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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

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K1A 0S5

Title - Sujet Aircraft De-Icer/Anti-Icer 8,000L	
Solicitation No. - N° de l'invitation W8476-196055/A	Amendment No. - N° modif. 001
Client Reference No. - N° de référence du client W8476-196055	Date 2019-05-07
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Signature	Date

Amendment 001

This amendment is raised to include the following documents to the Request for proposal:

1. Solicitation Documents

Insert: Product Description and Technical Evaluation Matrix (See next pages)

2. Attachments

Insert: W8486-196055_Annex_Annexe_A_V1

ALL OTHER TERMS AND CONDITIONS REMAIN UNCHANGED.



PURCHASE DESCRIPTION FOR

Aircraft De-Icer/Anti-Icer 8,000L



NOTICE

This documentation has been reviewed by the Technical Authority and does not contain controlled goods.

AVIS

Cette documentation a été révisée par l'autorité technique et ne contient pas de marchandises contrôlées.

OPI DSVPM 5 – DAVPS 5

Issued on Authority of the Chief of the Defence Staff
Publiée avec l'autorisation du chef d'état-major de la Défense
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1. SCOPE

1.1 Scope

- a) This Purchase Description covers the requirements of an 8,000L aircraft de-icer/anti-icer vehicle that includes a vehicle-mounted self-propelled, boom type aerial device, equipped with an aircraft de-icing fluid spraying system and a separate aircraft anti-icing fluid spraying system. The vehicle will de-ice/anti-ice aircrafts, including the C17 aircraft, at Royal Canadian Air Force Wings across Canada.

1.2 Instructions

- b) Requirements, which are identified by the word “**must**”, are mandatory. Deviations will not be permitted.
- c) Requirements identified with a “will” define actions to be performed by Canada and require no action/obligation on the Contractor’s part.
- d) Where “**must**” or “will” are not used, the information supplied is for guidance only.
- e) In this document “provided” **must** mean “provided and installed”.
- f) Where a technical certification is referred to in this specification, a copy of the certification or an acceptable Proof of Compliance **must** be supplied for the vehicle when requested by the Technical Authority.
- g) Metric measurements are used to define the requirement. Other measurements are for reference only and may not be exact conversions.
- h) Nominal dimensions reflect a method by which materials or products are generally identified, but which differ from the actual measured dimensions.

1.3 Definitions

- a) “**Technical Authority**” - The government official responsible for technical content of this requirement.
- b) “**Equivalent**” - Substitutes and alternatives that are equivalent in product, performance or a standard will be considered for acceptance by the Technical Authority where Proof of Compliance for equivalency for the respective requirement is provided for evaluation.
- 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.

2. APPLICABLE DOCUMENTS

2.1 Applicable Documents

- a) The following documents form part of this Purchase Description. The dates of issue are those in effect on the date of release of the Request for Proposals (RFP). Canada will not be supplying these documents. Sources are as shown:

American National Standards Institute

ANSI /SIA A92.7-1990 (R1998) Airline Ground Support Vehicle-Mounted Vertical Lift Devices
1430 Broadway
New York, NY, 10018
<http://webstore.ansi.org/>

Automotive (On-road) Diesel Fuel

CAN/CGSB Standard 3.517
Standards Council of Canada
270 Albert Street, suite 200
Ottawa, ON K1P 6N7
<https://www.scc.ca/en>

Canadian Occupational Health and Safety Regulations (COHSR), 2015

<http://laws.justice.gc.ca/eng/regulations/sor-86-304/index.html>

Motor Vehicle Safety Regulations (MVSR)

Government of Canada / Transport Canada
<https://www.tc.gc.ca/eng/acts-regulations/regulations-crc-c1038.htm>

SAE Handbook

SAE ARP 1247 Aircraft Ground Support Equipment General Requirements
SAE ARP 1328 Aircraft Ground Support Equipment Vehicle Stability Analysis
SAE ARP 1971 Aircraft De-Icing Vehicle Self-Propelled
SAE ARP 4806 Aerospace De-icing/Anti-Icing Self-Propelled Vehicle Functional Requirement
SAE ARP 5058 Enclosed Operator’s Cabin for Aircraft Ground De-icing Equipment

Society of Automotive Engineers Inc.
400 Commonwealth Dr,
Warrendale, PA, 15096
<http://www.sae.org>

Yearbook

Tire and Rim Association Inc.
3200 West Market St.
Akron, Ohio, 44321
<http://www.us-tra.org/traHome.htm>

Advisory Circulars 300 Series – Aerodromes and Airports (for additional information and guidance only)

Transport Canada
Government of Canada
330 Sparks Street
Ottawa, ON, K1A 0N5
<https://www.tc.gc.ca/>

3. REQUIREMENTS

3.1 Standard Design

- a) **Latest Model** - The vehicle design **must** be the manufacturer's latest model.
- b) **Industry Acceptability** - The vehicle design **must** have demonstrated industry acceptability by having been manufactured and sold commercially for at least 2 year, or be manufactured by a company that has at least 5 years' experience in design and manufacturing of a comparable type of equipment of equivalent or greater complexity.
- c) **Engineering Certification** - Original manufacturers engineering certification **must** be provided upon request for major drive train components, and major equipment systems and assemblies, to demonstrate that assemblies are used within their design limitations.
- d) **Regulations** – The vehicle **must** 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) **Published Ratings** - The vehicle **must** have system and component capacities equivalent to published ratings (i.e. product or component brochures).
- f) **Standard Components** - The vehicle **must** include all standard components, equipment and accessories for the model offered, although they may not be specifically described in this Purchase Description.
- g) **Spare Parts** - The manufacturer **must** ensure that components and parts used are readily available for a minimum period of ten (10) years from the date of manufacture.

