valve, switch, et cetera, on the diagram shall be properly identified to correspond to the markings on like parts on the HSV.

3.2.3.4.2 Operating instructions. Brief operating and precautionary instructions shall be permanently affixed near the appropriate system operator control panel. The instructions shall be clear, concise, and adequate to enable operation of the HSV without damage to the equipment or injury to personnel, and shall refer to the components as identified on the schematic diagrams.

3.2.3.4.3 Lubrication plate. A lubrication plate shall be provided directing attention to all lubrication fittings and components which require lubrication. The plate shall identify the type and grade of lubricant required for all operational temperatures.

3.2.4 Safety. The truck shall comply with all applicable requirements of the Federal Motor Carrier Safety Regulations (49CFR 393) and Federal Motor Vehicles Safety Standards (49CFR 571) at the time of manufacture. The principal walking surfaces shall be of an anti-skid self-cleaning type.

3.2.4.1 Component protection. All space in which work is performed during operation, service, and maintenance shall be free of hazardous protrusions, sharp edges, or other features which may cause injury to personnel. All moving parts and all parts subject to high operational temperatures or subject to being electrically energized, that are of such nature or so located as to be hazardous to personnel, shall be guarded or insulated to eliminate the hazard and shall be securely attached to the HSV with wire ropes or chains. "Dog tag" style beaded chains shall not be provided. Removable panels, if provided, shall be attached with captive fasteners. Tire valve stem caps shall be made of plastic.

3.2.4.2 Sound levels.

3.2.4.2.1 Pumping operation sound levels. The maximum A-weighted sound levels produced by the truck during defuel servicing pumping operations shall not exceed 84 decibel Acoustic (dBA) at a distance of 15 feet from the geometric center of the truck cab and at the operator's position in front of the operator control panel. An additional 2 dBA allowance over this sound level limit shall be permitted for production units to provide for variation in test site, temperature gradients, test equipment, and inherent differences in nominally identical HSVs.

3.2.4.2.2 Fire extinguishers. Two Type I, Class 2, Size 20 fire extinguishers, in accordance with A-A-393, shall be installed, one on each side of the truck. The fire extinguishers shall be accessible to personnel standing on the ground and shall be protected from tire splash.

3.2.5 Electromagnetic interference (EMI). The HSV shall be in accordance with the following radiated emission and susceptibility requirements of MIL-STD-461: RE102 (to the limits of the FIGURE RE102-4, Navy Fixed & Air Force curve) and RS103 (to the levels of TABLE VII) for the following ranges:

30MHz – 1GHz at 10 Volt per metre (V/m)

1GHz – 18GHz at 50V/m

3.2.6 Human engineering. The HSV shall be designed in accordance with MIL-STD-1472 for ease of operation, inspection, and maintenance, including the use of arctic mittens and Mission Oriented Protective Posture (MOPP) Level 4 Chemical Warfare Gear. The range of control positions of any device shall not obstruct the range of control positions of another device.

3.2.7 Fastening devices. All screws, bolts, nuts, pins, and other fastening devices shall be properly designed, manufactured, and installed with adequate means of preventing loss of torque or adjustment. Cotter pins, lock washers, or nylon patches shall not be used for this purpose, except for the attachment of trim items or as provided in commercial components. All components connecting to the chassis frame rails shall be installed in accordance with standard commercial practice. Tapped threads shall have a minimum thread engagement in accordance with Table I.

TABLE I. Minimum Thread Engagement

Material	Minimum Thread Engagement
Steel	1.0 times the nominal fastener diameter
Cast iron, brass, or bronze	1.5 times the nominal fastener diameter
Aluminum, zinc, or plastic	2.0 times the nominal fastener diameter

3.2.8 Welders and welding. All welders shall be certified to weld in accordance with AWS D1.1/D1.1M and AWS D1.2/D1.2M, as applicable. The contractor shall make available to the Government certifications for all welders being utilized on the HSV. Welding procedures and all welding on the HSV shall be in accordance with AWS D1.1/D1.1M and AWS D1.2/D1.2M, as applicable. The surface parts to be welded shall be free from rust, scale, paint, grease, and other foreign matter. Welds shall be of sufficient size and shape to develop the full strength of the welded parts. Welds shall transmit stress without cracking or permanent distortion when the parts connected by the welds are subjected to test, proof, and service loadings.

3.2.9 Foolproofness. Where improper installation of an item causes a malfunction, an asymmetric mounting system shall be provided, where practical, to ensure proper mounting of the item.

3.2.10 Weight and dimensions. Overall weight and dimensions in air transport configuration (see 2.4.1) shall not exceed:

Weight	26000 pounds.
Length	306 inches.
Width	96 inches.
Height	101 inches.

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3.3 Environmental conditions.

3.3.1 Operating temperature range. The HSV shall be capable of operating in ambient temperatures ranging from -40 ^{o}F to 125 ^{o}F.

3.3.2 Storage temperature range. The HSV shall be capable of being stored in ambient temperatures ranging from -40 ^{o}F to 125 ^{o}F.

3.3.3 Salt fog. The HSV shall be capable of storage and operation in high temperature, high humidity, salt laden, and sea coast environments without damage or deterioration of performance.

3.3.4 Sand and dust. The HSV shall be capable of storage and operation during exposure to wind-blown sand or dust without damage or deterioration of performance.

3.3.5 Humidity. The HSV shall be capable of storage and operation at relative humidity from 0 to 100 percent.

3.4 Transportability.

3.4.1 Air transportability. The HSV shall be transportable on C-130, C-5, and C-17 aircraft. Design criteria can be found in MIL-STD-1791. An air transportability report shall be submitted to the government representative at first production testing to begin the air transportability certification process. The report shall outline the steps necessary to load the HSV onto the specified aircraft, including diagrams, drawings, or instructions of the HSV preparation, loading, and tie down procedures (including engineering analysis of the tie down devices) for the HSV along with critical dimensions, HSV weights, axle weights, etc. In all air transport configurations, the HSV shall be capable of being restrained and withstanding, without loss of serviceability, 2.0 G up and 4.5 G down accelerations, and shall be capable of being restrained and withstanding, without loss of structural integrity, 3.0 G forward, 1.5 G aft, and 1.5 G lateral accelerations. The HSV shall be equipped with pressure relief devices or configured for air transport to prevent any part from becoming a projectile in the event of catastrophic loss of aircraft cabin pressure. The HSV shall roll on and off the aircraft, negotiating the required maximum ramp angles without shoring.

3.4.1.1 Shoring. The HSV shall be air transportable without shoring.

3.4.1.2 Axle weight. Axle weight shall not exceed 13,000 pounds.

3.4.1.3 Tire pressure. Tire pressure shall not exceed 100 psi and shall not be reduced for air transport.

3.4.1.4 Equipment removal and reconfiguration. Preparation for air transport shall take no more than 15 minutes and restoration to operating configuration shall take no more than 15 minutes for two persons using common hand tools (see 7.3.1). All equipment removed shall be stored on the HSV; caps and plugs shall permit moving and storage in transport configuration.
3.4.1.5 Tie downs. The HSV shall be symmetrically restrained during air and ground transport. Tie down points shall be rated at a minimum of 25,000 pounds, marked for capacity, with a clear

opening compatible with MIL-DTL-25959 and MIL-PRF-27260 tie down devices. Each end of each tie down device shall terminate at a tie down point and not pass through any other tie down point. There shall be no interference between tie down devices and the HSV. The tie down provisions shall be in accordance with 4.1 through 4.12 of MIL-STD-209.

3.5 Maintainability. All assemblies, controls, and installed equipment shall be located so that there is no interference with each other or the operation, and shall be readily accessible for maintenance operation, removal, and replacement using common hand tools (see 7.3.1). All operating controls and servicing shall be so designed to allow access by personnel wearing arctic clothing and mittens/gloves.

3.5.1 Inspection and servicing provisions.

a. Routine servicing tasks and pre-use inspections shall require no hand tools.

b. Drain plugs and filters shall be directly accessible from the ground and oriented to have unimpeded drainage to a catch pan.

c. The HSV shall be designed with maximum usage of sealed lifetime lubrication bearings.

d. The HSV shall be designed so the correct oil and coolant levels can be visually checked while the unit is running.

3.5.2 Special tools. The design of the HSV shall minimize the requirement for special tools. All special tools (see 7.3.2) shall be provided and stored on the HSV.

