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Bid Receiving - PWGSC / Réception des soumissions - TPSGC
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Gatineau, Québec K1A 0S5
Bid Fax: (819) 997-9776

SOLICITATION AMENDMENT
MODIFICATION DE L'INVITATION

The referenced document is hereby revised; unless otherwise indicated, all other terms and conditions of the Solicitation remain the same.

Ce document est par la présente révisé; sauf indication contraire, les modalités de l'invitation demeurent les mêmes.

Comments - Commentaires

Vendor/Firm Name and Address
Raison sociale et adresse du fournisseur/de l'entrepreneur

Issuing Office - Bureau de distribution
Vehicles & Industrial Products Division
11 Laurier St./11, rue Laurier
7A2, Place du Portage, Phase III
Gatineau, Québec K1A 0S5

Title - Sujet 22000L Aircraft Refueller	
Solicitation No. - N° de l'invitation W6399-180406/A	**Amendment No. - N° modif.** 001
Client Reference No. - N° de référence du client W6399-180406	**Date** 2017-09-12
GETS Reference No. - N° de référence de SEAG PW-$$HP-912-73255	
File No. - N° de dossier hp912.W6399-180406	**CCC No./N° CCC - FMS No./N° VME**
Solicitation Closes - L'invitation prend fin **at - à 02:00 PM** **on - le 2017-09-25**	**Time Zone** **Fuseau horaire** Eastern Daylight Saving Time EDT
F.O.B. - F.A.B. **Plant-Usine:** ☐ **Destination:** ☑ **Other-Autre:** ☐	
Address Enquiries to: - Adresser toutes questions à: Pearson, Neil	**Buyer Id - Id de l'acheteur** hp912
Telephone No. - N° de téléphone (873) 469-3312 ( )	**FAX No. - N° de FAX** (819) 953-2953
Destination - of Goods, Services, and Construction: **Destination - des biens, services et construction:**	

Instructions: See Herein

Instructions: Voir aux présentes

Delivery Required - Livraison exigée	**Delivery Offered - Livraison proposée**
Vendor/Firm Name and Address **Raison sociale et adresse du fournisseur/de l'entrepreneur** **Telephone No. - N° de téléphone** **Facsimile No. - N° de télécopieur**	
Name and title of person authorized to sign on behalf of Vendor/Firm (type or print) **Nom et titre de la personne autorisée à signer au nom du fournisseur/ de l'entrepreneur (taper ou écrire en caractères d'imprimerie)** **Signature** **Date**	

Canada

Solicitation No. - N° de l'invitation	Amd. No. - N° de la modif.	Buyer ID - Id de l'acheteur
W6399-180406/A	001	HP912
Client Ref. No. - N° de réf. du client	**File No. - N° du dossier**	**CCC No./N° CCC - FMS No/ N° VME**
W6399-180406	hp912.W6399-180406	

This solicitation amendment 001 is raised to revise Annex B purchase description and Appendix 1 Technical Information Questionnaire due to amount of questions received.

DELETE: Annex B

INSERT: Attach Annex B

DELETE: Appendix 1

INSERT: Attached Appendix 1

ALL OTHER TERMS AND CONDITIONS REMAIN THE SAME

NOTICE

This documentation has been reviewed by the technical authority and does not contain controlled goods.

AVIS

Cette documentation a été révisée par le responsable technique et ne contient pas de marchandises contrôlées.

PURCHASE DESCRIPTION FOR AVIATION REFUELLER 22,000 LITRES

1.0 SCOPE

1.1 Scope

This purchase description describes the requirements for all-wheel drive, dual compartment Aviation Refueller tank trucks with a capacity of 22,000 litres. These vehicles will be used for NATO F-34 (JP-8) and NATO F-37 (JP-8+100) helicopter fuelling and defuelling operations. The vehicles will incorporate pumping, filtration, metering, and overfill protection, and will incorporate two independent fuelling systems with tank capacities of 19,000 litres and 3,000 litres respectively.

1.2 Instructions

The following instructions must be used to interpret this specification:

(a) Requirements, which are identified by the word “must”, are mandatory. Deviations will not be permitted;

(b) Requirements identified with a “will” define actions to be performed by Canada and require no action/obligation on the Contractor’s part;

(c) Where “must” or “will” are not used, the information provided is for guidance only;

(d) In this document “provided” must mean “provided and installed”;

(e) Where a technical certification is referred to in this specification, a copy of the certification or substantive information must be supplied for the vehicle when requested by the Technical Authority at no cost to Canada;

(f) Metric measurements must be used to define the requirement. Other measurements are for reference only and may not be exact conversions; and

(g) Nominal dimensions reflect a method by which materials or products are generally identified for sale commercially, but which differ from the actual dimensions.

1.3 Definitions

The following definitions apply to the interpretation of this Purchase Description:

(a) "Technical Authority" - The government official responsible for technical content of this requirement;

(b) "Equivalent" - A standard, means, or component type, which the Technical Authority approves for this application, in writing, as meeting the specified requirements for form, fit, function and performance;

(c) "Vehicle" - The entire vehicle including all systems and sub-systems, in a complete manufactured state in accordance with the requirements in this Purchase Description;

(d) "Road Legal" - Applies to a self-propelled vehicle designed for or capable of transporting persons, property, material or permanently or temporarily affixed apparatus on a highway;

(e) "5th percentile adult female" – As defined in the *Motor Vehicle Safety Regulations (C.R.C., c. 1038)* a person having as physical characteristics a mass of 46.3 kg, height of 1499 mm, erect sitting height of 785 mm, normal sitting height of 752 mm, hip sitting breadth of 325 mm, hip sitting circumference of 925 mm, waist sitting circumference of 599 mm, chest depth of 191 mm, bust circumference of 775 mm, chest upper circumference of 757 mm, chest lower circumference of 676 mm, knee height of 455 mm, popliteal height of 356 mm, elbow rest height of 180 mm, thigh clearance height of 104 mm, buttock-to-knee length of 518 mm, buttock-to-poples length of 432 mm, elbow-to-elbow breadth of 312 mm and seat breadth of 312 mm;

(f) "95th percentile adult male" – As defined in the *Motor Vehicle Safety Regulations (C.R.C., c. 1038)* a person having as physical characteristics a mass of 97.5 kg, height of 1849 mm, erect sitting height of 965 mm, normal sitting height of 930 mm, hip sitting breadth of 419 mm, hip sitting circumference of 1199 mm, waist sitting circumference of 1080 mm, chest depth of 267 mm, chest circumference of 1130 mm, knee height of 594 mm, popliteal height of 490 mm, elbow rest height of 295 mm, thigh clearance height of 175 mm, buttock-to-knee length of 640 mm, buttock-to-poples length of 549 mm, elbow-to-elbow breadth of 506 mm and seat breadth of 404 mm;

(g) "Gross Axle Weight Rating (GAWR)" - The value specified by the vehicle manufacturer as the load-carrying capacity of a single axle system, as measured at the tire-ground interfaces;

(h) "Gross Vehicle Weight Rating (GVWR) - The value specified by the vehicle manufacturer as the loaded weight of a single vehicle; and

(i) "trade" – Means the selling, purchasing, exchanging, consigning, leasing or providing of any commodity, right, facility or service on the basis of measure and includes the business of providing facilities for measuring (commercial).

