

INCH-POUND

ATPD 2334

24 OCT 2003

PURCHASE DESCRIPTION ENGINEERING MISSION MODULE FIRE FIGHTING WATER DISTRIBUTOR

This purchase description is approved for use by the U.S. Army Tank-automotive and Armaments Command, Department of the Army, and is available for use by all Departments and Agencies of the Department of Defense.

1. SCOPE.

1.1 Scope. This purchase description covers an LHS (Load Handling System) Compatible Engineer Mission Module Fire Fighting Water Distributor, hereafter referred to as Water Distributor, for use on the HEMTT-LHS, PLS truck and PLS trailer.

1.2 Executive Summary. The Water Distributor will have a minimum capacity of 1,750 gallons (2,000 gallons desired) and will allow the transportation of partial water loads. The Water Distributor will be outfitted with a tank, water pump, hose reel, water cannon, control panel, swing down folding tank rack, dump valves on both sides and rear and optional heating device. The sole mission of the Water Distributor is to serve as a water tender for the Tactical Fire Fighting Truck. It will be capable of drafting from lakes, streams, and hydrants and transporting water for fire fighting teams and adding additional fire fighting capability. Mobility requirements of the HEMTT-LHS, PLS and PLS trailer will not be affected while transporting the Water Distributor. The Water Distributor must be certified for the transport of water over public highways and meet all EPA, SAE, DOT, and OSHA requirements applicable to a Water Distributor in the 2000 gallon capacity class at the time of manufacture. The Water Distributor shall meet ISO container requirements (stacking not required) of tankracks and meet requirements of worldwide intermodal shipping.

2. APPLICABLE DOCUMENTS.

2.1 General. The documents listed in this section are specified in sections 3 and 4 of the purchase description. This section does not include documents cited in other sections of this purchase description or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements documents cited in sections 3 and 4 of this purchase description, and all requirements listed therein.

2.2 Government documents.

2.2.1 Specifications, standards and handbooks. The following specifications, standards and handbooks form part of this purchase description to the extent specified herein. Unless otherwise specified, the issue of these documents shall be those listed in the issue of the

Department of Defenses Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation.

SPECIFICATIONS

FEDERAL

A-A-393	Extinguisher, Fire, Dry Chemical (Hand Portable)
A-A-50271	Plate, Identification

DEPARTMENT OF DEFENSE

MIL-DTL-5624	Turbine Fuel, Aviation, Grades JP-4, JP-5, and JP-5/JP-8 ST
MIL-C-53072	Chemical Agent Resistant Coating System Application Procedures and Quality Control Inspection
MIL-DTL-83133	Turbine Fuels, Aviation, Kerosene types, NATO F-34 (JP-8), NATO F-35, and JP-8+ 8+100

STANDARDS

FEDERAL

FED-STD-595	Colors Used on Government Procurement
-------------	---------------------------------------

DEPARTMENT OF DEFENSE

MIL-STD-209	Interface Standard for Lifting and Tiedown Provisions.
MIL-STD-1366	Transportability Criteria
MIL-STD-1472	Human Engineering
MIL-STD-461	Electromagnetic Emissions and Susceptibility, Requirements for the Control of Electromagnetic Interference
MIL-STD-464	Electromagnetic Environmental Effects Requirements Interference Standard

2.2.2 Other government documents, drawings and publications. The following other Government documents, drawings and publications form part of this document to the extent specified herein. Unless otherwise specified, the issues are those cited in the solicitation.

CODE OF FEDERAL REGULATIONS (CFR)

29 CFR	Occupational Safety and Health Standards (OSHA), Part 1910
49 CFR	Department of Transportation
40 CFR, parts 86 and 89	Control of Emissions of Air Pollution of Nonroad Diesel Engines

(Copies of the CFR are available from Superintendent of Documents, U.S. Government Printing Office, Washington DC 20402. They are also available on-line at - <http://www.access.gpo.gov/nara/cfr/>)

PURCHASE DESCRIPTIONS

ATPD 2206	Batteries, Storage: Lead-Acid, Maintenance Free
ATPD 2249	Tactical Fire Fighting Truck (TFFT)
ATPD 2304	The Off-Road Family of Vehicles (11 Ton to 16.5 Ton Payloads) and The Heavy Expanded Mobility Tactical Truck (HEMTT) Extended Service Program (ESP)

(Copies of these purchase descriptions are available from the US Army Tank-automotive and Armaments Command, AMSTA-TR-D/210, Warren, MI 48397-5000, or culkins@tacom.army.mil.)

DRAWINGS

11682336	Cable and Plug Assembly, Intervehicular Power Cable
----------	---

(Copies of these drawings are available from the US Army Tank-automotive and Armaments Command, AMSTA-TR-D/210, Warren, MI 48397-5000, or culkins@tacom.army.mil.)

NORTH ATLANTIC TREATY ORGANIZATION (NATO) MILITARY AGENCY FOR STANDARDIZATION (MAS)

STANAG 2413	Demountable Load Carrying Platforms
AVTP 03-160W	Dynamic Stability, dated Sept 1991

(Applications for copies of NATO publications should be addressed to NATO, Agency for Standardization (MAS), 35 Chesam Place, London SW1, England.)

2.3 Non-government publications. The following documents form part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents, which are DOD adopted, are those listed in the issue of the DODISS cited in the solicitation. Unless otherwise specified, the issues of the documents not listed in the DODISS are the issues of the documents cited in the solicitation (See 6.2).

AMERICAN NATIONAL STANDARDS INSTITUTE, INC. (ANSI)

ANSI/ASQC Z1.4	Sampling Procedures and Tables for Inspection by Attributes
ANSI Z535.4	Instruction, Lubrication, Caution, Warning and Operating plates

(Application for copies should be addressed to the American National Standard Institute, 11 W. 42nd Street, New York, NY 10036)

AMERICAN WELDING SOCIETY (AWS)

AWS D1.1	Structural Welding Code - Steel (DOD Adopted)
AWS D1.2	Structural Welding Code Aluminum (DOD Adopted)
AWS D1.3	Structural Welding Code - Sheet Steel (DOD Adopted)
AWS D14.3	Specification for Welding Earthmoving and Equipment

(Copies are available from the American Welding Society, 550 NW LeJeune Road, Miami, FL 33126.)

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

ASME Sec. VIII, Div. 1 Rules for the Construction of Pressure Vessels

(Copies are available from the American Society of Mechanical Engineers, 3 Park Avenue, New York, NY 10016)

GERMAN INDUSTRIAL STANDARDS

DIN 30722 Pay-Off Dump Trucks up to 32T (Flatrack Critical Dimensions)

(Copies are available from Global Engineering Documents, An IHS GROUP Company, 15 Inverness Way East, Englewood, Colorado 80112.)

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION (ISO)

ISO 668	Series 1 Freight Containers – Classification External Dimensions and Ratings
ISO 1161	Specifications for Corner Fittings For Series 1 Freight Containers
ISO 1496-3	Series 1 Freight Containers – Specifications and Testing – Part 3: Tank Containers for Liquids, Gases, and Pressurized Dry Bulk
ISO 1496-5	Series 1 Freight Containers – Specifications and Testing – Part 5: Platform and Platform Based Containers

(Application for copies of ISO standards should be addressed to the American National Standards Institute, 11 West 42nd Street, New York, N.Y. 10036.)

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 10	Standard for Portable Fire Extinguishers (National Fire Codes, vol. 1)
NFPA 1901	Standard for Automotive Fire Apparatus (DoD Adopted)
NFPA 1961	Standard on fire Hose (DoD adopted)

(Application for copies should be addressed to the National Fire Protection Association, One Batterymarch Park, Quincy, MA 02269-9101)

SOCIETY OF AUTOMOTIVE ENGINEERS (SAE)

SAE J185	Access Systems for Off-road Machines (DoD Adopted)
SAE J336	Sound Level for Truck Cab Interior
SAE J534	Lubrication Fittings (DoD Adopted)
SAE J753	Maintenance Interval Chart (DoD Adopted)

(Copies of these documents are available from the Society of Automotive Engineers, Department 105, 400 Commonwealth Drive, Warrendale, PA 15086.)

2.4 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Description. The Water Distributor is an ISO compatible system that will provide the ability to transport, store and distribute non-potable water using the HEMTT-LHS truck (M1120) and PLS trailer (M1076) with the HEMMT-LHS truck and the PLS truck (, M1075) as the prime mover. The sole mission of the Water Distributor is to serve as a water tender and provide additional fire fighting capability to the Tactical Fire Fighting Truck. The Water Distributor shall be compatible for transport, operation and use on the respective truck/trailer throughout the mission profile. The Water Distributor will be powered by an on-board diesel engine. The Water Distributor must be certified for the transport of water over public highways.

3.2 Commonality. Unless otherwise specified, commonality of parts shall be maintained to the maximum extent possible with the Tactical Fire Fighting Truck (TFFT) ATPD 2249. The Water Distributor and all components, parts and accessories shall be of the standard or optional commercial fire fighting type. The Water Distributor shall be complete in all respects as normally delivered to commercial users of fire fighting water tenders.

3.3 Test and acceptance. When specified (see 6.2) a sample shall be subjected to test and acceptance IAW 4.5.

3.4 Materials. Unless specified otherwise, the manufacturer shall be responsible for selecting materials capable of meeting all operational and environmental requirements as specified herein. The contractor shall verify that the materials used in the Water Distributor components are as specified in this document and meet all of the operational and environmental requirements specified herein.

