1. GENERAL REQUIREMENTS

1.1 General Vehicle Description – This specification covers a minimum 6,000 litre water capacity Aircraft Rescue and Fire Fighting services (ARFF) vehicle as described in the National Fire Protection Association's (NFPA) Standard 414 (2012). The proposed vehicle must meet all of the minimum requirements in the NFPA 414 Standard, as well as the specific requirements described in these specifications.

1.2 Intended Use – This vehicle is intended for use in rescue operations and in combating fires resulting from an aircraft ground emergency. It may also be used for other fire protection assignments necessary in airport operations.

1.3 Fire Suppression Characteristics – The vehicle supplied needs to possess the mobility and fire suppression system performance capabilities recommended for a major ARFF vehicle. It will require a minimum usable water capacity of 6,000 litre; a minimum litre capacity of Aqueous Film Forming Foam (AFFF) to support two loads of water using 3% AFFF, a minimum 225 kg complementary extinguishing agent (dry chemical) capacity and a total discharge capacity of 3400 litres per minute (LPM).

1.4 Standard Requirements – The ARFF vehicle supplied under this specification shall be the manufacturer's latest model, standard commercial product. The ARFF vehicle offered must have demonstrated industry acceptance by having been manufactured and put in service at airports within the past five years. As well, the vehicles in the configuration offered must have acceptable proven service at civil airports. Names and phone numbers of contacts are to be supplied by bidders when so requested.

1.5 Mandatory Items – Items noted in the basic specification as "shall" and "must" are **mandatory requirements.** No deviations will be accepted for these items.

1.6 Design - The controls and special features required to provide safe operation of the truck and to meet the specified performance requirements shall be identified and shown in photos or drawings to be submitted with the bid. The parts shall be of such size, material and strength so as to sustain the allowable loads imposed upon them during operation. The truck shall be constructed so that parts will not work loose in service. All liquids, including fire fighting agents,

SPECIFY THE ACTUAL COMPONENTS SUPPLIED, AND THEIR RATED CAPACITIES, FOR THE UNITS TENDERED. NOTE IN DETAIL ANY DEVIATIONS FROM THE SPECIFIED ITEMS.

PROPOSED VEHICLE

coolants and lubricants shall not spill or leak under all operational conditions, including longitudinal and side slope operations required by the Specifications. All components shall be built and mounted to withstand the strains, shocks, vibrations and other detrimental conditions incident to operation, maintenance, shipping and storage. The overall configuration shall limit strictly aesthetic panelling, trim and accessories in favour of weight and cost reductions. Insofar as it is consistent with other requirements, the vehicle shall have smooth rounded corners and no protruding objects.

2. REGULATIONS AND STANDARDS

2.1 General - All standards and specifications referenced herein refer to the latest editions. COMPLY_____

2.2 Highway Traffic Act – The vehicle supplied should comply in all respects as far as possible with the Highway Traffic Act of Regulations for every Province and Territory in Canada. COMPLY_____

2.3 Canada Motor Vehicle Safety Standards – All applicable Canada Motor Vehicle Safety Standards should be adhered to. COMPLY_____

2.4 Society of Automotive Engineers (SAE) – All notations in this specification refer to the most recent version in effect or its equivalent replacement specification in effect, by the SAE. COMPLY_____

2.5 National Fire Protection Association (NFPA) – The most recent version of the following standards shall apply to the vehicle: COMPLY_____

a) NFPA 412 Evaluating Foam Fire fighting Equipment on Aircraft Rescue and Fire fighting Vehicles

b) NFPA 414 Standard for Aircraft Rescue and Fire fighting Vehicles (NFPA 414 takes precedence over 412)

2.6 International Civil Aviation Organization (ICAO) - Chapter 5 of the Airport Services Manual on Rescue and Fire Fighting (latest edition) should apply to this vehicle. COMPLY_____

3. MAINTAINABILITY

3.1 Design - The vehicle design should be such that it:

3.1.1. Be capable of being maintained using commercially available tools and equipment as opposed to factory production line jigs and measuring instruments. Metric sizes are permitted if the required tools are "standard" and are commercially available. Any special equipment or tools unique to the proposed vehicle must be indentified and the cost clearly indicated in the proposal. COMPLY_____

3.1.1.1. Engine - State special tools or instruments required to perform engine tune-up. PROVIDE DETAILS_____

3.1.1.2. Transmission - State special tools or instruments required to trouble-shoot, repair or adjust the transmission. PROVIDE DETAILS_____

3.1.1.3. Foam Proportioning System - State special tools or instruments required to trouble-shoot, repair or adjust the foam proportioning system. PROVIDE DETAILS_____

3.1.1.4. Tires and Beadlocks - State special tools or presses required to mount and de-mount the tires and beadlocks. One beadlock tool must be supplied with the truck. PROVIDE DETAILS_____

3.1.2. Limits the number of tools and the variety of spare parts required for maintenance by such design practices as reducing the variety of bolt sizes, light bulb sizes, wire gages, tubing and pipe sizes consistent with safety and performance requirements. COMPLY_____

3.1.3. Front and rear wheels must be capable of being aligned on a truck alignment rack. COMPLY_____

3.1.4. Uses disconnect plugs, receptacles, junction boxes, bus bars and multiple-line connectors in the electrical system and readily detachable fittings in the hydraulic and pneumatic systems, as applicable. All disconnect points should be clearly labelled. All hydraulic and pneumatic lines and electrical wires should be colour or number coded. COMPLY_____

3.1.5. Include pilots, guides, slides, carriages or other COMPLY_____

features where such provisions can add to the ease of removal and installation or attachment of components.

3.1.6. Uses a fastener system that is easily disassembled and reassembled for all cabinets and bodywork that must be removed for access for maintenance and removal of components for repair or replacement. COMPLY_____

3.1.7. Operates with standard commercial lubricants. Grease and oil seals shall be of a design and located to provide accessibility for inspection, servicing and replacement. Panels which must be opened for access to lubrication points shall be hinged. Lubrication fittings shall be located in accessible, protected positions. Parts or assemblies which are not readily accessible for direct lubrication or are likely to be overlooked because of inaccessibility shall have extended fittings. A safety chain shall attach filler caps to lubrication fill points where practical. COMPLY_____

3.1.8. Locates drains, filler plugs, grease fittings, hydraulic line-bleeders and checkpoints so that they are readily accessible and do not require special tools for proper servicing. COMPLY_____

3.1.9. Ensures that the installation of each major subsystem or critical part can only be in its proper operation position. COMPLY_____

3.1.10. Provides accessible connections, where needed, to attach troubleshooting, analytical and diagnostic equipment to appropriate vehicle subsystems. COMPLY_____

3.2. Access to vehicle systems – The following systems must be accessible as described:

3.2.1. The engine must be accessible for hands-on inspection, adjustment and repair without the mechanic having to enter an engine compartment. COMPLY_____

3.2.2. The control actuators and regulators for the dry chemical system must be installed on a control panel situated so that a mechanic can easily inspect, adjust and repair the system without having to remove other chassis components to gain access. COMPLY_____

3.2.3. The nitrogen cylinder must be installed in such a way COMPLY_____

that one fire fighter can easily change cylinders without risking personal injury or muscle strain.

3.2.4. The engine and transmission oil fill and oil dipsticks must be accessible without the operator having to bodily enter a compartment of the vehicle. COMPLY_____

3.2.5. The electrical circuit breakers should be accessible from inside the cab. COMPLY_____

4. SAFETY FEATURES

4.1. All space which is occupied or in which work is performed during operation, servicing and maintenance of the truck shall be free from hazardous protrusions, edges, cracks or other elements which might cause injury to personnel. COMPLY_____

4.2. Safety features such as anti-skid treads, rigid steps to top of vehicle, catwalks, anti-skid deck plates, handrails and guards shall be provided at all high points where the protection of personnel is required. Entrances and exits from the cab shall not be obstructed by component or equipment location. COMPLY_____

4.3. Engine access for major maintenance must be provided on each side of the engine by steps or a platform accessible from ground level by means of a ladder. COMPLY_____

4.4. All rotating and reciprocating parts and all parts subject to high operational temperatures, are electrically energized, or are of such a nature or so located as to be a hazard to the safety of operating and maintenance personnel shall be insulated, enclosed or guarded. COMPLY_____

4.5. The design and arrangement of the cab and components shall optimize visibility for control of the truck for the performance of fire fighting operations. The windshield and supplemental cab windows should give the driver a lateral field of vision of at least 280^{o} (140^{o} to either side), with 90^{o} minimum upward visibility (from line of sight), and 25^{o} downward visibility (from line of sight). The ground should be visible to the driver at a point not greater than 4.5 m from the truck through the left two-thirds of the include angle of vision and 9 m from the truck through the right third of the included angle. COMPLY_____

4.6. All oil, hydraulic, and air system tubing and all electrical lines shall be located in protected positions. They shall be securely clipped to the frame or body structure and, except where a through-frame bulkhead connector is necessary, shall be furnished with protective looms, grommets or other appropriate wrapping at each point where they pass through panel or structural members. COMPLY_____

4.7. All components installed on the chassis shall be adequately protected to prevent damage from brush, stones, logs or other obstacles likely to be encountered by the vehicle during off-road performance. COMPLY_____

4.8. The truck shall provide a riding quality that will permit safe operation in the Critical Rescue Fire Fighting Access Area (CRFFAA) described in NFPA No. 402 at speeds up to 56 kph without exposing operating personnel wearing seatbelts to injury or causing damage to the vehicle. COMPLY_____

4.9. All components and systems shall be so designed that all operations can be performed without exertion of effort by operating personnel. Any fire fighting equipment controls located outside the truck shall be high enough to preclude operator stooping but shall be no higher than 168 cm above the ground or the top of the vehicle as applicable. COMPLY_____

4.10. Provision shall be made to readily test the condition of all warning light bulbs. All instrument and warning lights should be displayed in a panel or panels in such a way that they will be most useful, convenient and visible to the driver. The panel or panels should either be hinged for back access or removable by the use of quick disconnect fittings for all electrical, air and hydraulic circuits. All instruments and controls shall be illuminated, with backlighting to be used where practical. COMPLY_____

4.11. The cab shall have all the necessary controls within easy reach of the driver for the full operation of the vehicle. The controls for the fire fighting system shall also be within easy reach of the turret operator seated to the right of the driver. COMPLY_____

4.12. An electronic back-up audible warning device that is audible above the ambient noise level in the workplace where the vehicle is being used shall be provided. This device and the back-up lights shall be activated automatically when the COMPLY_____

transmission is shifted into reverse.