3.6 Engine and related equipment. The HSV shall be equipped with a diesel engine. Consistent with the requirement to operate on fuels as specified in 3.7.1.

3.6.1 Engine starting system.

3.6.1.1 Engine starting aids. The engine shall start within 15 seconds cranking in any ambient temperature within the required operating range of the HSV. Installed glow plugs, fluid starting aids, and heat from the winterization system (see 3.10), as shown in Table II, may be used prior to and during the start period to facilitate engine starting under the following conditions:

TABLE II. Engine starting aids.

Temperature Range	Starting Aids Permitted
40° F through 125 °F	None
1° F through 39° F	Glow plugs and fluid starting aids
-40 °F through 0° F	Glow plugs, fluid starting aids, and heat from the winterization system

3.7 Engine fuels.

3.7.1 Engine operating fuels. The following shall be standard operating fuels:

a. 1-D S15, 1-D S500, 1-D S5000 in accordance with ASTM D975, based on nationally set seasonal temperature requirements.

b. 2-D S15, 2-D S500, 2-D S5000 in accordance with ASTM D975, based on nationally set seasonal temperature requirements.

c. Diesel Fuel Oil, Biodiesel Blends (B-20) in accordance with ASTM D7467, based on nationally set seasonal temperature requirements.

d. JP-5, in accordance with MIL-DTL-5624.

e. JP-8, in accordance with MIL-DTL-83133.

f. Jet A in accordance with ASTM D1655 with JP-8 additives.

h. Jet A-1 in accordance with either ASTM D1655 or Defense Standard 91-91 with JP-8 additives.

i. TS-1 in accordance with GOST 10227 with U.S. JP-8 additives.

j. Diesel Gas Oil in accordance with JIS-K-2204, based on nationally set seasonal temperature requirements.

k. Automotive Diesel in accordance with TUPRAS 400, based on nationally set seasonal temperature requirements.

l. Diesel Fuel Oil in accordance with TUPRAS 410, based on nationally set seasonal temperature requirements.

m. Automotive Fuel, Diesel in accordance with BS EN 590, based on nationally set seasonal temperature requirements.

n. Diesel Fuel Oil, in accordance with GOST 305, based on nationally set seasonal temperature requirements.

3.7.2 Engine emergency fuels. The following shall be emergency fuels:

a. Jet A or Jet A-1 in accordance with ASTM D1655 without JP-8 additives.
b. Jet A-1 in accordance with Defense Standard 91-91 without JP-8 additives.

Note: Jet A and Jet A-1 may contain corrosion inhibitor/lubricity improver and icing inhibitors which shall result in properties equal to JP-8.

3.7.3 Fuel filters. Primary and secondary fuel filters and a heated fuel/water separator shall be provided. The fuel/water separator shall include a water coalescer and a drain valve that is readily accessible by an operator or a mechanic. A combination fuel filter and fuel/water separator may be provided. Fuel filter elements shall be easily replaceable by a mechanic using nothing more than common hand tools (see 7.3.1) without loss of engine prime.

3.8 Exhaust system. The exhaust system shall be constructed of stainless steel. The muffler(s) shall be constructed of aluminized steel or stainless steel. Exhaust system outlet(s) shall be directed away from personnel accessing any operator control panel or equipment compartment and the engine air intake, and shall not be pointed directly toward the ground. The truck muffler shall be mounted under and behind the front bumper, with a right side outlet pointing down and forward. The exhaust system shall not extend behind the truck cab.

3.9 Electrical system. The HSV wiring system and electrical components shall be in accordance with NFPA 407 and SAE ARP 1247. All wiring rear of the cab shall be run in plastic/metallic tubing and shall utilize vapor proof connectors. All electrical enclosures shall be vapor proof. All exposed connections shall be weather protected.

3.9.1 Batteries and battery compartment.

3.9.1.1 Batteries. Batteries shall be maintenance free and easily accessible for daily inspection without the need for hand tools.

3.9.1.2 Battery compartment. The batteries shall be enclosed in a weatherproof box or compartment and be readily accessible. The battery box shall be frame mounted and located forward of the back of the cab. If the battery box cannot be located forward of the back of the cab, it shall be located on the right side of the truck with the power cables routed within conduit a minimum of six inches forward of the rear of the cab. The battery cover shall be easily detachable and reattachable and shall not interfere with any electrical wiring harnesses in the battery compartment.

3.9.1.3 Battery cables. The battery cables shall be sized to handle the system voltage and current levels, be clearly identified with "+" and "-" or red and black markings, and shall not be spliced.

3.10 Winterization system. A winterization system may be provided for starting in temperatures to -40 ^{o}F. The winterization system may include heaters for engine coolant, engine oil, and the fuel tank, as well as battery warmers. The winterization system shall be designed to operate from an external 110 or 220 volt, 50 or 60 cycle, power source utilizing the external electrical connections. The winterization system shall incorporate high-temperature shutoff switches to prevent overheating of any fluid or component.

3.11 Floodlight. A fully adjustable floodlight shall be provided on the forward left side of the HSV. The light shall illuminate the entire left side of the HSV. A fully adjustable floodlight shall be provided on the rear of the HSV. The rear light shall illuminate the entire rear working area of the HSV. An individual switch and adjusting handle shall be provided for each light to allow operation from the ground. The lights shall not operate unless the HSV's parking lights are on. The lights shall have a minimum of 1000 candlepower.

3.12 Mounted equipment. The HSV shall consist of the mounted equipment necessary to fuel and defuel aircraft on a Type III hydrant system.

3.13 Flow and pressure control.

3.13.1 Flow and pressure control system (PCS). The flow and PCS shall consist of the necessary control valves, pilot valves, selector controls, automatic controls, venturis, gauges, surge suppressors, and safety devices necessary to regulate the flow and pressure of fuel during refueling and defueling on the Type III hydrant systems.

3.13.1.1 Flow control system (FCS). The FCS shall control flow rates from 0 to a minimum of 750 gallons per minute (GPM) through the ground discharge hose(s) and flow rates from 0 to 1000 +0/-25 GPM through the lift platform hose(s). The flow control system shall not allow the flow rate to exceed the rated flow of the fuel filtration system.

3.13.1.2 Pressure control system (PCS). A primary and secondary PCS shall be provided on the HSV. The primary pressure control shall be set to independently control the single-point nozzle pressure at the aircraft to a maximum of 52 +3 psig. The secondary pressure control shall be set to control the single-point nozzle pressure if the primary PCS fails to control the single-point nozzle pressure at the aircraft to a maximum of 57 +3 psig. The PCS shall limit pressure surges, due to a quick two second shutdown at the aircraft, to 120 psig at the single-point nozzle. The pressure surge during quick shutdown at the aircraft shall not exceed the published rating of any component in the fuel flow system. The PCS shall sense fuel pressure through some form of pressure compensator in order to simulate single-point nozzle pressure at the aircraft. The in-line pressure control valve shall incorporate the following features: (1) an opening rate adjustable from 2 to 25 seconds, and (2) a closing rate adjustable from 10 to 30 seconds. A pressure relief system shall be provided to prevent pressure buildup in the pumping system after all fueling operations are complete and the single-point nozzles are properly stored. The pressure relief system shall not allow backflow of fuel into the recovery tank (see 3.16.1.8) when the single-point nozzles are connected to the aircraft.

3.13.1.3 Pilot control valves. All flow and pressure control system pilot control valves shall be located so that a mechanic can observe the operator control panel gauges, operate the controls, and adjust the pilot control valves while standing on the ground. The pilot control valves shall include provisions to prevent unauthorized adjustments.

3.14 Defuel system. When specified (see 7.2c), the HSV shall be provided with a defuel system capable of defueling aircraft through the ground discharge hoses and through the lift platform hoses. The defuel system shall be capable of defueling at a flow rate of 175 gpm without the assistance of aircraft boost pumps and 300 ± 10 gpm with the assistance of aircraft boost pumps with a hydrant pit pressure of 160 pounds per square inch gauge (psig). The defuel suction line shall incorporate an 8 mesh low-pressure drop strainer that is easily removed for cleaning. The defuel system shall be activated through a defuel mode selector switch located on the operator control panel.