3.2 Operating Conditions

3.2.1 Weather

- a) The vehicle **must** operate under the extremes of weather conditions found in Canada in temperatures ranging from -46 to 39° C (-50.8 to 102° F) and cold starting from -40° C (-40 °F) with external aids as specified in Paragraph 3.7.2.

3.2.2 Terrain

- a) The vehicle **must** be operable on concrete and asphalt surfaces that include year round operations on rain, snow, hard packed snow and ice with up to 2.0% (percent) slope in all weather conditions.

3.3 Safety Standards

3.3.1 Vehicle Safety Regulations

- a) The vehicle **must** be designed and built in accordance with the latest version of ANSI /SIA A92.7, SAE ARP 1247, SAE ARP 1971, SAE ARP 1328, SAE ARP 4806 and SAE ARP 5058.

3.3.2 Noise Level

- a) The vehicle noise level **must** meet the requirements of legislation relative to Canadian Occupational Health and Safety Regulations (COHSR).

3.3.3 Human Factors Engineering

- a) The vehicle, all systems, and components **must** comply with the relevant sections of the COHSR.
- b) The vehicle **must** be manufactured/assembled for safety and ease of use by CAF users with anthropometric characteristic measurements ranging from 95th percentile male to 5th percentile female.
- c) The vehicle **must** have entry and exit points equipped with handles and steps sized and positioned to accommodate CAF users with anthropometric characteristic measurements ranging from 95th percentile male to 5th percentile female.
- d) The vehicle **must** be equipped, with warning and instruction plates, non-slip walking surfaces and heat shields, for operator safety.

3.4 Vehicle Performance, Ratings and Dimensions

3.4.1 Performance

- a) The vehicle **must** sustain a speed of at least 40 km/h (24.9 mph) when fully loaded.
- b) The vehicle **must** be to apply de-icing and anti-icing fluid to all exterior surfaces of the C-17 Globemaster and other similar wide body jets and military aircrafts.
- c) The vehicle **must** provide a safe configuration for maneuvering at a minimum sustained speed of 6 km/h (3.7 mph) with fluid and fuel tanks at both minimum and maximum operating levels and at all boom positions.

- d) The vehicle **must** be designed for single operator use.
- e) If a truck chassis is provided, it **must** be designed to be driven and operated by a single operator from the de-icing cab.

3.4.2 Weight Ratings

- a) 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 and as defined in the *Motor Vehicle Safety Regulations (C.R.C., c. 1038)*.
- b) 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.
- c) The total load on each axle of the vehicle **must** not exceed the GAWR for that axle.

3.4.3 Dimensions

- a) The vehicle **must** have dimensions for safe transport across Canada.
- b) The maximum overall **height** of the vehicle **must** be 4.2 metres (13.7 feet).
- c) The maximum overall **length** of the vehicle **must** be 12.8 metres (42 feet).
- d) The maximum overall **width** of the vehicle **must** be 4.5 metres (14.7 feet).
- e) The vehicle minimum ground clearance **must** be 200 mm (7.8 inches).

3.5 C-17 Air Transportability

- a) The vehicle **must** be air transportable in a C-17 Globemaster (Canadian Forces CC-177) without the removal of the aerial boom.
- b) For C-17 Aircraft loading, the vehicle tie down provisions **must**:
 - i. Accept a minimum forward load of 3 g, rearward load of 1.5 g, vertical load of 2 g and lateral load of 1.5 g (1 g = shipping weight of the equipment), loads are not imposed simultaneously;
 - ii. Be positioned to anchor the vehicle, to prevent shifting or movement during transport;
 - iii. Be permanent and integrally attached;
 - iv. Be positioned to provide access for the attachment of cables or turnbuckles;
 - v. Be clearly marked with the maximum permitted load; and
 - vi. Provide complete tie down provision locations with decals in the vehicle cab.

3.6 Frame

- a) The frame **must** be either a truck chassis or purpose-built chassis, manufactured for use in all conditions specified in Paragraphs 3.2, 3.3 and 3.4.

- b) Two (2) recovery tow hooks rated for the maximum weight of the vehicle **must** be provided at the front of the vehicle, one on each side of the centreline.
- c) At least one (1) recovery tow hook rated for the maximum weight of the vehicle **must** be provided at the rear of the vehicle.

3.6.1 **Outriggers or Stabilizers**

- a) If required, stabilizers or outriggers **must** be provided in accordance with safety requirements in ANSI/SAIA A92.7.
- b) If stabilizers or outriggers are required, an emergency system **must** be provided to allow the vehicle to be moved with the outriggers/stabilizers in an extended position.

3.7 **Engine**

- a) The engine **must** operate on ultra-low sulphur diesel fuel to the CAN/CGSB Standard 3.517 and meet the latest emission standards.

3.7.1 **Engine Components**

- a) A replaceable air filter(s) **must** be provided.
- b) A cooling system **must** be provided.
- c) A combustion air cleaning system **must** be provided, with an air cleaner restriction indicator visible to the operator.
- d) A full flow replaceable oil filter **must** be installed.
- e) An engine shutdown or de-rate system **must** be provided, including a visual warning indicator visible from the operator position.