1.4 Applicable Documents

The following documents form part of this purchase description. Effective documents are those in effect on date of release of the RFP. Sources are as shown:

EI SPEC 1581 - Specifications and Laboratory Qualification Procedures for Aviation Fuel Filter/Water Separators
EI 1529 - Aviation Fuelling Hose and Hose Assemblies

Energy Institute (EI)
61 Cavendish Street
London, UK, WIG 7AR

API RP 1004 - Bottom Loading and Vapor Recovery for MC-306 & DOT-406 Tank Motor Vehicles
American Petroleum Institute (API)
1220 L Street, NW
Washington, DC 20005-4070

B620 - Highway Tanks and TC Portable Tanks for the Transportation of Dangerous Goods
B621 - Selection and Use of Highway Tanks, TC Portable Tanks, and Other Large Containers for the Transportation of Dangerous Goods Classes 3, 4, 5, 6.1, 8 and 9
B836 - Storage, Handling, and Dispensing of Aviation Fuels at Aerodromes
CSA C22.2 No. 42-10 – General use receptacles, attachment plugs, and similar wiring devices
Canadian Standards Association (CSA)
178 Rexdale Blvd.
Rexdale, Ontario M9W 1R3

CAN/CGSB 3.517 - Diesel Fuel
CAN/CGSB Standard 3.23 - Aviation Turbine Fuel (Grades JET A and JET A-1)
Standards Council of Canada
55 Metcalfe Street, Suite 600
Ottawa, ON, K1P 6L5

Motor Vehicle Safety Regulations (MVSR)
Government of Canada, Transport Canada,
http://www.tc.gc.ca/eng/act-regulations/regulations-crc-c1038htm

NFPA 385 - Tank Vehicles for Flammable and Combustible Liquids
NFPA 407 - Standard for Aircraft Fuel Servicing
National Fire Protection Association (NFPA)
1 Batterymarch Park
Quincy, Massachusetts 02169-7471

Commercial Item Description A-A-50696 - Reels, Static Discharge, Grounding, 50 and 75 Foot Cable Lengths
GSA - Specification Section
470 L'Enfant Plaza
Suite 8100
Washington, DC 20407

R.S., 1985, c. W-6 - Weights and Measures Act
http://laws-lois.justice.gc.ca/eng/acts/W-6/page-1.html

Canadian Occupational Health and Safety Regulations (COHSR), 2015
http://laws.justice.gc.ca/eng/regulations/sor-86-304/index.html

ANSI-ASC A14.3-2008 - American National Standard for Ladders – Fixed – Safety Requirements
American National Standard Institute, Inc.
www.americanladderinstitute.org

NATO STANAG 4362 - Fuels for Future Ground Equipment Using Compression Ignition or Turbine Engines
http://www.nato.int/

Hazardous Products Act
Government of Canada
http://laws-lois.justice.gc.ca/eng/acts/H-3/

MIL-STD-209K – Department of Defence, Interface Standard for Lifting and Tie down Provisions
http://www.sddc.army.mil/sites/TEA/Functions/Deployability/TransportabilityEngineering/Modeling/Documents/MIL-STD-209K_2005-02-22.pdf

SAE ARP5818 – Design and Operation of Aircraft Refueling Tanker Vehicles
http://www.sae.org

2.0 REQUIREMENTS

2.1 Standard Design
The vehicle must:

(a) Be the manufacturer's latest model;

(b) Have demonstrated industry acceptability by having been manufactured and sold commercially for at least two (2) years, or be manufactured by a company that has at least five (5) years experience in design and manufacturing of a comparable type of equipment of equivalent or greater complexity;

(c) Have engineering certification available, upon demand, for this application from the original manufacturers for major drive train components, and major equipment systems and assemblies, to demonstrate that assemblies are used within their design limitations;

(d) Conform to all applicable laws, regulations and industrial standards governing manufacture, safety, noise levels and pollution in effect in Canada at the time of manufacture. International equivalent laws, regulations, and industrial standards will be accepted only if certified for equivalency by a professional engineer;

(e) Have system and component capacities equivalent to their published ratings (i.e. product or component brochures); and

(f) Include all components, equipment and accessories normally supplied for the model offered, although they may not be specifically described in this Purchase Description;

(g) Include components readily available for a minimum period of ten (10) years from the date of manufacture; and

(h) Comply with Hazardous Products Act of Canada concerning the use of hazardous materials, ozone depleting substances, polychlorinated biphenyls, asbestos and heavy metals used in the manufacture and assembly of the product supplied

2.2 Operating Conditions

The unladen or fully laden vehicle must operate on airport runways, taxiways, and primary and secondary roads and off-road (e.g. construction sites, open fields and dirt tracks) under the extremes of weather conditions found in Canada in temperatures ranging from -40°C to +37°C in conditions including rain, snow, hail and freezing rain.

2.3 Safety Standards

The vehicle must:

(a) Meet the provisions of the Motor Vehicle Safety Regulations (MVSR);

(b) Have a Safety Compliance Certification Label with a National Safety Mark (NSM) as a seal of compliance, or be accompanied by a Vehicle Import Form containing proof of Inspection by the Registrar of Imported Vehicles;

(c) Meet the requirements of NFPA 385 and NFPA 407, CSA B836, CSA B621, EI 1529, EI 1581, SAE ARP5818 and all other relevant standards normally used by industry;

(d) Be certified to TC 406 pursuant to CSA B620; and

(e) Meet the requirement of the Weights and Measures Act (R.S., 1985, c. W-6).

2.4 Transport Canada Registration

The contractor/sub-contractor must be registered with Transport Canada for the fabrication and assembly of Highway and Portable Tanks for the Transportation of Dangerous Goods pursuant to CSA-B620.

2.5 Human Engineering and Safety

The vehicle, all systems and components must:

(a) Comply with the relevant sections of the COHSR;

(b) Be safe and easy to use by a 95th percentile male to 5th percentile female under all operating conditions;

(c) Have all entry and exit points equipped with handles and steps suitably sized and positioned to accommodate a 95th percentile male to 5th percentile female; and

(d) Be equipped, where required for operator safety, with safety features such as warning and instruction plates, non-slip walking surfaces and heat shields.

2.6 Performance

The bidder must provide a computer generated vehicle performance prediction analysis for a fully loaded vehicle performed in conformance with SAE J2188, using proposed equipment engine and transmission.

2.6.1 Vehicle Performance

The vehicle, at GVWR, must:

(a) Sustain a forward speed of at least 100 km/h (62.5 mph) and a cruising speed of at least 95 km/h (59.4 mph);

(b) Have an engine, transmission and related equipment that is compatible with an operation cycle that includes long periods of slow driving and extensive idling;

(c) Safely traverse and stop on a 20% (11.45 degrees) side slope; and

(d) Be transportable on all provincial roads and highways by commercial low-bed trailers without any major modification.

2.6.2 Dimensions and Ratings

(a) The vehicle must have road legal dimensions across Canada.

(b) The GVWR of the vehicle must not be less than the sum of the unloaded vehicle mass, the cargo carrying capacity, and the product obtained by multiplying the designated seating capacity by 68kg as defined in the Motor Vehicle Safety Regulations (C.R.C., c. 1038).

(c) Each GAWR must be equal to or less than the load rating of the weakest component in the axle system, i.e., axle housing, suspension, wheels, or tires.

(d) The total load on each axle of the vehicle must not exceed the GAWR for that axle.

(e) Axle loads must comply with all the provincial weight restrictions across Canada.

(f) The center of gravity of the vehicle including the complete product tank, substructure, and mounted equipment under all loading conditions (full to empty) and driving positions must be in accordance with SAE ARP5818.

(g) The truck must have a ground clearance of at least 30 cm (12 in) in areas other than at the axles, wheels and tires.

(h) The truck must have a turning radius in accordance with SAE J695 of no more than 35 m (115 ft).

2.6.3 Transportability

Tie down provisions must be provided in accordance with MIL-SPEC-209K to secure the vehicle in case of transport by rail and road.

2.7 Truck

The requirements for the truck are given in the following sections.

2.7.1 Engine

The engine must:

(a) Operate on ultra-low sulfur diesel fuel in accordance with CAN/CGSB Standard 3.517;

(b) Have a conventional electrical starter (air start system is unacceptable);

(c) Have an automatic shutdown protection system for low oil pressure and high temperature to protect the engine during pumping operations when the operator cannot view the engine instruments;

(d) Be Tier 4 (minimum) turbocharged and electronically controlled; and

(e) Be equipped with an exhaust brake.

2.7.2 Engine Components
The engine must include:

(a) A replaceable dry-type air filter that includes a filter restriction gauge;

(b) Engine coolant for temperatures down to –34°C; and

(c) An exhaust system in accordance with NFPA 407 that is vertically mounted.

2.7.3 Truck Fuel System
The vehicle must be equipped with:

(a) A self-regulating in-line electric or coolant type fuel heater to warm the fuel before it enters the fuel filter(s), and to maintain the fuel temperatures above the waxing/gelling point during cold weather operation; and

(b) Insulated chassis fuel lines to maintain a constant temperature of the fuel when exposed to the extremes of weather conditions found in Canada.