3.15 Lift platform. When specified (see 7.2b), the HSV shall be provided with a variable height lift platform. The lift platform shall be located adjacent to the rear of the cab and shall be provided with two discharge hoses for servicing any commercial type wide bodied aircraft. The lift platform shall be capable of being lowered to the lowest position with the lift platform hoses connected to the aircraft. The lift platform shall meet all requirements of 29CFR 1910.67 and shall be equipped with the following features: (1) aluminum guard rails with an entry gate and a toe plate, (2) an access ladder or steps, (3) single- point nozzle pressure gauge, (4) lift controls and manual override, (5) an emergency engine shut-off switch (see 3.24.2), and (6) an appropriately sized, weather protected, operator control panel incorporating the necessary controls for proper operation of the lift platform. The lift platform shall raise from the stowed position to the height required to allow a small human, as defined by MIL-STD-1472, to service any wide bodied aircraft at the under wing receptacle. Provisions shall be made for easy entry and exit of the platform. The platform shall raise and remain at any selected height with two 250-pound operators onboard. There shall be no signs of excessive lean, sway, or instability that would constitute an unsafe operating condition of the fully loaded platform in any position. The platform shall be capable of being fully raised or lowered in not less than 15 seconds or more than 35 seconds. A means shall be provided to prevent rapid accidental lowering of the platform in the event of hose or other component failure. A lowering device (manual override) that will override the main control and provide a smooth controlled lowering of the platform shall also be provided in a convenient location accessible by the operator from the ground. The lift platform shall have a wing stop control which will stop the platform from lifting if the highest portion of the lift comes in contact with the aircraft wing. The lift platform system shall incorporate a safety interlock that sets the parking brakes when the lift platform is not in the full down position. The platform shall have a minimum 2000 pound lift capacity. The platform deck shall not exceed 54 inches from the ground when in the stowed position.

3.16 Filtration.

3.16.1 Filtration system. The filtration system shall be rated for the maximum flow and pressure. The filter vessel and elements shall be qualified in accordance with the requirements of EI 1581, Specification and Qualification Procedures for Aviation Jet Fuel Filter Separators, Category M100, Type S, Two Stage System configuration.

3.16.1.1 Filter vessel. The filter vessel shall be designed and constructed in accordance with the most recent addition and revision of Section VIII of the ASME Boiler and Pressure Vessel Code. The vessel shall be inspected and stamped by a qualified ASME inspector. The pressure vessel shall be constructed of aluminum. The filter vessel shall remain full during pumping or while taking a sample from the drain. The filter vessel drain shall have a self-closing valve, accessible to a person standing or kneeling on the ground. The filter vessel shall be stenciled with 1 inch black lettering identifying:

a. The next change date (month and year). Three years from installation date.

b. Filter coalescer element part number from element end cap.

c. Maximum allowable differential pressure (15 psig).

3.16.1.2 Air eliminator. An air eliminator shall be provided in the top of filter vessel to allow automatic purging of air from the pumping system. The eliminator shall be vented into a suitable location and shall not allow the backflow of air into the filter vessel. The air eliminator shall have an orifice 1/8 inch or less in diameter.

3.16.1.3 Water-slug shutoff device. A water-slug shutoff device shall be provided to stop fuel flow within 10 seconds when a predetermined water level is reached in the vessel and then resume fuel flow within 30 seconds when the water level is lowered to a predetermined level.

3.16.1.4 Float-actuated selector valve. The float actuated selector valve used in conjunction with the flow shut off system shall include provisions which permit manual movement of the float through its complete range for testing when installed and the system is pressurized. The manual adjustment shall be accessible by an operator standing on the ground.

3.16.1.5 Water drain. The water sump of the filter vessel shall be equipped with a one inch manually operable ball-type valve with a spring return handle that renders the valve normally closed. The drain valve shall be: (1) designed to prevent fuel contact with the operator, (2) directed toward the ground, (3) guarded from damage, and (4) accessible without crawling under the HSV.

3.16.1.6 Filter separator check valves. All fuel lines entering and exiting the lower portion of the filter vessel shall be equipped with check valves as necessary to keep the filter vessel full of fuel after initial filling of the filter vessel. The only means to drain the filter vessel shall be the manual drain valve and lower chamber drain plug.

3.16.1.7 Element sealing. Element connections shall be sealed by one of the methods outlined in EI Specification 1581.

3.16.1.8 Fuel recovery tank. A fuel recovery tank of sufficient size (24 hours of operational use) to allow for thermal expansion of fuel and fuel from the fuel filtration system air eliminator shall be provided. The tank shall be equipped with relief valves and vents as necessary for safe

operation. The fuel recovery tank shall be equipped with a manual drain valve to allow for complete draining of the tank. An automatic emptying system to empty the fuel recovery tank during refueling and defueling servicing operations shall be provided and shall incorporate a full tank shutdown system. The automatic emptying system shall not utilize an electrically driven pump and shall not allow the backflow of fuel into the recovery tank when not in use. The automatic emptying system shall return the fuel up-stream of the fuel filtration system. The system shall also incorporate an override momentary-on push button located on the operator control panel to allow the manual operation of the automatic emptying system. The system shall not allow the dumping of fuel on the ground. The automatic emptying system shall operate only when the deadman control is activated. A gauge shall be provided on the tank to monitor the level of fuel and shall be readable by the operator standing on the ground. A high-level warning light, illuminating Red, shall be provided for the recovery tank and shall be located on the operator control panel. The high-level recovery tank warning light shall illuminate whenever the fuel level in the recovery tank exceeds the predetermined level where the automatic return system is scheduled to activate. The high-level recovery tank warning light shall remain illuminated until product level drops below the return system activation point.

3.17 Piping. Pipe mounting shall prevent failure due to chaffing, vibration, or movement, due to operational or mobility induced forces. Piping shall be protected when passing through sheet metal and shall not be used as a step. Coupling grooves shall be cut or rolled in accordance with coupling manufacturer's requirements and recommendations. Pipe and fittings shall be either flange or groove connected, or a combination. The piping shall be seamless schedule 40 aluminum in accordance with ASTM B241/B241M or seamless schedule 10 TP 304L stainless steel in accordance with ASTM A312/A312M. Fuel pressure build-up in the piping and hose(s) shall relieve into the fuel recovery tank.

3.18 Volumetric flow meter (meter). All fuel flow through the filtration system shall be metered. The meter shall be certified accurate for High Flow to ± 0.2 percent between 50 and 1000 GPM in accordance with NIST Handbook 44 Section 3.31 Table 1. The meter shall be electronic, positive displacement, with LED digital display, capable of displaying totalized flow and a rate of flow indicator in gallons per minute. The meter shall have a resettable counter and a non-resettable totalizer. Advancement of counter and primary indication elements shall be in accordance with NIST Handbook 44 Section 3.31 S.1.1.4-5. The meter shall be readable from 15 feet distant for daytime or nighttime operations.

3.19 Hose reels. The hose reels shall be designed for servicing with any portion of the hose unwound. The hose reel shall rewind the entire flooded hose at a rate of 1.5 feet per second or greater. The hose reels shall be of the top pull type. The hose reel drum size shall be in accordance with EI 1529. The reel shall have features to prevent over-travel during deployment and rewind. The rewind assembly shall incorporate a clutch and brake assembly. The fluid path shall be aluminum or stainless steel. The reels shall also be furnished with a manual crank for emergency rewinding. Provisions shall be made for storing the crank on the HSV. The reel shall be designed to prevent the last 1/2 turn of hose from unwinding from the reel. Stainless steel guide rollers utilizing permanently lubricated metal bearings shall be provided to prevent damage to the hose while winding or unwinding. All moving parts (drive chains, gears, etc.) shall be equipped with protective coverings to prevent injury to the operator and damage to hoses.

3.19.1 Hydrant hose reel. The hydrant hose reel shall be located on the left (driver side) of the HSV. The hose reel shall be capable of storing 30 feet of EI 1529 hose. The hydrant coupler shall be no higher than 3 feet above the ground when in the stowed position. A momentary-on push button for rewinding the hydrant hose reel hose reel shall be provided and shall be conveniently located such that the operator can guide the single-point hose with one hand while operating the rewind control button with the other hand..

3.19.2 Discharge hose reels. The ground discharge hose reels shall be located on the rear of the HSV facing rearward. Each reel shall be designed to store 75 feet of 2 ½ inch diameter EI 1529 hose.

3.20 Hoses.

3.21 Servicing hoses. The HSV shall be equipped with a hydrant hose, two ground discharge hoses and two lift platform servicing hoses. All hoses shall conform to EI 1529, Grade 2, Type C. The hoses shall be equipped with couplings in accordance with EI 1529. The coupling shall be of two-piece construction, internally expandable, non-reattachable design constructed of high strength corrosion resistant metal.