4.13. A warning siren shall be provided having a sound output of not less than 95 decibels at 31 m directly ahead of the siren and not less than 90 decibels at 31 m measured at 45^{o} to either side. The siren speaker shall be mounted to permit maximum forward sound projection and shall be protected from foam dripping from the turret or water splashed up by the lines. A switch for the siren shall be provided for the driver and for the turret operator. COMPLY_____

4.14. Two air horns shall be provided, mounted for optimum sound projection in a protected area below the level of the front bumper in front of the vehicle's seated occupants. Horn activation shall be by means of a control button or ring located at the steering wheel. COMPLY_____

5. QUALITY ASSURANCE

5.1. The contractor shall assume complete responsibility for all component parts of the entire vehicle, even though major portions may be sub-contracted. This responsibility shall include design, construction, inspection, performance testing and servicing. The contractor's policy shall be to remain capable of furnishing parts and technical assistance for the normal life of the vehicle. COMPLY_____

5.2. The contractor shall also be responsible for assuring that the vehicle itself and its fire suppression system meet the specified performance criteria. All major components shall have the manufacturer's approval/recommendation for this type service and the manufacturer's ratings shall not be exceeded by actual imposed loads. COMPLY_____

6. INSPECTION AND ACCEPTANCE BY TRANSPORT CANADA

6.1. Notification for Inspection – Prior to delivery, the Contractor will notify Transport Canada in writing, indentifying by serial number the vehicle which is ready for inspection and acceptance by the Department. The Contractor will attach a copy of the Quality Control sign – off sheet for the unit to be inspected, indicating that it has been completed and that all known defects have been corrected. Transport Canada requires two weeks advance notice on all inspections. COMPLY_____

6.2. Vehicle Preparation – Prior to the arrival of the TC inspector, the completed vehicle must be clean; all tanks will be full of the appropriate fluids (i.e. fuel, oil, anti-freeze, water, pressure vessels, dry chemical, etc). The foam tank will be filled with water. The tires will be at indoor room temperature before the inspection begins.

COMPLY_____

6.3. Static Inspection Area – The Contractor will provide a heated, well lit, indoor bay for the purpose of allowing Transport Canada inspectors or their representatives to thoroughly inspect each vehicle. A creeper and a flashlight will be available for the inspector's use at the inspection bay. Also available during inspection visits, will be access to a telephone, a desk for writing reports, a photocopier and FAX machine.

COMPLY_____

6.4. Road Test – For the purpose of conducting a road test, the Contractor will provide the TC inspector with a recommended route, a set of dealer's licence plates and a service representative to accompany the TC inspector. The Contractor will also provide adequate liability insurance coverage for the vehicle while it is being driven by the TC inspector on public roads.

COMPLY_____

6.5. Pumping Tests – The manufacturer will provide a suitable paved or grassy area where the pump portion of the fire fighting system can be tested in both the static pumping mode and the pump and roll mode. For this series of tests, the foam tank will be filled with water, NOT AFFF.

COMPLY_____

6.6. Defects Found by Transport Canada Inspector – If the Inspector identifies any deviations from this specification, the Contractor must correct the defective vehicle and re-notify Transport Canada when the vehicle is once again ready for re-inspection. The Manufacturer must also correct any previously overlooked defects identified by the TC Inspector on all subsequent inspections of the same vehicle.

COMPLY_____

6.7. Acceptance of Vehicle by Transport Canada – Once all defects have been rectified, acceptance of the vehicle will be signified in writing to the Contractor by the TC Inspector by issuing a signed Certificate of Acceptance. This Certificate authorizes the Contractor to deliver the unit to the destination airport. The approved acceptance format will be agreed on, by the Crown and the Prime Contractor prior to the signing of the contract.

COMPLY_____

6.8. Vehicle Ready for Inspection/Acceptance – The Contractor shall not declare a vehicle ready for inspection if parts or equipment are missing, or if known defects exist. COMPLY

7. WARRANTY

7.1. Warranty – General Terms – All of the following warranty conditions are in addition to any general warranty terms stated in other portions of the Request for Proposal. COMPLY

7.2. Warranty Duration – Major Components – The following major assemblies will be warranted to be free from defects in material and workmanship for a minimum period of 24 months or 2000 hours of usage (or as otherwise stated), commencing the day that the vehicle is put into service at the destination airport:

a) engine including starting system, electrical charging system, fuel system, compressed air system and computerized control systems

b) power divider

c) transmission including torque converter and control system

d) transfer case

e) all axles including differentials and speed reducing planetary gears

f) all drive shaft components

g) foam package and valves

h) the water tank shall be warranted against leakage, cracking, corrosion or delamination for a minimum of fifteen years

7.3. Warranty Period – Non-Major Components – All non-major components shall be warranted free form defects in material and workmanship for twelve months. COMPLY

7.4. Warranty Claim Response Time - The Contractor will ship repair parts to the destination airport within 24 hours of being COMPLY

notified of a breakdown of a vehicle while it is under this warranty. If the Contractor is unable to furnish the required part(s) to restore the vehicle to service, Transport Canada reserves the right to obtain the part(s) or service elsewhere and claim the total cost from the Contractor.

7.5. Warranty Parts Ordering and Maintenance Information Availability - The contractor should provide 48 hour parts ordering and maintenance information service both during the warranty period and after the warranty period. It is acceptable for the service after hours to be done on a call back basis provided the maximum call back wait time is 6 hours. COMPLY_____

7.6. Responsibility for Actioning Warranty Claims – The Contractor remains responsible for providing warranty action in response to all claims submitted by the destination airport. Parts may be shipped directly from sub-contractors or from dealers to the site; however, this does not absolve the Contractor from the responsibility to ensure that prompt warranty action is taken when the need arises. COMPLY_____

7.7. Warranty Coverage – The warranty offered shall include all failures attributed to the lack of, or improper installation of fail-safe mechanisms, eg. Engine shut down devices, relief valves, etc. COMPLY_____

8. MANUALS AND DOCUMENTATION

8.1. The contractor shall furnish the following publications in English in accordance with standard commercial practices applicable to the vehicle (including body and special fire suppression equipment) furnished under the contract;

a) Operator’s manual with lubrication charts (two paper/two CD-ROM) COMPLY_____

b) Parts manual (two paper) COMPLY_____

c) Maintenance/service manual (two paper/two CD-ROM) COMPLY_____

8.2. These manuals will cover the complete vehicle and shall be in accordance with the requirements specified in NFPA 414. Parts manuals must reference contractor part numbers to indicate a dedication to parts support and inventory in the interest of COMPLY_____

48 hour support. In addition to this basic requirement, vendor references shall be provided upon request.

8.3. A cross reference of all filters shall be provided. COMPLY_____

8.4. All manuals must be delivered to the destination airport at or before the time of delivery of the vehicle. COMPLY_____

9.0 VEHICLE SPECIFICATIONS

9.1 Materials - Materials not specifically covered by this specification or applicable referenced specifications or standards shall be of the best quality currently used in commercial practice for AFFF vehicle fabrication. COMPLY_____

9.1.1 Metals - All metal parts and components, except the engine, which are normally in contact with the fire fighting agents and coolant liquid for extended periods of time, shall be fabricated of materials resistant to the corrosive action of the fire fighting agents and coolant liquid.

9.1.2 Dissimilar Metals - The use of dissimilar metals in contact with each other should be avoided. Metal plating or metal spraying of dissimilar base metals to provide similar or suitable abutting surfaces will be permitted. The use of dissimilar metals separated by suitable insulating materials will be permitted.

9.1.3 Protective Treatment - Materials that are subject to deterioration when exposed to weather and operational conditions normally encountered during service shall be protected against such deterioration in a manner that will in no way prevent compliance with the performance requirements. Protective coatings that are known to chip, crack or scale with age or extremes of climatic conditions or on exposure to heat shall not be used.

9.2 Performance- The vehicle shall be powered by a rear mounted diesel engine capable of developing sufficient power under normal operating conditions to achieve the required performance characteristics when fully loaded in accordance with the requirements of NFPA 424 (2012) COMPLY_____

9.2.1 Conditions – The truck shall be capable of withstanding the following conditions without detrimental effect to subsequent operation: COMPLY_____

a) Ambient temperatures ranging from -40°C to +40°C.

b) Relative humidity to 100%

c) Driven snow, sleet and rain.