3.7.2 **Cold Weather Starting Aids**

- a) Low temperature engine starting aids **must** be provided to meet the operating conditions in Paragraph 3.2.1.
- b) A thermostatically controlled water separator/fuel filter **must** be provided to preheat diesel fuel prior to starting.
- c) A 110-volt battery heater(s), blanket or pad **must** be provided.
- d) All cold weather aids **must** be connected with a cover-protected, external electrical power plug, powered through dedicated shoreline receptacles.
- e) The cold weather aid receptacles **must** be grouped together.

3.7.3 **Exhaust System**

- a) The vehicle **must** be equipped with an exhaust system shielded to prevent personnel contacting a heated surface.

- b) The exhaust system **must** prevent entry of rain.
- c) If a Selective Catalytic Reduction (SCR) System is used, there **must** be manual deactivation and activation controls for the automatic regeneration of the Diesel Particulate Filter (DPF).

3.8 Fuel Tank(s)

- a) A fuel tank(s) **must** be provided for the engine, auxiliary engine and combustion heaters, if provided.
- b) The fuel tank(s) **must** have a fuel capacity sufficient for a minimum of four (4) hours of de-icing operations.
- c) If more than one fuel tank is used, separate fuel gauges **must** be provided.

3.9 Transmission

- a) The vehicle **must** be equipped with fully automatic or hydrostatic drive transmission.
- b) The transmission **must** have an oil heater, if required to meet the operating conditions specified in Paragraph 3.2.
- c) The transmission **must** have an oil cooler, if required to meet the operating conditions specified in Paragraph 3.2.
- d) The transmission **must** have a replaceable oil filter.
- e) The transmission shift control **must** clearly indicate the position of the shift column under all lighting conditions.
- f) The transmission **must** include a “Park” or “Neutral” starting interlock.
- g) A means to measure oil level **must** be provided.
- h) An audible back-up alarm **must** be installed to alert personnel that the vehicle transmission is in reverse.

3.10 Braking System

- a) The vehicle **must** be equipped with a power assisted (air, hydraulic, electric, etc.) braking system.
- b) If an air brake system is provided, the braking system **must** include a wet tank reservoir.
- c) If an air brake system is provided, the braking system **must** include an automatic air dryer.

3.10.1 Parking Brake

- a) The vehicle **must** be equipped with a parking brake.
- b) The parking brake control **must** be positioned so it will not interfere with the operator or snag their clothing when entering or exiting the vehicle.

3.11 Suspension System

- a) The vehicle **must** be equipped with a suspension system.
- b) The suspension system **must** be provided with double acting shock absorbers on all axles, if required.
- c) If an air system is provided, it **must** include immediate response automatic ride height control.
- d) If an air system is provided, a heated automatic air tank drain valve **must** be provided.

3.12 Steering

- a) The vehicle **must** be provided with a front-wheel power steering system.

3.13 Wheels, Rims and Tires

- a) Tires and rims **must** be selected in accordance with MVSR Technical Standards Documents No. 120, Revision 1R for a truck chassis **or** Tire and Rim Association Handbook for the purpose-built chassis.
- b) Tires **must** have a tread pattern for use in the operating conditions described in Paragraph 3.2.
- c) The wheels, tires and rims **must** include valve extensions for inner tires, if used, to allow for easy access.
- d) For each tire size provided, one full size spare tire assembly **must** be delivered with each vehicle.

3.14 Cab

- a) The vehicle **must** be equipped with a weatherproof cab.
- b) A fully adjustable driver's seat **must** be provided, with suspension.
- c) The driver's seat **must** have dark upholstery and include a retractable **(3-point)** seat belt.
- d) A trainer seat **must** be provided and include a lap belt as a minimum.
- e) A minimum of one (1) door **must** be provided.
- f) If more than one (1) door is provided, they **must** be keyed alike.
- g) A ventilation/heater and defrosting system **must** be provided, with a multi-speed fan, applicable for the operating conditions as specified in Paragraph 3.2.1.
- h) All windows **must** have glass tinting to reduce solar heating effects.
- i) A cab roof window of at least 400 square inches **must** be provided.
- j) The cab roof window **must** be electrically heated and equipped with windshield wiper.

- k) A powered windshield washer system **must** be provided with multi-speed wipers, where the wiper blades **do not** travel from a vertical center windshield position to a horizontal position near the roof line.
- l) The cab floor or floor mats **must** be weatherproof.
- m) A rotating interior sun visor(s) **must** be installed.
- n) A back-up camera system **must** be installed in the cab with a screen size of at least 17.7 cm (7 inches) that displays in colour.
- o) An AM/FM stereo radio with an auxiliary port **must** be provided.
- p) Two heavy-duty, powered and heated exterior side mirrors, with convex section, **must** be provided with in-cab controls.
- q) The cab **must** be equipped with a 4.5 kg (10 lb) ULC approved and rechargeable dry chemical fire extinguisher, type ABC 10G, equipped with a pressure gauge, service inspection tag, and accessible to the operator.

3.15 Aerial Device

- a) The vehicle **must** be equipped with an aerial device.
- b) The aerial device **must** be a hydraulically controlled telescoping boom.
- c) The aerial device **must** have a working height of at least 16.7 m (55 ft).
- d) The aerial device **must** include an automatic cab levelling system.
- e) The aerial device **must** have non-continuous boom rotation achieved by turret swing through at least a 340° arc.
- f) The aerial device **must** include a boom rest for boom storage in the stowed position with automatic boom stowage.