2.7.4 Cold Weather Starting Aids
The vehicle must be equipped with:

(a) A 110-volt coolant block heater of the highest wattage capacity recommended by the engine manufacturer;

(b) A fuel filter/water separator incorporating a thermostatically controlled heater;

(c) A removable cold weather front of a design approved for use by the engine and truck OEM that does not generate excessive thermal stress within the radiator(s) and does not interfere with the intercooler operation;

(d) A cold weather starting system as follows:
   i. Air intake heater system or glow plugs; and
   ii. 110-volt battery heater(s) having wattage matched to battery size to prevent battery damage due to overheating;

(e) A self-sustaining engine coolant heater. Eberspaecher engine coolant heater is suggested for this application.

Note: All electrical cold weather aids must be connected together with a single, cover-protected, external electrical power plug in accordance to CSA-C22.2-Wiring Devices.

2.7.5 Power Train
The vehicle must have a power train that consists of components transmitting power from the engine output shaft to driven wheels as follows:

(a) A factory installed all-wheel drive system warrantied by the chassis manufacturer, that delivers power to all wheels (i.e., 6x6) as follows:

i. Driver selected part-time; or
ii. Full-time;

(b) Include an electronically controlled fully automatic transmission as follows:
i. Minimum of six (6) forward speeds including double overdrive;
ii. One (1) reverse speed;
iii. Include an oil cooler and replaceable oil filter;
iv. Include a transmission oil dipstick; and
v. Shift control indicated the selected gear, visible in all lighting conditions;

(c) Include a “Park” or “Neutral” starting interlock;

(d) Include tandem rear axle with dual wheels and a limited slip or driver controlled locking differential(s) on the drive axle(s); and

(e) Include a guard to prevent product tank and equipment damage resulting from failed driveshaft components.

2.7.6 Power Take Off (PTO)

The dual pumping systems must be driven by PTO shafts or hydraulic motors. If a PTO system is used, it must:

(a) Be a hot-shift PTO controllable by the operator from the cab; and

(b) Include a heavy-duty drive shaft with a safety guard covering the PTO shaft.

2.7.7 Steering

The vehicle must be equipped with a power assisted steering system with a telescopic/tilt steering column.

2.7.8 Brakes

The vehicle must be equipped with the manufacturer's standard braking system including a parking brake and an electronic stability control system.

2.7.9 Brake Interlock

The vehicle must be equipped with a brake interlock in accordance with CSA B836 as follows;

(a) Prevents the vehicle from being moved when:
i. Any catwalk fold-down safety rail is raised;
ii. The PTO is engaged (if a PTO is provided);
iii. Any product tank internal valve is open;
iv. Any connection is made to a bottom loading adapter and vapour recovery; and
v. Any refueling nozzle is removed from the storage hook;

(b) Equipped with amber warning lights and audible alarm mounted in the cab that will come on whenever an interlock protected component is removed or dislodged from its stowed position;

(c) In case of emergency, the brake interlock system must have a provision to override the interlock system and allow the brakes to be released.

(d) The interlock override device must bear a seal to prevent tampering when not in use.

(e) A dash mounted red indicator light must signal the driver that the brake interlock is being overridden.

(f) Interlock protected components include the following:
i. Locking securing device (e.g., clevis or locking pins); and
ii. Identified with safety warning labels;

(g) When the vehicle speed exceeds 10 kph (6 mph), the brake interlock must not engage and apply the brakes even when an interlock condition exists or a protected component is released from its storage hook.

2.7.10 Wheels and Tires
The vehicle must:

(a) Be equipped wheels and tires selected in accordance with MVSR Technical Standards document number 120, Revision 1R;

(b) Have treads for use in the complete range of operating conditions;

(c) Include valve extensions for inner tires, if used, to allow for easy access; and

(d) Include a full-size spare wheel and tire with on-board provision for mounting/storage.

2.7.11 Chassis
The chassis must:

(a) Be a full frame truck (no frame extensions to be used); and

(b) Be designed so that it can be towed from the front or rear (not suspended) of the vehicle by commercial tow trucks while loaded to capacity.

2.7.12 Cab
The vehicle must include the following:

(a) Conventional cab (i.e., not be a cab-over style);

(b) A minimum of two doors for entry and egress;

(c) Extended cab by a minimum of 66 cm (26 in) to accommodate a fold-down bunk and storage area;

(d) A factory installed air conditioning system;

(e) High output temperature controlled forced air heater and defroster;

(f) Large windshield to provide maximum visibility;

(g) Tinted glass/windows to reduce solar heating effects;

(h) Power windows and power door locks;

(i) Overhead map lights;

(j) Cruise control;

(k) Electric windshield washers;

(l) Electric, intermittent windshield wipers capable of clearing the windshield during driving operations, and where the wiper blades **do not** travel from a vertical center windshield position to a horizontal position near the roof line;

(m) High-back, fully adjustable, air suspended driver and passenger seats with cloth inserts and arm rest on both sides. An armrest on the door is acceptable;

(n) Retractable 3- point shoulder/lap belt assemblies for the driver and the passenger;

(o) Two folding (rearward) aerodynamic, heavy-duty, heated, motorized, rear view mirrors which provide a full length view of the product tank, to include a convex section and painted the same colour as the cab or finished in a bright metallic non-painted colour;

(p) Two rotating and pivoting dual interior sun visors;

(q) A clear plastic stone and bug deflector mounted on the front hood;

(r) Premium insulation (cab and floor), dark upholstery, coat hooks and armrests on both doors;

(s) Heavy duty rubber matting or spray polyurethane coating installed over the entire floor;

(t) Manufacturer's standard interior trim;

(u) Interior and instrument panel lights to provide adequate lighting for nighttime operations;

(v) A back-up camera with a driver accessible screen with a minimum size of 12.7 centimetres (5 inches) wide;

(w) An AM/FM radio with a CD player and auxiliary jack;

(x) Minimum two (2) USB charging ports and one (1) cigarette-lighter style 12-volt plug; and

(y) Dash coffee cup holders (minimum 2).

2.7.13 Controls and Instruments
The vehicle must be equipped with:

(a) Instruments and controls that are readily visible and within reach of the operator seated in the vehicle driver's seat;

(b) Instruments as follows minimum:
   i. A tachometer;
   ii. An odometer showing cumulative distance in kilometres and engine running time up to at least 9,999 hours;
   iii. A fuel gauge;

iv. A coolant temperature gauge with a high coolant temperature indicator;
v. An oil pressure gauge with a low engine oil pressure indicator;
vi. A voltmeter or ammeter;
vii. A low air pressure indicator;
viii. If a PTO is provided, an indicator light within the cab and at the pumping station to indicate when the PTO is engaged; and
ix. A Diesel Exhaust Fluid (DEF) level gauge.

(c) Controls as follows:
i. Permanently marked to identify and show the function of each control lever or switch;
ii. Sized and spaced in accordance with SAE AIR1375 Revision C; and
iii. Included the following as a minimum:
a. A differential lock control with an engaged/disengaged indicator; and
b. A back up alarm with an On/Off over-ride switch within reach of the driver;

2.7.14 Truck Electrical System
The vehicle must be equipped with manufacturer's standard 12-volt electrical system that includes:

(a) Brushless alternator with sufficient output at low RPM to supply current to all batteries and all electrical load requirements for fuelling operations;

(b) A master disconnect switch for electrical system accessible from ground level on the driver's side;

(c) Wiring protected by insulating grommets where passing through metal;

(d) Electrical circuits protected with fuses, relays or circuit breakers; and

(e) An isolation bar to prevent trickle discharge of the batteries.

2.7.15 Batteries
The vehicle must be equipped with the following:

(a) Minimum four (4) heavy-duty maintenance free batteries with a total cold cranking ampere capacity of at least 2700 (CCA); and

(b) A battery box as follows:
i. Located in an accessible and well protected area; and
ii. Include battery hold-downs and heat shielding (if necessary).

2.7.16 Truck Lights
The vehicle must be equipped with the manufacturer's standard lighting, using LED lights where available, as follows:

(a) Contrary to CMVSS, include a single manually-operated switch that shuts off all light emitting sources internal and external to the vehicle (i.e., complete black-out including brake lights, dash lights, headlights, etc.); and

(b) Includes the following lights:
i. Two (2) chassis mounted front headlights with high/low beam;
ii. Two (2) chassis mounted front fog lights inserted into the bumper; and

iii. Front and rear black-out lights.

2.8 Refuelling System

The requirements for the refueling system are given in the following sections.