3.21.1 Hydrant hose. The hydrant hose shall be 30 feet in length and 4 inches in diameter.

3.21.2 Discharge hoses. The ground discharge hoses shall be 60 feet in length and 2-1/2 inches in diameter.

3.21.3 Lift platform hoses. The lift platform discharge hoses shall be 2-1/2 inches in diameter. The hose length shall allow a large human, as defined in MIL-STD-1472, to connect to a single-point nozzle five feet on either side of the truck center line. Provisions shall be made for storage of the hose on the lift platform, so the hose will not be chaffed, twisted, crimped, or pinched under any operating condition.

3.22 Single-point nozzles and couplers. Each hose shall be equipped with a dry break coupler. A D3 Universal Inlet Single-point Nozzle Coupling with single-point nozzle in accordance with SAE-AS-5877 shall be provided for each ground discharge hose. A type D-2 single-point nozzle in accordance with SAE-AS-5877 shall be provided for each lift platform hose. The single-point nozzles shall include a 40 mesh stainless steel strainer and an automatic vacuum breaker. The hydrant hose shall be equipped with a 4 inch API style coupler conforming to EI Spec 1584. When specified (see 7.2d), a 351GF-14S Moosehead Coupling shall be required for hydrant pit connection. The hydrant and servicing single-point nozzles shall have stowage receptacles with interlocks which prevent the parking brake from releasing unless the single-point nozzles are properly stored. The servicing single-point nozzle receptacles with interlocks shall be compatible with all single-point nozzles complying with the applicable version of SAE-AS-5877.

3.23 Deadman control.

3.23.1 Deadman control system (DCS). A DCS shall be provided in accordance with NFPA 407 and as specified herein. The deadman device shall be air operated and shall stop flow to and from the aircraft IAW the parameters as specified in NFPA 407. Deactivation of the deadman device shall stop the flow of fuel by closing the hydrant pit valve and by closing a valve downstream of the hydrant coupler. If an inline control valve is provided, it shall be utilized as the valve downstream of the hydrant coupler. The DCS shall be equipped with 70 feet of supply hose and be positioned so the control handle can be operated from the operator control panel, ground discharge hose reels and raised lift platform. The deadman control lever shall be operable by an operator wearing artic type mittens. The deadman hose shall be stored on a reel. The reel shall hold at any deployed hose length and shall have a non-manual rewind system. A ball stop shall be provided on the deadman hose near the deadman control lever to prevent over wind of the deadman hose. A rewind reel is not required for an electrical DCS, however provisions for storage of the cable shall be provided. When in the defuel mode of operation, deactivation of the deadman device shall reduce engine speed to idle regardless of the position of the auxiliary throttle.

3.23.1.1 Sensing lines. Sensing lines for connection to the Type III hydrant system shall be provided and located on a reel(s) next to the hydrant hose reel. Two lines shall be required for connection to the pit; one line shall be dedicated for air pressure and the other line for fuel pressure. The reel(s) shall be the spring rewind type. The sensing lines shall not exceed the length of the hydrant hose. The reel shall be equipped with arresting features for making random stops at any position. Provisions shall be made to prevent the last half turn of hose from unwinding and a ball stop shall be provided to prevent over wind. Dummy sensing line connections shall be installed adjacent to the reel to secure connections when not in use.

3.24 Operator control panel. A covered operator control panel shall be located on the driver's side of the HSV adjacent to the hydrant hose reel. The operator control panel shall be fully illuminated for nighttime servicing operations. The operator control panel shall be easily accessible for maintenance from the rear and may swing out, if necessary. Instructions and diagram plates shall be mounted on or adjacent to the operator control panel. All components on the panel shall be weather proof. The operator control panel controls shall include but not be limited to:

a. Defuel Mode Selector (See 3.14)

b. Manual Recovery Tank Override Button (See 3.16.1.8)

c. Recovery Tank High-Level Warning Light (See 3.16.1.8)

d. Auxiliary Throttle Control (See 3.24.1)

e. Emergency Engine Shut-off Switch (See 3.24.2)

f. Tachometer (See 3.24.3)

g. Pressure Gauges (See 3.24.4)

h. Surge Suppresser Fill Connections (See 3.24.6)

3.24.1 Auxiliary throttle. An auxiliary throttle, adjustable to within 50 revolutions per minute (rpm) of the maximum rated engine speed or maximum pump speed, shall be provided and utilized during defuel servicing operations. The auxiliary throttle shall be used for controlling flow and shall be located on the operator control panel. The auxiliary throttle shall hold any speed setting and provide an emergency return to idle feature.

3.24.2 Emergency engine shutoff. An emergency engine shut-off switch shall shut down the truck engine without the use of any other control. The switch shall be an on-off toggle switch marked by a red circle, color number 31136 of FED-STD-595, at least one inch in diameter.

3.24.3 Tachometer. An electronic, LED digital display, tachometer shall be provided and shall have provisions for indicating the maximum engine speed in rpm for pumping. The tachometer shall incorporate numerical value readout and shall be readable from a distance of 15 feet, during daytime or nighttime operations.

3.24.4 Pressure gauges. Pressure gauges shall be identified by function and shall be of the LED digital display type, with the pressure readouts taken from pressure transducers that are incorporated in the flow and pressure control system. Pressure gauges shall be included for the following functions: (1) Single-point nozzle pressure, (2) Differential pressure, (3) Pump discharge pressure, (4) Hydrant inlet pressure, and (5) Surge suppressor. The single point nozzle pressure gauge shall indicate actual pressure at the single-point nozzle, or shall use a system reference point that gives a full range reading within one psig of actual pressure. All pressure gauges shall incorporate the following features: (1) display a numerical value, (2) be certified accurate to within one percent of the scale range, (3) be at least 10 percent greater than any recordable pressure, (4) include provisions for indicating maximum safe operating pressure, and (5) readable from a distance of 15 feet during daytime or nighttime servicing operations.

3.24.4.1 Differential pressure gauge. The differential pressure gauge shall be a non-calibrating gauge that shall be capable of continuously monitoring the pressure drop across the filter coalescer stage during servicing operations and shall register and hold the highest-pressure drop achieved during servicing operations.

3.24.5 Emergency fuel shutoff. The HSV shall incorporate three independent emergency fuel shut-off control switches. The emergency fuel shut-off control switches shall be located as follows: (1) one on the operator control panel, (2) one on the passenger's side of the HSV opposite the operator control panel, and (3) one on the gauge panel of the lift platform. The emergency fuel shut-off control shall be a toggle switch that is either activated or push-pull. If a push-pull type of air operated valve is used in the toggle switch, then the valve shall be a two-position detent valve which is easily operated and arranged so that it is pushed to activate. The emergency fuel shut-off controls shall immediately terminate the fuel flow in any mode regardless of whether the deadman device is activated or deactivated. The emergency fuel shut-off control shall not be recessed and shall be manually operated.

3.24.6 Surge suppressor. The HSV shall incorporate surge suppressor(s) for controlling surge. The fill connections for the surge suppressors shall be located on the operator control panel.

3.25 Sampling provisions.

3.25.1 Sampling devices. The main flow system shall be equipped with two sampling connections; one upstream of the filter separator near the hydrant hose outlet, the other downstream of the filter near the discharge hoses. The fuel sampling devices shall be easily accessible while standing on the ground. Adequate space shall be provided to connect an in-line sampler such as the Millipore Corporation, Bedford, MA 01730, fluid sampling kit, catalog No. XX64 037 00, for solid and water samples. The sampling device shall consist of the necessary corrosion resistant piping, a one quarter turn ball valve, and a quick disconnect with a dry break coupler and dust plug for connection to the sampling kit.

3.26 Static discharge grounding reels. Two Type I, spring rewind, grounding reels, in accordance with A-A-50696, shall be installed side-by-side at the rear of the pumping compartment on the left side of the truck. One reel shall have a welder style grip clamp and the other shall have a grounding plug. The reels shall be bolted to the truck, with a resistance between each reel and the chassis frame of not more than 0.5 ohm. The cable reel shall be fitted with a cable guide that allows deployment and rewinding of the cable in a tangle-free manner. The static cables shall be equipped with a cable stop to prevent the bonding clip or plug from striking the reel guide.