3.15.1 Operator's Station Cab

- a) A one-person enclosed operator's station cab mounted for ground level entry during the stowed position **must** be provided on the aerial device.
- b) The cab **must** be weatherproof and protect the operator from contact with fumes from de-icing fluid.
- c) The cab **must** provide a clear view without affecting operations.
- d) A forced-air heater and defroster system **must** be provided.
- e) Windshield wipers and washers **must** be provided.
- f) The cab **must** have a capacity of at least 136 kg (299.8 lb).

- g) The cab **must** include all controls and indicators for the full de-icing and anti-icing operations, all vehicle operations as well as all in-cab controls such as the heaters and defrosters.
- h) If a purpose-built vehicle is provided, the operator's station cab and the cab specified in Paragraph 3.13 can be integrated into one cab located on the boom.

3.16 De-icing and Anti-icing Tanks

- a) The vehicle **must** be equipped with at least two (2) tanks constructed out of corrosion resistant material.
- b) The tanks **must** have a minimum total usable capacity of 8,000 litres (1759.8 Imp gallons).
- c) The tanks **must** be designed to prevent fluid overflow or tank pressure build-up during heating with the use of baffles and vents.
- d) The tanks **must** have baffling to prevent undue fluid motion and the cavitation of the fluid pump(s) during manoeuvring.
- e) The tank pressure fill lines and valves **must** be located for access from ground level.
- f) 20ft tank fill hoses **must** be provided for each tank to draw fluid from an external source equipped with dust-covers and with on-board storage.
- g) The tank fill and drain valves **must** be at least 5 cm (2 inch).
- h) The tanks **must** be designed for drainage.
- i) Each tank **must** have manholes located at the top for cleaning access.
- j) The tanks **must** have manual fill holes located at the top.
- k) The tanks **must** have fall arrest harness anchor points or safety rails located at the top.
- l) A minimum of one (1) tank access ladder **must** be provided with hand rails and grip strut material.
- m) Visible fluid level gauges **must** be provided for each tank.
- n) Colour coding **must** be provided for each of the de-icing and anti-icing tanks, pipes, valves and related components.
- o) Audible and visual warnings **must** be located in the cab when approaching a low tank level condition indicating approximately 2 minutes of spraying time remains.

3.17 Auxiliary Engine

- a) If an auxiliary engine is provided, it **must** meet the requirements of Paragraph 3.7.

3.18 De-icing Fluid Dispensing System

- a) The de-icing fluid dispensing system **must** provide a maximum flow rate of at least 220 LPM (48.4 IGPM).

- b) The system **must** be compatible with Type I (ethylene and/or propylene glycol based) heated de-icing fluids.
- c) The system **must** include a pump.
- d) The pump **must** be equipped with a sensor(s) to automatically prevent it from running dry.
- e) The system **must** include a minimum of 10 m (32.8 ft) long ground hose and a swivel mounted spray nozzle located on the vehicle body accessible from ground level.
- f) A shut-off valve **must** be installed immediately up-stream of the ground hose.
- g) The ground reel **must** be stowed on an automatic hose reel.
- h) The system **must** include a fluid meter that indicates, in litres, the de-icing fluid dispensed.
- i) The fluid meter **must** have a readout in the cab.
- j) The system **must** be designed for the complete drainage of fluid in the tank, supply and return piping, by drain valves, to prevent freeze-up.

3.19 Anti-icing Fluid Dispensing System

- a) The anti-icing fluid dispensing system **must** provide a maximum flow rate of at least 75 LPM (16.5 IGPM).
- b) The fluid handling system **must** be compatible with Type IV (ethylene and/or propylene glycol based with added thickeners) anti-icing fluids.
- c) The anti-icing fluid dispensing system **must** include a pump.
- d) The pump **must** be equipped with a sensor(s) to automatically prevent it from running dry.
- e) The system **must** include a fluid meter that indicates, in litres, the de-icing fluid dispensed.
- f) The fluid meter **must** have a readout in the cab.
- g) The system **must** be designed for the complete drainage of fluid in the tank, supply and return piping, by drain valves to prevent freeze-up.

3.20 Forced Air System

- a) A forced air system **must** be provided.
- b) The forced air system **must** be selectable to supply forced air only or a mixture of forced air and de-icing fluid from the nozzle specified in Paragraph 3.21.
- c) The forced air system **must** remove accumulated snow from aircraft surfaces without damage to the aircraft.

3.21 Dispensing Nozzle System

- a) The nozzle system **must** be fix-mounted on a remote controlled base.

- b) The nozzle **must** be compatible with Type I and Type IV fluids.
- c) The nozzle system **must** be used for de-icing, anti-icing and forced air capabilities separately or in combination.
- d) Controls to select between de-icing, anti-icing and forced air capabilities separately or in combination **must** be provided in the operator's station cab.
- e) The nozzle system **must** produce high pressure and low pressure de-icing.
- f) The nozzle **must** have a spray pattern controlled by using an adjustable nozzle that varies from a cone-shaped spray to a solid stream as selected by the operator.
- g) The nozzle **must** be fully controllable by the operator.

