TRIAL DIRECTIVES OF CRASH (WATER/FOAM) FIRE TENDER FOR AIR FIELDS IS:951:2003

Sl. No.	Technical Parameter	QRs/Specification	Trial Directive	Result expected/desired
1	**PURPOSE :**	The Water cum Foam Air Field Crash Fire Tender shall be highly specialized for aerodrome rescue and fire fighting purpose. Vehicle shall be capable of reaching to the aircraft crash site as per ICAO standard.	It should be suitable for Aerodrome Rescue and fire Fighting	It should be as per QRs
2	**APPLICABLE STANDARDS:**	Design, construction features, materials, equipment and interpretation of Terminology of specification of Air Field Crash Tender shall be in accordance with : **a.** Airport Service Manual- Part- I, DOC No. 9137-AN 1899 with latest applicable amendments. **b.** Indian Standard IS 951:2003 (Functional requirement for Airfield Crash Tender) **c.** National Fire Protection Code 414 edition 2012. **d.** BS-IV/latest available. **e.** Chassis: 6x6 chassis.	As per the certificates provided by the firm	It should be as per QRs
3	**BASIC REQUIREMENT**	**a.** Capacity of water tank: 6500 Ltrs. **b.** Capacity of Foam tank 800 Ltrs or 12% of Water Capacity. **c.** Auxiliary Foam Compatible: DCP (150 Kgs) **d.** Overall Size should match the vehicle requirement **e.** Drive: All Wheel Capability (Configuration 6x6) **f.** Gross Vehicle Weight: Gross Vehicle Weight (weight of fully staffed, loaded and equipped vehicle) shall not exceed maximum permissible limit weight of chassis by manufacturer.	Shall be measured physically	It should be as per QRs

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		g. Centre of Gravity: kept as low as possible **h.** Tilt Angle/Stability: 28/30 degree on static condition in both ways **i.** Steering: Right Hand Steering is mandatory. **j.** Angle of Approach: 30 Degree Min. **k.** Angle of Departure: 30 Degree Min. **l.** Inter axle Clearance Angle: 12 degree Min. m. Ground Clearance: at least 595mm. n. Under axle clearance FA/RA: at least 350mm/350mm. o. Slide Slope: 20% on both sides. p. Grad ability: 35% of dry pavement of minimum speed of 1.6 Km/hr. q. Turning Circle Radius: As per BIS (less than 3 lengths of ACFT). r. Ford ability: not less than 608 mm. s. Articulation: 300 mm. t. It shall be possible to operate the monitor and the two hand lines at the pump delivery pressure of 8.5 Kgf/ Cm^2 and shall be capable of sustaining high pressure up to 12.5 kgf..		
4	**MATERIAL SELECTION AND TREATMENT**	4.1 The **tubular steel (40mmX40mmX2mm)** shall be used for construction of the appliance shall be made with a view to provide strength and durability to the chassis 4.2 i) Timber shall not be used in body construction. ii) The body shall be constructed of materials that provide the lightest weight consistent with the strength necessary for off pavement operation over rough terrain and when exposed to excess heat. The body may be unitized with chassis rigid structure type or it may be flexible mounted on the vehicle chassis. It shall also include front and rear fenders or wheel wells, body panel shall be removable where necessary to provide access to the interior of the vehicle.	As per the certificate provided by the firm and physically check by BOO.	It should be as per QRs

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		iii) Access doors shall be provided for those areas of the interior of the vehicle which must be frequently inspected. iv) The working deck of the vehicle shall be adequately reinforced to permit the crew to perform their duties in the turret area, water tank top fill area, foam liquid top fill area and in other areas where access to auxiliary or installed equipment is necessary. v) Hand-rails or bulwarks shall be provided where necessary for the safety and convenience of the crew. Rails and stanchions shall be strongly braced and constructed of a material, which is durable and resists corrosion, vi) Steps or ladders shall be provided for access to the top fill area. The lowermost steps(s) may extended below the angle of approach or departure or ground clearance limits if it (they) is (are) designed to swing clear. All other steps shall be rigidly constructed. All steps shall have a non-skid surface, with a least 150 mm toe room. Lowermost step(s) shall be no more than 558 mm above ground level when the vehicle is full laden. Adequate lighting shall be provided to illuminate steps and walkways. vii) A heavy duty front bumper shall be mounted on the vehicle and secured to the frame structure. viii) The appliance is intended for use in tropical conditions with constant high humidity and heat The use of rubber and similar materials shall be avoided. ix) All parts which forms water ways or come in contact with water shall be of corrosion resisting material. All metal pipelines shall be hot dipped/ galvanized. All metal parts exposed to atmosphere shall be of corrosion resisting material. All metal fasteners shall be galvanized/chrome plated to avoid rusting. 4.3 Paint finish shall be 'Fire Red' in colour as per IS 2932 and shall be resistant to damage from fire fighting agents.		