9.2.2 Mobility – The fully loaded and equipped truck shall be capable of meeting the following requirements in daily operation:

a) Accelerate from a standing start to 80 kilometres per hour (kph) on dry pavement free from loose material within 25 seconds. COMPLY_____

b) Maintain maximum allowable traffic speeds up to at least 100 kph on typical dry paved highway surfaces continuously for a minimum distance of 40 km with the tires inflated for highway travel without showing overheat symptoms in any portion of the cooling system or power train. COMPLY_____

c) Operate continuously for 40 km at speeds up to 96 kph over all types of terrain encountered in cross-country travel, including paved and unpaved roads, and on grades normally encountered in this type of operation. During this performance evaluation, the vehicle shall be operated in all-wheel drive. At least 8 km of this operation shall be cross-country travel. COMPLY_____

d) Operate on smooth, dry level pavement through a range from 1.6 kph to at least 16 kph while discharging agent from the roof turret at maximum rated capacity without interruption. COMPLY_____

e) Ascend a smooth, dry, paved road having a 20% grade at a maintained speed of at least 13 kph. COMPLY_____

f) Ascend, stop, start and continue ascending; and descend, stop, start and continue descending a 20% grade at a speed of at least 3 kph with extinguishing agent being discharged at maximum rated capacity from COMPLY_____

the roof turret without interruption.

g) Ascend and descend a dry, hard surface incline having a 50% grade at not less than 1.6 kph. COMPLY_____

h) Operate in both directions on a 20% side slope with extinguishing agent being discharged in any direction of roof turret nozzle azimuth at maximum rated capacity without interruption. While stationary and turned in either direction, the steering shall be capable of being moved to the maximum turning angle either right or left without any vehicle instability. COMPLY_____

i) Negotiate pooled water to a depth of 5 centimetres (cm) for a distance of at least 46 m at a speed of at least 64 kph without engine flooding/stalling, loss of direction control, loss of breaking or electrical system(s) shorting. COMPLY_____

j) Be held and controlled by the service brakes on an incline of 50% when headed up or down. COMPLY_____

k) Have a proven and demonstrated minimum side slope stability of 30^{o}. The manufacturer shall provide a certification signed by the company's Chief Engineer for ARFF Vehicles confirming that the vehicle as built meets the 30^{o} requirement based on an actual tilt table test to Society of Automotive Engineers (SAE) J2180 (1998) criteria. Blocking the tires during this test is unacceptable. COMPLY_____

l) Be brought to 5 successive complete stops using service brakes under any load condition within 11 m from a speed of 32 kph on a dry, paved, approximately level road, free of loose material. COMPLY_____

m) The service brake system shall have the capacity to deliver 70% full braking capacity to the brakes when applied at a rate of 3 applications per minute with the transmission in high gear and the engine at maximum speed. COMPLY_____

n) The service brakes shall stop the vehicle within 11 m from 32 kph and within 49 m from 64 kph. COMPLY_____

o) Service brake stopping distances shall be accomplished on a dry, hard, approximately level COMPLY_____

roadway free from loose material and with a roadway width equal to the vehicle width plus 122 cm without any part of the vehicle leaving the roadway.

p) An emergency brake system shall be provided that is applied and released by the driver from the cab and is capable of modulation, by means of the service brake control. With a single failure in the service brake system of a part designed to contain compressed air or brake fluid (other than failure of a common valve, manifold, brake fluid housing, or brake chamber housing), the vehicle shall stop in no more than 88 m from 64 kph without any part of the vehicle leaving a dry, hard, approximately level roadway having a width equal to the vehicle width plus 122 cm. COMPLY_____

q) The parking brake shall be capable of holding the fully loaded vehicle on a 20% grade without air or hydraulic assistance. COMPLY_____

r) Climb a vertical wall at least 46 cm high and negotiate terrain which will deflect the diagonally opposite wheels of the truck in alternatively contrary directions of at least 36 cm without damage to the vehicle. COMPLY_____

s) Wall to wall turning clearance diameter of the fully loaded vehicle shall be not greater than 3 times its overall length. COMPLY_____

9.2.3 Fire System – The fire suppression system shall have a minimum total discharge capacity of 3400 L/minute in accordance with the following criteria; COMPLY_____

a) A combination of roof and bumper turrets shall be supplied with a minimum combined total capacity of discharging 3400 L/minute in accordance with Table 1. COMPLY_____

Table 1

	Straight Stream		Fully Dispersed	
	Minimum Discharge (Water Rate) L/minute	Far Point At Least	Full Width	Full Width Far Point At Least
Roof Turret	2040	58 m	11 m	20 m
Horizontal rotation of 240 degrees Vertical travel of 45 degrees above to 20 degrees below horizontal				
Bumper Turret	1360	46 m	9 m	15 m
Horizontal rotation of 180 degrees Vertical travel of 45 degrees above to 20 degrees below horizontal				

b) The foam produced by either the turret, the hose reel, the pre-connected hand-line or the under-truck nozzles shall have the minimum expansion ratio and drain time specified by NFPA. COMPLY_____

9.3 Winterization

9.3.1 A winterization system shall be provided which will include a minimum 50,000 Btu diesel fired closed loop winterization kit or equivalent. COMPLY_____

9.3.2 The winterization kit shall not detract from the performance of the vehicle or the fire fighting system in ambient temperatures up to +43.5°C. COMPLY_____

9.3.3 The winterization system shall provide sufficient insulation and heating capacity by means of hot-re-circulating liquids with the heat being produced from a diesel fuel fired heater. The system shall permit satisfactory operation of the vehicle and fire fighting systems for a period of two hours at -40°C with the vehicle fully operational and the engine running. Along COMPLY_____

with protecting the piping system, additional heating shall be provided in compartments that are less than 183 cm above the ground that are intended for rescue equipment storage. The temperature in these equipment storage compartments shall be maintained at a minimum of +4.5°C with and ambient temperature of -34.5°C.

9.4 Chassis

9.4.1 Vehicle Dimensions and Clearances - The vehicle shall conform to the following:

a) The rating of the chassis shall equal or exceed the actual gross weight of the fully equipped vehicle. The Gross Vehicle Weight (GVW), including the weight of the complete chassis, cab with all attachments, accessories, and equipment; the body with rated payload, including a full complement of fuel, lubricant, coolant and a full crew, shall not exceed the Gross Vehicle Weight Rating (GVWR). COMPLY_____

b) The weight shall be distributed as equally as possible over the axles and tires under all conditions of loading. The variations in the average axle weight between any two tires on any one axle while fully loaded shall not exceed 5% right and left, or 10% between any two axles. The differential between front and rear axle loadings shall not exceed 15% of the average axle loading for the vehicle including crew, less expendable agent. The centre of gravity of the vehicle shall be kept as low as possible under all conditions of loading. At a minimum, the vehicle shall be capable of operation on a 20% side slope in either direction and shall not roll over while stationary on a 30° side slope. COMPLY_____

c) The maximum overall width of the vehicle and equipment (excluding the mirrors) shall not exceed 335 cm. COMPLY_____

d) The wheelbase shall be the shortest practicable, but shall not exceed 560 cm. COMPLY_____

e) The overall length of the vehicle excluding the bumper turret shall not exceed 1090 cm. COMPLY_____

f) The overall height, with upper body safety rails, COMPLY_____

shall not exceed 380 cm.

g) The vehicle track shall be a minimum of 244 cm. COMPLY

h) The angles of approach and departure shall be not less than 30^{o}. COMPLY

i) The inter-axle clearance angle shall be not less than 12^{o}. COMPLY

j) The minimum under-body clearance shall be not less than 45 cm. COMPLY

k) The minimum under axle clearance at the lowest point shall be not less than 33 cm. COMPLY

9.4.2 Frame – The frame shall be constructed either of :

a) Bolted, minimum 100,000 psi steel channel construction, using grade 8 bolts, and shall be provided with adequate cross members, exclusive of engine supports, or PROVIDE DETAILS

b) Robust tubular steel rails certified for the application and strength equivalent to strength specified in (a).

The frame shall be designed and constructed so as to support the gross weight of the body and payload, transmission, pump, filled agent tanks and all other equipment under the specified operating conditions. No alterations shall be made to the frame which will reduce its designed strength. The frame shall be equipped with:

a) A heavy duty front and rear bumper mounted on the ends of the vehicle and secured to the frame structure. The headlamps and tail lights may be recessed within the front and rear bumpers respectively. COMPLY

b) Two front and two rear towing eyes must be integrated with the front and rear ends of the frame rails respectively. COMPLY

c) A pintle hook shall be provided at the rear of the COMPLY

truck, mounted securely to the frame rails. Holland Model PH-T-60-AL or similar.

9.5 Engine – The vehicle shall be equipped with a rear mounted internal combustion type diesel engine producing a minimum of 540 bhp. The engine shall be equipped with an electric fuel management system and a block heater.

PROVIDE DETAILS _____

9.5.1 Engine Detail – The engine must include:

a) A two-stage severe, service-type air cleaner with the first stage self-cleaning and protected from the ingress of snow, rain and extinguishing agents. The filter shall include a service indicator of the continuous monitoring type.

COMPLY_____

b) Oil filters of the spin-on replaceable element type as recommended by the engine manufacturer.

COMPLY_____

c) A heavy duty, corrosion-resistant, exhaust system designed to avoid undue back pressure shall be provided. The system shall be located and constructed so that the entrance of exhaust gases into the cab or the engine air intake shall be prevented under all conditions of operation. The tailpipe shall exhaust to the rear and shall not be directed toward the ground. The tailpipe shall be mounted in such a manner that rain and snow ingestion is prevented. It must also be designed so as not to disperse the foam blanket.