3.4.1 Ozone depleting substance. Class 1 and Class II ozone depleting substance shall not be used in the design, manufacture, test, operation or maintenance of the Water Distributor. Any chemical substance, identified as an Ozone Depleting Substance, must be replaced by a NON-DEPLETING substance, or certified to be of such a necessity to the mission requirements of the end item as to prevent the accomplishment of the mission if it cannot be replaced.

3.4.2 Radioactive material. No radioactive material shall be used in any part of the Water Distributor.

3.4.3 Asbestos material. No asbestos material shall be used in any form in any part of the Water Distributor.

3.4.4 Resistance to fuel. Materials used for Water Distributor components shall be inherently resistant to, and shall not absorb, any fuels referenced in this PD.

3.4.5 Resistance to fungus. Materials that are nutrients to fungi shall not be used for Water Distributor or shall be treated with a fungicidal agent.

3.4.6 Reserved.

3.4.7 Deterioration prevention and control. The Water Distributor components shall be fabricated from compatible materials, inherently corrosion resistant or treated to provide against corrosion and deterioration during storage and operational conditions experienced. The Water Distributor shall be capable of operation in a military environment including extended periods in high humidity, salt spray, road de-icing chemicals atmospheric contamination, gravel impingement, and temperature extremes for a ten-year service life. Surfaces not painted or subject to relative movement or wear shall be alternatively protected from corrosion. There shall be no corrosion requiring repair or replacement of parts between semi-annual maintenance inspections. No actions beyond normal washing, semi-annual maintenance and replacement of damaged paint shall be necessary to keep the corrosion prevention in effect. Such capability shall be achieved by a combination of production techniques, materials selection and design features.

3.4.8 Dissimilar metals. Dissimilar metals shall not be used in contact with each other except to complete an electrical circuit or protect against galvanic corrosion.

3.4.9 Recycled, recovered or environmentally preferable materials. The components incorporated into the Water Distributor shall be newly fabricated. Used, rebuilt or remanufactured components, pieces and parts shall not be incorporated into the Water Distributor.

3.4.10 Metal fabrication. Metal used in the fabrication of the Water Distributor shall be free from kinks and sharp bends. The straightening of material shall be done by methods that will not cause injury to the metal. Flame-cut material and welds shall be free of slag. All bends of a major character shall be made with controlled means in order to insure uniformity of size and shape. Precautions shall be taken to avoid overheating.

3.4.11 Painting. All painting shall be performed IAW MIL-C-53072 using only those cleaning, pretreatment, primer, and topcoat specifications contained therein except that a A-A-52474 can be substituted for MIL-P-53084. It is the responsibility of the contractor to select the proper pre-treatment, primer and topcoat to achieve short term and long term adhesion and corrosion resistance. Regardless of the number of layers of topcoat, the total dry film thickness (from substrate to outer layer) shall not exceed 13 mils. Adhesion and corrosion resistance examination and certification (4.1.3 and 4.1.5) shall be the methods by which paint and pre-treatment systems are qualified. Parts normally not painted in commercial practice, such as tires, hoses and hydraulic cylinders, shall not be painted but shall be protected against corrosion.

The WD exterior treat, prime and paint requirements were developed to provide a surface of low reflectivity, no effort shall be made to counter that effect. All metal and plastic surfaces not normally painted shall be prepared, treated and finished to provide a matte finish. There shall be no exposed chrome, reflective surfaces, or ornamental trim.

3.4.11.1 Camouflage pattern. The WD shall be painted in accordance with Government furnished camouflage pattern. Variants not requiring camouflage pattern shall be painted Green 383 - color chip #34094 or Tan 686 - color chip 33446) in accordance with (IAW) Fed-STD-595 as specified by the Procurement Contracting Officer under a contract modification.

3.4.12 Welding. All welding shall be accomplished IAW one or more of the following, or the equivalent, as appropriate:

AWS D1.1 - Steel

AWS D1.2 - Structural Aluminum

AWS D1.3 - Sheet Metal

AWS D14.3 - Specification for Welding Earthmoving and Equipment

ASME - Sec. VIII, Div. 1 – Rules for the Construction of Pressure Vessels

3.4.13 Workmanship. All parts, components, and assemblies of the Water Distributor including castings, forgings, molded parts, stampings, machined surfaces, and welded parts shall be clean and free from defects that compromise, limit or reduce the capability of the Water Distributor to meet the requirements specified herein. Any components, parts, or assemblies which have been repaired or modified to overcome deficiencies shall not be used without prior specific approval of the Procurement Contracting Officer (PCO). Welded, bolted and riveted construction utilized shall be in accordance with the highest standards of the industry. Any area in which hydraulic or electric lines pass shall be radiused so as to prevent wearing and cutting. All hydraulic lines shall be mounted and secured to prevent chafing due to relative motion. All lubricants provided shall be clean and used IAW their intended use. Wherever possible, components, wiring, fuel lines, and hydraulic lines shall be mounted in protected locations to minimize the possibility of damage from normal use. No evidence of fluid leaks, beyond weep (6.5.4.1) or seep (6.5.4.2), shall be present with the exception of packed joints that shall exhibit no more than one drip (6.5.4.4) per minute.

3.4.14 Lubrication. Lubricants shall be standard military or commercial equivalents. All surfaces requiring lubrication shall be provided with means of lubricating. Permanently lubricated (6.5.6) joints, surfaces and/or bearings shall be used where practicable. When permanently lubricated joints, surfaces and/or bearings cannot be used, lubrication fittings IAW SAE J534 shall be provided and shall be located in a protected position accessible to a grease gun with a flexible 10-inch extension. Accessibility shall be provided without removal or adjustment of accessories or parts. A lubrication data plate (see 3.4.5.2) identifying the lubrication points shall be mounted in a readily visible location on the Water Distributor.

3.5 Compatibility. The Water Distributor shall be compatible with the TFFT, HEMTT-LHS, PLS, as well as other military and commercial transport means as described herein. The Water Distributor shall be capable of being safely transported throughout the mission profile on the

HEMTT-LHS, PLS truck, and PLS trailer systems. When transporting the Water Distributor, the current level of HEMTT-LHS, PLS truck, and PLS trailer mobility and stability shall be maintained regardless of liquid level IAW AVTP (Allied Vehicle Test Publication) 03-160W.

3.5.1 LHS/PLS compatibility. The water tank rack system shall meet the LHS interface requirements of DIN 30722 and STANAG 2413. It shall have removable rollers so that it is compatible with the M1076 PLS trailer. It shall be capable of being loaded on and unloaded from the HEMTT-LHS, PLS truck, and PLS trailer empty, full desired, using only the HEMTT-LHS and PLS load handling system. Provisions shall be provided to securely store the rollers when required.

3.5.2 ISO compatibility. The Water Distributor shall conform dimensionally to the requirements of Table 2 of ISO 668 as a 1C or 1CX twenty (20) foot container. The container frame shall have corner fitting locations that conform to ISO 668 for a 1C or 1CX container. Upper and lower corner castings shall conform to ISO 1161. When stowed for transport, all accessories and components, including add-on items as applicable, shall fit within the ISO interface dimensions (except the water cannon, which may extend above the top dimension). The Water Distributor shall be designed for and capable of being lifted from the four top corner fittings, four bottom corner fittings, meeting the external restraint (longitudinal), and transverse and longitudinal rigidity requirements of ISO 1496-3. Contractor shall obtain ISO cert prior to FUI.

3.5.3 Forklift compatibility. The Water Distributor shall have forklift pockets, for empty lifting, conforming to ISO 1496-5. The Water Distributor shall be protected from accidental piercing by the forklift tines when the tines are inserted into the fork pockets. The tank and Water Distributor components shall be within the physical envelope of the ISO frame to avoid contact with the forklift carriage.

3.5.4 Electrical Interface. Electrical interface to the truck from the Water Distributor shall be provided through the electrical portion of the Universal Power Interface Kit (UPIK) on the Truck (Appendix C). A storage location (e.g., a dummy connector) shall be provided on the Water Distributor for any electrical interface connectors when not in use and shall provide mechanical restraint and environmental protection.

3.5.6 Pneumatic Interface. Pneumatic interface to the truck from the Water Distributor shall be provided through the pneumatic portion of the Universal Power Interface Kit (UPIK) on the Truck (Appendix C). A storage location (e.g., dummy connector) shall be provided on the Water Distributor for any pneumatic interface connectors when not in use and shall provide mechanical restraint and environmental protection.

3.6 Human Systems Integration (HIS)/MANPRINT.

3.6.1 Manpower and Personnel. The EMM-WD will not require any increase in the overall number of operators, maintainers, or support personnel over the predecessor 6000-gallon water distributor. Introduction of this system into engineer units will not require any increase in physical, sensory, or mental abilities of the personnel who are responsible for its operation, maintenance or support. The Water Distributor shall be operated by MOS 62J, 51M (as of 30 September 2003, these MOSs will be deleted and will become 21J and 21M, respectively), and maintained by MOS 62B soldiers. The Water Distributor shall not add any additional limitations

on the operator or maintainers of the system.