2.8.1 Fuel Types

The product tank, pumping, filtration, metering, delivery and piping equipment supplied must be compatible with NATO F-34 (JP-8) and NATO F-37 (JP-8+100) fuel.

2.8.2 Fuelling System - 19,000 L Compartment

The fuelling systems must:

(a) Permit low-pressure (overwing) fuelling as follows:
   i. All fuel delivered must be filtered and then metered; and
   ii. Incrementally or infinitely variable fuelling flow up to a maximum of 570 litres (151 US gallons) per minute, controllable from the pumping station;

(b) Permit defuelling the product tank compartment through the 6.4 cm (2.5 in) bottom loading adapter while the vehicle is disabled (No air or electrical operation on the truck);

(c) Be designed to allow for Hot Closed Circuit Refuelling (HCCR) operations (hot-refuelling).

2.8.3 Fuelling/Defuelling System – 3,000L Compartment

The fuelling systems must:

(a) Permit low-pressure (overwing) fuelling as follows:
   i. All fuel delivered must be filtered and then metered;
   ii. Incrementally or infinitely variable fuelling flow controllable from the pumping station.

(b) Permit low-pressure (overwing) defuelling as follows:
   i. All reclaimed fuel must be filtered and then metered before being returned to the product tank compartment; and
   ii. Incrementally or infinitely variable defuelling flow with a minimum range of 50 to 166.6 litres (13.2 to 44 US gallons) per minute, controllable from the pumping station.

(c) Permit defuelling the product tank compartment through the 6.4 cm (2.5 in) bottom loading adapter while the vehicle is disabled (No air or electrical operation on the truck);

2.8.4 Overfill Protection

Each product tank compartment must have overfill protection as follows:

(a) High-Level - A high-level shutdown system installed to prevent the overfilling of the product tank during defuelling or when bottom loading through the API 6.5 cm (2.5 in) and 10 cm (4 in) adaptors; and

(b) Electronic - Electronic overfill/retain protection for bottom loading through the API 6.5 cm (2.5 in) and 10 cm (4 in) adaptors as follows:
   i. Compatible with API RP 1004 commercial loading-racks;
   ii. Include the following:
      a. Thermistor socket;
      b. 4 J-slot Optic socket; and

c. A float socket.

Note: A system manufactured by Scully, Civacon or FloTech is suggested for this application.

2.8.5 Product Tank
The following applies:

(a) Must have two (2) compartments as follows:
i. One (1) 19,000 litre compartment;
ii. One (1) 3,000 litre compartment; and
iii. Plus an additional allowance of 3% for expansion per compartment;

(b) Material - The product tank assemblies, including any components directly welded to the tank, but not including piping components, must be constructed of aluminum alloy;

(c) Baffles – Each compartment must include baffles with flanged apertures with a minimum 60 cm (24 in) inside diameter for personnel access;

(d) Manhole - The product tank must have manholes as follows:
i. 19,000 litre compartment - at least two (2) manholes, one (1) forward and one (1) at the rear of the compartment;
ii. 3,000 litre compartment - at least one (1) manhole:
iii. Manhole covers as follows:
a. Hinged, installed with the hinge closest to the front of the vehicle; and
b. At least 50 cm (20 in) in diameter;
iv. All manholes accessible from a tank top catwalk;

(e) Piping - All piping must be either aluminum or stainless steel appropriate for use for refueling operations. Connections made by Victaulic couplings or companion flanges must be used where required. Dissimilar metals must be protected from galvanic corrosion;

(f) Sump - A sump must be provided within each product tank compartment to trap water that has a volume of at least 1.0% of the tanks nominal capacity. Fuel supplied to the product tank and fuel suction from the tank must not be via the sump. Sump must be sloped and fitted with a self-closing nominal 1-inch gate valve to ensure it can be fully drained of accumulated water;

(g) Vapour Recovery - The tank must incorporate a vapour recovery system conforming to API RP 1004 as follows:
i. Include a connector located near the bottom-loading connectors; and
ii. Equipped with an override/bypass mode for situations where vapour recovery is not present;

(h) Catwalk - A full-length catwalk in accordance with the Canada Occupational Health and Safety Regulations must be provided at the top of the tank as follows:
i. Not present a hazard to personnel or interfere with top-mounted equipment; and
ii. Walking area equipped with a non-slip surface and automatic fold-down safety rails operable from the ground, coated with a fuel resistant rubberized compound to increase grip and to provide thermal insulation;

(i) Rollover - All outlets, valves, closures, piping, or any devices that if damaged in an accident could result in a loss of product must be protected with an accident damage protection system in accordance with CSA B620 with drains as follows:
   i. Provided on all four (4) bottom corners of the rollover protection; and
   ii. Drain lines minimum 3.8 cm (1.5 in) diameter to drain liquids from the center of the rollover sections;

(j) Ladder - A heavy duty aluminum ladder in accordance with the Canada Occupational Health and Safety Regulations must be provided to safely and easily access the top of the tank as follows:
   i. Include rungs that are at least 10 cm (4 in) deep by 45.7 cm (18 in) wide;
   ii. A ladder frame as follows:
      a. Minimum step distance of 28 cm (11 in);
      b. No less than 15 cm (6 in) clearance between the tank and the ladder at any point;
      c. Rises at least 25 cm (10 in) above the height of the rollover protection rails and then curve downward to meet the rails; and
      d. Have flexible type joints, if attached to the vehicle chassis, to relieve flexing stress between the chassis and the tank;
   iii. Grab handles to provide safety of ascent and descent as follows:
      a. Handrail on each side of the ladder; and
      b. Handles on the top of the tank that are continuous with the handrails on the sides of the ladder.

2.8.6 Fuel Pumps

The pumping system must include fuel pumps as follows:

(a) Self-priming centrifugal type aviation fuel pump for the 19,000 litre compartment;

(b) Positive displacement pump for the 3,000 litre compartment;

(c) Designed to work with an engine high idle as may be required in cold weather operation, with all components operating within manufacturer's specifications at this higher idle speed;

(d) Have an output capable of meeting the design flow rates and pressure requirements of the dispensing system;

(e) Include an easily accessible stainless steel screen located on the inlet side of each pump;

(f) Automatically drop to low speed and pressure when a closed discharge is encountered;

(g) Capable of operating without appreciable wear, damage, or overheating against a closed discharge at low speed and pressure for a period of fifteen (15) minutes.

2.8.7 Valves and Vents

The following applies:

(a) Internal valves must be capable of being repaired and replaced from the tank exterior; and

(b) Vent valves must each be equipped with a fire screen, hood, and air filter;

(c) Product Loading Valves - The bottom loading system is the primary means of receiving product and must include the following:

i. A 10 cm (4 in) bottom loading adapter system conforming to API RP-1004, located on the curb side of the vehicle with a protective cap and lanyard to protect the adaptor when not in use; and
ii. A 6.4 cm (2.5 in) bottom loading adapter system (NSN 1560-00-949-2087), located on the curb side of the vehicle with a protective cap and lanyard to protect the adaptor when not in use.

2.8.8 Filtration

Each product tank compartment must be equipped with is own filter-separator filtration system.

2.8.8.1 Filtration System - 19,000L Compartment

(a) The filtration system must be designed, manufactured and qualified to EI 1581, Category M and M100, using a single make/model for the coalescer and separator as follows:

i. Filter vessel: Velcon model HVA-1838M150 and made of aluminum;
ii. Filter element (Stage 1): Velcon model I-638A4TB-CAT (NSN 4330-20-006-9352); and
iii. Filter element (Stage 2): Velcon model SO-636CM (NSN 4330-01-544-3410);

(b) The filtration system must be equipped with the following:
i. A Water Defence in accordance with CSA B836 with an indicating light on the Pumping Control Panel to indicate a water shutdown condition; and
ii. Fuel sampling ports, for quality control checks, at the inlet and outlet of the filter vessel and next to the recirculation adaptor as follows:
a. Incorporate valves and quick connect couplings compatible with the match weight monitor sampling kit, NSN 6695-21-800-0032; and
b. Couplings protected by dust covers retained by lanyards;

(c) Filter vessel to be cleaned and new filters installed prior to delivery, and one (1) complete spare set of filters to be provided with each vehicle.