COMPLY_____

d) The following safety devices limiting the engagement of the engine starter must be provided:

COMPLY_____

- An interlock to ensure that the engine can be started only when the transmission range selector control is in the neutral position;

- A manually-operated switch in the engine compartment to isolate the starter when the engine is being serviced.

e) A fast idle device to automatically increase the idle of the drive engine to 1050-1200 RPM when activated. The device shall also include a safety system to disengage the fast idle before the truck

COMPLY_____

transmission is shifted out of neutral.

f) An automatic engine warning system shall be provided. The system shall provide the driver with an audible and visual indication of excessive engine temperature and low oil pressure. COMPLY_____

9.5.2 Engine Cooling System – The engine cooling system shall:

a) Be of the circulating liquid type with a thermostatic control appropriate to maintain a coolant temperature consistent with the engine manufacturer's recommendations when operating under the intended service conditions. COMPLY_____

b) Be designed so that upon failure of the thermostatic controls, the engine may continue normal operation without evidence of overheating from restricted engine coolant circulation. COMPLY_____

c) Provide a bypass to permit coolant circulation in the engine block, with the thermostat closed, until normal operating temperature is reached. COMPLY_____

d) Have draincocks installed at the low point of the cooling system and at such other points as may be necessary to drain the system completely. COMPLY_____

e) Provide a coolant temperature gauge on the cab instrument panel. COMPLY_____

f) Be provided with an engine cooling system that includes a fan. The fan operation shall be automatically controlled by a system which monitors engine coolant, engine oil and intake manifold pressures. COMPLY_____

g) A radiator constructed of a copper fin core or equivalent and durable end tanks. COMPLY_____

h) Provide an approved engine cooling system filter and conditioner assembly with a spin-on filter. COMPLY_____

i) All the coolant and the heater hoses shall be made of a silicone material installed with pressure compensating clamps. COMPLY_____

j) A low engine coolant level indicator light and buzzer shall be provided in the cab. COMPLY_____

k) A high engine coolant temperature indicator light and buzzer shall be provided in the cab. COMPLY_____

9.5.3 Fuel System - The fuel system shall include, but not limited to, injector(s), fuel pumps (one electrical and one mechanical), fuel strainers, all necessary piping, valves, fittings, fuel lines and all other necessary accessories to make up a complete system. PROVIDE DETAILS _____

a) The fuel tank shall be equipped with an accessible drain plug. COMPLY_____

b) The filler pipe opening shall be in an accessible location outside the cab and shall be at least 10 cm in diameter. To prevent the possibility of having fuel splashed into the face of a person filling the fuel tank, the filler location shall not be any higher than 127 cm off the ground level. COMPLY_____

c) The fuel tanks shall have a minimum capacity of 348 litres and shall be mounted so that it will not be damaged by distortion of the chassis and will not be affected by external heat, or heat from the engine or exhaust. COMPLY_____

d) An in-line auxiliary fuel pump for the main ARFF vehicle engine priming must be provided. This priming pump shall operate automatically whenever the main engine is started and also have provisions to operate to re-prime the ARFF vehicle’s primary engine’s fuel system after replacement of the fuel filter(s). COMPLY_____

e) A fuel water separator/filter with a thermostatically controlled heating element shall be provided to effectively filter any fuel contamination encountered. The filter water separator shall be mounted in a position that will provide protection from wheel splash or rough terrain operation. COMPLY_____

9.5.4 Governor – An engine high idle control shall be provided to control the engine idle at approximately 1200 RPM when activated. This control shall be safety interlocked to activate only after the transmission has been placed in the neutral position and parking brake has been set. COMPLY_____

9.6 Electrical System – The apparatus shall have an on-vehicle networking system, also known as multiplexing, which will provide real time or current state diagnostic capability and reduce troubleshooting or downtime. All electrical circuit wiring shall be made with stranded conductors of a carrying capacity commensurate with the anticipated maximum circuit loading with insulation in accordance with the recommended standards of the Society of Automotive Engineers (SAE). Overall covering of conductors shall be Hypalon, or equal. All connections shall be made with lugs or terminals mechanically secured to the conductors. Wiring shall be thoroughly secured in place and suitably protected against heat, oil and physical injury. Circuits shall be provided with automatic thermal circuit reset breakers for overload protection. Each wire shall be number and colour coded to match a number coded electrical schematic. Standardized quick disconnect plugs shall be provided throughout for ease of maintenance in removing components or in the event of system damage. All function wiring harnesses shall be loomed. Bundled and/or standard wiring harnesses are not acceptable. Wiring shall be connected to a minimum of three (3) power distribution centres as applicable for ease of servicing, including one for the chassis, one for the engine and one for 110 volt devices.

PROVIDE DETAILS _____

9.6.1 Power Supply – The vehicle shall be provided with a 12V DC electrical system for lighting and starting.

COMPLY_____

a) A 270 amp heavy duty alternator per SAE J-56 duel belt driven with voltage regulator shall be provided, capable of producing a total 270 amps output at idle. The alternators shall be adequate to service the full operational electrical load and be provided with fully automatic regulation.

COMPLY_____

b) One weatherproof, polarized male plug having an amp rating suitable for the application shall be mounted on the left side of the cab. The plug shall be of the Super Auto-Eject type, wired to the battery conditioner and the engine coolant pre-heater. The matching female receptacle shall be furnished with the vehicle.

COMPLY_____

9.6.2 Batteries

a) Two (2) Group 31 high reserve batteries, each with a minimum rating of 1000 Cold Cranking Amperes (CCA) at 0^{o} Fahrenheit (F), with battery charge and 120 V power receptacles, shall be provided. COMPLY_____

b) Batteries shall be securely mounted and adequately protected against physical injury, water spray and engine and exhaust heat. The battery compartment shall be corrosion resistant, sufficiently ventilated and shall be readily accessible for examination, testing and maintenance, mounted in a structural fibreglass composite tray. Battery clamps and hardware shall be stainless steel. COMPLY_____

c) A remote voltmeter shall be installed near the batteries. The voltmeter shall include a switch to allow the condition of the batteries to be read. COMPLY_____

d) A switch shall be mounted adjacent to the battery installation that will prevent the vehicle from being started from the cab during vehicle maintenance. This switch shall not interrupt the major power supply to the vehicle's starter. COMPLY_____

e) A Kussmaul or similar on-board battery charger, with 12 amp output shall be installed on the vehicle. COMPLY_____

9.6.3 Starting Device – An electrical starting device shall be provided. When operating under maximum load, the starter's current draw shall not adversely affect the function of other electrical equipment required during the start-up process. COMPLY_____

9.6.4 Radio Interference Suppression – The vehicle shall be adequately radio interference suppressed to permit positive understandable voice radio communications under all operating conditions. A copy of the test report should be submitted at the time of delivery. COMPLY_____

9.6.5 Lighting System – The lighting system, including reflectors and clearance lights, shall be the COMPLY_____

manufacturer's current standard provided the equipment shall meet the applicable Canada Motor Vehicle Safety Standard (CMVSS). The system shall include:

a) Two or more halogen headlights with upper and lower driving beam. COMPLY_____

b) Dual taillights and stoplights, one set on each side of the vehicle at the rear, recessed into the bumper for protection from brush damage and shall be totally sealed. In addition, a second set of "high-mount" stoplights shall be installed as high as possible on the rear of the vehicle. All of these lights shall be Light Emitting Diode (LED) type. COMPLY_____

c) Turn signals, front and rear, with a visual indicator, and a four-way flasher feature and be equipped with an electronic flasher. These lights shall be LED type. The flasher unit should emit an audible click when operating. COMPLY_____

d) The headlights and the front turn signal and marker lights shall be recessed for protection from brush damage and be totally sealed. COMPLY_____

e) Reflectors, markers and clearance lights shall be furnished and installed in conformance with applicable CMVSS. COMPLY_____

f) Compartment lights, non-glare type, arranged to illuminate both sides of the engine and the interior of all access and storage compartments with an individual switch located in each compartment. COMPLY_____

g) Adequate lighting shall be provided to illuminate all steps. In addition, lighting shall be provided to illuminate the ground beside the vehicle in accordance with NFPA 1901. COMPLY_____

h) Two back-up lights installed at the rear of the vehicle and intermittent audible alarm to be automatically switched on by the selection of reverse gear. COMPLY_____

i) A 3-position switch shall be provided for the following lighting, with one position for red "emergency" lighting (items 1-5) and the second for COMPLY_____

amber “non-emergency” lighting (item 6) (or equal to NFPA 414 section B.10).