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5.	Cabin	i) The cabin shall be Aero dynamically designed and mounted on the forward part of the vehicle. It shall provide seating for 5 persons including driver (two adjustable seats and a long fixed seat for 3 crew member). In addition there shall be instrument panel and equipment as specified without any hindrance to crew. ii) The cabin shall meet the visibility requirements of the wind. Shield shall be of shatter proof safety glass and all other windows shall be constructed of approved safety glass. The cabin shall be provided with wide gutters to prevent foam and water dripping on the wind shield and side windows. There shall be enough space to keep and to enable the crew except driver to put on protective clothing and breathing apparatus (B.A.) set while on way to a call. The doors in the cabin should be operable at 90^0 for easy ingress and egress of crew. iii) The cabin shall be weather proof and shall be full insulated thermally and acoustically with a fire resistant material. iv) The cabin roof shall be covered with aluminium chequered sheet in such a way that the entrapment of rain water/foam solution on cabin roof is totally avoided by providing necessary gutters for draining.	AS per the certificates provided by the firm and physically check by BOO.	It should be as per QRs
6.	Brakes	i) The braking system shall feature service, emergency and parking brake system. Service brakes shall have power actuation through air, hydraulic or air over hydraulic. ii) Service brakes shall be of all wheel type with split circuits so that failure of one circuit shall not cause total service brake failure and shall be able to hold fully loaded vehicle on a 50 percent grade. iii) The services brakes shall stop the vehicle at full load within 10.7 m from 32 kmph and within 40 m from 64 kmph on a dry hard appropriately roadway level, free from loose materials and sufficiently wide roadway without any part of vehicle leaving roadway.	All the brakes shall be applied physically on moving vehicle. The parking brake shall be applied on the vehicle parked on8 to 10 degree slope.	The vehicle shall able to stop smoothly

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		iv) The service brakes shall provide one power assisted stop with the vehicle engine inoperative or the stopping distances specified above for each vehicle class. v) An emergency brakes system shall be provided which is applied and released by the driver from the cabin and is capable for modulation by means of the service brake control. vi) The parking brake shall be capable of holding the fully loaded vehicle on a 20 percent grade without air or hydraulic assistance.		
7.	**ENGINE:**	**a. Engine: Turbo charged air –cooled 4 cycle 25T Diesel Engine, Bharat Stage IV or latest version emission ratio compliant or equivalent chassis.** b. Engine Output: sufficient to perform output requirement specified herein should not less than 360 BHP @2100 rpm (min). c. Acceleration: 0-80Km/hr in 40 seconds. The acceleration time shall be achieved on ambient temperature varying from -15^{0}C to 50^0 c and at elevation up to 600 M without engine pre-heating. d. Top Speed: 100 to 120 Km/hr. e. Response Time: 120 second for a distance of 2.8 Km with three 90 degree turn. f. Cooling System: To avoid overheating of engine under tropical condition. g. Fuel tank Capacity: As per OEM/ for minimum 5h continuous operation. h. Engine starting System: 24 volts and minimum 30 Amperes.	AS per the certificates provided by the firm and physically check by BOO.	It should meet the QRs.

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		i. Positive Operation of Radio Equipment: By way of radio separation of electrical system. j. Recharging of Battery: Both in battery charger while mobile and AC receptacle on ground. k. Exhaust: To be located far away from pump operating position. l. Service Brake: All wheel type with split circuit. m. Towing eye/hook: 2 at front and 2 at rear n. Power take off: Engine department. Power to be operated by vehicle engine through suitable power take off. o. Transmission: Manual. p. Steering: Ram-assisted power steering system. A steering mechanism shall be so designed as to permit manual steering sufficient to bring the vehicle to a safe stop in the event of failure of power assistance. The power steering shall have sufficient capacity so that more than 7kg pull is required on the steering wheel in order to turn the steering wheel from lock to lock with engine running. q. Wheels: single wheel type r. Tyres: with tubes or tubeless s. Crew cabin: driver+5 t. Access doors: easy accessible to engine, pump, foam proportional system, battery storage, fluid reservoir. u. Extension Ladder: Alloy aluminium extension ladder (10.5 m) light alloy Truss type - 1 No. v. Ground sweep/under truck nozzle: 6(3 in front of front axle+1 behind the front axle+1 in front of 1st rear axle +1 in between the rear axle) with foam solution discharge to protect under side of the vehicle. The throw of the nozzle shall be 6M and shall be controlled from cabin interior types & wheels.		

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8.	**WATER TANK**	a. Capacity: 6500 ltrs b. Filling: self-refilling from pump c. Water tank shall have rated capacity as per class and the tank outlets shall be arranged in such a way that 85 percent of rated capacity can be used if the vehicle is standing on: a) 20 percent side slop, and b) 30 percent ascending/descending slope. d. Tank shall be made of 5mmX4mmX3mm thickness stainless steel of grade 304 as per IS 6603, tank with suitable longitudinal and traverse baffles, which shall permit easy access for internal inspection. The tank shall withstand hydrostatic pressure of 0.3kg/cm^2 e. Tank shall be provided with hinged lid, a top filling hole with filter of 450 mm size and drain hole of not less than 63mm dia with a quick action spherical type valve at the bottom. The manhole shall be quick opening type and shall be clearly marked "Water" f. Baffle plates: longitudinal and transversal are required. g. Over –flow piping 100 mm dia minimum shall be arranged in such a way that it release pressure on overfilling without wasting water during vehicles manoeuvres. h. Tank filling connection: 04 water filling connection in standard 63 mm instantaneous coupling, two on left and another two on right with strainers and non-return valve. i. The water tank shall be separate from crew compartment, chassis, engine and easily removable, and shall be mounted on chassis in a manner that the torsional strains during movement are minimum. j. A direct filling connection shall also be provided to fill the tank from open source of supply and shall be of sizes, so as to fill the tank in 2 min at 5 kg/cm^2 pressure. k. Arrangement of lifting the tank without damage should be provided for repair and maintenance, etc.	The firm shall provide certificates. The same will be checked physically by the BOO.	It should be as per QRs

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