3.27 Wheel chock storage container. A wheel chock storage container 24 inches long, 10 inches deep and 6 inches high; shall be furnished and installed in a space located on the driver's side in an easily accessible location. The bottom of the container shall be smooth and have drainage holes. The container shall be designed for easy removal and storage of wheel chocks without allowing the chocks to fall out during road operation.

3.28 Chassis and cab.

3.28.1 Chassis. The HSV shall consist of a standard commercial truck chassis and cab, Type I, Class D, in accordance with FED-STD-794 and as specified herein. The HSV shall be towable from the front with or without the front tires off the ground. The driver side and passenger side mirrors shall be electronically adjustable from the driver position within the cab. Both driver and passenger side mirrors shall be large enough to provide a clear and distinct perspective of the entire length of the truck and rear bumper. The HSV shall include backup lights and a backup alarm. The backup alarm shall meet the Type D (87 dBA) requirements of SAE J994. Unless provided as standard equipment on the commercial chassis, all lighting shall be LED. The chassis shall be equipped with driveshaft guards positioned to prevent any drive shaft from contacting any fuel containing component in the event of failure.

3.28.2 Cab. In addition to the cab requirements of FED-STD-794, the cab shall be equipped with the following: an air filter service indicator; low coolant level indicator; coolant temperature gauge; transmission temperature gauge; fuel level gauge; oil pressure gauge; oil temperature gauge; hourmeter; tachometer; and two switched reading lights for use while seated or while

standing at either door during night operations. An air conditioning system in accordance with 3.4.24 of FED-STD-807 shall be provided. A separate 15-amp circuit, with breaker, shall be provided in the cab for a purchaser provided radio.

3.29 Transmission. The HSV shall be equipped with an automatic transmission. During defuel servicing operations, the transmission shall automatically lock in gear when the PTO is engaged and shall remain locked in all throttle positions.

3.29.1 Power take-off PTO. The defuel delivery system pump shall be driven via a transmission driven PTO or split shaft gearbox design. The system shall be designed to either move the truck or drive the pump; never both concurrently. PTO engagement, from road to pump mode or from pump to road mode, shall occur without gear clash or system shock loading. The auxiliary throttle shall not operate while the PTO is in road mode and the truck accelerator pedal shall not operate while the PTO is in pump mode. PTO engagement shall be controlled from the driver's seated position and shall not occur unless and until selector is in neutral, engine is at idle, and truck parking brake is engaged.

3.30 Winterization system. A winterization system shall be provided for starting in temperatures to -40° F. The winterization system shall include heat sources for engine coolant, engine oil, and fuel tank as well as battery warmers. The winterization system shall be designed to operate externally on 110 or 220 VAC, 50 or 60 Hertz. A labeled light on the instrument panel shall indicate when the AC power is connected. The winterization system shall incorporate high-temperature shutoff switches to prevent overheating of any fluid or component.

3.31 Hydraulic system. If a hydraulic system is utilized, it shall be in accordance with 3.13.1.3 of SAE ARP1247 except as otherwise specified herein. O-ring face seal hydraulic fittings may be used in lieu of flared fittings (see 3.13.1.3.12 of SAE ARP1247). Hydraulic fluid shall be in accordance with MIL-PRF-83282. All hydraulic system components, including the hydraulic tank, shall comply with all corrosion resistance requirements specified herein.

3.32 Brakes. The HSV shall be equipped with an air brake system. The air system shall be rechargeable from auxiliary air lines, using 0.25 inch male style quick-disconnect fittings, one located at the front and one at the rear of the truck. A sealed emergency brake interlock override valve shall be mounted inside the cab. Each air reservoir shall have a manually operated drain valve.

3.33 Spare wheel and tires. All tires and wheels shall be identical and shall be in accordance with the Tire and Rim Association requirements for this application. A spare wheel and tire assembly shall be provided with each HSV. A mount point on the HSV is not required. The wheel and tire assembly shall be secured in the lift platform without damaging any components or material.

3.34 Workmanship. The HSV, including all parts and accessories, shall be constructed and finished in a thoroughly workmanlike manner. Workmanship objectives shall include freedom from blemishes, defects, burrs and sharp corners and edges; accuracy of dimensions, surface

finish, and radii of fillets; thoroughness of welding, painting, and riveting; marking of parts and assemblies; and proper alignment of parts and tightness of assembly fasteners.

3.35 Bolted connections. Bolt holes shall be accurately punched or drilled and shall be deburred. Threaded fasteners shall be tight and shall not work loose during testing or service usage.

3.36 Riveted connections. Rivet holes shall be accurately punched or drilled and shall be deburred. Rivets shall be driven with pressure tools and shall completely fill the holes. Rivet heads shall be full, neatly made, concentric with the rivet holes and in full contact with the surface of the component.

3.37 Gear and lever assemblies. Gear and lever assemblies shall be properly aligned and meshed and shall be operable without interference, tight spots, loose spots, or other irregularities. Where required for accurate adjustment, gear assemblies shall be free of excessive backlash.

3.38 Cleaning. The HSV shall be thoroughly cleaned. Loose, spattered, or excess solder; welding slag; stray bolts, nuts, and washers; rust; metal particles; pipe compound; and other foreign matter shall be removed during and after final assembly.

4. REGULATORY REQUIREMENTS.

4.1 Recycled, recovered materials. Recycled, recovered, or environmentally preferable materials (see 7.3.3) should be used to the maximum extent possible provided that the material meets or exceeds the operational and maintenance requirements, and promotes economically advantageous life cycle costs. The offeror/contractor is encouraged to use recovered materials to the maximum extent practicable, in accordance with 23.403 of the Federal Acquisition Regulation (FAR). However, used, rebuilt, or refurbished items shall not be provided.

4.2 Green Procurement Program. Green Procurement Program (GPP) is a mandatory federal acquisition program that focuses on the purchase and use of environmentally preferable products and services. GPP requirements apply to all acquisitions using appropriated funds, including services and new requirements. FAR 23.404(b) applies and states the GPP requires 100% of EPA designated product purchase that are included in the Comprehensive Procurement Guidelines list that contains recovered materials, unless the item cannot be acquired: a) competitively within a reasonable timeframe; b) meet appropriate performance standards, or c) at a reasonable price. The prime contractor is responsible for ensuring that all subcontractors comply with this requirement.

5. PRODUCT CONFORMANCE PROVISIONS.

The products provided shall meet the salient characteristics of this Commercial Item Description, conform to the producer's own drawings, specifications, standards, and quality assurance practices, and be the same product offered for sale in the commercial marketplace, modified as necessary to comply with the requirements herein. The Government reserves the right to require proof of such conformance.

5.1 Classification of inspections. The inspection requirements specified herein are classified as follows:

a. First production inspection (see 5.2).

b. Conformance inspection (see 5.3).

5.2 First production inspection. The first production HSV shall be subjected to the analyses, demonstrations, examinations, and tests described in 5.5 - 5.5.20. The contractor shall provide or arrange for all test equipment and facilities. Testing and demonstrations shall be performed on a simulated Type III Hydrant System (see 7.3.4). Unless otherwise specified, all testing and demonstrations in which the engine is operated shall be performed using JP-8 turbine fuel.

5.3 Conformance inspection. Each production HSV shall be subjected to the demonstrations, and tests described in 5.5.7 - 5.5.20.

5.4 Inspection requirements.

5.4.1 General inspection requirements. Apparatus used in conjunction with the inspections specified herein shall be laboratory precision type, calibrated at proper intervals to ensure laboratory accuracy.

5.4.2 Data. During all testing specified herein, at least the following data, unless not applicable, shall be recorded at intervals not to exceed 30 minutes. Additional data or shorter intervals shall be provided as appropriate for any specific test.

a. Date.

b. Time started.

c. Time finished.

d. Ambient temperature.

e. Ambient humidity.

5.4.3 Test rejection criteria. Throughout all tests specified herein, the HSV shall be closely observed for the following conditions, which shall be cause for rejection:

a. Failure to conform to design or performance requirements specified herein or in the contractor's technical proposal.

b. Any spillage or leakage of any liquid, including lubricant or hydraulic fluid, under any condition, except as allowed herein.

c. Structural failure of any component, including permanent deformation, or evidence of impending failure.

d. Evidence of excessive wear.

e. Interference between the HSV components or between the HSV, the ground, and all required obstacles, with the exception of normal contact by the tires.

f. Misalignment of components.

g. Evidence of undesirable roadability characteristics, including instability in handling during cornering, braking, and while traversing all required terrain.

h. Conditions that present a safety hazard to personnel during operation, servicing, or maintenance.

i. Evidence of corrosion or deterioration.