1. One 360 degree red, rotating warning beacon shall be mounted on a pole, on the vehicle’s top surface, at the front left body section of the vehicle. COMPLY_____

2. One 360 degree amber rotating beacon shall be mounted on a pole, on the vehicle’s top surface, at the front right body section of the vehicle. COMPLY_____

3. Two forward facing red LED lights shall be mounted on the front bumper (Whelen or equal). COMPLY_____

4. Two rear facing red LED lights shall be mounted on the lower rear of the engine cover (Whelen or equal). COMPLY_____

5. Three red LED lights shall be mounted on each side (Whelen or equal). COMPLY_____

6. A lower emergency warning light disable switch shall be installed on the instrument panel to disable the ten lights in 3-5 seconds when desired. COMPLY_____

j) In addition to the normal vehicle headlight system, two high intensity halogen driving lights shall be mounted in protected positions at the front of the vehicle. COMPLY_____

k) Illumination shall be provided for all access steps and the top work deck area for re-servicing the water and foam tanks. COMPLY_____

l) Two halogen floodlights shall be mounted at the rear of the vehicle on the engine enclosure controlled by a switch in the cab. These lights shall also illuminate whenever the transmission selector is placed in reverse. COMPLY_____

m) Two sets of automotive push type red and white cab dome lights shall be provided, one set mounted on the ceiling above the driver and the second set above the turret operator. COMPLY_____

n) Two automotive type map lights shall be provided, one mounted on the ceiling above the driver and the second above the turret operator. COMPLY_____

o) Two halogen spotlights shall be installed on the roof turret with a switch in the cab. COMPLY_____

p) One High Intensity Discharge (HID) light shall be installed on the bumper turret with a switch in the cab. COMPLY_____

q) Two scene lights shall be installed on each side, including switches in the cab and near each light. COMPLY_____

r) License plate brackets shall be mounted at the front and rear of the vehicle. The rear bracket shall be illuminated. COMPLY_____

s) Daylight running lights with an alternating “wig-wag” feature shall be provided. COMPLY_____

t) An auxiliary generator/lighting package shall be provided to include: COMPLY_____

1) A 10 KW 120/240 volt, 60 Hertz(Hz) hydraulic generator, capable of being started or stopped by means of cab controls, whether the vehicle is parked or moving. A light shall be provided near the generator controls to indicate when the generator is running. COMPLY_____

2) Two (2) 120 Volts Alternating Current (VAC) duplex receptacles with one straight blade and one twist lock each, one mounted on each side of the cab complete with weatherproof hinged covers. These receptacles shall be ground fault indicator (GFI) protected. COMPLY_____

9.7 Transmission

9.7.1 A transmission, twin disk speed automatic, with twin disc PTO torque converter or equivalent shall be provided. The transmission control shall be locking T-handle gear selector with back lighting for night operation and shall be located within easy reach of the operator. The continuous drive transmission shall be certified as suitable for use in this vehicle by the PROVIDE DETAILS _____

transmission manufacturer.

9.7.2 The hydraulic system shall include oil pumps, easy service oil filter and screens, hydraulic control system and an oil cooling system capable of limiting the stabilized transmission oil temperature to that recommended by the transmission manufacturer at all ambient temperatures encountered. COMPLY_____

9.7.3 The transmission shall have sufficient range to provide a top speed in highest range of 100 KPH and enough reduction in lowest range to produce the tractive effort needed for the fully loaded vehicle to ascend a 50% grade. Spacing of intermediate ranges shall provide an adequate number of speeds for all operating conditions without excessive overlap. COMPLY_____

9.8 Transfer Case

9.8.1 The transfer case shall be separate from the transmission. COMPLY_____

9.8.2 A centre differential shall be provided which will transfer power to the front and rear axles at all times, compensating for differences in front and rear drive shaft revolutions to enhance tire tread life when manoeuvring on dry, paved surfaces. A driver controlled system shall be provided which allows the lockout of differential action to maximize traction for off-pavement operation. The differential lockout control shall be conveniently located for the driver. Operator familiarity and safety of operation are of great concern. Per NFPA 414 (2012), “all-wheel drive on these vehicles shall incorporate a drive to the front and rear axles that are engaged at all times during the intended airport service”. Due to the enhanced performance benefits and reliability of a full time all-wheel drive system, a driver controlled disconnect of the front axle will not be allowed. COMPLY_____

9.9 Axles:

9.9.1 The front and rear axles furnished shall be certified as being suited for use in this vehicle by the axle manufacturer. Axle manufacturer’s published rating shall not be raised to conform to the requirements of this specification. COMPLY_____

9.9.2 Front and rear axles shall have adequate capacity to carry the maximum imposed load under all intended operating conditions. For vehicle handling, stability and off-runway performance, the axles shall have identical track width. COMPLY_____

9.9.3 Positive drive to each wheel is required to negotiate soft ground, unimproved surfaces, snow or ice. Positive wheel drive shall be achieved by use of a driver controlled lockup which will insure that each wheel of the vehicle is driven independently of the others. COMPLY_____

9.9.4 Axles shall be of the double reduction type with final gear reduction taking place in a planetary gear set in the wheel and end assembly. COMPLY_____

9.9.5 The steering drive ends must be designed in such a manner that the constant velocity or cardan joints are protected from external dirt and moisture. Tapered roller trunnion bearings are required to optimize the life cycle characteristics of the axle. COMPLY_____

9.10 Suspension System – A High Mobility Off-Road Suspension System meeting the requirements of NFPA 414 shall be provided. COMPLY_____

9.10.1 The vehicle shall have a suspension system having a rating capacity at least equal to the imposed load, measured at ground level with the vehicle loaded to its rated Gross Vehicle Weight. Design of the axle/suspension system shall be such that the total un-sprung weight of the vehicle will be no greater than 20% of the gross weight of the vehicle when fully loaded. When spring capacity is rated at the spring pads, un-sprung weight shall be deducted. COMPLY_____

9.10.2 Special consideration shall be made towards a suspension design with provisions for reduced maintenance, by providing lube for life components and maximum parts commonality between axle/suspension components. COMPLY_____

9.10.3 The suspension design shall be such that there is at least 40 cm of total wheel travel and a minimum of 15.7 cm in either direction before the suspension bottoms on the energy absorbing bumpers. COMPLY_____

9.11 Wheels, tires and rims

9.11.1 The wheels shall be steel disc type. Rim contours and size shall conform to the current recommended practices of the Tire and Rim Association Inc., for the type of vehicle and the intended service. PROVIDE DETAILS _____

9.11.2 All wheels shall be disc type with all to be of identical offset, bolt patterns and size and must be completely interchangeable for permanent use between the front and rear axles. COMPLY_____

9.11.3 Tires shall have an aggressive tread design and shall be capable of all performance requirements within the Critical Rescue Fire Fighting Access Area at a tire pressure of 245 kPa. All tires shall be of the same size and tread design. Tires shall be steel belted radials, Michelin 24R21 XZL, or equivalent. COMPLY_____

9.11.4 One spare wheel and tire assembly shall be provided in a serviceable condition but shall not be vehicle mounted. The wheels shall be painted the same colour as the exterior of the vehicle. COMPLY_____

9.11.5 All tires provided, including the spare, shall be equipped with beadlocks. A beadlock compression tool shall also be provided. COMPLY_____

9.11.6 Mud flaps shall be provided at each wheel well position to reduce the damage from stone, brush, etc. being thrown off by the tires. COMPLY_____

9.12 Braking System – The braking system shall comply with all applicable Canadian Motor Vehicle Safety Standards. It shall be a dual air system with one circuit for the front brakes and one for the rear brakes such that a single failure in one circuit (other than failure of a common valve, manifold or brake chamber housing) will not disable the entire system. PROVIDE DETAILS _____

The brake system will also include:

a) Service brakes. They shall be of the all-wheel, air-mechanical type having a brake surface area of no less than 1,290 square centimetres per wheel. A brake chamber shall be provided for each wheel and shall be mounted so that no part of the brake chamber projects below the axle. COMPLY_____

b) Foot control. The pedal shall be suspended or treadle type. COMPLY_____

c) Air dryer. Shall be desiccant type, Bendix AD-IP (or equal) located immediately downstream from the air compressor. COMPLY_____

d) The un-loader head type air compressor shall be engine driven, with a capacity of at least 16 Cubic feet per minute (CFM), 453 LPM, sufficient to increase air pressure in the supply and service reservoirs when the engine is operating at the vehicle manufacturer's recommended revolutions per minute (RPM). If reservoir volume is greater than the minimum required, proportionately longer build-up time is allowed. COMPLY_____

e) The total reservoir volume must be at least 12 times total combined brake chamber volume at full stroke. Reservoirs shall be equipped with drain and safety valves. Provision for a quick build-up of pressure shall be furnished including a separate quick build-up tank. Quick build-up of tank pressure from 0 kPa to the minimum pressure required for operation of the brake system shall be accomplished within 15 seconds relying solely on vehicle air compressor output. Provisions shall be installed to drain all the air reservoirs at one location from the exterior of the vehicle. The provisions shall eliminate the need for an individual to go underneath the vehicle to accomplish the required periodic draining of the air reservoirs. Each of the drain points shall be labelled. COMPLY_____

f) The parking or emergency brake system shall be an entirely independent mechanical system. It may be connected to the same brake shoes as the service brakes but only through an entirely separate mechanical means. The parking brakes shall be of the spring set type, integrally mounted with the service air brake chambers of the rear axles. Provision shall be made for release of the spring brakes in an emergency when the air system is inoperative. COMPLY_____

g) The brake system shall include an all-wheel electronic anti-lock brake system certified for the installation on the proposed vehicle. The installation shall include a self-diagnostic system that will present its readout in the cab. COMPLY_____

h) The front and rear axle brake assemblies shall be equipped with automatic slack-adjusters. COMPLY_____

i) The air system shall also be supplied with a connection mounted on the left side of the cab to allow vehicle air system pressure to be maintained by a shop air compressor. The connection shall be an auto-ejecting type (Kussmaul, or equal). COMPLY_____

j) A pneumatic air outlet output connection shall be installed on the vehicle, to include a quick disconnect, Milton #777 or equal, female connector (installed) and a related male connector shipped loose. A 15 m long, 5 mm Inside Diameter (ID) air hose shall be provided that will be equipped with a connector to mate with the above connection. COMPLY_____

9.13 Steering – The steering system must be complete with power assisted, dual steering actuators. NFPA 414, paragraph 2-10 shall apply. COMPLY_____

9.13.1 The wall to wall turning diameter of the fully loaded truck shall be the minimum possible for maximum manoeuvrability and shall not be greater than 3 times the overall length of the truck. COMPLY_____

9.13.2 The power assist shall have sufficient capacity so that no more than 15 lbs (7kg) pull is necessary on the steering wheel rim to turn the front wheels lock to lock on dry level pavement with the engine idling. COMPLY_____

9.13.3 The steering system shall be designed to permit the vehicle to be brought to a safe stop following a failure of the power assist system. COMPLY_____

9.13.4 The fully laden vehicle shall not exhibit oversteer characteristics in any phase of its normal operations. COMPLY_____

9.13.5 Stops shall be provided in the steering system to limit the steering angle to the maximum intended by the chassis manufacturer and to prevent damage to the power assist system or the front axle. COMPLY_____

9.13.6 A centreline-mounted or left-of-centre minimum 20” padded steering wheel shall be provided with integral horn button and integral, self-cancelling, turn signal lever. If a tilt and/or telescopic steering column is available, it shall be provided. COMPLY_____

9.13.7 Pivots used in the steering system must include rubber COMPLY_____

boots to protect against moisture and dirt. Grease nipples must be provided for lubrication.