2.8.8.2 Filtration system - 3,000L compartment

(a) The filtration system must be designed, manufactured and qualified to EI 1581, Category M and M100, using a single make/model for the coalescer and separator as follows:

i. Filter vessel: Velcon model HVA-1218M150X and made of aluminum;
ii. Filter element (Stage 1): Velcon model I-618A4 (NSN 4330-20-007-1188); and
iii. Filter element (Stage 2): Velcon model SO-318C (NSN 4330-20-007-1187);

(b) The filtration system must be equipped with the following:
i. A Water Defence in accordance with CSA B836 with an indicating light on the Pumping Control Panel to indicate a water shutdown condition; and
ii. Fuel sampling ports, for quality control checks, at the inlet and outlet of the filter vessel and next to the recirculation adaptor as follows:
a. Incorporate valves and quick connect couplings compatible with the match weight monitor sampling kit, NSN 6695-21-800-0032; and
b. Couplings protected by dust covers retained by lanyards;

(c) Filter vessel to be cleaned and new filters installed prior to delivery, and one (1) complete spare set of filters to be provided with each vehicle.

2.8.9 Additive Injection System

The additive injection system must be provided for the 19,000 litre product tank compartment as follows:

(a) Be the Gammon Technical Products Digital Viper additive injection system (part # GTP-9076DF-12VDC-100) to inject the high temperature thermal stability additive NATO S-1749, known commonly as "+100", at a rate of 256 parts per million parts fuel;

(b) Have a reservoir as follows:
- i. Hold sufficient additive to treat at least 150,000 litres of fuel;
- ii. Be equipped with a drain and a shut-off valve to allow for servicing;
- iii. Be sealed from the atmosphere when the system is not in use and have a breather system as follows:
  - a. Replacement air to the reservoir dried by desiccant while additive is being drawn; and
  - b. Desiccant changes colour to indicate required replacement;
- iv. Be identified with painted letters "NATO S-1749 OTAN";

(c) Have an additive low-level warning light installed on the pumping control panel that turns on when there is just enough additive in the reservoir to treat one (1) product tank full of fuel; and

(d) Default to off until activated by the operator, and reset to off after each fuelling.

2.8.10 Fuel Delivery Equipment

The following fuel delivery equipment must be provided:

(a) Overwing Fuelling (19,000 litre compartment) - Filtered and metered product dispensed through a nominal 5 cm (2 in) system consisting of the following components:
- i. Hose Reel - An electric or air-assisted fuel hose reel as follows:
  - a. The capacity to hold, at minimum, 30.5 m (100 ft) of 5 cm (2 in) inside diameter hard walled hose;
  - b. Include a brake and locking device; and
  - c. Have a manual hand crank (with a storage provision near the reel for a removable crank);
  - d. Equipped with a hose guiding system.
- ii. Hose – 30.5 m (100 ft) of Continental 5 cm (2 in) inside diameter hard walled hose as described on ContiTech data sheet 2331200 installed on the hose reel with all required fittings and ends as follows:
  - a. Free end to have a 5 cm (2 in) female dry break coupling and dust plug; and
  - b. Other end connected to the hose reel;
- iii. Nozzle - A 3.8 cm (1.5 in) fuelling nozzle (OPW 295SAJ-0200 (NSN 4930-01-567-6286) is suggested for this application) with the following:
  - a. 100 mesh screen;
  - b. Protective cap;
  - c. Grounding plug cap;
  - d. Grounding clamp part #ALS-10A (NSN 5999-00-134-5844); and
  - e. A male dry break adaptor and swivel;
- iv. Closed Circuit Refuelling Nozzle - One (1) Carter model 64017Z (NSN 4930-01-370-3061) to be provided;

(b) Overwing Fuelling/Defuelling (3,000 litre compartment) - Filtered and metered product dispensed through a nominal 3.8 cm (1.5 in) system consisting of the following components:
  i. Hose Reel - An electric or air-assisted fuel hose reel as follows:
    a. The capacity to hold, at minimum, 16.8 m (55 ft) of 3.8 cm (1.5 in) inside diameter hard walled hose;
    b. Include a brake and locking device; and
    c. Have a manual hand crank (with a storage provision near the reel for a removable crank);
  ii. Hose - 16.8 m (55 ft) of Continental 3.8 cm (1.5 in) inside diameter hard walled hose as described on ContiTech data sheet 2331200 installed on the hose reel with all required fittings and ends as follows:
    a. Free end to have a 3.8 cm (1.5 in) female dry break coupling and dust plug; and
    b. Other end connected to the hose reel;
  iii. Nozzle - A 3.8 cm (1.5 in) fuelling nozzle (OPW 295SAJ-0200 (NSN 4930-01-567-6286) is suggested for this application) with the following:
    a. 100 mesh screen;
    b. Protective cap;
    c. Grounding plug cap;
    d. Grounding clamp part #ALS-10A (NSN 5999-00-134-5844); and
    e. A male dry break adaptor and swivel.

(c) Recirculation System - A system to permit fuel recirculation through the pump, filter and hose back into their respective product tank compartment. Any additional equipment required for recirculation must be provided. Loose equipment must have a stowage provision inside a storage container.

2.8.11 Other equipment

The following equipment must be provided:

(a) Secondary containment berm as follows:
  i. Located in an easily accessible dedicated weatherproof aluminum storage box with a non-locking door; and
  ii. Labeled “Secondary Containment Berm, Berme de Confinement Secondaire" in 5 cm (2 in) high grey or silver text on a black or red background;

(b) Spill Kit - A fuel spill kit, such as the AF Pollution Abatement Systems Inc. AF16, as follows:
  i. Located in an easily accessible dedicated weatherproof aluminum storage box with a non-locking door; and
  ii. Labeled “Spill Kit, Trousse de déversement” in 50 cm (2 in) high black text;

(c) Fire Blanket - A fire blanket, such as the Steel Fire Equipment FB64 or equivalent, as follows:
  i. Be a three-ply consisting of two layers of woven glass fabric with an inner layer of fire-retardant material;
  ii. Be nominal 122 cm x 183 cm (48" x 72");
  iii. Be located in a fire engine red painted aluminum weatherproof storage canister that:
    a. Has a self-latching door that does not interfere with removal of the blanket; and
    b. Is labeled “Fire Blanket, Couverture Anti-Feu” in 50 cm (2 in) high red letters on a white background;

(d) Fire Extinguishers - Fire extinguishers as follows:

i. Exterior Fire Extinguishers - Two (2) fire extinguishers in accordance with CAN/ULC-S503 or CAN/ULC-S504 (minimum 20-BC rated) as follows:
   a. Minimum 9 kg (20 lb) Purple-K dry chemical extinguishers;
   b. Secured with heavy duty mounting brackets; and
   c. Located on either side of the vehicle;
ii. Interior Fire Extinguisher - A fire extinguisher, suitable for low temperature, as follows:
   a. Ansul Fire Protection Sentry K-5 5 kg (11 lb) dry chemical (Purple K) extinguisher; and
   b. Mounted in an appropriate bracket in a readily accessible area within the vehicle cab;

(e) Wheel Chocks - Two (2) wheel chocks capable of restraining a fully loaded vehicle as follows:
   i. Be made from a fuel resistant elastomeric compound; and
   ii. Have a mounting bracket incorporated into the body for the storage of both wheel chocks that is positioned for easy access on the driver side of the vehicle;

(f) Nozzle Hooks – Nozzle storage hooks with brake interlock mounted at each of the fuelling hose reels such that the nozzles do not require removal from the hose prior to placement into the respective hook;

(g) Hose - Two (2) Continental 5.06 cm (2 in) inside diameter hard walled hoses as described on ContiTech data sheet 2331200 as follows:
   i. 5.5-6 m (18-20 ft) in length each;
   ii. Male and female dry break couplings and dust plugs on each end;
   iii. Mounted in hose tubes on the side of the product tank;

(h) Dipstick – A product tank dipstick and a depth chart;

(i) Operator Tool Kit - Including wheel wrench, jack(s) and all other daily maintenance/emergency roadside repair equipment, stowed in a storage cabinet; and

(j) First Aid – A first aid and burn kit in the vehicle cab (such as the Uline H-1875 and H-4173).