3.6.2 Human Factors Engineering (HFE). The contractor shall ensure that HFE considerations are an integral part of the engineering and design considerations in the Water Distributor configuration. Additional guidance on HFE design considerations in this area may be obtained from MIL-STD-1472 or commercial equivalent standards. The WD controls, displays, symbology, and operating procedures will promote smooth, expeditious, and error free system operation. Several HFE functional areas of particular concern include General Requirements, Control and display Integration, Visual Displays, Controls, Labeling, Anthropometry, Design for Maintainer, Operational Ground and shipboard Vehicles, Hazards and Safety, and User-Computer Interface. Include features that augment soldier survivability by minimizing system detectability, probability of being attacked if detected, probability of damage if attacked, and soldier fatigue and injury. HFE requirements shall include provisions for effective man-machine interface and preclude any Water Distributor characteristics which would require extensive cognitive, physical, or sensory skills; complex manpower or training intensive tasks; or which result in frequent or critical human performance errors during operation, maintenance, or deployment of the system. The Water Distributor shall be deployable, emplaceable, operable, recoverable and maintainable in daylight and darkness by 5th percentile female through 95th percentile male soldiers (as defined in MIL-STD-1472) dressed in Battle Dress Uniform (BDU), cold-wet weather protective clothing, Fire Fighting Gear, and the protective ensembles for Mission Oriented Protective Posture (MOPP) Levels 0 through IV. Operator workload, accuracy, time constraint, mental processing, or physical requirements shall not exceed operator or maintainer capabilities.

3.6.3 Health and Safety. The Water Distributor shall be safe to operate, transport, maintain, and store. A fail-safe design shall be provided for all aspects of the Water Distributor that may result in damage to equipment or injury to personnel. Safety and the elimination of Health Hazards shall be given major consideration during the engineering and design process. Hazards which expose personnel or equipment to injury or damage shall be eliminated or controlled. The Water Distributor shall not pose any uncontrolled health or safety hazards to trained soldiers. Exposed parts and contact surfaces which are subject to high operating temperatures (defined as 140° F for momentary contact and 120° F for prolonged contact) shall be shielded. Moving or rotating parts that are a hazard to personnel shall be enclosed or guarded. High-pressure lines or hoses and exhaust gases shall be vented or routed away from the operator's station and console. Protective devices shall not impair operating or maintenance functions. Gauges, warning lights, and control indicators shall use commercially accepted or military standard (ref. only MIL-STD-1472, Section 5) safety conventions.

3.6.4 Noise Limits. Noise levels produced by the Water Distributor shall not exceed 90 dB(A) at the operator's position and at occasionally occupied positions defined to be one meter perimeter horizontally from any location on the perimeter of the Water Distributor at a height of 1.6 meters above the ground. Noise levels will be measured in accordance with SAE J336 or equivalent. At any location in the vicinity of the Water Distributor that exceeds 85 dB(A), hearing protection shall be required in these areas and the requirement for hearing protection shall be clearly displayed on the Water Distributor.

3.6.5 Freeze prevention. An additive or a Cold Weather Kit shall be provided to allow water re-supply operations and storage in ambient temperatures of 32°F to -25°F. The additive or Cold Weather Kit shall maintain water temperature above 40 deg F in the storage tank and all piping with the exception of the hose reel (3.7.1.2). The hose reel shall remain available for use with the Cold Weather Kit installed. The use of an outside power source is permissible but shall be limited to 120/240 AC electrical generators.

3.6.6 Operation. The operator shall be capable of performing all of the Water Distributor's loading and dispensing operations while it is mounted on the Palletized Load System (PLS) trailer, while it is mounted on the HEMTT-LHS/PLS truck or similar vehicle, or while it is sitting on the ground.

3.6.7 Weight. The maximum gross weight of the Water Distributor, fully loaded with water and all associated components, shall not exceed 26,000 pounds.

3.6.8 Lighting.

3.6.8.1 Light Bars. Two rows with three (3) red element strobe type light bars in each row shall be mounted on top of the Water Distributor. The light bar shall have both forward and side facing strobe heads. A switch on the cab control box (3.7.4.2) shall control the light bar.

3.6.8.2 Forward Strobe Lights. Two forward flashing red strobe warning lights shall be provided. The lights shall be not more than 48 inches above the ground. The light shall flash at a rate of 60 cycles per minute. A switch on the cab control box (3.7.4.2) shall activate the forward strobe lights

3.6.8.3 Rear Strobe Lights. Two rearward flashing red strobe warning lights shall be provided. The lights shall be not less than 72 inches above the ground. The light shall flash at a rate of 60 cycles per minute. A switch on the cab control box (3.7.4.2) shall activate the rearward warning lights.

3.6.8.4 Intersection Lights. Four red strobe intersection lights shall be provided. The lights shall be side facing and shall be mounted at the lower front and rear corners of the Water Distributor. The lights shall flash at a rate of 60 cycles per minute. A switch on cab control box (3.7.4.2) shall activate the intersection lights.

3.6.8.5 Work Lights. Two (2) diffused lens work lights shall be mounted at the upper rear corners of the vehicle. The lights shall be a minimum 50,000 candlepower each and shall adjust vertically a minimum of 45 degrees above and below horizontal. The work lights shall rotate a minimum of 345 degrees.

3.6.8.6 Floodlights. Two (2) clear lens floodlights, that can telescope a minimum of three feet from the apparatus, shall be mounted on each side of vehicle accessible from the pump panel. The lights shall be a minimum 50,000 candlepower each and shall adjust vertically a minimum of 45 degrees above and below horizontal. The lights shall rotate a minimum of 345 degrees.

3.6.9 Compartments. All compartments shall be designed to allow for adequate storage space and for easy access to and removal of stowed equipment by fire fighting crew in the 5th percentile female through 95th percentile male soldiers. All compartments shall have heavy-duty compartment doors and drain holes. Doors will be sealed to ensure weather-resistant compartments. Door latch handles shall be operable with one hand. Shelving shall support a minimum of 200 lbs. without permanent deformation and shall be adjustable without removal of

fasteners. Compartment doors will have positive door open option to prevent unexpected door closing and shall include keyed-alike locking latches flush with the body of the vehicle. All handles, latches, controls, mounted equipment, compartments and access panels shall be arranged to avoid interference occurring during operations, and shall have space to provide clearance for large gloved hands, artic clothing and mittens, decontamination clothing and mittens, and fire fighting clothing and mittens.

3.6.10 Hose storage. The Water Distributor will be equipped with the following types of hose storage.

3.6.10.1 Hose Beds. The vehicle hose bed shall store 400 feet of 3-inch double-jacketed NFPA water hose. A hose bed having an open design will include dark colored vinyl cover for hose protection from ultraviolet radiation and shall be mildew, water resistant and fire resistant, or corrosion resistant.

3.6.10.2 Suction Hose Storage. Provisions shall be made to carry the 30 feet of 5 inch suction hose and its pre-filter and float (3.7.2.6).

3.6.10.3 Hose Reel. An electric rewind hose reel having a minimum of 150 feet of minimum 1.5 inch diameter hose IAW NFPA 1961 shall be provided. An adjustable nozzle shall be provided on the end of the hose.

3.6.10.4 Connection Time. The Water Distributor must be easy for soldiers to quickly hook up within 5 minutes, with the desired connection time of 1 minute.

3.6.10.5 Fire extinguisher. A 10 pound ABC rated fire extinguisher shall be provided. The fire extinguisher shall be mounted in a readily accessible location, but away from the power supply (3.7.2.3). Reference NFPA 10.

3.7 Major components.

3.7.1 Tank. The water tank, in accordance with NFPA 1901, shall have a minimum rated capacity of 1750 gallons with a desired capacity of 2,000 gallons. Tank will be baffled in accordance with NFPA Bulletin 1901 requirements. Baffles will have vent openings at both the top and bottom to permit movement of air and water between compartments. The water tank mounting system will allow for off-road use. The tank will be durable for extended off-road (cross-country) operations.

3.7.1.1 Tank Venting. The tank shall be vented to relieve pressure during maximum fill rate and combined discharge operations, and shall be capable of relieving excess liquid in the event of tank overflow. Vents shall not be fabricated of collapsible hose. Drainage shall not flow over the outer panels or in the tracks of the vehicle tires and shall be below the Water Distributor's lowest body panel/structural member. The vent shall be sized to meet the quick dump requirements (3.7.8).

3.7.1.2 Tank Fills. Two 2 1/2 inch National Hose Thread female connections on each side at the rear of the Water Distributor shall be provided. The connections shall not be located higher than 48 inches above the ground. Each connection shall have a replaceable 1/4 inch mesh strainer, a manual drain valve, a check valve, 45 degree turn-down fittings, and a chained on rocker lug

plug or cap.

3.7.1.3 Manhole. The water tank shall be equipped with a removable manhole cover with a clear opening diameter of not less than 20 inches. A covered top opening of not less than five inches internal diameter with a removable 0.25 inch strainer shall be provided for gravity filling or pump filling the tank from above. The fill opening may be incorporated as part of the manhole cover.

3.7.1.4 Water level indicator. The Water Distributor shall be equipped with a tank water level indicator, located on the control panel (3.7.4). Levels of "Full", "3/4", "1/2", "1/4" and "Empty" shall be indicated by colored electric lights.

3.7.2 Pump assembly. The pump assembly, in accordance with NFPA 1901, shall have a 600 GPM water pump directly driven off of the diesel engine, shall be provided. The pump shall be capable of continuous operation for a minimum of eight hours, at varying output levels, without degradation. The pump shall be tolerant of debris in the water supply either through construction or an appropriate pre-filter. The pre-filter(s), if used, shall have a minimum service life of 100 hours and shall be serviceable by the operator in 10 minutes. A method of draining the water pump with on-board tools, without tools desired, shall be provided for cold weather storage. The pump shall be tested by the supplying vendor per NFPA 1911.

3.7.2.1 Temperature Relief. The pump shall be equipped with a pressure relief governor and an automatic temperature relief device to discharge agent to the ground below the truck (lowest body panel / structural member) and not flow in the tracks of the tires, when temperatures in the pump exceed 170 degrees F.