9.13.8 Ball and socket pivots must not exceed the angle at which the socket contacts the neck of the ball stud at any point in the vertical travel of the front axle and at any possible steer angle. COMPLY_____

9.14 Cab

9.14.1 The cab shall be constructed using aluminium alloy extrusions and 3 mm aluminium plate to minimize weight and provide protection against corrosion. The cab design shall eliminate the possibility of water entering the cab under any circumstances. The cab shall be a separate unit, flexibly 3-point mounted on the main vehicle frame. COMPLY_____

9.14.2 The cab shall have seats for crew members complete with approved red, integral 3-point seat belts with automatic retractors. The driver's seat shall be positioned to allow visibility to the front as well as to both sides. All seats shall have provisions to accommodate a Self Contained Breathing Apparatus (SCBA) and shall include a removable or retractable insert to cover the SCBA bottle. The SCBA in each seat shall be secured by a positive mechanical means of holding it in its stored position. The driver's seat shall be adjustable fore and aft and shall be equipped with a mechanical height adjustment feature. COMPLY_____

9.14.3 Adequate space shall be provided for the instruments, radios, controls and other safety equipments required by three fire fighters without hindering crew operations. Wide opening doors shall be provided on each side of the cab with necessary steps and hand grabs to permit rapid and safe entrance and exit from the cab. The door hinges shall be stainless steel piano type and shall extend the full height of the door to provide strength to keep the door in alignment. The cab shall be provided with wide gutters to prevent foam and water from dripping on the windshield and side windows. COMPLY_____

9.14.4 A one piece windshield shall be provided. The windshield shall be of shatterproof laminated safety type glass and all other windows shall be approved laminated or tempered tinted safety type glass. The cab COMPLY_____

doors shall be equipped with electric windows. Control switches for the electric windows shall be provided on the console to the right of the driver.

9.14.5 A centre console shall be provided between the driver and turret operator which house the turret controls, siren, radio equipment, electric window controls, remote heated mirror controls, heating and air conditioning controls. COMPLY_____

9.14.6 A windshield deluge system shall be included to cool the windshield and to provide operator visibility during fire fighting operations. It shall be so designed to flood the windshield with clear agent water while fire fighting pumps are engaged (foam or water mode). Clear water shall be discharged at a minimum rate of 11 Lpm under sufficient pressure and in a pattern which will assure the driver/operator's field of vision can be kept clear of foam solution when used in conjunction with the windshield wiper. The windshield wipers shall be automatically energized to the low speed mode of operation whenever the deluge system is operated. COMPLY_____

9.14.7 Two, minimum 2-speed defroster fans shall be provided. A switch shall be mounted in the instrument panel within the driver's reach to turn the fans "on" and "off". A guard shall be mounted around each rotating blade. COMPLY_____

9.14.8 Air conditioning shall be provided. The air conditioning system shall be driven from the vehicle engine; 60,000 BTU minimum. The system shall be filled with a Hydro fluorocarbon (HFC)134A refrigerant. COMPLY_____

9.14.9 A minimum of two clothes hooks shall be mounted on the back wall of the cab. COMPLY_____

9.14.10 Two outside rear view mirrors having a minimum surface area of not less than 387 sq. cm each shall be provided. These mirrors shall be heated and power remote controlled from the driver's seat. As well, a wide angle convex mirror on each side with a minimum surface area of 226 sq. cm will be provided. COMPLY_____

9.14.11 The following cab mounted cab controls shall be provided as applicable with illumination of controls by

backlighting or flood lighting as required:

a)	Accelerator Pedal	COMPLY_____
b)	Brake Pedal	COMPLY_____
c)	Pump Control-Agent Selector	COMPLY_____
d)	Siren Switch w/Microphone	COMPLY_____
e)	Master Electrical Switch	COMPLY_____
f)	Ignition Switch	COMPLY_____
g)	Engine Start Switch	COMPLY_____
h)	Engine Shutdown Switch	COMPLY_____
i)	Parking Brake Control	COMPLY_____
j)	Headlight Switch	COMPLY_____
k)	Panel Light Switch	COMPLY_____
l)	Differential Lock Switch	COMPLY_____
m)	Transmission Range Selector	COMPLY_____
n)	Emergency Light Switches	COMPLY_____
o)	Adjustable, Tilt Steering Wheel, with Self-Cancelling Turn Signals	COMPLY_____
p)	Windshield Wiper and Washer Controls	COMPLY_____
q)	Heater/Defroster, Air Conditioning Controls	COMPLY_____
r)	Cab Dome Light Switch	COMPLY_____
s)	Windshield Deluge Control	COMPLY_____
t)	Engine High Idle Control	COMPLY_____
u)	Dual Agent Hosereel Discharge Switch	COMPLY_____
v)	Pre-connect Handline Discharge Switch	COMPLY_____

w) Roof Turret Controls COMPLY_____

x) Bumper Turret Controls COMPLY_____

y) Generator Start/Stop Switch(s) COMPLY_____

z) Driving Light Switch COMPLY_____

aa) Fog Light Switch COMPLY_____

bb) Roof Turret High Intensity Discharge (HID) Light Switch COMPLY_____

cc) Bumper Turret Spotlight Switch COMPLY_____

9.14.12 The following equipment shall be provided in or on the cab as may be applicable:

a) Heater/defroster with minimum 200 Btu output per cubic foot of cab space (minimum 60,000 Btu) with blower capacity per minute equal to cab volume, with fresh air intake and with a sufficient number of defroster ducts to rapidly clear all cab glass. COMPLY_____

b) Two outside rear view mirrors. COMPLY_____

c) Driver and crew seats, each with a red, integral 3-point seat belt. COMPLY_____

d) Horn. COMPLY_____

e) Windshield wipers (3) with delayed and multi-speed capability, appropriate for removing foam. COMPLY_____

f) Siren. COMPLY_____

g) A sun visor for each crew position. COMPLY_____

h) An illuminated inclinometer. COMPLY_____

i) Stability Dynamics Ltd Lateral “G” Force device, Model LG Alert (or equivalent). COMPLY_____

j) Two Streamlight SL-40 (or simlar) portable rechargeable lanterns shall be installed in the cab, one on each side of the instrument panel. COMPLY_____

9.15 BODY – The body shall be fabricated from aluminium alloy, 3 mm aluminium plate, designed to provide the lightest weight consistent with strength, heat and corrosion resistance requirements. Sheet metal screws shall not be used in construction of the apparatus body. Sheet metal panels shall be bolted or welded to their support structures for ease of replacement in the event of damage and to allow normal vehicle flexing and movement. COMPLY_____

9.16 Steps, Ladders, Walkways and Running Boards – Rigid, integral steps, ladders, walkways and running-boards located at the cab, on top and at the rear shall be provided as required for ascending and descending, or servicing the vehicle. All steps walkways and running-boards shall be of the non-skid type. Steps shall include stainless steel or aluminium kick-plates for appearance and long life. COMPLY_____

9.17 Handrails – Aluminium extruded handrails with a slip resistant finish shall be provided at the top of the centre body section. The top of the handrails shall be a minimum of 900 mm above the top of the vehicle's walking surface. Aluminium extrusion hand-grabs shall be located on the vehicle as required to insure the safe passage of personnel entering or exiting the cab or while standing on a designated work area. COMPLY_____

9.18 Compartments – All compartments on the vehicle, except those providing service access, shall be of dustproof and rainproof construction and shall be equipped with roller shutter aluminium doors with bar type external latching mechanisms. The latch mechanisms shall provide a positive closure. They shall be accessible from the ground by personnel of average height without the aid of steps or ladders. COMPLY_____

9.18.1 Sufficient compartments, specifically designed to contain the required auxiliary equipment shall be provided. COMPLY_____

9.18.2 All storage compartments shall be vented and drained. COMPLY_____

9.18.3 One piece Poly Vinyl Chloride (PVC) ribbed matting shall be provided in each compartment intended for storage and on any roll-out tray. COMPLY_____

9.18.4 All compartments shall be illuminated when the doors are opened. Lighting for compartments shall be provided COMPLY_____

by circular lights, each having a 21 Candle Power (CP) minimum rating.