2.8.12 Body
The following applies:

(a) Material - As follows:
   i. All skirting, fenders, cabinet boxes, and cabinet doors must be constructed of aluminum alloy; and
   ii. All cabinet doors must be supported by stainless steel piano hinges;

(b) Cabinets – The body must incorporate weatherproof cabinet for storage of equipment as follows:
   i. Have elastomeric seals and gutters to prevent the ingress of dust, debris, and water;
   ii. Have door holders to hold them in the open position and latches (if required) to keep the doors open in high wind conditions;
   iii. Have recessed positive locking door handles with a padlocking provision;
   iv. Have locks on the cabinet doors that can be opened by one master key;
   v. Pumping Cabinet - Include a pumping cabinet as follows:
      a. Enclose the meter(s), fuelling hose reels, low pressure hose reel, pumping control panel, and related equipment, with sufficient room around the equipment for ease of maintenance and operation;

b. Positioned at the rear of the product tank with a door to access the hose reels; and
c. Have a solid sloping floor with a drain;

vi. Storage Cabinet - Minimum one (1) storage cabinet on either side of the vehicle must be provided for storage of nozzles and loose items as follows:
a. Have top hinged one-piece doors;
b. Have a solid floor lined with removable open grid elastomeric matting for protecting tools and the compartment finish; and
c. Include tie-downs or equipment holders to secure loose items;

vii. Containment Cabinet - Minimum one (1) storage cabinet located on either side of the vehicle must be provided for storage of a secondary containment berm kit and the spill kit as follows:
a. Have top hinged one-piece doors; and
b. Include tie-downs or equipment holders to secure loose items;

(c) Fenders – All wheels must be equipped with fenders to retain road splash;

(d) Mud flaps – Mud flaps must be provided;

(e) Bumper - Heavy-duty, full width, front and rear bumpers must be provided as follows:
i. Be designed such that the fully loaded vehicle can be pushed without damage; and
ii. Have recessed lights and reflectors (if required);
iii. Have rubber push pads;

(f) Tow Hooks - The vehicle must be equipped with tow hooks as follows:
i. Two (2) front and two (2) rear tow hooks or loops of sufficient strength and mounting to permit the recovery of the fully loaded vehicle; and
ii. Tow points to be fully accessible without having to crawl under the vehicle;

(g) License Plate Holder – One (1) illuminated license plate holder at the rear of the vehicle and one (1) license plate holder at the front of the vehicle must be provided.

2.8.13 Controls
All controls necessary for the operation of the pumping system must be:

(a) Grouped within the pumping control panel;

(b) Permanently marked to identify and show their function in English and French, or international symbols as defined by SAE J1362; and

(c) Properly sized and arranged to allow personnel wearing Cold Wet Weather Gloves (NSN 8415-21-920-9019) to operate the equipment.

2.8.14 Pumping Controls
The following applies:

(a) Throttling Valve - A throttling valve must be installed between the meter and the hose reel of each product tank compartment to control the flow rate as follows:
i. Be a manually controlled, graduated, locking type, lever operated throttling valve;
ii. Be readily accessible to the operator; and
iii. Used to control the fuelling or defuelling flow rate;

(b) Deadman - A deadman control must be provided to initiate or terminate fuelling or defuelling operations as follows:
   i. Have a cable of at least 30.6 m (100 ft) in length; and
   ii. Have a spring-retracting reel provided for the electrical cable;

(c) Fuel/Defuel - A control must be installed on the pumping control panel for the 3,000 litre compartment to allow the operator to select between fuel and defuel operations;

(d) Internal Valve Controls –Switches must be installed on the pumping control panel for opening and closing the internal valves of the product tank compartments with a visual means of indicating open or closed position of the valves; and

(e) Emergency Shut-Off – Two (2) emergency shut-off controls must be provided as follows:
   i. One (1) located on each side of the vehicle in accordance with NFPA 407;
   ii. Each identified with the words "EMERGENCY FUEL SHUTOFF" in letters of at least 5 cm (2 in) high in accordance with NFPA 407; and
   iii. Identify the action to be taken in case of an emergency by arrow or the appropriate wording (i.e., "PUSH" or "PULL").

2.8.15 Instruments
All instruments necessary for the operation of the pumping system must be:

(a) Grouped within the pumping control panel; and

(b) Permanently marked to identify their function.

2.8.16 Pumping Instruments
The following applies:

(a) Product Meter - Two (2) electronic fuel meters must be provided, one for each product tank compartment, as follows:
   i. Located after the filtering system;
   ii. Meter all fuel delivered/recovered through the pumping system to the aircraft;
   iii. Include a bypass in case the metering system becomes non-functional, with a seal to prevent tampering when not in use;
   iv. Display the fuel dispensed in litres;
   v. Be clearly visible and within reach of an operator standing on the ground at the control panel; and
   vi. Be certified for trade by Measurements Canada as specified by the Measurement Canada Approval Number S.WA-0368 Rev. 9;

(b) Fuel Management System – The vehicle must be equipped with the Liquid Controls LCR-II Data Management System that performs the following functions:
   i. Maintain flight schedules;
   ii. Perform inventory stock control;
   iii. Provide meter totalizer readings;
   iv. Provide electronic temperature compensation; and
   v. Allow data transmission between vehicle and office via removable media, with the potential for wireless transmission;

(c) Delivery Slip Printer - A delivery slip printer must be provided, located in the vehicle cab, that prints delivery slips that should include the following information:
- i. Header: National Defence / Défense Nationale Name and Address of the Trader;
- ii. Ticket Number;
- iii. Squadron Number, Aircraft Type and Number;
- iv. Home base/Country of Origin;
- v. Date, Start Time, and End Time;
- vi. Truck Number;
- vii. Defuel Mode – Not for Trade;
- viii. Net Volume, Gross Volume, Volume Correction Statement and Type of Fuel Issued;
- ix. Issued By: Operator name and signature block; and
- x. Accepted by: service number, rank, name, and signature block;

(d) Fuel Pressure Differential Gauge - A direct reading differential pressure gauge must be provided as follows:
- i. Have a range of 0 to 206.8 kPa (0 to 30 psi);
- ii. Be Gammon Technical Products GTP-8980-G connected to read the differential pressure across the filter-separator;
- iii. Have a peak pressure hold feature that is capable of being reset; and
- iv. Have a differential pressure proximity switch that can stop the flow;

(e) Flow Rate Display - Minimum one (1) electronic flow rate display must be provided as follows:
- i. Display in Litres per Minute; and
- ii. Display all fuel rates being delivered through the pumping system to the aircraft

(f) Fuel Level Display - A fuel level measurement system in each product tank compartment must be provided as follows:
- i. Display product tank level with overfill and low level protection;
- ii. Be Titan Logix TD 80 with dual displays as follows:
  - a. Main display located on the bottom loading side; and
  - b. Remote display located in the control panel cabinet.

2.8.17 Electrical System
The following applies:

(a) Wiring must be installed in conduit or employ encapsulated cable. The tubing must run the full length between components or enclosures without splicing;

(b) All wiring (conductors) must be full-length from component to component without any splicing;

(c) Electrical circuits for installed equipment must be protected by identified vapour proof automatic circuit breakers in the form of push buttons;

(d) All wiring must be labelled at each connecting end;

(e) Grommets must be used when wiring passes through sheet metal.

2.8.18 Electrical Equipment
The following applies:

(a) Grounding Studs – Grounding studs must be installed as follows:

i. At least ten (10) brass grounding studs installed at the following locations:
   a. One (1) as close as possible to each of the three (3) manhole covers;
   b. Two (2) studs must be located near the bottom loading and recirculation adaptors;
   c. Two (2) studs must be installed as close as possible to the lower rear corners of the product tank;
   d. Two (2) studs must be installed on the front bumper, one on each side; and
   e. One (1) stud must be located close to the recirculation adaptor;
ii. The grounding studs must:
   a. Be unpainted brass; and
   b. Each be labelled with red circle measuring 10 cm (4 in) in diameter, centred on or placed next to the stud with the words “Ground” and “Borne de terre” within the circle;

(b) Grounding Cables – Two (2) grounding cables and reels must be provided as follows:
   i. NSN 4930-01-334-5812 (100 foot cable);
   ii. Include recoil reels and grip clamps (part #ALS-10A (NSN 5999-00-134-5844)) installed in the pumping cabinet;

(c) Bonding – The engine, cab, product tank, chassis frame, fuel delivery components and other metal parts must be electrically bonded;

(d) Power Inverter - A 12 VDC to 120VAC power inverter must be provided as follows:
   i. Minimum 2 kW power inverter;
   ii. Equipped with a protective cover; and
   iii. Supply two 15 Amp, GFI, duplex outlets, in weatherproof enclosures located conveniently for passenger use;

(e) Lighting - The following lighting must be provided:
   i. Work lighting - A minimum of three (3) Betts Industries Model 325503 (NSN 6240-01-662-5626) LEDs lights installed in locations to permit the operator to direct the aim of the light on the work area in any direction from the vehicle, with a control switch(es) for the lights located in the cab;
   ii. Cabinet Lighting - Red and white LED lights located in the servicing and pumping control cabinets as follows:
      a. Vapour proof switches in the respective cabinets to control the lighting;
      b. Lighting master controlled when the pumping system is powered up; and
      c. An additional adjustable light installed to illuminate the ground surrounding the cabinet to a radius of at least 2.5 meters (8.2 ft);
   iii. Strobe Light - Equipped with a low profile amber strobe light protected by a bush guard, with a quick disconnect electrical connector and mounted on a pedestal behind the cab at the roof line with a switch mounted within the cab.