3.7.2.2 Priming. The Water Distributor shall be equipped with a motor driven primer pump. The primer pump shall have the capacity to prime the dry fire pump through 30 feet of hard suction hose at a 10-foot lift. The primer pump shall develop 22 inches Hg vacuum at a pressure altitude of 1,000 feet and conform to standards outlined in NFPA Pamphlet No.1901.

3.7.2.3 Power source. Power for the Water Distributor shall be provided by an integral Diesel Engine. The diesel engine shall be equipped with a muffler with a rain cap. The diesel engine shall be operable on JP-8 fuel IAW MIL-DTL-5624 as well as standard diesel IAW MIL-DTL-83133. The engine shall be monitored and controlled at the control panel (3.7.4) and have the following features: a safety shutdown, a non-keyed ignition switch, a tachometer, an hour meter, and any other necessary gauges shall be included. Two 12-volt batteries shall be included to provide power for all electrical requirements of the Water Distributor. The batteries shall be housed in a battery box sized to accept two 6TMF (ATPD 2206) batteries. A 24 VDC slave starting system shall be provided that has a NATO slave connector compatible with the Intervehicular Power Cable identified in US Army Drawing 11682336. A tethered dust cap shall be provided for the NATO Slave Connector. The power source shall be capable of meeting all performance requirements specified in this PD. It shall be capable of starting and operating in all environmental conditions referenced in section 3.11, and shall be capable of operating on all fuels specified in section 3.6.2. It shall also be equipped with an integral recharging capability to maintain sufficient battery charge during all modes of operation as specified in this PD.

3.7.2.4 Power source housing. A nominal enclosure per 3.6.9 shall be included to protect the power source and pump assembly during transport, and minimize noise signature during

operation. Any such enclosure shall in no way inhibit cooling of the engine such that excessive temperatures are reached under any operating condition specified in this PD.

3.7.2.5 EPA compliant power source. As applicable, the power source provided with the Water Distributor shall have an EPA emission certification as specified in CFR Title 40, parts 86 and 89.

3.7.2.6 Starting system. The Water Distributor power source shall be equipped with an electric start capability. Cold starting aids may be included with Water Distributor to assist in starting at low temperatures.

3.7.2.7 Self Loading. To provide for the filling of the Water Distributor tank from an outside water supply it shall have the capability to pump non-potable water, salt water desired, into the tank from a source ten (10) feet below the level of the pump. The water modules shall have both CONUS and OCONUS (NATO) adapters to fill from hydrants. Self loading shall be accomplished with a minimum 5 inch diameter flexible, non-collapsing loading hose that is also compatible with the TFFT pump suction fitting, reference NFPA 1961. A minimum of 30 feet of hose, in one or more sections, shall be furnished with each Water Distributor. A pre-filter, with integral float, that attaches at the inlet end of the loading hose with a quick disconnect fitting shall be provided.

3.7.3 Piping system. The Water Distributor piping system shall be designed in accordance with NFPA 1901, and to allow easy access to all components for maintenance, repair and operation. All discharge and filling ports specified herein shall be equipped with NST type fittings with captive dust caps or plugs as applicable. All ports, with the exception of top loading, shall be equipped with shut-off valves. All ports shall be located within the Water Distributor ISO structure. A shut-off valve shall be provided at the Control Panel, for all tank/piping system interfaces to allow flow stoppage from the tank. All valves or valve controls used in the Water Distributor piping system shall be easily accessible to the operator at the control panel.

3.7.4 Control Panel. The Water Distributor shall have a pump operator's control panel, on the driver's side of the truck, accessible from the ground, to monitor engine and water flow functions and control valves. A weatherproof cover shall be provided to protect the operator's control panel from the weather when the panel is not in use. Controls and instruments shall be grouped by function. Instruments with warning lights shall also have audible alarms. The pump panel shall be accessible for maintenance. Instruments shall be lighted for night operation. In addition to the controls requirements of NFPA 1901, the following shall be provided:

- 1) Panel activation switch, including the panel lights.
- 2) Fuel level gauge with low level warning light.
- 3) Engine Voltmeter/Tachometer/Hour Meter.
- 4) Emergency engine shutdown switch.
- 5) Water tank level 4 light sensor, with a low level warning light and timed 30-second alarm.
- 6) Fire pump temperature gauge with high temperature warning light.
- 7) Weather resistant speaker and microphone, and headset jack.

3.7.4.1 Operational fault controls. In addition to the emergency engine shutdown switch, the following sensors shall be incorporated into the Water Distributor:

- a. Excessive heater temperature;
- b. Low oil pressure and excessive temperature for the Water Distributor pump power source;
- c. Low water level pump power source.
- d. Tank overfill on board

When a sensor is activated, sufficient indication of the condition(s) shall be provided to the operator via warning lights on the control panel. After the condition which caused activation of the sensor is resolved, the system shall be capable of resetting to normal operating status.

3.7.4.2 Cab Control Box. The Water Distributor shall be equipped with cab control, in the form of a portable control box, which shall provide limited control of a Water Distributor on the truck from the cab of the truck (see 3.5.4 for interface requirement). The control box shall have an attachment mechanism such that it is readily removable and visible to the operator when seated in the driver's seat of the truck. Removal or installation of the control box shall be accomplished by the operator in five minutes or less and without the use of tools. An environmentally protected storage space for the control box, for use when not in the cab of the truck, shall be provided on the Water Distributor. Switches and displays on the control box shall be protected from damage during handling.

3.7.5 Folding Tank Rack. The Water Distributor will be equipped with a swing down folding collapsible tank suitable for conducting quick dump water shuttle operations. The folding tank shall be equal to or greater in volume than the Water Distributor main tank. The tank shall be capable of being set up and disassembled by two persons and be stowed on a rack on the side of the Water Distributor.

3.7.6 Water cannon. A rear mounted water cannon shall be provided. Control of the water cannon shall be from a platform at the rear of the Water Distributor. The water cannon shall be capable of directing the output over a minimum 180-degree, 360-degree desired, are centered about the rear of the Water Distributor. The water cannon shall be capable of delivering water a minimum of 125 feet, 175 feet desired, away from the Distributor. A non-adjustable and an adjustable firefighting nozzle with a stream pattern shall be provided with the water cannon.

3.7.8 Quick Dump. The Water Distributor shall incorporate three dump valves (one on each side of the tank and rear), that empties the entire system within 2 minutes. The water must be capable of being dumped to either the right side, the left side or the rear of the vehicle through an extension chute that protrudes 14 inches minimum beyond the vehicle frame. Control of the dump valve shall be from the Control Panel (3.7.4) and the truck Cab Control Box (3.7.4.2).

3.7.9 Discharge Connections. Two 2 ½ inch male National Hose Thread discharge connections shall be provided on each side of the Water Distributor, accessible from the ground. Each discharge shall have a control valve, a manual drain, a 45-degree turndown fitting, and a chained on rocker lug cap.

3.8 Non-major components.

3.8.1 Basic Issue Items (BII). The following adapters, wrenches and hose shall be provided with the Water Distributor to allow interfacing with commercial and Army water storage and

distribution equipment:

- 3 - Universal Hydrant Wrench Holders with 1 – Hydrant and 2-Spanner Wrenches
- 2 - 2 1/2 inch to 2 1/2 inch male to male NST adapter
- 2 - 2 1/2 inch to 2 1/2 inch female to female NST adapter
- 8 - 50 foot sections of 3 inch double jacketed NFPA water hose (with 2 1/2 inch fittings)

Recessed locking latches are required to provide physical security of the BII compartment(s).

3.8.2 Water Cannon Operator's platform. The design shall incorporate a platform with a railing that when deployed shall allow for the safe operation of the Water Distributor when the Water Distributor is loaded on the truck or trailer. The platform shall be strong enough to support two personnel simultaneously, and be located such that it can be deployed and secured for transport from the ground. Provisions to access the platform from the ground shall be provided to allow safe operator access and departure. All Platforms, Catwalks, and Steps shall be IAW SAE J185.

3.8.3 Catwalks, and Steps. A catwalk with a railing shall be provided on top of the water tank from front to rear. All Platforms, Catwalks, and Steps shall be IAW SAE J185.

3.8.4 Tools and maintenance items. The Water Distributor shall be equipped with any tools necessary for safe and efficient operation and crew maintenance. All tools shall be positively attached or stored on the Water Distributor. The Government reserves the right to determine if a tool is necessary.

3.8.5 Fire extinguisher. The Water Distributor shall be equipped with a minimum of one fully charged fire extinguisher, mounted in quick release brackets. The brackets shall hold the fire extinguisher securely during transport of the Water Distributor in the HEMTT-LHS and PLS mission profile but shall be capable of quick release by soldiers wearing MOPP IV protective clothing and cold weather gear. The extinguisher shall be accessible to personnel standing on the ground. Protection from mud, water, ice, and damage during transport shall be provided. Adequate storage box space shall be provided per 3.5.9.2 to allow alternative stowage. The extinguisher shall be dry chemical Type 1 with a 4A:60B:C rating, 10-pound capacity IAW A-A-393.

3.8.6 Identification and data plates. An Identification Plate shall be provided and shall contain, as a minimum, the model number, nomenclature, national stock number, serial number, USA registration number, contract number, contractor's name, and date of manufacture. A sample Identification plate is provided in Appendix A, format is optional. The Water Distributor shall also have a Transport Data Plate. The Transport Data Plate shall show the Water Distributor tare weight, gross weight, and shipping weight (tare weight plus 500 pounds). A Water Distributor side and end view shall be used to indicate overall dimensions, lifting and tiedown provisions, and center of gravity locations. Procedures for lifting shall be depicted. The WD shall have a UL data plate for fire department pumps. Additional Data Plates shall be provided as required. Identification and data plates shall be constructed IAW A-A-50271, Composition A or C, installed in a readily visible location and shall be attached with rivets, screws, or bolts.