3.22 De-Icing Heating System

- a) The heating system **must** include a heater(s) for the de-icing fluid.
- b) The heater **must** maintain the fluid temperature at a temperature of the de-icing fluid at a minimum of 80°C under all operating conditions.
- c) The heater(s) **must** also incorporate a separate over temperature switch.
- d) The heating system **must** be designed to meet the heating time requirements specified in SAE ARP 1971.
- e) If a fuel-fired heater is provided, a flame detection circuit, fluid flow switch and exhaust spark arrester **must** be provided along with all other components required to prevent the burning of accumulated fuel.
- f) If a fuel-fired heater is provided, shielding **must** be provided for the combustion chamber with the heater(s) completely enclosed within the exterior surfaces of the vehicle.
- g) Components of the heater(s) **must** be corrosion resistant and compatible with de-icing fluids.
- h) The heating system **must** include "hot at nozzle" heating.

3.22.1 Fire Extinguishing System

- a) An automatic fire extinguishing system **must** be installed.
- b) The extinguishing agent **must** be Purple K or equivalent.

3.23 Pump(s) Disconnect

- a) The de-icing and anti-icing pumps **must** have a means to be clutched or disconnected from the drive engine to allow for the operation of aerial device while performing non-de-icing roles.

3.24 Body Compartments

- a) Body compartments **must** be provided for the fluid tanks, auxiliary engine, pumps, heaters and all other components other than the aerial boom and nozzle system.

- b) The body compartments **must** be weatherproof and insulated for the weather conditions specified in Paragraph 3.2.1.
- c) The body compartments **must** provide access to service the enclosed components.
- d) The top surface of the compartments **must** have the capacity to support a 136 kg (299.8 lb) person.
- e) The top surface of the compartments **must** be anti-slip and have steps, handles, platforms and fall-arrest attachment points.
- f) The compartments **must** have flush-mounted panel doors and latches.
- g) All exposed edges or corners of the body **must** have a smooth radius to prevent injury to operator and damage to materiel.

3.25 Accessories

- a) Front licence plate holder **must** be provided.
- b) Rear licence plate holder with LED light **must** be provided.
- c) Mud flaps **must** be provided.
- d) A hazmat spill kit(s) **must** be provided with on-board storage.

3.26 Hydraulic System

- a) The vehicle **must** be equipped with a hydraulic system.
- b) A hydraulic oil cooler **must** be provided, if required.
- c) Hydraulic filter change indicators **must** be provided.
- d) Hydraulic hoses **must** be grouped together and clearly identified.
- e) Clearly marked test ports **must** be provided.
- f) Hydraulic pressure test gauge with applicable fittings and hoses **must** be provided.

3.27 Automatic Lubrication System

- a) The vehicle **must** be equipped with a Groenveld auto-lubrication system or equivalent.
- b) The system **must** include a grease reservoir, accessible for level checking and refilling.
- c) The grease reservoir **must** be full on delivery.
- d) A grease level indicator **must** be provided.
- e) A grease distribution pump **must** be provided.
- f) An adjustable timer **must** be installed to control the greasing intervals.

- g) All grease point that are not serviced by the auto-lubrication system **must** be clearly identified.

3.27.1 Lubricants and Fluids

- a) All lubricants and fluids provided **must** meet the operating conditions specified in Paragraph 3.2.1.

3.28 Electrical System

- a) The vehicle **must** be equipped with a 12-volt or 24-volt electrical system
- b) Wiring **must** be protected by insulating grommets, where passing through metal.
- c) Heavy-duty, maintenance free batteries **must** be provided in an enclosure and secured in an accessible location.
- d) A master disconnect switch, accessible from the ground, **must** be provided.

3.29 Lighting

- a) The vehicle **must** be equipped with LED lights only, which includes: type signal, marker, tail, stop, clearance, licence plate, and back-up lights.
- b) If a truck chassis is provided it **must** meet MVSR lighting requirements.
- c) Lights **must** be recessed or otherwise protected from damage with all components accessible for servicing.
- d) Instrument and controls panel lights **must** be provided and be dimmable.
- e) At least one (1) amber coloured beacon light mounted on the highest point of the vehicle when the boom is stowed **must** be provided.
- f) One (1) adjustable work light **must** be provided mounted on the boom to light the nozzle system.
- g) Two (2) adjustable work lights **must** be provided mounted on the top of the operator's station cab.
- h) At least two (2) adjustable work lights **must** be provided mounted at the rear of the vehicle.
- i) Lighting **must** be provided in all body compartments.
- j) All controls for the lights **must** be located in the cab and in the operator's station cab.

3.30 Controls

- a) Each control **must** be permanently marked to identify the function, in both English and French or international symbols as defined by SAE J1362.
- b) Vehicle controls **must** be grouped together in the cab specified in Paragraph 3.14 and in the operator's station cab specified in Paragraph 3.15.1.
- c) De-icer controls **must** be grouped together in the operator's station cab specified in Paragraph 3.15.1.

- d) Controls **must** not restrict the operator's field of view.

3.31 Instruments

- a) Instruments **must** be metric and visible to the seated operator in all lighting conditions.
- b) An ammeter, voltmeter or charging indicator **must** be provided.
- c) An engine coolant temperature indicator **must** be provided.
- d) A hydraulic oil temperature and level **must** be provided.
- e) An engine oil pressure indicator **must** be provided.
- f) An hour-meter with numeric display, which accurately records accumulated engine running time up to at least 9,999 hours **must** be provided.
- g) A fuel level indicator **must** be provided.
- h) A speedometer **must** be provided.
- i) An engine tachometer **must** be provided.
- j) An indicator to show when the aerial boom is not in the stowed position **must** be provided.
- k) De-icing fluid temperature gauge reading **must** be provided.
- l) De-icing and anti-icing fluid level indicators **must** be provided.
- m) If an auxiliary engine is provided instruments b), c), e) f) and i) **must** be provided for this auxiliary engine.