2.9 Hydraulic System

If applicable, the hydraulic system must be complete with all required components for the operation of the installed hydraulic equipment including pump, motors, actuator, cylinders, reservoir, oil cooler, filters with change indicators, clearly marked test ports and control valves. The reservoir, if applicable, must labelled with approved hydraulic fluid and reservoir capacity.

2.10 Lubricants

The Aviation Refueller must be delivered with the manufacturer's standard lubricants and fluids consistent with the delivery location and season. The refueller must not require the use of manufacturer's special lubricants and hydraulic fluids following break-in period.

2.11 Paint

The following procedures apply to painting the cab, chassis, cabinets, tank and all piping (not including inside cabinets):

(a) The Aviation Refueller must be painted in the manufacturer's standard painting process that yields a durable finish with a smooth appearance free of runs, sags and orange peel in accordance with the following
   i. All external surfaces and components of the Aviation Refueller must be painted; and
   ii. Non-ferrous interior components (e.g., piping, fittings, etc.) must not be painted except where required for durability or leak detection;

(b) Chrome and chromed decorative features must not be employed or painted on the external finish;

(c) Prior to painting, all ferrous metals must undergo phosphate conversion coating or E-coating and aluminum components must undergo a cleaning and etching treatment;

(d) The prime coating must be a high durability corrosion resistant type, such as epoxy; and

(e) The Aviation Refueller vehicle and tank must be painted white and all other components in the manufacturer's standard color scheme.

2.12 Corrosion Resistant Materials

The vehicle must:

(a) Be designed to prevent galvanic corrosion; and

(b) Utilize materials in the manufacturing process that resist damage or deterioration from cleaning with hot or cold water, steam and detergents.

2.13 Corrosion Protection

In addition to standard factory rust proofing, aftermarket rust proofing must be provided such as Krown Rust Control or Rust Check, and a decal and warranty for the coating provided with the vehicle upon delivery.

2.14 Identification

The following applies:

(a) A stamped plate must be installed on the body in a conspicuous and protected location that permanently indicates, at minimum, the following information:
   i. Cab and chassis manufacturer, date of manufacture, and serial number;
   ii. Body (including product tank, cabinets, etc.) manufacturer, date of manufacture, and serial number; and
   iii. Vehicle tare weight (GVWR and GAWR);

(b) A corrosion-resistant metal identification plate must be permanently affixed to the tank or its supporting structure in accordance with CSA B620 that indicates product tank compartment capacities.

2.15 Warning and Instruction Plates

The vehicle must be equipped with warning and equipment operation instruction plates as follows:

(a) Be in bilingual (English and French) format and within easy view of the operator;

(b) Include the following as a minimum:
- i. Operating instructions;
- ii. Fuel Flow Diagrams including location of valves;
- iii. Warning label for proper handling of the +100 additive, mounted in a conspicuous location near the reservoir;
- iv. Engraved metal plate labels for valves, gauges, controls, fuel system service points, product tank sump, drain points and sampling locations, attached with rivets in conspicuous locations;
- v. Four (4) dangerous goods placard holders with placards for product "1863" located on each side of the vehicle (front, back and each side); and
- vi. Include the words "FLAMMABLE" and "NO SMOKING" on all four sides of the vehicle.

2.16 Conspicuity Tape

Strips of reflective tape (such as 3M Scotchlite Diamond Grade 980) must be applied in accordance with the Motor Vehicle Safety Regulations (MVSR.

3.0 INTEGRATED LOGISTIC SUPPORT

3.1 Deliverable Information

The Contractor must provide the following Deliverable Information:

(a) Equipment Manuals –The following manuals must be provided:
- i. Operator's Manual – A copy of the Operator's manual in both hard copy and electronic (MS Word or PDF format) with each vehicle as follows:
  - a. Bilingual format or as two (2) manuals (one English, one French); and
  - b. Contain the description, operation, maintenance and routine repair of the complete equipment, including sub-systems, as follows:
    1. Instructions for the safe operation of the vehicle in cold and hot weather;
    2. Pre-operation and post-operation inspections;
    3. Daily operator maintenance instructions/checks (including lubrication); and
    4. Safety Warnings;
- ii. Maintenance (Shop Repair) Manual - A copy of the Maintenance (Shop Repair) Manual in both hard copy and electronic (MS Word or PDF format) to the delivery location as follows:
  - a. Bilingual format or as two (2) manuals (one English, one French); and
  - b. Contains the following information:
    1. A trouble shooting guide, showing the steps and tests required to determine the exact cause of a problem and an explanation of what steps would be required to correct a problem;

2. A listing of the necessary tolerances, torque levels, fluid volumes required;
3. A listing of any special tools required (including item part numbers);
4. An electrical circuit diagram outlining all the electrical components in the vehicle; and
5. Information on the order of disassembly and assembly of the systems and components of the vehicle;

iii. Parts Manual – A copy of the Parts Manual in English in both hard copy and electronic (MS Word or PDF) format to the delivery location, which contains the following information:
   a. Illustrations showing all components of the vehicle including equipment and accessories from other manufacturers that is supplied against the requirements of the contract. The illustrations must have numbers for the itemization of the parts;
   b. A listing for all itemized parts showing the manufacturer's part numbers (including Original Equipment Manufacturer's), the part name and a brief description of the item; and
   c. Cross reference relating all part numbers (including Original Equipment Manufacturer's) to the correct figure and item number;

iv. Miscellaneous Equipment Manuals – A hard copy of each of the Miscellaneous Equipment Manuals to the delivery location, in English, for assemblies not produced by the Prime manufacturer that are added to the vehicle, including the following information:
   a. Operating Instructions;
   b. Parts Manual; and
   c. Maintenance Manual (Shop Repair);

*Note: Manuals provided on CD/DVDROM must **not** require installation, password and/or Internet connection to be accessed and must be an unlocked PDF in a searchable format.*

(b) Data Summary - A bilingual Data Summary for the vehicle by completing the TA's template with data and vehicle pictures (in electronic format) as follows:
   i. One left-front three-quarter view; and
   ii. One right-rear three-quarter view;

(c) Dimensional Drawing – A drawing in all three views that gives dimensions of vehicle components, sizes, etc. with the vehicle part number and manufacturer's name;

(d) Warranty Letter – A paper copy of the completed bilingual Warranty Letter delivered with the vehicle, and a copy of the Warranty Letter in electronic format (PDF) delivered to the Technical Authority including the following:
   i. A list of all Canadian designated warranty service providers that will honor the warranty for the equipment and attachments (if applicable) procured under this contract, including the contact person and phone number at each warranty service provider;
   ii. Additional warranty coverage of sub-systems and a copy of the warranty letter from each subsystem's OEM;
   iii. Warranty period as negotiated in the contract; and
   iv. Contractor contact information, name and phone number, for warranty support.