3.8.7 Instruction, lubricating, caution, warning and operating plates. A Lubricating Plate IAW

SAE J753 shall be provided except that it shall reference military lubricants. The lubricating plate shall be installed adjacent to the Identification Plate. Instruction, Caution, Warning and Operating plates shall be provided as required. Cautions and warnings shall comply with ANSI Z535.4. Instruction, Lubricating, Caution, Warning and Operating Plates shall be constructed IAW A-A-50271 or equivalent. Rigid metal plates shall be attached with rivets, screws, or bolts. Flexible plates shall use a fastening system adequate to ensure the plate remains attached for the service life of the Water Distributor.

3.8.8 Markings. Water Distributor markings such as safety and instructional markings shall be letters or numerals one inch in height. Painted markings, letters and numerals shall be lusterless black paint. Color shall conform to Chip No. 37030 of FED-STD-595. "CARC" shall be painted in black block letters no larger than one inch in a conspicuous location near the identification plate. Compliance will be verified during FUI, PVT, QCI and FPT.

3.9 Transportability. The Water Distributor shall be transportable worldwide without special permits by highway, rail, marine, and air modes worldwide as specified in MIL-STD-209 and MIL-STD-1366. When mounted on a truck or PLST the Water Distributor shall not degrade the transportability of the truck or PLST beyond the limits established in MIL-STD-209 and MIL-STD-1366. Preparation, by two crewmembers, for transport by any mode shall not exceed 15 minutes using authorized on-board equipment. All parts requiring removal must have a place for storage on the Water Distributor. The contractor shall provide a certification of compliance.

3.9.1 Lifting and tiedown provisions. The Water Distributor (at tare weight plus 500 pounds) shall be equipped with multipurpose (lifting and tiedown) provisions that meet the requirements of MIL-STD-209. Testing shall be conducted at the tare weight plus 500 pounds. Lifting slings shall not adversely contact any part of the Water Distributor. Cable guides, if required, shall prevent the lifting slings from slipping fore or aft for any lifting scenario (tare weight plus 500 pounds). The guides shall be positioned on center with the front and rear lifting provisions and not add to the Water Distributor width. The guides shall be able to accommodate up to 2-inch diameter lifting slings. Radiuses shall be 3-inch minimum.

3.9.2 Cargo aircraft transport. The Water Distributor alone shall be capable of being transported on the C-130, C-141, C-5, and C-17 aircraft while secured to a 463L pallet train while loaded to tare weight plus 500 pounds. The HEMTT-LHS equipped with an empty Water Distributor shall be C-5 and C-17 transportable.

3.9.3 Rail transport. The Water Distributor alone and the Water Distributor mounted on a HEMTT-LHS truck, PLS truck or PLST, loaded on a 50-inch high railcar, shall meet the dimensional requirements of the Association of American Railroads (AAR) Outline Diagram for Single Loads, Without End Overhang, on Open-Top Cars, which applies to standard-gauge rail lines in the Continental United States (CONUS). The Water Distributor alone shall undergo two rail impact tests; once on a Container-on-Flatcar (COFC) using the ISO corner fittings to tie it down, and once on a regular cushioned draft gear car using the MIL-STD-209 tiedown provisions to tie it down. The Water Distributor mounted on a HEMTT-LHS truck, PLS truck or PLST, shall undergo rail impact testing on a regular cushioned draft gear car using the MIL-STD-209 tiedown provisions to tie it down. Rail impact testing shall be performed IAW

Appendix D, with the Water Distributor at tare weight plus 500 pounds, without degradation or damage.

3.9.3.1 Rail transport pin holes. The Water Distributor shall be equipped with rail transport pin holes to accept the pins on the HEMTT-LHS truck, PLS truck and PLS trailer. The pins are used to secure the Water Module to the truck or trailer when rail transporting the Water Module on the truck or trailer. The pins shall be designed for ease of insertion.

3.10 Reliability and Maintainability (R&M) Requirements. The ORD for the Engineer Mission Modules-Water Distributor does not contain quantitative R & M Requirements. However, R & M testing will be conducted as part of the PVT. Testing will be composed of Load handling cycles, water pumping and endurance operation/mileage while mounted on the HEMTT-LHS Truck and PLS Trailer Trucks. The test will be conducted in accordance with the Operational mode/Mission Profile for the system as described below. One mission cycle consists of the following

<u>TERRAIN</u>	<u>MILES</u>
Primary Road	15
Secondary Roads	25
Trails	50
<u>Cross-Country</u>	<u>10</u>
TOTAL	100

3.11 Environmental conditions. The Water Distributor shall be operable in day and during limited visibility conditions with illumination. Limited visibility operations at night must be performed with the equipment's lighting system. The WD shall be capable of meeting all water distribution operational requirements, including short term storage (6.5.11) with water tank in any fill state, in the temperature range of +120°F to +33°F without the use of a kit, and from 32°F to -25°F with a Cold Weather Kit (3.6.5). Additionally the Water Distributor shall be capable of being transported and stored (empty) in a temperature range of +120°F to -50°F.

3.12 Communication equipment. The vehicle shall provide for communication between all crewmembers as follows:

3.12.1 Hand Held Radio Set. The Water distributor shall be equipped with a set of two (2) two-way, FM, hand-held, 5 watt, 150-174 MHz, Motorola Model HT1250 radios and (1) two-way, VHF, 40 Watt, Motorola CDM-1550, Model No. AAM25KK59AA, 128 channel net base radio. The radio set shall be water and heat resistant with programmable channel selection. Each hand held radio shall be provided with two sets of rechargeable batteries, each with an eight hour minimum rated operational battery life per charge. The radio set shall include a battery pack-recharging unit, which maintains battery charge for the four sets of replacement batteries.

3.13 Electromagnetic Environmental Effects (E3). The WD will be Near Strike Lightning (NSL)/Electromagnetic Environmental Effects (E3) and electronic warfare/information warfare survivable. This survivability is defined as: the WD will be capable of all critical operations, in a degraded mode of operation. Operation through a NSL event is not required and re-cycling power to restore mission critical functions within 12 hours is acceptable. The design shall conform to the requirements of MIL-STD-461 and MIL-STD-464.

3.13.1 Electromagnetic Emission Interference (EMI). The WD shall comply with applicable EMI and electromagnetic emission susceptibility requirements in accordance with MIL-STD-461, and commercial electromagnetic compatibility standards/ recommendations as needed to support engine, transmission, braking, or other electronic controls.

3.13.2 Electromagnetic Environmental Effects (E3). The WD shall comply with the Electromagnetic Radiation Operational requirements in accordance with MIL-STD-464, using TABLE 1C.

3.13.3 Near Strike Lightning (NSL). The WD is required to survive a nearby lightning strike having the characteristics provided in MIL-STD-464, which occurs at a distance of 100m.

3.13.4 High-altitude Electromagnetic Protection (HEMP) and Electromagnetic Environmental Effects (E3). The WD will be High Altitude Electromagnetic Pulse (HEMP)/Near Strike Lightning (NSL)/Electromagnetic Environmental Effects (E3) and electronic warfare/information warfare survivable. This survivability is defined as: the vehicle will be capable of all critical driving and earthmoving/water distributing operations, in a degraded mode of operation. Operation through a HEMP or NSL event is not required and re-cycling power to restore mission critical functions within 12 hours is acceptable. The design shall conform to the requirements of MIL-STD-461 and MIL-STD-464.

3.13.5 Nuclear, Biological and Chemical Contamination. The WD will possess NBCC and decontamination survivability, with minimal replacement of external components desired.

4. VERIFICATION

4.1 Methods of verification.

4.1.1 Test. Verification shall be accomplished through systematic operation of the end item under appropriate conditions, with or without instrumentation, and the collection, analysis, and evaluation of quantitative data.

4.1.2 Analysis. Verification shall be accomplished by technical or mathematical evaluation, mathematical models or simulations, algorithms, charts, diagrams, and representative criteria.

4.1.3 Examination. Verification shall be accomplished by visual inspection of the end item or it's components, reviewing descriptive documentation, certifications, and comparing characteristics to established criteria.

4.1.4 Demonstration Verification shall be accomplished by appropriate functional checks and/or operation of the end item or its components.

4.1.5 Certification A document-certifying conformance to a specific requirement of standard signed by the certifying official or responsible party. When required by contract or this specification, certifications may be used in lieu of additional verification methods and must include supporting documentation (test data, material analysis, etc.).

4.2 Responsibility for inspection. Unless otherwise specified in the contract, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or this specification, the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any inspections set forth in this specification where such inspections are deemed necessary to assure supplies and service conform to prescribed requirements.

4.2.1 Responsibility for compliance. All items must meet all requirements of Sections 3 and 5. The inspections set forth in this specification shall become part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of assuring that all products or supplies submitted to the Government, for acceptance, comply with all requirements of the contract. Sampling in quality conformance does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to acceptance of defective material.