5.5 Test methods.

5.5.1 Examination of product. Each HSV shall be examined to verify compliance with the requirements herein prior to accomplishing any other demonstrations or tests listed in 5.5. A contractor-generated, Government-approved checklist (part of the test procedure) shall be used to identify each requirement not verified by an analysis, certification, demonstration, or test, and shall be used to document the examination results. Particular attention shall be given to materials, workmanship, dimensions, surface finishes, protective coatings and sealants and their application, welding, fastening, and markings. Proper operation of each HSV function shall be verified. Certifications and analyses shall be provided in accordance with Table III. Each production HSV shall be inspected to a Government-approved reduced version of the checklist.

TABLE III. Certifications and analyses.

Paragraph	**Required Certifications and Analyses**
3.2 Design and construction.	Contractor certification that the HSV is designed and constructed in accordance with 3.2.
3.2.1 Materials, protective coatings, and finish.	Contractor certification that the HSV's materials, protective coatings, and finishes are in accordance with 3.2.1.

TABLE III. Certifications and analyses - Continued

Paragraph	**Required Certifications and Analyses**
3.2.1.1 Metals.	Contractor certifications that all metals used in the design of the HSV are in accordance with 3.2.1.1.
3.2.1.2 Impregnation of castings.	Contractor certification that the impregnation of casting requirements are in accordance with 3.2.1.2.
3.2.1.3 Elastomers.	Contractor certifications that all elastomeric materials used in the design of the HSV are in accordance with 3.2.1.3.
3.2.1.4 Protective coatings.	Contractor certifications that the protective coatings used on materials in the design of the HSV are in accordance with 3.2.1.4.
3.2.1.5 Dissimilar metals.	Contractor certification that dissimilar metal requirements are in accordance with 3.2.1.5.
3.2.1.6 Finish.	Contractor certification that the finish requirements are in accordance with 3.2.1.6.
3.2.1.7 Fluid traps and faying surfaces.	Contractor certification that the fluid traps and faying surfaces requirements are in accordance with 3.2.1.7.
3.2.1.7.1 Ventilation.	Contractor certification that the ventilation requirements are in accordance with 3.2.1.7.1
3.2.1.9 Rustproofing.	Contractor certification that the rustproofing requirements are in accordance with 3.2.1.9.
3.2.4 Safety.	Contractor certification that the safety requirements are in accordance with 3.2.4.
3.2.5 Electromagnetic interference (EMI).	Contractor certification that EMI requirements are in accordance with 3.2.5.
3.2.6 Human engineering.	Contractor certification that human engineering requirements are in accordance with 3.2.6.
3.2.7 Fastening devices.	Contractor certification that all fastening devices are in accordance with 3.2.7.
3.2.8 Welders and welding.	Contractor certification that all welding requirements are in accordance with 3.2.8.
3.2.9 Foolproofness.	Contractor certification that foolproofness requirements are in accordance with 3.2.9.
3.3.1 Operating temperature range.	Contractor certification that the HSV shall be capable of operating in ambient temperatures ranging from -40 ^{o}F to 125 ^{o}F.

TABLE III. Certifications and analyses - Continued

Paragraph	**Required Certifications and Analyses**
3.3.2 Storage temperature range.	Contractor certification that the HSV shall be capable of being stored in ambient temperatures ranging from -40 ^{o}F to 125 ^{o}F
3.3.3 Salt fog.	Contractor certification that the HSV shall be capable of storage and operation in high temperature, high humidity, salt laden, and sea coast environments without damage or deterioration of performance.
3.3.4 Sand and dust.	Contractor certification that the HSV shall be capable of storage and operation during exposure to wind-blown sand or dust without damage or deterioration of performance.
3.3.5 Humidity.	Contractor certification that the HSV shall be capable of storage and operation at relative humidity from 0 to 100 percent.
3.4.1 Air transportability.	Contractor certification that air transportability requirements are in accordance with 3.4.1.
3.4.1.1 Shoring.	Contractor certification that shoring shall not be required in accordance with 3.4.1.1.
3.4.1.5 Tie downs.	Contractor certification that tie downs are in accordance with 3.4.1.5.
3.5.2 Special tools.	Contractor certification that all special tool requirements are in accordance with 3.5.2.
3.6 Engine and related equipment.	Contractor certification that the engine and related equipment requirements are in accordance with 3.6.
3.7.1 Engine operating fuels.	Contractor certification that the HSV engine shall operate on the fuels specified in3.7.1.
3.7.2 Engine emergency fuels.	Contractor certification that the HSV engine shall operate on the emergency fuels specified in 3.7.2.
3.9 Electrical system.	Contractor certification that the electrical system requirements are in accordance with 3.9.
3.9.1.1 Batteries.	Contractor certification that the battery requirements are in accordance with 3.9.1.1.

TABLE III. Certifications and analyses - Continued

Paragraph	**Required Certifications and Analyses**
3.9.1.3 Battery cables.	Contractor certification that the battery cable requirements are in accordance with 3.9.1.3.
3.12 Mounted Equipment.	Contractor certification that the necessary mounted equipment is provided to fuel and defuel the aircraft from a Type III hydrant system as specified in 3.12.
3.16.1 Filtration system.	Contractor certification the filtration system requirements are in accordance with 3.16.1.
3.16.1.1 Filter vessel.	Contractor certification that the filter vessel requirements are in accordance with 3.16.1.1.
3.16.1.7 Element sealing.	Contractor certification that the element sealing requirements are in accordance with 3.16.1.7.
3.21 Servicing hoses.	Contractor certification that the servicing hoses requirements are in accordance with 3.21.
3.28.1 Chassis.	Contractor certification that the chassis requirements are in accordance with 3.28.1.
3.31 Hydraulic system.	Contractor certification that the hydraulic system requirements are in accordance with 3.31.
3.34 Workmanship.	Contractor certification that workmanship requirements are in accordance with 3.34.
3.35 Bolted connections.	Contractor certification that bolted connections requirements are in accordance with 3.35.
3.36 Riveted connections.	Contractor certification that riveted connections requirements are in accordance with 3.36.
3.37 Gear and lever assemblies.	Contractor certification that gear and lever assemblies requirements are in accordance with 3.37.
3.38 Cleaning.	Contractor certification that cleaning requirements are in accordance with 3.38.
4.1 Recycled, recovered materials.	Contractor certification that the recycled, recovered materials requirements are in accordance with 4.1.
4.2 Green Procurement Program (GPP).	Contractor certification that the GPP requirements are in accordance with 4.2.

5.5.2 Sound level test. A sound level test shall be performed on the defuel pumping system (if required) operations in accordance with the requirements as specified in 3.2.4.3.1. The maximum A-weighted sound levels produced by the truck during pumping operations shall not exceed 84 dBA at a distance of 15 feet from the geometric center of the truck cab and at the operator's position in front of the operator control panel. An additional 2 dBA allowance over this sound level limit shall be permitted in order to provide for variation in test site, temperature gradients, test equipment, and inherent differences in nominally identical vehicles. The test shall be performed on the first production model only.

5.5.3 Electromagnetic interference test. Certification for EMI testing shall be acceptable in lieu of testing. (See Table III).

5.5.4 Environmental testing. Certifications for environmental testing shall be acceptable in lieu of testing. (see Table III).

5.5.5 Weight and dimension tests.

5.5.5.1 Weight and center of gravity test. The weight, center of gravity, and axle weights of the first production HSV shall be measured to demonstrate compliance with the weight requirement of 3.2.10 and the axle weight requirement of 3.4.1.2. The test shall be performed on the first production model only.

5.5.5.2 Dimension measurement. The first production HSV shall be measured to demonstrate compliance with the dimensional requirements of 3.2.10. The test shall be performed on the first production model only.

5.5.6 Transportability verification.

5.5.6.1 Air transportability analysis. Certification for Air transportability analysis shall be acceptable in lieu of an engineering analysis.

5.5.6.2 Equipment removal and reconfiguration demonstration. A first production HSV shall be configured for transport on C-130, C-5, and C-17 aircraft and then reconfigured for operation to demonstrate compliance with 3.4.1.4. It shall be demonstrated that the forces required do not exceed those allowed in MIL-STD-1472. The demonstration shall be performed on the first production model only.