3.32 Paint

- a) All metal surfaces **must** be protected.
- b) The prime coating **must** be a high durability, corrosion resistant type, such as an epoxy.
- c) The colour **must** be Dupont Axalta 750206 E B Penn Dot Yellow or equivalent.

3.33 Retroreflective Tape

- a) Retroreflective tape **must** be placed on the vehicle on all extremities of the vehicle and operator cabs, along the vehicle body and along the aerial boom.
- b) If a truck chassis is provided, placement of the tape **must** be in accordance with the Motor Vehicle Safety Regulations (MVSR).

3.34 Corrosion Protection

- a) The vehicle **must** be designed and manufactured to prevent galvanic corrosion.

- b) The materials used in the vehicle manufacturing **must** resist damage or deterioration as a result of cleaning with hot or cold water, steam, or detergents (such as automotive cleaning products).
- c) A commercial rust prevention coating **must** be applied to the vehicle, such as Krown Rust Control or Rust Check or equivalent.
- d) A decal and warranty papers for the rust prevention coating **must** accompany the vehicle.

3.35 Warning, Markings and Instruction Plates

- a) All identification, instructional, and warning labels **must** be bilingual or International symbols defined in SAE J1362.
- b) All identification, instructional, and warning labels **must** within view of the operator.
- c) All gauges and controls and **must** be permanently labelled.

3.35.1 Vehicle identification

- a) The vehicle identification information **must** be permanently affixed in a conspicuous and protected location.
- b) Identification information **must** include the cab and chassis manufacturer's name, model number, serial number, and model year.
- c) Identification information **must** include the body manufacturer's model and serial number.
- d) Identification information **must** include the equipment manufacturer's model and serial number.
- e) Identification information **must** include the GVWR and GAWR ratings.

4. INTEGRATED LOGISTIC SUPPORT

4.1 Vehicle Manuals

- a) All manuals required for the description, operation, maintenance and repair of the complete equipment, including sub-systems, **must** be provided.

4.1.1 Operator's Manuals

- a) The operator's manuals **must** be bilingual (English/French).
- b) The operator's manuals **must** include instructions for the safe operation of the vehicle.
- c) The operator's manuals **must** include daily operator maintenance instructions/checks (including lubrication).
- d) The operator's manuals **must** include safety warnings.
- e) The operator's manuals **must** include hand signals (as necessary).

- f) The operator's manuals **must** include instructions for the preparation of the vehicle for air transportability.

4.1.2 **Parts Manual(s)**

- a) The parts manual(s) **must** be in English (bilingual is desirable).
- b) The parts manual **must** have illustrations showing all components of the vehicle including equipment and accessories from other manufacturers that are supplied to meet the requirements of the contract, with numbers for the itemization of the parts.
- c) The parts manual **must** have a listing for all itemized parts showing the Original Equipment Manufacturers (OEM) part number, the part name and a brief description of the item.
- d) The parts manual **must** cross reference the OEM part number to the correct illustration and item number.
- e) The parts manual **must** have a representation of bilingual warning signs and identification labels delivered on the equipment.

4.1.3 **Maintenance Manuals**

- a) The maintenance manual **must** be English (French translation is desirable).
- b) The maintenance manual **must** include a trouble shooting guide, showing the steps and tests required to determine the exact cause of a problem and an explanation of the steps required to correct a problem.
- c) The maintenance manual **must** include a listing of the necessary tolerances, torque levels, fluid volume, and special tools as per Paragraph 4.3.4 (including item part numbers).
- d) The maintenance manual **must** include information on the order of disassembly and assembly of the systems and components of the vehicle.
- e) The maintenance manuals **must** include instructions for the preparation of the vehicle for air transportability.

4.1.4 **Manual Delivery to Technical Authority**

- a) Sample manuals **must** be submitted to the Technical Authority (TA) prior to the delivery of the vehicle/trailer for each model and or sub-system for approval. Sample manuals will not be returned. TA will provide approval or comments on the manuals within 30 days.
- b) One (1) complete set of approved manuals (Operator's, Maintenance, and Parts) in electronic format **must** be delivered to the Technical Authority.

4.1.5 **Manual Delivery with Vehicle**

- a) One (1) complete set of manuals (Operator's, Maintenance, and Parts) **must** accompany each vehicle.
- b) The manuals **must** be in paper and electronic format.

4.1.6 **Electronic Format**

- a) Approved copies of the electronic format manuals **must** be delivered on CD/DVD-ROM.
- b) CD/DVD-ROM **must not** require installation, password and/or Internet connection to be accessed and be an unlocked PDF in a searchable format.

4.1.7 **Provisional Manuals**

- a) In the event that approved manuals are not available at the time of delivery of the equipment, manuals marked "Provisional" **must** be supplied with the equipment.
- b) The contractor **must** deliver replacement approved manuals to all destinations where Provisional manuals were delivered.

4.1.8 **Manual Supplements**

- a) The contractor **must** supply manual supplements (Operator's, Maintenance and Parts) to support dealer-installed equipment not covered in the Vehicle Manuals.
- b) Manual supplements **must** be delivered in accordance with Paragraphs 4.1.4 and 4.1.5.