4.2.2 Government verification. All quality assurance operations performed by the contractor will be subject to Government verification at unscheduled intervals. Verification will consist of (a) surveillance of the operation to determine that practices, methods, and procedures of the written quality assurance system plan are being properly applied, and (b) Government product inspection to measure the quality of the product offered for acceptance. Deviation from the prescribed procedures or instances of poor manufacturing practices, which might have an adverse effect upon the quality of the product, will immediately be called to the attention of the contractor. Failure of the contractor to promptly correct deficiencies shall be cause for suspension of acceptance until corrective action has been made, at no additional cost to the Government, or until the conformance of the product to prescribe criteria has been demonstrated.

4.2.3 Parts and components. The contractor, when requested, shall make available for Government inspection legible drawings and printed specifications to which the end item or any of these parts/components were manufactured. Such drawings and specifications shall be annotated to reflect the latest revision incorporated therein. Upon completion of inspection(s) by the Government, all drawings and specifications will be returned to the contractor. The Government reserves the authority to inspect end items or any parts/components during all manufacturing processes and reject such material that does not conform to either Government or contractor drawings/specifications. All deficiencies detected during any contractor or Government inspection (end item or in process) shall be corrected by the contractor at no cost to

the Government. During any Government inspection, the contractor shall provide inspection assistance upon request.

4.2.4 Inspection Equipment: Unless otherwise specified in the contract, the contractor is responsible for the provision and maintenance of all inspection equipment necessary to assure that supplies and services conform to contract requirements. Commercial, modified commercial, or supplier designed inspection equipment or measuring set-ups must be capable of repetitive measurements to an accuracy of 10 percent of the component tolerance, control of inspection, measuring, and test equipment shall be in accordance with the quality assurance provisions set forth in the contract.

4.3 Classification of inspections. The inspection requirements specified herein are classified as follows (ref Table I):

- a. First Unit Inspection (FUI) (4.5.1).
- b. Production Verification Test (PVT) (4.5.2).
- c. Quality Conformance Inspection (QCI) (4.6).
- d. Follow-On Production Test (FPT) (4.7).

TABLE I
CLASSIFICATION OF EXAMINATIONS AND TESTS

The examinations/tests referenced in this table may be modified at the discretion of the Government by the deletion or addition of inspections to assure adherence to specifications/contractual requirements.

<u>TEST</u>	<u>LOCATION</u>
First Unit Inspection (FUI)	Place of Manufacture
Production Verification Test (PVT)	Government Proving Ground
Quality Conformance Inspection (QCI)	Place of Manufacture
Follow-on Production Test (FPT)	Government Proving Ground

RQMTS	TITLE	VERIFICATION METHOD					VERIF. CLASS/EVENT			
		CERT	ANLS	DEMO	EXAM	TEST	FPUI	PVT	QCI	FPT
3.4	Material	X					X			
3.4.1	Ozone depleting substance	X					X	X		X
3.4.2	Radioactive material	X					X			
3.4.3	Asbestos material	X					X	X		X
3.4.4	Resistance to fuel	X					X	X		X
3.4.5	Resistance to fungus	X					X			
3.4.7	Deterioration, prevention & control	X					X	X		X
3.4.8	Dissimilar metals	X					X	X		X
3.4.9	Recycled, recovered, or environmentally preferable materials	X					X	X		X
3.4.10	Metal fabrication				X		X	X	X	X
3.4.11	Painting				X		X	X	X	X
3.4.11.1	Camouflage pattern				X		X	X	X	X
3.4.12	Welding				X		X	X	X	X
3.4.13	Workmanship				X		X	X	X	X
3.4.14	Lubrication				X		X	X	X	X
3.5	Compatibility	X				X	X	X		
3.5.1	LHS/PLS compatibility	X				X	X	X		
3.5.2	ISO compatibility	X					X	X		X
3.5.3	Forklift compatibility	X				X	X	X		X
3.5.4	Electrical interface	X				X	X	X	X	
3.5.6	Pneumatic interface	X					X	X		X
3.6.1	Manpower & personnel	X					X	X		X
3.6.2	Human factors engineering					X		X		X
3.6.3	Health and safety					X		X		X
3.6.4	Noise limits					X		X		X
3.6.5	Freeze prevention					X		X		X
3.6.6	Operation					X		X		X
3.6.7	Weight	X				X	X	X	X	X
3.6.8.1	Lighting bars				X	X	X	X	X	X
3.6.8.2	Forward strobe lights				X	X	X	X	X	X
3.6.8.3	Rear strobe lights				X	X	X	X	X	X
3.6.8.4	Intersection lights				X	X	X	X	X	X
3.6.8.5	Work lights				X	X	X	X	X	X
3.6.8.6	Flood lights				X	X	X	X	X	X
3.6.9	Compartments				X		X	X	X	X
3.6.10.1	Hose beds				X		X	X	X	X
3.6.10.2	Suction hose storage				X		X	X	X	X
3.6.10.3	Hose reel				X		X	X	X	X
3.6.10.4	Connection Time					X	X	X	X	X
3.6.10.5	Fire Extinguisher				X		X	X	X	X

RQMTS	TITLE	CERT	ANLS	DEMO	EXAM	TEST	FPUI	PVT	QCI	FPT
3.7.1	Tank	X					X	X		X
3.7.1.1	Tank venting				X		X	X	X	X
3.7.1.2	Tank fills					X	X	X		X
3.7.1.3	Manhole				X		X	X	X	X
3.7.1.4	Water level indicator				X		X	X	X	X
3.7.2	Pump assembly			X			X	X		X
3.7.2.1	Temperature relief			X			X			X
3.7.2.2	Priming			X			X			X
3.7.2.3	Power source				X		X	X	X	X
3.7.2.4	Power source housing				X		X	X	X	X
3.7.2.5	EPA compliant power source	X					X			X
3.7.2.6	Starting system	X					X			X
3.7.2.7	Self loading			X			X	X		X
3.7.3	Piping system				X		X	X	X	X
3.7.4	Control panel					X	X	X	X	X
3.7.4.1	Operational fault controls					X	X	X	X	X
3.7.4.2	Cab control box					X		X		X
3.7.5	Folding tank rack					X	X	X	X	X
3.7.6	Water cannon					X	X	X	X	X
3.7.8	Quick dump					X	X	X		X
3.7.9	Discharge connections				X		X	X	X	X
3.8.1	Basic issue items				X		X	X		X
3.8.2	Water cannon operator's platform				X		X	X	X	X
3.8.3	Catwalks and steps				X		X	X	X	X
3.8.4	Tools & maintenance items				X		X	X		X
3.8.5	Fire extinguisher				X		X	X	X	X
3.8.6	Identification & data plates				X		X	X	X	X
3.8.7	Instruction, lubricating, caution, warning & operating plates				X		X	X	X	X
3.8.8	Markings				X		X	X	X	X
3.9	Transportability	X				X	X	X		
3.9.1	Lifting & tie-down provisions		X			X	X	X		
3.9.2	Cargo aircraft transport		X				X	X		
3.9.3	Rail transport		X			X	X	X		
3.9.3.1	Rail transport pin holes				X		X	X	X	X
3.10	Reliability & maintainability requirements					X		X		X
3.11	Environmental conditions					X		X		X
3.12	Communication equipment	X					X			
3.12.1	Hand held radio set					X	X	X	X	X
3.13	Electromagnetic Environmental effects					X		X		
3.13.1	Electromagnetic emissions Interface					X		X		
3.13.2	Electromagnetic Environmental Effects					X		X		
3.13.3	Near Strike Lighting					X		X		
3.13.4	High-altitude Electromagnetic Protection (HEMP) and Electromagnetic Environmental					X		X		
3.13.5	Nuclear, Biological and Chemical contamination					X		X		

4.4 Inspection conditions. Unless otherwise specified, the inspections cited in Table I may be conducted at any ambient temperature between -50 degrees F (-46 degrees C) and 120 degrees F (49 degrees C) at any ambient humidity, solar radiation, and precipitation and within the mission profile.

4.4.1 Welding. Certification shall be furnished that the Water Distributor was welded IAW AWS D1.1, D1.2, D1.3, D14.3 (where steel stock, sheet metal or aluminum has been used) and/or ASME Sec. VIII, Div. 1. Welds shall be visually examined. Other records, such as

welder certifications, shall be examined to validate compliance with AWS D1.1, D1.2, D1.3 D14.3 and/or ASME Sec. VIII, Div. 1.

4.5 Test and acceptance

4.5.1 First Production Unit Inspection (FPUI)

4.5.1.1 In-process inspection. During fabrication of the first unit, in-process inspections will be conducted by Government representatives to evaluate conformance of materials and workmanship to requirements in the Scope of Work, the Purchase Description and applicable specifications. The Water Distributor and all components shall be available for inspection. These inspections shall be made at the contractor or subcontractor's facilities prior to application of primer and paint. Processing and welding procedures, quality system, inspection records, calibration procedures, radiographic procedures and welder certifications will be reviewed and evaluated during the in-process inspections. Each of these aforementioned certifications must be available for review prior to the in-process inspection.

4.5.1.2. Contractor inspection. The first unit shall be inspected by the contractor at the place of manufacture. The First Unit Inspection (FUI) shall include as a minimum the inspections referenced in Table I. Any other additional inspections shall be required at the Government's discretion. The Government reserves the right to witness and/or participate in the contractor inspection. The purpose of the inspection is to verify conformance of the water distributor to the requirements and suitability to proceed to PVT. Failure to meet any requirement will indicate that the water distributor is not ready for PVT testing until corrections are made, and subsequent retest indicates it is ready to proceed. Upon successful completion of FPUI, the Government shall notify the contractor that he can proceed to PVT.