5.5.6.3 Tie down provision verification.

5.5.6.3.1 Tie down provision analysis. Certification for tie downs shall be acceptable in lieu of an engineering analysis.

5.5.7 Flow control system (FCS) test. A FCS test shall be performed to verify the FCS is capable of controlling flow rates from 0 to a minimum of 750 + 0/-25 GPM through the ground discharge hose(s) and flow rates from 0 to 1000 + 0/-25 GPM through the lift platform hose(s) as

required in 3.13.1.1. The test shall also verify the FCS does not allow the flow rate to exceed the rated flow of the fuel filtration system.

5.5.8 Pressure control system (PCS) test. A PCS test shall be performed to verify the PCS is in compliance with the requirements of 3.13.1.2. The test shall verify: (1) the primary PCS is capable of independently controlling the single-point nozzle pressure at the aircraft to a maximum of 52 +3 psig, (2) the secondary PCS is capable of independently controlling the single-point nozzle pressure at the aircraft to a maximum of 57 +3 psig when the primary PCS fails, (3) with a two second shutdown at the aircraft, the PCS is capable of limiting pressure surges at the aircraft to 120 psig at the discharge single-point nozzle(s), (4) the PCS is able to sense fuel pressure through some form of pressure compensator in order to simulate single-point nozzle pressure at the discharge single-point nozzle(s), and (5) the in-line pressure control valve has an opening rate adjustable from 2 to 25 seconds and closing rate adjustable from 10 to 30 seconds. The test shall verify: (1) a pressure relief system is provided to prevent pressure buildup in the pumping system after all fueling operations are complete and single-point nozzles properly stored, and (2) the pressure relief system does not allow backflow of fuel into the recovery tank when the single-point nozzle(s) are connected to the aircraft single-point receptacles.

5.5.9 Pilot control valve demonstration. A demonstration shall be performed to show all pilot control valves are in compliance with the requirements of 3.13.1.3. The demonstration shall show: (1) all flow and pressure control system pilot control valves are located so that a mechanic can observe the operator control panel gauges, operate the controls, and adjust the pilot control valves while standing on the ground, and (2) the necessary safety features are in place for the pilot control valves to prevent unauthorized adjustments to the pumping system.

5.5.10 Defuel system test. If equipped with a defuel system, a defuel system test shall be performed to verify the defuel system is in compliance with the requirements of 3.14. The test shall verify the HSV is capable of: (1) defueling aircraft through the rear ground discharge hoses and through the lift platform hoses, and (2) defueling at a flow rate of 175 gpm without the assistance of aircraft boost pumps and 300 ± 10 gpm with the assistance of aircraft boost pumps with a hydrant pit pressure of 160 pounds per square inch gauge (psig). The test shall verify: (1) the defuel suction line incorporates an 8 mesh low-pressure drop strainer that is easily removed for cleaning, and (2) the defuel system activation occurs when engaging the defuel mode selector switch located on the operator control panel.

5.5.11 Lift platform demonstration. If equipped with a lift platform, a test shall be performed to verify the lift platform is in compliance with the requirements of 3.15. The test shall show: (1) the lift platform has variable height capability, (2) the lift platform is located adjacent to the rear of the cab and provided with two discharge hoses, (3) the lift platform is capable of being lowered to the lowest position with the lift platform hoses connected to the aircraft, (4) the lift platform is equipped with: (a) aluminum guard rails with an entry gate and a toe board, (b) an access ladder or steps, (c) single point single-point nozzle pressure gauge, (d) lift controls and manual override, and (e) an emergency engine shut-off switch; (5) the lift platform has the capability to raise from the stowed position to the height required to allow a small human, as defined by MIL-STD-1472, to service any wide bodied aircraft at the under wing receptacle, (6)

provisions are provided for easy entry and exit of the platform, (7) the lift platform is capable of rising and remaining at any selected height with two 250-pound operators onboard, (8) there are no visible signs of excessive lean, sway, or instability that would constitute an unsafe operating condition of the fully loaded platform in any position, (9) the lift platform is capable of being fully raised or lowered in not less than 15 seconds or more than 35 seconds, (10) a feature is provided to prevent rapid accidental lowering of the platform in the event of any component failure, (11) a lowering device (manual override) is provided that will override the main control and provide a smooth controlled lowering of the platform and is located in a convenient location accessible by the operator from the ground, (12) the wing stop control will stop the platform from ascending if the highest portion of the lift comes in contact with the aircraft wing, (13) the safety interlock sets the parking brakes when the lift platform is not in the full down position, (14) the lift platform has a minimum 2000 pound lift capacity, (15) the lift platform deck does not extend higher than 54 inches from the ground when in the stowed position, and (16) the lift platform incorporates an appropriately sized, weather protected, operator control panel that contains the necessary controls for proper operation of the lift platform.

5.5.12 Water-slug shut-off device demonstration. A demonstration shall be performed to verify the water-slug shutoff device is in compliance with the requirements of 3.16.1.3. The demonstration shall show (1) the shutoff device stops the flow of fuel within 10 seconds when the water in the vessel reaches a predetermined level, (2) resumes fuel flow within 30 seconds when the water is lowered to a predetermined level, and (3) fuel flow is terminated when water is manually introduced into the system.

5.5.13 Fuel recovery tank demonstration. A demonstration shall be performed to verify the fuel recovery tank is in compliance with the requirements of 3.16.1.8. The demonstration shall show: (1) the tank is of sufficient size (24 hours of operational use) to allow for thermal expansion of fuel and fuel from the fuel filtration system air eliminator, (2) the tank is equipped with relief valves and vents as necessary for safe operation, and (3) the tank is equipped with a manual drain valve to allow for complete draining of the tank. The demonstration shall show that fuel recovery tank is equipped with an automatic emptying system that will empty the fuel recovery tank during refueling and defueling servicing operations and incorporates a full tank shutdown system. The demonstration shall show the automatic emptying system: (1) does not utilize an electrically driven pump, (2) does not allow the backflow of fuel into the recovery tank when not in use, (3) returns the fuel up-stream of the fuel filtration system, (4) does not allow the dumping of fuel on the ground, and (5) operates only when the deadman control is actuated. The following features shall be verified: (1) the system shall incorporate an override momentary-on push button located on the operator control panel to allow the manual operation of the automatic emptying system, (2) a gauge is provided on the tank to monitor the level of fuel and is readable by the operator standing on the ground, (3) a high-level warning light, illuminating Red, is provided for the recovery tank and is located on the operator control panel, (4) the high-level recovery tank warning light illuminates whenever the fuel level in the recovery tank exceeds the predetermined level where the automatic return system is scheduled to activate, and (5) the high-level recovery tank warning light remains illuminated until product level drops below the return system activation point.

5.5.14 Hose reel demonstration. A demonstration shall be performed to verify the hose reels are in compliance with the requirements of 3.19. The demonstration shall show: (1) the hose reels are designed for servicing with any portion of the hose unwound, (2) the hose reels are able to rewind the entire flooded hose at a rate of 1.5 feet per second or greater, (3) the hose reels are of the top pull type, (4) the hose reel has features to prevent over-travel during deployment and rewind, (5) the hose reels are furnished with a manual crank for emergency rewinding, and (6) the hose reel is designed to prevent the last 1/2 turn of hose from unwinding from the reel. The demonstration shall verify the following: (1) stainless steel guide rollers with permanently lubricated metal bearings are provided to prevent damage to the hose while winding or unwinding, (2) all moving parts (drive chains, gears, etc.) are equipped with protective coverings to prevent injury to the operator and damage to hoses, (3) provisions are made for storing the crank on the HSV, (4) the hose reel drum size is in accordance with EI 1529, and (5) the rewind assembly incorporates a clutch and brake assembly.

5.5.15 Deadman control system (DCS) test. A demonstration shall be performed to verify the DCS is in compliance with 3.23.1. The test shall verify: (1) the system terminates fuel flow to and from the aircraft in accordance with the parameters as specified in NFPA 407, (2) deactivation of the deadman device terminates fuel flow by: (a) closing the hydrant pit valve, and (b) closing a valve downstream of the hydrant coupler. If an inline control valve is provided, it shall be utilized as the valve downstream of the hydrant coupler. The test shall verify the following: (1) the DCS is equipped with 70 feet of supply hose and is positioned so the control handle can be operated from the operator control panel, ground discharge hose reels, and raised lift platform, (2) the deadman control lever is operable by an operator wearing artic type mittens, (3) the electrical DCS (if provided), has been certified as intrinsically safe and incorporates a timer system for continuous operator input, (4) the electrical DCS (if provided), has provisions for storage of the cable, (5) the deadman hose is stored on a reel, (6) the reel holds at any deployed hose length and incorporates a non-manual rewind system, (7) a ball stop is provided on the deadman hose near the deadman control lever to prevent over wind of the deadman hose, and (8) deactivation of the deadman device when in the defuel mode of operation, returns engine speed to idle regardless of the auxiliary throttle position.