4.1.9 **Changes to Manuals**

- a) During the period of the contract, changes to equipment, which affect the contents of manuals, **must** be reflected in the revision of the electronic and paper version of the manuals.
- b) Changes to the manuals **must** conform to the same format and presentation requirements as the original manuals.
- c) The revised electronic version of the manual **must** be sent to the Technical Authority by the Contractor.

4.2 **Warranty Letter**

- a) The warranty letter **must** include additional warranty coverage of sub-systems and a copy of the warranty letter from each sub-system's Original Equipment Manufacturer (OEM).
- b) The warranty letter **must** include warranty period as negotiated in the contract.
- c) The warranty letter **must** include Contractor contact information, name and phone number, for warranty support.

4.2.1 **Warranty Letter Delivery**

- a) The Contractor **must** provide a bilingual warranty letter to the Technical Authority and with each vehicle. If the Technical Authority requires the letter to be in DND format, then they will provide the Contractor a template for the DND acceptable format of the warranty letter.

4.3 **Other ILS Deliverables to Technical Authority**

- a) All ILS deliverables in Paragraph 4.3 **must** be delivered to the Technical Authority by the first vehicle delivery at the latest.

4.3.1 **Data Summary**

- a) The Contractor **must** provide a bilingual Data Summary for each make/model/configuration of vehicle by completing Technical Authority's template with data and a vehicle picture.

4.3.2 **Photographs**

- a) The Contractor **must** provide photographs in colour, taken against a plain background, and in digital JPEG format with a minimum 10 megapixel resolution.
- b) One left front three-quarter view of a completed unit **must** be provided.
- c) One right rear three-quarter view of a completed unit **must** be provided.

4.3.3 **Dimensioned Drawing**

- a) One side and front view sketch showing the dimensions **must** be provided. Brochure sketches are acceptable.

4.3.4 **Special Tools List** - The Contractor **must** provide an itemized list of specific special tools required for the servicing and repair of the vehicle and include:

- a) Item name;
- b) Contractor's part number;
- c) Manufacturer's part number (OEM);
- d) Quantity recommended per delivery location;
- e) Unit price; and
- f) Unit of issue.

4.3.5 **Preventive Maintenance Replacement Parts Kit List (PMRPKL)** - The contractor **must** provide a list detailing the parts that are required to perform preventive maintenance to the system for a period of 12 months, and include:

- a) Item name;
- b) Contractor's part number;

- c) Manufacturer's part number (OEM);
- d) Manufacturer's NATO Supply code (NCAGE) or name and address;
- e) NSN (NATO Stock Number) (if known);
- f) Quantity per equipment;
- g) Quantity recommended;
- h) Unit price; and
- i) Unit of issue.

4.3.6 **Recommended Spare Parts List (RSPL)** - The Contractor **must** provide a list detailing the spare parts deemed necessary to maintain the vehicle for a period of 24 months exclusive of any warranty period, and include:

- a) Item name;
- b) Contractor's part number;
- c) Manufacturer's part number (OEM);
- d) Manufacturer's NATO Supply code (NCAGE) or name and address;
- e) NSN (NATO Stock Number) (if known);
- f) Quantity per equipment;
- g) Quantity recommended;
- h) Unit price; and
- i) Unit of issue.

4.3.7 **Supplementary Provisioning Technical Documentation (SPTD)**

- a) The Contractor **must** provide SPTD as per 2.1
- b) The SPDT **must** include each item appearing on the RSPL as defined in 4.3.6
- c) For item identification and cataloguing purposes, the technical data supplied **must** be sufficiently comprehensive to allow DND to classify and fully describe the items within the NATO codification system.

4.4 **Safety Recalls and Servicing Data**

- a) Safety recalls, and manufacturer's technical service bulletins, or equivalent **must** be provided to the technical authority and the final delivery locations on a continuing basis, throughout the life expectancy of the vehicle or for no less than 10 years.

4.5 Initial Parts Kit

- a) One initial parts kit **must** be delivered with each vehicle.
- b) Each kit **must** include a complete set of filters and filter elements from the Original Equipment Manufacturer (OEM) required in the first 12 months of service.

4.6 Training

4.6.1 Operator Training

- a) The Contractor **must** provide an operator training course.
- b) The course **must** be given at the delivery destinations.
- c) The course **must** be available in both official languages.
- d) The course **must** have minimum duration of one (1) day to provide training for up to eight (8) operators and have the final dates arranged with the Technical Authority.
- e) The course **must** have a syllabus or course outline and schedule available for review and approval by the Technical Authority seven (7) days prior to the course commencement date.
- f) After completion of the course the Contractor **must** have a “*PROOF OF OPERATOR TRAINING*” certificate signed by a Crown Representative for the destination. The Technical Authority will supply this document in an electronic format.

4.6.2 Operator Training Curriculum

- a) Safety precautions to be observed while operating and servicing the vehicle **must** be included in the curriculum.
- b) Vehicle operating characteristics **must** be included in the curriculum.
- c) Vehicle operating procedures **must** be included in the curriculum.
- d) Pre-operating and pre-shutdown procedures **must** be included in the curriculum.
- e) Daily/weekly operator servicing procedures **must** be included in the curriculum.
- f) The preparation of the vehicle for air transportability must be included in the curriculum.
- g) A minimum of two (2) hours practical operating experience, per operator, **must** be provided.

4.6.3 Maintenance Training

- a) The Contractor **must** provide a maintenance training course.
- b) The course **must** be given at the delivery destinations.
- c) The course **must** be available in both official languages.