4.5.1.3 Provisional inspection. The first unit shall be subject to provisional inspection at the contractor's plant by representatives of Government procuring activity. At the time of this inspection the contractor shall make available his inspection plan, inspection records and certifications pertinent to the Water Distributor and components. The contractor shall provide inspection assistance upon request.

4.5.1.4 Repair of defects. Defects (6.5.12) found, as a result of above inspection, shall be corrected by the contractor at no additional cost to the Government. Failure of the contractor to promptly correct defects shall be cause for suspension of acceptance of units until corrective action has been accomplished. Upon completion of any required repairs and re-inspections, the FUI unit shall become the manufacturing standard and shall be the last unit shipped under the contract. Corrective actions as a result of any defects found shall be fully reinspected/retested to the Government's satisfaction and all related retest and reinspection costs are the responsibility of the contractor.

4.5.1.5 Final approval and acceptance. Final approval and acceptance by the Government of the first production unit(s) shall be withheld until PVT and the User Excursion test (UE) have been completed and final determination has been made regarding conformity of the unit(s) to contractual/specification requirements including, but not limited to, workmanship and materials. Upon completion of FPUI, the Government will authorize commencement of PVT to be followed by UE however approval for the FPUI will not be granted until both PVT and UE are successfully completed to the Government's satisfaction. Final approval for FPUI, PVT, and UE as the First Article Test (FAT) will be given after successful completion of the aforementioned tests in writing by the PCO.

4.5.2 Production Verification Test (PVT). To determine conformance to Section 3 (inclusive) after completion of FUI (4.4.1), two production (non FUI unit) units shall be randomly selected by the Government. These units shall be subjected to a truck transport durability test as outlined in 4.3, Table I.

4.5.2.1 Test deficiencies. Deficiencies found during or as a result of the PVT, shall be cause for rejection of the Water Distributor until evidence has been provided by the contractor that corrective action has been taken to eliminate the deficiency. Any deficiency found shall be prima facie evidence that any Water Distributors already accepted are similarly deficient unless evidence satisfactory to the PCO is furnished in writing by the contractor that they are not similarly deficient. Such deficiencies on all Water Distributors shall be corrected by the contractor at no additional cost to the Government. Corrective action(s) as a result of deficiencies found during inspections or as a result of PVT shall be successfully/fully retested to that portion of the test or inspection to the Government's satisfaction and at not cost to the Government. Approval to proceed to UE will be given in writing by the PCO upon successful completion of PVT.

4.5.2.2 User Excursion Test (UE) At the conclusion of PVT, two water distributors will take part in a UE along with the Tactical Fire Fighting Truck. All transportation costs associated with the shipping of the units from the PVT site to the UE sight shall be the responsibility of the contractor. The contractor is required to conduct an operator course and a maintenance course prior to UE.

4.5.2.3 First Article Test (FAT). FAT shall consist of First Production Unit Inspection (FPUI), Production Verification Test (PVT), and User Excursion Test (UE). FAT approval will be provided in writing by the PCO upon successful completion of the afore- mentioned tests. The final configuration baseline shall be established upon successful completion of FAT. Full-scale production acceptance will commence upon successful completion of FPUI, PVT, and UE.

4.6 Quality conformance inspection

4.6.1 Final Inspection of Each Water Distributor. The contractor, in accordance with Table 1 shall subject each production water distributor to a complete final inspection. The Government

at its option may witness this final inspection or conduct its own final inspection. The QCI shall be conducted utilizing a contractor prepared and Government approved Final Inspection Record (FIR).

4.6.2 Final Inspection Failure. If a water distributor fails to pass any inspections specified in the FIR, the Government shall withhold acceptance until evidence has been provided by the contractor that corrective action has been taken to correct such deficiencies and preclude the reoccurrence of these same deficiencies.

4.7 Follow-on production test (FPT). The Government may randomly select Water Distributors at any time during the production contract period and subject these Water Distributors to all applicable tests referenced in Table I (minimum) as well as a 2,500 mile (1,250 miles on Truck and 1,250 miles on PLST) durability test. Tests shall be conducted by the Government at a Government test site. The test Water Distributors shall be subjected to Quality Conformance Inspection by the contractor in accordance with 4.6.

4.7.1 Test deficiencies. Deficiencies found during or as a result of the FPT, shall be prima facie evidence that all Water Distributors produced since PVT or the last acceptable FPT are similarly deficient. This shall be cause for rejection of all Water Distributors produced since the last acceptable test, unless evidence to the contrary is produced which is satisfactory to the PCO or until corrective action has been taken to repair and correct the deficiency. Such deficiencies on all Water Distributors shall be corrected by the contractor at no additional cost to the Government. Corrective action carried out as a result of FPT deficiencies shall be successfully demonstrated during a full retest of that portion of the FPT. Retest costs are the responsibility of the contractor.

4.8. Method of Inspection. The examinations and tests depicted in Section 4 are the minimum required to determine a conformance to the requirements delineated in Section 3 of this purchase description. Additional examinations and tests by the contractor or the Government may be required to determine conformance to specification requirements. The Government shall specify what examinations and test shall be performed and which parties shall perform the examinations.

4.9 Test Unit Refurbishing. Upon completion of PVT, UE and FPT the units shall be returned to the contractor's plant at contractor's expense for refurbishing by the contractor. Refurbishing shall be accomplished under the surveillance and direction of the Government Representative, making such parts replacement and repairs as are necessary to make the units acceptable as a contract item.

5. PACKAGING

5.1 Packaging. For acquisition purposes the packaging requirements shall be as specified in the contract. When actual packaging of materiel is to be performed by DoD personnel, these personnel need to contact the responsible packaging activity to ascertain requisite packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activity within the Military Department or Defense Agency, or within the Military Department's System Command. Packaging data retrieval is available from the managing

Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging agency.

5.2 Servicing and adjusting. Prior to acceptance of the Water Distributor by the Government, the contractor shall at no additional cost to the Government service and adjust each Water Distributor including at least the following: adjustment of electrical system; complete lubrication of mounted equipment with standard commercial lubricants; and check of the continuity of the electrical system.

6. NOTES

6.1 Definitions.

6.5.1 Dissimilar metals. Two metal specimens that are in contact or otherwise electrically connected to each other in a conductive solution and generate an electric current.

6.5.2 Galvanic corrosion. The accelerated corrosion caused by the more active metal (anode) of a dissimilar metal couple in an electrolyte solution or medium, and decreased corrosive effects on the less active metal (cathode), as compared to the corrosion of the individual metals, when not connected, in the same electrolyte environment. A listing of galvanic series and ways of preventing galvanic corrosion can be found in MIL-STD-889.

6.5.3 Commercial components. Commercial components are defined as components of the latest model/series, which have been manufactured and marketed at the required rated capacity to the commercial Water Distributor industry for at least one year preceding the issuance of the request for technical proposals. All components shall be as represented in the manufacturer's technical data and information. The technical data and information herein referenced shall be identical to the specification and technical material furnished by the contractor to their commercial customer.

6.5.4 Fluid leaks. The following definitions shall be used for the classification of defects for leaks:

6.5.4.1 Weep. Any non-recurring evidence of fluid beyond the seal.

6.5.4.2 Seep. Any recurring evidence of fluid beyond the seal that does not result in formation of a droplet.

6.5.4.3 Droplet. Any non-recurring evidence of fluid beyond the seal that results in formation of a droplet.

6.5.4.4 Drip. Any recurring evidence of fluid beyond the seal where droplet forms and falls.

6.5.5 Mission-oriented protective posture (MOPP) IV. The highest level of individual protection during chemical or germ warfare to facilitate mission accomplishment. Overgarments, overboots, mask/hood and gloves will be worn at this level of protection.

6.5.6 Permanently lubricated. Through choice of materials and/or sealing methods the lubricating qualities of a joint are maintained for a minimum 10 years and/or 50,000 miles without need for additional lubrication or maintenance. During this period there shall be no degradation in the performance of the lubricated joint

6.5.7 Width. For the purposes of meeting the requirements of paragraph 3.5.2, width shall be measured IAW SAE J1100 with a tolerance of no more than one inch. All exterior dimensions terminate at the outside surface of sheet metal, bumpers, or integral moldings, unless otherwise specified

6.5.8 Weights, payloads and ratings. Component rating shall be manufacturer's current published rating for on/off road operating conditions as specified in Section 3. Component rating shall not be raised to meet the requirements of this specification.

6.5.8.1 Tare weight. The tare weight shall include the weight of the Water Distributor, all attachments, accessories, equipment, BII, and a full complement of fuel, lubricants, coolant, and hydraulic fluid (as applicable).

6.5.8.2 Gross weight. Gross weight is defined as the tare weight plus the maximum payload.

6.5.9 Terrain conditions.

6.5.9.1 Primary roads. Two or more lanes, all weather, maintained, hard surface (paved) roads with good driving visibility used for heavy and high density traffic. These roads have lanes with a minimum width of 108 inches (2.75 M), road crown to 20 degrees and the legal maximum GVW/GCW for the country or state is assured for all bridges. These roads are surfaces having Root Mean Square (RMS) value of 0.1 inch (2.54 mm).

6.5.9.2 Secondary roads. Two lanes, all weather, occasionally maintained, hard or loose surface (e.g., large rock, paved, crushed rock, gravel) intended for medium-weight, low-density traffic. These roads have lanes with minimum width of 98.5 inches (2.5 M) and no guarantee that the legal maximum GVW/GCW for the country or state is assured for all bridges. These roads are surfaces having a RMS value varying between 0.3 inch (7.63 mm) - 0.6 inch (15.24 mm).