9.18.5 A compartment open warning indicator light shall be provided on the cab's dash. COMPLY_____

9.18.6 The lower rear compartment on the right side shall include a height adjustable shelf with a roll-out tray at the midpoint of the compartment. The tray shall be capable of being locked in either the stored or fully extended position. COMPLY_____

9.18.7 A height adjustable shelf with roll-out tray shall be installed in the lower forward compartment on the left side. This tray shall be capable of being locked in either the stored or the fully extended position. COMPLY_____

9.19 Pump Drive – The pump shall be driven by the truck engine through a power divider, permitting operation of the pump and simultaneous operation of the vehicle. The drive shall be designed in such a manner to allow the pump to be engaged at any speed and in any gear. PROVIDE DETAILS _____

The power divider shall be mounted on the fly-wheel housing of the engine and shall serve to split the engine drive into separate drives for the water and foam pumps and the main drive to the vehicle transmission. In addition, the power divider shall provide mounting and drive arrangements for the modulating clutch oil pump. This pump shall be direct drive or gear driven and shall circulate oil through the power divider to dissipate the heat generated by clutch operation. The drive to the water pump clutch shall be direct mechanical, shall always be running when the engine is operating and its speed shall be controlled by the speed of the engine. A separate over-centre clutch shall be provided for the pump drive as a means of disconnecting the pump when it is not in use. For maintainability, the pump clutch shall be easily replaceable as a unit as well as easily re-buildable in the field. COMPLY_____

The drive to the main transmission when the truck is being driven in a normal mode shall be through a torque converter and engine RPM shall be controlled as it would normally be by the accelerator pedal. COMPLY_____

In pump mode, the drive to the converter/main transmission shall be through the clutch which may be "modulated" (operator controlled slippage). The accelerator pedal, which in the COMPLY_____

normal mode controls engine RPM, shall be connected to a modulating valve which in turn allows the driver to modulate the clutch. Thus, the driver shall be able to control the speed of the vehicle and manoeuvre while discharging foam or water at rated capacity without a reduction in pump operating pressure. When in the pump mode, the pumping RPM will increase automatically only after a discharge orifice is opened to minimize heat build-up and potential damage to the pump during standby operation when water is not being discharged.

PROVIDE DETAILS _____

9.20 Water Pump – The water pump shall be single stage centrifugal type designed to provide a discharge rate of minimum 3400 LPM. The total discharge capacity of the water pump shall include the maximum discharge flow rate tolerance of 6820 LPM @ 200 PSI with a pressure sensing governor system. The total discharge flow rate required by the water pump shall include any capacity needed for the creation of a foam solution. It shall incorporate a mechanical type seal not requiring regular periodic adjustment. When operating the water tank as an aircraft fire fighting unit, the pump shall be capable of providing a turret straight stream or dispersed water/foam pattern over the performance range specified by NFPA. The pump shall be certified by the manufacturer as to its suitability in this vehicle at the specified performance.

COMPLY_____

PROVIDE DETAILS _____

The water pump shall be gravity primed from the vehicle tank.

COMPLY_____

9.21 Pump Connections, Piping, Couplings and Valves

9.21.1 The suction system shall be designed for efficient flow at the designed pumping rates. There shall be a drain at the lowest point with a valve for draining all of the liquid from the pumping system when desired. Plumbing to the drains shall be heavy duty wire braid hose for long service life.

COMPLY_____

9.21.2 Piping shall be stainless steel securely mounted and provided with flexible couplings in areas of stress. Victraulic type couplings shall be provided to facilitate removal of piping or equal as applicable.

COMPLY_____

9.21.3 All valves should be of the quick opening type which can be serviced in-line and be selected for ease of operation and freedom from leakage (Swing-Out type, or equal).

COMPLY_____

9.21.4 All water system piping shall be tested on the suction

COMPLY_____

side of pump for leakage. All water and AFFF solution discharge piping shall be tested for leakage at 1-1/2 times system operating pressure.

9.21.5 A means of pressure regulation shall be provided that is adjustable to maintain working pressures from 1035 to 2070 kPa at normal pumping RPM. COMPLY_____

9.21.6 All flexible hoses subject to pump pressure including drain lines and pressure gauge connections shall be wire braid reinforced hose. For long life, minimum burst pressure shall be 6902 kPa. COMPLY_____

9.21.7 Water and foam tank level indicators shall be provided on each side of the vehicle in addition to those mounted in the cab. The indicators shall be sealed. COMPLY_____

9.21.8 One gated 64 mm Storz discharge connection (no equal) with a bleeder valve shall be installed on each side. A liquid filled 64 mm pressure gauge shall be mounted near each connection. COMPLY_____

9.22 Overheat Protection – The agent system shall be protected against pressure build-up due to heat caused by deadhead pumping through the use of an automatic thermal relief valve. COMPLY_____

9.23 Water Tank and Filler Connections – The water tank must have the following features:

a) A minimum usable capacity of 6,000 litres of water. It shall be properly baffled with each tank division no more than 2000 litres. The tank shall be constructed of 13 mm polypropylene which is resistant to deterioration by water common to the purchaser’s location and shall be warranted for the service life of the apparatus. COMPLY_____

b) The tank construction and piping connection shall be designed and fabricated to prevent the possibility of chemical and galvanic corrosion. COMPLY_____

c) The tank shall be equipped with a readily removable manhole cover over the tank discharge. It shall also have an anti-swirl baffle, a low point drain valve and a top water filler opening with a screen and gasketed cap. Filler opening diameter shall be approximately 20 cm. COMPLY_____

d) The tank outlet and suction piping shall be of sufficient COMPLY_____

size to permit the maximum required discharged rate from all outlets.

e) The tank shall be 3-point mounted in a manner that will not transfer torsional strains of off-pavement driving from the chassis frame to the tank. The tank shall be separate and distinct from the body and be easily removable as a unit. COMPLY_____

f) The tank shall be adequately vented to the atmosphere to permit rapid and complete filling without pressure build-up, and to permit water or agent discharge at the maximum design flow rate without danger of tank collapse. COMPLY_____

g) Tank fill connections shall be provided on each side of the vehicle in positions where they can be easily reached from the ground. The connections shall be so constructed that water shall not be lost from the tank when connection or disconnection is made. All water fill openings shall be provided with strainers. COMPLY_____

h) The water tank fill piping shall terminate in a 64 mm Storz hose connection on each side. This connection shall be sized to allow filling the water tank in a maximum of 2 minutes at a pressure of 552 kPa at the tank intake connection. COMPLY_____

i) Each fill connection shall be equipped with a bleeder valve to bleed off air or water in the hose connected to it. COMPLY_____

j) The water tank shall be provided with a shutoff. COMPLY_____

k) The remote water tank level indicator shall be installed in the cab and in a compartment on each side of the vehicle. The indicators shall be sealed. COMPLY_____

9.24 Foam Liquid Concentration Tank

9.24.1 The foam liquid concentrate tank shall be of sufficient capacity to support 12,000 litres of water at 3 parts of concentrate to 97 parts of water. The tank shall be of the rigid type, flexibly mounted, separate and distinct from the body and be easily removable as a unit. Construction shall be of 13 mm polypropylene. COMPLY_____

9.24.2 The tank shall be equipped with a removable manhole to permit access to the sump area. Tank outlets shall be located above the bottom of the sump and of adequate COMPLY_____

size to permit maximum flow. The outlets shall be arranged to permit the use of the full capacity of the tank with the vehicle level and at least 75% of the tank capacity with the vehicle inclined on a 20% side slope, or ascending or descending a 30% grade. A large capacity drain connection shall be installed flush with the bottom of the tank. The foam drain shall terminate at the side of the vehicle to allow for easy recovery of the foam.

9.24.3 A fill trough shall be provided equipped with a brass or stainless steel mesh screen, 6 mm mesh or finer. The trough shall be connected to the foam liquid storage tank with a fill line designed to introduce foam liquid concentrate near the bottom of the tank so as to minimize foaming within the storage tank. COMPLY_____

9.24.4 A 38 mm hose connection with a strainer and a plug with chain shall be provided on each side of the vehicle to permit the pumping of foam-liquid concentrate into the storage tank or tanks. A manual shutoff valve shall be provided to prevent the loss of foam liquid. COMPLY_____

9.24.5 The tank shall be adequately vented to permit rapid and complete filling without the build-up of excessive pressure and to permit emptying the tank at the maximum design flow rate without danger of collapse. COMPLY_____

9.24.6 Neither the water nor the foam tank shall be subject to the reaction forces of valve or system actuators. All actuators shall be mounted to brackets distinct and separate from the tank walls to isolate the tanks from this external stress. COMPLY_____

9.24.7 A pneumatically operated foam transfer pump with a 38 mm hose connection shall be installed in a compartment on the left side of the vehicle to allow the foam tank to be filled or drained. COMPLY_____

9.24.8 A remote LED foam tank level indicator shall be installed in the cab and in a compartment on each side of the vehicle. The indicators shall be sealed. COMPLY_____

9.25 Foam Liquid Concentrate Piping – The foam liquid concentrate piping and fittings that comes into contact with foam concentrate or foam solution shall be stainless steel, brass or copper. Heavy duty rubber hose may be used where greater COMPLY_____

flexibility is required provided that it is wire braid reinforced with a minimum burst pressure of 6,902 kPa. Care shall be taken that combinations of dissimilar metals that produce galvanic corrosion are not selected or that such dissimilar metals are electrically insulated. The foam liquid concentrate piping shall be adequately sized to permit the maximum required flow rate.

9.26 Foam Proportioning System – A WFHC ATP (around the pump) foam proportioning system shall be provided to accurately and automatically proportion foam concentrate at 3% (3 parts of foam to 97 parts of water). The pumping RPM and foam induction shall commence only when a discharge orifice is opened. Response time for the proportioned foam to the inlet of each discharge shall not exceed 5 seconds. COMPLY

The system shall incorporate a means of producing water only for flushing and training purposes. The system must be configured or placarded so that the operator can tell whether the foam concentration is set at 3 percent or that only water will enter the turret or handline.