- d) The course **must** have a minimum duration of one (1) day to provide training of up to eight (8) maintenance personnel and have the final dates arranged with the Technical Authority.
- e) The course **must** have a syllabus or course outline and schedule available for review and approval by the Technical Authority seven (7) days prior to the course commencement date.
- f) After completion of the course, the Contractor **must** have a “*PROOF OF MAINTENANCE TRAINING*” certificate signed by a Canada Representative for the destination. The Technical Authority will supply this document in an electronic format.

4.6.4 **Maintenance Training Curriculum**

- a) Operator’s training detailed in Paragraph 4.6.2 **must** be included in the curriculum.
- b) Operation and maintenance safety precautions **must** be included in the curriculum.
- c) Preventive maintenance including servicing schedules (10 % of classroom time) **must** be included in the curriculum.
- d) Trouble shooting, testing, and adjustments (70 % of classroom time) **must** be included in the curriculum.
- e) Utilization of special tools and test equipment **must** be included in the curriculum.

4.6.5 **Training Materials**

- a) Training materials **must** be provided to each attendee and be available in French for locations in Quebec.
- b) Training materials **must** include a list of topics to be covered;
- c) Training materials **must** include an approximate timetable showing when topics are scheduled to be covered and how much time is scheduled for each topic;
- d) Training materials **must** list any reference material; and
- e) Training materials **must** make available any reference material used.

Technical Evaluation Matrix

Title:

Aircraft De-Icer/Anti-Icer 8,000L

Date:

2019-04-18

Technical Evaluation Matrix
Aircraft De-Icer/Anti-Icer 8,000L

Bidder Information

Bidder Name: _____
 Proposal Date: _____
 Proposed Make and Model: _____

Technical Mandatory Criteria			Location in Bid Proposal
PD Reference	PD Requirement	Bid Evaluation Requirement	
3.4.1	<p><u>Performance</u> a) The vehicle must sustain a speed of at least 40 km/h (24.9 mph) fully loaded.</p>	Substantive Information	
3.4.1	<p><u>Performance</u> b) The vehicle must be apply de-icing and anti-icing fluid to all exterior surfaces of the C-17 Globemaster and other similar wide body jets and military aircrafts.</p>	Substantive information including information on ability to de-ice/anti-ice C-17 Globemaster Aircraft.	
3.4.1	<p><u>Performance</u> c) The vehicle must conduct all de-icing and anti-icing operations at minimum sustained speed of 6 km/h (3.7 mph).</p>	Substantive Information	
3.4.1	<p><u>Performance</u> d) The vehicle must be designed for single operator use.</p>	Substantive Information	
3.4.2	<p><u>Weight Ratings</u> c) The total load on each axle of the vehicle must not exceed the GAWR for that axle.</p>	Substantive information including load calculations to demonstrate that the load on each axle does not exceed the GAWR of each axle.	

Technical Evaluation Matrix
Aircraft De-Icer/Anti-Icer 8,000L

Bidder Information

Bidder Name: _____
 Proposal Date: _____
 Proposed Make and Model: _____

Technical Mandatory Criteria			
PD Reference	PD Requirement	Bid Evaluation Requirement	Location in Bid Proposal
3.4.3	<u>Dimensions</u> c) The maximum overall height of the vehicle must be 4.2 metres (13.7 feet).	Substantive Information	
3.4.3	<u>Dimensions</u> d) The maximum overall length of the vehicle must be 12.8 metres (42 feet).	Substantive Information	
3.4.3	<u>Dimensions</u> e) The maximum overall width of the vehicle must be 4.5 metres (14.7 feet).	Substantive Information	
3.4.3	<u>Dimensions</u> f) The vehicle minimum ground clearance must be 200 mm (7.8 inches).	Substantive Information	
3.15	<u>Aerial Device</u> c) The aerial device must have a working height of at least 16.7 m (55 ft).	Substantive Information	

Technical Evaluation Matrix
Aircraft De-Icer/Anti-Icer 8,000L

Bidder Information

Bidder Name: _____
 Proposal Date: _____
 Proposed Make and Model: _____

Technical Mandatory Criteria		
PD Reference	PD Requirement	Location in Bid Proposal
3.16	<p><u>De-Icing and Anti-Icing Tanks</u> b) The two tanks must have a minimum total usable capacity of 8,000 litres (1759.8 Imp gallons).</p>	Substantive Information
3.18	<p><u>De-Icing Fluid Dispensing System</u> a) The de-icing fluid dispensing system must provide a maximum flow rate of at least 220 LPM (48.4 IGPM).</p>	Substantive Information
3.19	<p><u>Anti-Icing Fluid Dispensing System</u> a) The anti-icing fluid dispensing system must provide a maximum flow rate of at least 75 LPM (16.5 IGPM).</p>	Substantive Information
3.20	<p><u>Forced Air System</u> a) A forced air system must be provided.</p>	Substantive Information
3.22.1	<p><u>Fire Extinguishing System</u> a) An automatic fire extinguishing system must be installed.</p>	Substantive Information

**Technical Evaluation Matrix
Aircraft De-Icer/Anti-Icer 8,000L**

Bidder Information

Bidder Name: _____
 Proposal Date: _____
 Proposed Make and Model: _____

Proposed Equivalents			
PD Reference	PD Requirement	Bid Evaluation Requirement	Location in Bid Proposal