5.5.16 Auxiliary throttle demonstration. A demonstration shall be performed to verify the auxiliary throttle is in compliance with 3.24.1. The demonstration shall be performed in the defuel mode of operation and shall show: (1) the auxiliary throttle is adjustable to within 50 revolutions per minute (rpm) of the maximum rated engine speed or maximum pump speed, (2) the auxiliary throttle is capable of controlling flow, (3) the auxiliary throttle is capable of holding any speed setting, and (4) the auxiliary throttle incorporates an emergency return to idle feature.

5.5.17 Emergency engine shutoff demonstration. A demonstration shall be performed to verify the emergency engine shutoff is in compliance with 3.24.2. The demonstration shall show: (1) the emergency engine shut-off switch shuts down the HSV engine without utilizing any other control(s), and (2) the emergency engine shut-off switch is an on-off toggle switch marked by a red circle, color number 31136 of FED-STD-595, at least one inch in diameter.

5.5.18 Differential pressure gauge demonstration. A demonstration shall be performed to verify the differential pressure gauge is in compliance with 3.24.4.1. The demonstration shall show:

(1) the differential pressure gauge is a non-calibrating gauge that is capable of continuously monitoring the pressure drop across the filter coalescer stage during refuel servicing operations, and (2) the differential pressure gauge is capable of registering and holding the highest-pressure drop achieved during refuel servicing operations.

5.5.19 Emergency fuel shutoff demonstration. A demonstration shall be performed to verify the emergency fuel shut off is in compliance with the requirements of 3.24.5. The demonstration shall show upon activation of each control switch, the flow of fuel flow is terminated in any mode, regardless of whether the deadman device is activated or deactivated. The demonstration shall verify the HSV incorporates three independent switches for emergency fuel shutoff. The location of each switch shall be as follows: (a) one on the operator control panel, (b) one on the passenger's side of the HSV opposite the operator control panel, and (c) one on the operator control panel of the lift platform. The demonstration shall show: (1) the emergency fuel shut-off switch is a toggle switch that is either activated or push pull, (2) the emergency fuel shut-off switch is not recessed, and (3) the emergency fuel shut-off switch is manually operated.

5.5.20 Power take-off (PTO) demonstration. A demonstration shall be performed to verify the PTO is in compliance with the requirements of 3.29.1. The demonstration shall show: (1) the defuel system pump is driven through a transmission driven PTO or split shaft gearbox design, (2) the system is designed to either move the HSV or drive the pump; never both concurrently, (3) PTO engagement, from road to pump mode or from pump to road mode, occurs without gear clash or system shock loading, (4) the auxiliary throttle does not operate while the PTO is in road mode and the HSV accelerator pedal does not operate while the PTO is in pump mode, and (5) PTO engagement is controlled from the driver's seated position and shall not occur unless the selector is in neutral, the engine is at idle, and the HSV parking brake is engaged.

6. PACKAGING. Preservation, packing, and marking shall be as specified in the contract or order.

7. NOTES.

7.1 Source of documents.

7.1.1 Department of Defense and Federal documents. Department of Defense and Federal documents, except for GOST 10227-86, are available online at https://assist.dla.mil/quicksearch/ or from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094. A copy of GOST 10227-86 can be obtained from the Procuring Contracting Officer (PCO).

7.1.2 FAR. FAR may be obtained from the Superintendent of Documents, P.O. Box 371954, Pittsburgh PA 15250-7954. Electronic copies of the FAR may be obtained from https://www.acquisition.gov/far/index.html

7.1.3 ASTM documents. Application for copies should be addressed to ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken PA 19428-2959. Electronic copies of ASTM standards may be obtained from http://www.astm.org .

7.1.4 AWS documents. Application for copies should be addressed to American Welding Society, 550 N.W. LeJeune Road, Miami FL 33126. Electronic copies of AWS standards may be obtained from http://www.aws.org .

7.1.5 SAE documents. Application for copies should be addressed to SAE, Inc., 400 Commonwealth Drive, Warrendale PA 15096. Electronic copies of SAE standards may be obtained from http://www.sae.org/ .

7.1.6 NFPA documents. NFPA documents may be obtained at www.nfpa.org/index.asp or from National Fire Protection Association 11 Tracy Drive Avon, MA 02322.

7.1.7 CFR documents. The Code of Federal Regulations (CFR) may be obtained at http://www.gpoaccess.gov/cfr/index.html or obtained from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC, 20402.

7.1.8 ASME documents. ASME documents may be obtained at www.asme.org or from American Society of Mechanical Engineers, P.O. Box 2900, Fairfield NJ 07007.

7.1.9 Gammon Technical Products. Gammon Technical Products information may be obtained at http://www.gammontech.com/ or from Gammon Technical Products 2300 Highway 34, Manasquan, NJ 08736.

7.1.10 API. API documents may be obtained at www.api.org or from American Petroleum Institute Monogram Program 1220 L Street, NW Washington, DC 20005-4070.

7.1.11 Syn-Tech Fuel Master. Syn-Tech Fuel Master information may be obtained at http://www.syntech-fuelmaster.com/ or from Syn-Tech Systems, Inc. P.O. Box 5258, Tallahassee, FL 32314.

7.1.12 Energy Institute. EI documents may be obtained at http://www.energyinst.org or from Energy Institute, 61 New Cavendish Street, London, W1G 7AR, United Kingdom.

7.1.13 Japanese Industrial Standards. Japanese Industrial Standards can be obtained at http://www.ihs.com/ .

7.1.14 National Institute of Standards and Technology. NIST documents may be obtained at http://www.nist.gov or from NIST, 100 Bureau Drive, Stop 1070, Gaithersburg, MD 20899-1070.

7.1.15 British Standards. BS documents may be obtained at http://www.bsigroup.com or from 389 Chiswick High Road, London, W4 4AL, United Kingdom.

7.2 Ordering data. Acquisition documents should specify the following:

a. Title, number, and date of this CID.

b. Specify Type required (See 2. & 3.15).

c. Defuel System capability, if required (see 3.14).

d. 351GF-14S Moosehead coupling, if required, for hydrant pit connection. (See 3.22)

7.3 Definitions.

7.3.1 Common hand tools. A non-powered tool that is likely to be found in a typical mechanic's toolbox. Common hand tools include open end, boxed end, combination, socket (both 6- and 12-point in both standard and deep-well), and hex key wrenches, in SAE sizes up to and including 1-inch and metric sizes up to and including 25-mm; ratchet handles, extensions, and swivels; slotted and Phillips-head screwdrivers; regular and snap-ring pliers; and a ball-peen hammer.

7.3.2 Special tool. A tool that is not commercially and readily available from a source other than the HSV contractor.

7.3.3 Recycled, recovered materials. Materials collected and recovered from solid waste and reprocessed to become a source of raw materials, as compared to virgin raw materials. The components, pieces and parts incorporated in the HSV may be newly fabricated from recovered materials to the maximum extent practicable, provided the HSV produced meets all other requirements of this CID. Used, rebuilt or re-manufactured components, pieces and parts is not to be incorporated.

7.3.4 Type III Hydrant System. The type III system is an "on demand" type system which maintains a constant pressure of approximately 65 psig. When pressure starts to drop, additional pumps activate. Flow rates of up to 1200 GPM are possible with pressures ranging from 60 to 160 psig at the farthest hydrant outlet from the operating pump house. Aircraft servicing pressure is controlled by a control valve mounted in the hydrant pit. The control valve receives sensing pressure (fuel) and air pressure from the hydrant hose truck. Defueling is accomplished by using the pump on the hose truck to overcome the hydrant pressure.

7.4 Key words.

Air transportable
Commercial aircraft
Hydrant system
Military aircraft

Custodians:
Air Force – 84

Preparing Activity:
Air Force – 84

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Air Force – 99

Agent:
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NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST Online database at https://assist.dla.mil .