(e) Recommended Spare Parts List - A hard copy list detailing the spare parts deemed necessary to maintain the vehicle for a period of 12 months exclusive of any warranty period, including the following information for each item:

i. Item name;
ii. Contractor's part number;
iii. Original manufacturer's number;
iv. Original manufacturer's NATO Supply code (NCAGE) or name and address;
v. NSN (NATO Stock Number) (if known);
vi. Quantity per equipment;
vii. Quantity recommended;
viii. Unit price; and
ix. Unit of issue;

(f) Preventive Maintenance Replacement Parts List - A hard copy list detailing the parts required to perform preventive maintenance for the system for a period of 12 months including the following information for each item:
i. Item name;
ii. Contractor's part number;
iii. Original manufacturer's number;
iv. Original manufacturer's NATO Supply code (NCAGE) or name and address;
v. NSN (NATO Stock Number) (if known);
vi. Quantity per equipment;
vii. Quantity recommended;
viii. Unit price; and
ix. Unit of issue;

(g) Special Tools List - A hard copy itemized list of specific special tools required for the servicing and repair of the vehicle including the following information for each item:
i. Item name;
ii. Original manufacturer's part number;
iii. Quantity recommended per equipment;
iv. Unit price; and
v. Unit of issue;

3.2 Training
The Contractor must deliver training as follows:

(a) Operator Training - An operator training session, in English, dealing with the specific features and capabilities of the equipment as follows:
i. One (1) day (eight (8) hours maximum) operator training for a up to six (6) DND candidates at the delivery location at a date and time as arranged with the Technical Authority;
ii. Include the following:
a. Features of the vehicle and fuelling system;
b. Daily maintenance/service;
c. Safety systems and precautions; and
d. Operating procedures including fuelling, defuelling and recirculation operations;
iii. Provide each candidate with a "Proof of Operator Training" certificate signed by the Contractor and a DND representative;

(b) Maintenance Training - A maintenance training session, in English, dealing with vehicle and fuelling system maintenance as follows:

i. Two (2) day (eight (8) hours per day maximum) maintenance training for up to six (6) DND candidates at the delivery location at a date and time as arranged with the Technical Authority;
ii. Include the following:
    a. Features of the vehicle and fuelling system;
    b. Operating procedures including fuelling, defuelling and recirculation operations;
    c. Safety systems and precautions;
    d. Trouble shooting;
    e. Equipment test and adjustment;
    f. Special tools and test equipment; and
    g. All first and second line maintenance procedures;
iii. Provide each candidate with a flow chart showing fuelling, defuelling and recirculation operations for both high and low flow rate, an air diagram and an electric diagram display; and
iv. Provide each candidate with a "Proof of Maintenance Training" certificate signed by the Contractor and a DND representative;

(c) Training Video - Operator and maintainer training videos to be provided for use during initial training and retained by DND for refresher training covering all training subjects noted above. The video must be delivered on CD/DVD-ROM, be interactive and of high quality of 1600x720 pixels minimum resolution, and ***not*** require installation, password and/or Internet connection to be accessed;

3.3 Safety Recalls and Servicing Data

The following information must be provided to the Customer location, on a continuing basis, throughout the life expectancy of the vehicle (10 years):

(a) Safety recalls; and

(b) Manufacturer's technical service bulletins.

Note: This service can be made available as an Internet Service.

TECHNICAL INFORMATION QUESTIONNAIRE

This questionnaire covers technical information, which must be provided for evaluation of the configuration(s) of the vehicle offered.

Where the specification paragraphs below indicate "Proof of Compliance", the "Proof of Compliance" must be provided for each performance requirement/specification.

Offerors should indicate the document name/title and page number where the "Proof of Compliance" can be found.

Definitions for ***Equivalent*** and ***Proof of Compliance*** are found in the DEFINITIONS section at the end of this document.

OFFEROR INFORMATION

Bidder Name:

Date:

COMPLIANCE

Equipment proposed complies with all requirements specified in the Purchase Description.

YES ☐ NO ☐

SUBSTITUTES/ALTERNATIVES

Are any substitutes/alternatives offered as ***Equivalent*** to any requirement specified in the Purchase Description?

YES ☐ NO ☐

If yes, please identify all substitutes/alternatives offered as ***Equivalents*** below and indicate where in the proposal related information can be found:

_____

_____

_____

_____

_____

AVIATION REFUELER

Year:

Make:

Model:

SPECIFICATION PARAGRAPHS

2.1(b) **Client References** - ***Proof of Compliance***

The bidder ***must*** provide details of contracts related to the design, manufacture, and delivery of complete refuelling tenders of at least (2) two models of refuellers. The bidders ***must*** provide the following information:

i. Client and delivery location;
ii. Year completed; and
iii. List of make and models

Client references information can be found in:
Document: _____ Page: ___

2.4 **Transport Canada Registration** - ***Proof of Compliance***

The Contractor/Sub-Contractor must be registered with Transport Canada for the manufacture and assembly of Highway and Portable Tanks for the Transportation of Dangerous Goods pursuant to CSA-B620.

CSA-B620 TC 406 certification for the manufacture and assembly can be found in:
Document: _____ Page: ___

2.6 **Performance** - ***Proof of Compliance***

The bidder ***must*** provide a computer generated vehicle performance prediction analysis for a fully loaded vehicle which ***must*** be performed in conformance with SAE J2188, using proposed equipment engine and transmission.

Proof of compliance can be found in:
Document: _____ Page: ___

2.6.1 **Vehicle Performance** - Proof of Compliance

(a) Speed:

Maximum forward speed:
Cruising speed

Proof of compliance can be found in:
Document: _____ Page: ___

2.6.2 **Dimensions and Ratings** - ***Proof of Compliance***

(a) Dimensions:

Total height of the vehicle:
Total length of the vehicle:
Total width of the vehicle:

Proof of compliance can be found in:
Document: _____ Page: ___

(b) Gross Vehicle Weight Rating (GVWR):

Proof of compliance can be found in:
Document: _____ Page: ___

(c) Gross Axle Weight Rating (GAWR) for each axle:

Proof of compliance can be found in:
Document: _____ Page: ___

(f) Turning Radius:

Proof of compliance can be found in:
Document: _____ Page: ___

2.7.1 **Engine** - ***Proof of Compliance***

(a) The engine must operate on ultra-low sulfur diesel fuel in accordance with CAN/CGSB Standard 3.517:

Proof of compliance can be found in:
Document: _____ Page: ___

2.7.6 **Power Take Off** - ***Proof of Compliance***

The dual pumping systems must be driven by PTO shafts or hydraulic motors:

Proof of compliance can be found in:
Document: _____ Page: ___

2.8.8.1 **Filtration System – 19,000L Compartment** - ***Proof of Compliance***

(a) i Filter vessel make/model:
i.i Filter Element Stage 1 make/model:
iii Filter Element Stage 2 make/model:

Proof of compliance can be found in:
Document: _____ Page: ___

2.8.8.2 **Filtration System – 3,000L Compartment** - ***Proof of Compliance***

(b) i Filter vessel make/model:
i.i Filter Element Stage 1 make/model:
iii Filter Element Stage 2 make/model:

Proof of compliance can be found in:
Document: _____ Page: ___

2.8.9 **Additive Injection System** - ***Proof of Compliance***

(a)i Make/model:

Proof of compliance can be found in:
Document: _____ Page: ___

2.8.16 **Pumping Instruments** - ***Proof of Compliance***

(a) Product meter make/model:

Proof of compliance can be found in:
Document: _____ Page: ___

(b) Fuel management system make/model:

Proof of compliance can be found in:
Document: _____ Page: ___

(f) Fuel level display make/model:

Proof of compliance can be found in:
Document: _____ Page: ___

2.11 **Paint** - ***Proof of Compliance***

(e) Paint colour:

Proof of compliance can be found in:
Document: _____ Page: ___

DEFINITIONS

"**Equivalent**" - A standard, means, or component type, which has been accepted by the Technical Authority as meeting the specified requirements for form, fit, function and performance;

"**Proof of Compliance**" - An unaltered document, such as a brochure and/or technical literature and/or a third party test report provided by a nationally and/or internationally recognized testing facility and/or a report generated by a nationally and/or internationally recognized third party software. The document must provide detailed information on each performance requirement and/or specification. Where a document submitted as Proof of Compliance does not cover all the performance requirements and/or specifications or when no such document is available or when modifications to the original equipment or customization are required to achieve the performance requirements and/or specifications, a Certificate of Attestation (as a separate document) signed by a senior engineer representing the Original Equipment Manufacturer (OEM) detailing the modifications and how they meet the performance requirements and/or specifications must be provided. The certificate must detail all performance requirements and/or specifications required to substantiate compliance. One certificate can be provided for one or all performance requirements and/or specifications;