9.27 Roof Turret – A joystick controlled electric roof turret with a manual override shall be provided. The turret shall have a minimum foam/water discharge duel rate of 3400 LPM and a minimum dry chemical discharge rate of 5.4 kilograms/second (kg/sec). It shall be of a single barrel configuration of the non-aspirated type with the joystick control mounted on the centre console, accessible to the driver and turret operator. The turret shall provide a discharge pattern which is infinitely variable from straight stream to fully disperse. The turret shall be optimized for AFFF with the resultant foam conforming to the properties specified in NFPA 412. All foam patterns shall be at an operating pressure of 1657 kPa. COMPLY

9.28 Bumper Turret – A non-aspirated bumper turret shall be provided. The turret shall have a minimum foam/water discharge single rate of 1360 LPM. It shall be electric joystick controlled and have a fixed oscillation capability of 180^{o} (90^{o} each side of centre). COMPLY

9.29 Dry Chemical System – The dry chemical system shall be a minimum 225 kg system having a minimum capacity for 204 kg of Vivid Purple-K dry chemical. The agent storage cylinder shall conform to all applicable Canadian Standards Association (CSA) standards for unfixed pressure vessels. The system shall be pressurized by one, 11.3 cubic metre (cu.m) (nominal rating), COMPLY

nitrogen cylinder with integral gauge to allow full discharge and blowdown of the unit without tank change. The vehicle mounted system shall discharge a minimum of 90% of the containerized agent without flow fluctuations or interruptions.

9.29.1 One dual agent handline on an accessible reel shall be provided. The reel shall include 31 m of twinned hose and nozzle for the discharge of water, foam or dry chemical. The hose reel shall be equipped with a 12 VDC electric rewind motor with manual rewind provisions and rollers for hose deployment. A tension device should be installed to prevent the unreeling of the hose. The nozzle shall be capable of discharging 60 Gallons per minute (GPM) of foam solution and 2.25 kg/sec of dry chemical in accordance with the performance requirements of the A/C. Controls installed near each hose reel shall allow charging of the nitrogen into the dry chemical tank and charging of the dry chemical into the hose reel. COMPLY_____

9.29.2 Dry chemical is not required.

9.29.3 A funnel shall be provided for easy recharging. COMPLY_____

9.29.4 One 8.5 cu.m nitrogen bottle shall be supplied with an integral pressure gauge for re-servicing the vehicle mounted dry chemical system. This quantity of nitrogen provided shall be such that it will provide a complete discharge of the dry chemical agent powder plus perform a blowdown operation. One spare nitrogen cylinder with its own lifting bracket shall also be provided. COMPLY_____

9.29.5 An electric winching mechanism shall be provided to lift the nitrogen cylinder to its stored position or to lower it to ground level. The lifting/lowering mechanism shall be stored on the vehicle adjacent to the nitrogen cylinder storage area. This storage provision must accommodate for the braking and for the high G forces experienced during off road travel as described in the Specification as applicable or equal. COMPLY_____

9.30 Pre-connected Handlines

9.30.1 All handlines will conform to NFPA 414, paragraph 2-15.7.4. COMPLY_____

9.30.2 Two handlines, each fitted with 30 mm threaded coupling COMPLY_____

shall be provided. The handlines shall be stored in a compartment on each side of the truck. Flow shall be controlled in each compartment, accessible to the user with a manual back up.

9.30.3 A safety interlock mechanism shall be provided to permit charging the lines only after the hose has been fully removed. COMPLY_____

9.30.4 There shall be a light installed on the cab dash panel to indicate when all of the hose has been deployed. Each handline shall consist of 150 feet of 38 mm hose which shall be pre-connected and ready for use, fitted with a TFT Bubble cup, variable flow nozzle with pistol grip, having a minimum discharge rate of 360 litres per minute at a safe working pressure of 90 psi. COMPLY_____

9.30.5 An adjustable, horizontal shelf shall be installed to provide a hose storage area above the pre-connected handline. This shelf arrangement shall provide sufficient storage for an additional 150 feet of 38 mm soft jacketed hose on each side of the truck. COMPLY_____

9.31 Under-truck Nozzles – There shall be minimum two nozzles mounted under the truck and controlled from the cab in order to protect the bottom of the vehicle and the inner sides of the wheels and tires with foam solution discharged in a spray pattern. The minimal total discharge shall be 80 litres per minute. COMPLY_____

9.32 Insulation and heating – Insulation and heater(s) shall be installed to protect liquid tanks, piping and valves from freezing for at least a 4-hour period when the crash vehicle is exposed to -40^{o}C ambient temperature in the standby mode. The insulation shall be adequate to allow the vehicle to stand by with engine running in -40^{o}C ambient temperature 4 hours without becoming inoperative due to freezing. The insulation shall not support insects or bacteriological life, absorb or retain moisture and shall be fire-resistant and self-extinguishing. The bodywork enclosing the foam equipment, the hose line compartments, and all valves, piping and gauge lines shall be insulated and heated. Isolation valves shall be provided for each coolant heater. If a fuel-fired heater is located in a compartment where other equipment is stored, its exhaust system must be insulated and incorporate a protective screen to prevent equipment in the compartment from contacting a hot surface. No water or foam shall be lost to the ground at any COMPLY_____

stage of heater operation.

9.33 Treating and Painting

9.33.1 All parts of the vehicle shall be cleaned, treated and primed prior to assembly. To insure that the paint will adhere to aluminium surfaces in the most optimum manner, all aluminium components shall be pre-treated prior to painting using an aluminium conversion process with a chromate etch. COMPLY_____

9.33.2 After the vehicle is completely assembled, except for bright trim parts, the entire unit shall be primed, puttied, water sanded and painted the specified colour with a lead and chromate free high solids polyurethane colour coat. A minimum of two coats shall be applied and thickness shall be 3.5 mils. To ensure full gloss, colour retention and durability, a minimum of two coats of low VOC clear coat shall be applied at 2 mils film thickness minimum. COMPLY_____

9.33.3 The finished paint shall be free from “orange peel” (pebbly finish), runs and other imperfections. COMPLY_____

9.33.4 The exterior of the vehicle shall be painted yellow. COMPLY_____

9.33.5 Lettering/numbering/striping shall be provided as specified. COMPLY_____

9.33.6 The interior of all compartments and the cab shall be painted with a grey/white splatter finish. COMPLY_____

9.34 Nameplates and Instruction plates - All nameplates and instruction plates shall be metal or plastic which will not be degraded by weathering. The information shall be engraved, stamped or etched on each plate. If metal, they shall be made of a non-corrosive material, chrome plated or nickel silvered. All plates shall be attached with screws, bolts or rivets. Each plate shall be mounted in a conspicuous place. COMPLY_____

9.34.1 Nameplates shall show make, model, serial number and other such data as to positively identify the item. COMPLY_____

9.34.2 Information plates shall provide important instructions to be followed in operating or servicing the vehicle or equipment. These information plates shall include warnings or cautions and shall be located and be of COMPLY_____

sufficient size to be readily seen under normal operating and/or servicing conditions.

10.0 TRAINING OF OPERATORS AND MAINTAINERS – As soon as practicable, the Contractor shall, at his expense, provide the following training course: COMPLY_____

a) Basic operation and preventive maintenance of all systems in the vehicle for the benefit of the site vehicle mechanics. This course will be given at the Wabush Airport at a mutually-agreed time and will take at least two full days. It shall extensively cover the logic and operation of the air, electrical and agent systems including a comprehensive review of the schematics of those systems; troubleshooting; vehicle components; and disassembly and repair (excluding engine and automatic transmission). Airfare, tuition, meals and lodging are to be included.

b) Familiarization for up to three training personnel, covering all aspects of the operation of the vehicle and user maintenance. This course must be held at delivery site and last at least one full day. Airfare, tuition, meals and lodging are to be included.

11.0 EXTRA EQUIPMENT

11.1 Provide the following extra equipment;

a) Provide a Hydraulic Extrication tool. Holmatro or equivalent. The kit shall include a portable pump, hoses, combination spreader cutter and a set of pulling chains with adapters. The cabinet must be located in a convenient accessible location on the truck. COMPLY_____

b) One 30 lb. purple K fire extinguisher complete with bracket. COMPLY_____

c) Two 12-volt Streamlite SL-45 rechargeable lanterns or similar shall be installed in the cab, one on each side of the instrument panel. COMPLY_____

d) Two (2) 430 or 570 LPM water/foam solution pre-connected hand line hoses located in a lower body compartment, one(1) on each side of the vehicle with 60 m of 38 mm double jacket fire hose and piston grip nozzle for each. COMPLY_____

12.0 DELIVERY

12.1 The vehicle and its accessories, spare parts and tools, shall be packed in such a manner as to insure acceptance and safe delivery by the Wabush Airport, Wabush, NL.

COMPLY_____

12.2 It is mandatory that the vehicle and its accessories, spare parts and tools be delivered to the Wabush Airport, Wabush, Newfoundland no later than January 15th, 2014.

COMPLY_____

12.3 If the above delivery date cannot be met, the contractor shall supply and transport, to and from the Wabush Airport, a temporary equivalent replacement ARFF vehicle, no later than January 15th , 2014, for use by the Wabush Airport until the final delivery of the new ARFF vehicle.

COMPLY_____