6.5.9.3 Cross Country. One lane, dry weather, unimproved, seldom maintained loose surface roads, intended for low-density traffic. Trails have a minimum width of 98.5 inches (2.5 M), no large obstacles (boulders, logs, and stumps) and no bridging. These are surfaces having a RMS value varying between 0.5 inches (12.7 mm) - 1.5 inches (38.1 mm).

6.5.10 Load cycles.

6.5.10.1 LHS cycle. A Load Handling System (LHS) cycle shall start when a Water Distributor, loaded to a predetermined payload, is on the ground and the truck LHS is in a secure non-load/unload position at the front of the truck. Next the LHS shall attach to the Water Distributor, load and secure it to the truck. Next the LHS shall unsecure the Water Distributor and unload it to the ground, and finally the LHS will return to its original position.

6.5.10.2 Fatigue cycle. A fatigue cycle is that portion of the LHS cycle that creates the highest stress on the Water Distributor. To reduce test time only this portion of the cycle is performed.

6.5.10.3 Load/transfer/unload cycle. A Load/Transfer/Unload cycle shall start when a Water Distributor loaded to a predetermined payload is on the ground and the truck LHS is in a secure non-load/unload position at the front of the truck. Next the LHS shall attach to the Water Distributor, load and secure it to the truck. Next the LHS shall unsecure the Water Distributor and transfer and secure it to the PLST. Next the LHS will unsecure the Water Distributor from the PLST then transfer and secure it back to the truck. Next the LHS will unload the Water Distributor to the ground, and finally the LHS will return to its original position.

6.5.11 Short term storage. Short term storage shall be 72 hours or less without the need for any maintenance actions beyond functional checks.

6.5.12 Definitions of recurring major and minor defects. The inspector shall verify that an inspection of each vehicle is performed by the contractor. The Government inspector shall assure that all deficiencies encountered during the inspection are enumerated on the deficiency sheet for the vehicle. The defects noted on the deficiency sheet shall contain sufficient description to allow the Government inspector and the contractor's representative to classify the deficiency IAW the classification of defects of the vehicle specification and definitions contained in ANSI/ASQC Z1.4. Corrective action shall be taken for recurring deficiencies.

6.5.13 Truck. The M1120 HEMTT-LHS and the M1075 PLS are referred to as the "truck" in the body of this document.

6.5.14 PLS trailer. The M1076 PLS Trailer is referred to as the "PLST" in the body of this document.

6.5.15 Abbreviations and acronyms

ANSI	American National Standard Institute
ASME	American Society of Mechanical Engineers
AWS	American Welding Society
BII	Basic Issue Items
C	Celsius
CFR	Code of Federal Regulations
DOD	Department of Defense
DOT	Department of Transportation
EMM	Engineering Mission Module
EPA	Environmental Protection Agency
F	Fahrenheit
FIR	Final Inspection Record
FPT	Follow on Production Test
FUI	First Unit Inspection
HEMTT	Heavy Expanded Mobility Tactical Truck
HFE	Human Factors Engineering

IAW	In Accordance With
ISO	International Organization for Standardization
LHS	Load Handling System
MOPP	Mission Oriented Protective Posture
MOS	Military Occupational Specialty
MR	Maintenance Ratio
NFPA	National Fire Protection Association
ORD	Operational Requirements Document
OSHA	Occupational Safety and Health Administration
PCO	Procurement Contracting Officer
PLS	Palletized Load System
PVT	Production Verification Test
QCI	Quality Conformance Inspection
SAE	Society of Automotive Engineers
TACOM	Tank-automotive and Armaments Command
TFFT	Tactical Fire Fighting Truck
UPIK	Universal Power Interface Kit

APPENDIX A

SAMPLE IDENTIFICATION PLATE

ENGINEER MISSION DISTRIBUTOR WATER DISTRIBUTOR	
MODEL NO.	_____
NSN	_____-_____-_____-_____
SERIAL NO.	_____
1	USA REGISTRATION NO. _____
2	CONTRACT NO. _____
3	MANUFACTURER _____
4	DATE OF MANUFACTURE _____

APPENDIX B
ANNEX A OF STANAG 2413H

To be Provided in Hard Copy

APPENDIX C
ELECTRICAL SCHEMATIC FOR
UNIVERSAL POWER INTERFACE KIT

To be Provided in Hard Copy

APPENDIX D

RAIL IMPACT PROCEDURE

D.1 Scope. This appendix details the procedure for conducting rail impact testing. This appendix is a mandatory part of this purchase description.

D.2 Purpose. This procedure is intended to test equipment that will be transported by rail, to determine the effect of normal railroad car impacts that occur during rail shipment, and to verify the structural integrity of the test item and the adequacy of the tiedown system and the tiedown procedures. All test items shall be tested at their tare weight unless otherwise specified in the transportability requirements for this item.

D.3 Test conditions. This test is conducted by mounting the test item on a rail car in its rail shipment configuration and then performing a series of at least four impacts. The first three shall be at 6.4, 9.7 and 12.9 km/h (4, 6 and 8 mph), respectively, in the same direction. The fourth shall be conducted at 12.9 km/h in the reverse direction. All four impacts shall have a tolerance of +0.8/-0.0 km/h (+0.5/-0.0 mph). If the test commodity can be shipped in two orientations (such as lengthwise and crosswise on the rail car), the four impacts shall be repeated for each orientation. The Rail Impact test will be performed at a Government test site. Upon successful completion of this test, final approval will be given by the Army Transportability Agency.

D.4 Failure analysis. A test item shall be classified as not having survived the rail impact test and will be deemed a test failure if any item that is attached to or included as an integral part of the test item breaks free, loosens or shows any sign of permanent deformation beyond specification tolerances. A test item that passes this procedure should be capable of rail transport without damage to the item or tiedowns.

D.5 Rail impact procedure.

Step 1. Position from one to five rail cars on a level section of track. The first rail car shall have a standard draft gear, the remaining cars may be either standard or cushioned draft gear. Satisfy the following conditions:

- a. Adjust the total weight of the car assemblage (see above) to at least 114,000 kilograms (250,000 pounds).
- b. Compress the couplers between cars to take up any slack.
- c. Set all of the air and hand brakes on the car(s) to be used.
- d. Secure any load in or on the car(s) to prevent sliding or shifting, any movement greater than 5 cm shall be justification for retest.

Step 2. Mount the test item on the test car. The test car shall be a cushioned draft

gear railcar. The test item manufacturer is responsible for the development of transportation instructions, and shall coordinate these with, and obtain approval from the Military Traffic Management Command Transportation Engineering Agency (MTMCTEA), well in advance of rail impact testing. Mounting of the test item shall incorporate the standard loading and bracing method as shown in Section 6 of the Association of American Railroads (AAR) "Rules Governing the Loading of Department of Defense Material on Open Top Cars.*" No exotic or unusual tiedown methods shall be used; any non-standard loading and bracing must be approved by the Military Traffic Management Command Transportation Engineering Agency (MTMCTEA), ATTN: MTTE-DPE, 720 Thimble Shoals Blvd, Suite 130, Newport News, VA 23606-2574 prior to testing. The arrangement of the test item and its blocking and tiedown to be tested shall be identical to that proposed and approved by MTMCTEA (if non-standard).

*This requirement is mandatory for all equipment developed for use in the U.S. Equivalent European standards may apply for non-U.S. commodities.

Step 3. Situate the test car between the buffer cars and the locomotive, and pull the test car at least 65 meters (200 feet) from the buffer car(s) along a level section of track (a minimum distance to achieve the required locomotive speeds).

Step 4. Position the knuckles of the buffer and test cars for coupling.

Step 5. Install a timing device to measure the test car speed (+/- 0.1 km/h (0.6 mph)) just prior to impact with the buffer car(s). Suggested methods include electronic timing (microswitches) and radar. The use of torpedoes and a stopwatch is permissible but not recommended because of the inaccuracies involved.

Step 6. Push the test car toward the buffer car(s) and, by using the locomotive's speedometer or other means, release the test car when the desired test speed is reached, thus allowing the test car to freely impact the buffer car(s).

NOTE: Any impacts below the required test speeds shall be repeated. Impacts above the required test speed shall be accepted providing the requirements of paragraph 3 are satisfied. Retesting shall be accomplished with new tiedown material to eliminate additive effects and, if possible, a new test item.

Step 7. Repeat Step 6 until the test car(s) has impacted the buffer car three times at the same end, once each at speeds of 6.4, 9.7 and 12.9 km/h (4, 6, and 8 mph) +0.8/-0.0 km/h (+0.5/-0.0 mph). Reverse the test car and repeat the 12.9 km/hr impact, for a total of 4 impacts.

NOTE: Adjustments of the lading or securing mechanisms, or reconditioning of the bracing or items of securement are not allowed during the test. If the tiedowns or chock blocks become loose during the test, a decision to completely retest will be made by MTMCTEA or the test director.

Step 8. Repeat steps 1-7 for any other shipping orientation.

Step 9. Record the pertinent information for each impact, to include the following:

- a. Complete test item identification.
- b. The number and speed of impact.
- c. Observations of tiedowns, blocking, fittings, etc.
- d. Observations of the test item's physical condition.
- e. Results of any operational checks.

NOTE: Cargo requiring extraordinary attention, i.e., nuclear, one-of-a-kind, high value, or key military equipment, may justify changes to the test procedure and criteria; these shall be identified by the developer Program Manager, and approved by the Commander, Military Traffic Management Command Transportation Engineering Agency (MTMCTEA), ATTN: MTTE-DPE, 720 Thimble Shoals Blvd, Suite 130, Newport News, VA 23606-2574.