

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

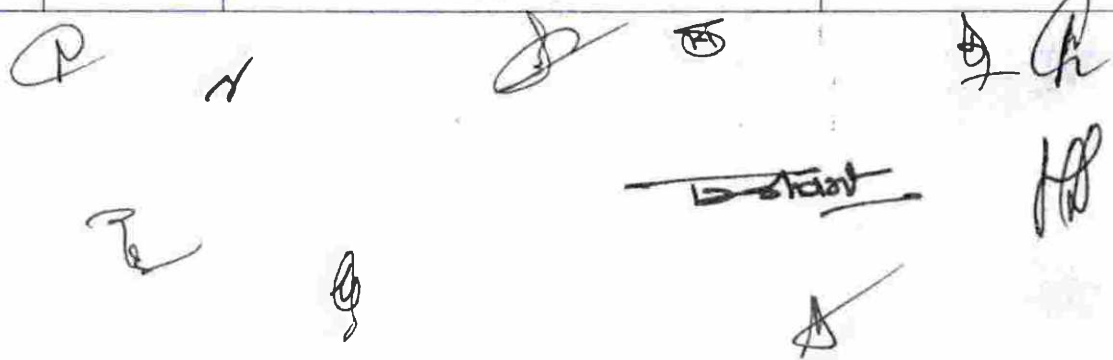
Sl	Specification	Qualitative requirements	Trial Directives for POOs
1.	Purpose :	The Water cum Foam Air Field Crash Fire Tender shall be highly specialized for aerodrome rescue and fire fighting purpose. Vehicle shall be capable of reaching to the aircraft crash site as per ICAO standard.	It shall be ensured that the vehicle is suitable for Aerodrome Rescue and fire fighting as per QRs and ICAO standard.
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-VI/latest available. e. <u>Chassis: 6x6 chassis.</u>	The vehicle shall meet the requirement as per relevant standards and 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.	The vehicle shall be checked physically and should meet the requirement as per relevant standards and QRs.

		<p>g. Centre of Gravity: Centre of gravity of the vehicle shall be kept as low as possible under all conditions of loading.</p> <p>h. Tilt Angle/Stability: 28/30 degree on static condition in both ways</p> <p>i. Steering: Right Hand Steering is mandatory.</p> <p>j. Angle of Approach: 30 Degree Min.</p> <p>k. Angle of Departure: 30 Degree Min.</p> <p>l. Inter axle Clearance Angle: 12 degree Min.</p> <p>m. Under axle clearance FA/RA: as per BIS requirement.</p> <p>n. Slide Slope: 20% on both sides.</p> <p>o. Gradability: As per BIS requirement.</p> <p>p. Turning Circle Radius: As per BIS (less than 3 lengths of ACFT).</p> <p>q. Fordability: not less than 608 mm.</p> <p>r. Articulation: 300 mm (minimum).</p> <p>s. It shall be possible to operate the monitor and the two hand lines at the pump delivery pressure of 10 Kg/ Cm².</p>	
4.	Material selection and treatment	<p>4.1 The tubular steel (40mm x 40mm x 2mm) shall be used for construction of the appliance with a view to provide strength, durability and elasticity to the chassis.</p> <p>4.2 i) Timber shall not be used in body construction.</p> <p>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</p>	<p>Shall be checked physically and should meet the requirement as per relevant standards and QRs. Necessary material of construction certificates from the manufacturer as per QRs shall also be checked and verified.</p>

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		<p>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.</p> <p>4.3 Paint finish shall be 'Fire Red' in colour as per IS 2932 and shall be resistant to damage from fire fighting agents.</p>	
5.	Cabin	<p>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.</p> <p>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° for easy ingress and egress of crew.</p> <p>iii) The cabin shall be weather proof and shall be full insulated thermally and acoustically with a fire resistant material.</p> <p>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.</p>	Shall be checked physically and should meet the requirement as per relevant standards and QRs.

	<p>c . Acceleration: 0-80Km/hr in 40 seconds. The acceleration time shall be achieved on ambient temperature varying from 0-50°C and at elevation up to 600 M without engine pre-heating.</p> <p>d. Top Speed: 100 to 120 Km/hr.</p> <p>e. Response Time: 120 second for a distance of 2.8 Km with three 90 degree turn.</p> <p>f. Cooling System: To avoid overheating of engine under tropical condition.</p> <p>g. Fuel tank Capacity: As per OEM/ for minimum 5h continuous operation.</p> <p>h. Engine starting System: 24 volts and minimum 30 Amperes.</p> <p>i. Positive Operation of Radio Equipment: By way of radio separation of electrical system.</p> <p>j. Recharging of Battery: Both in battery charger while mobile and AC receptacle on ground.</p> <p>k. Exhaust: To be located far away from pump operating position.</p> <p>l. Service Brake: All wheel type with split circuit.</p> <p>m. Towing eye/hook: 2 at front and 2 at rear</p> <p>n. Power take off: Engine department. Power to be operated by vehicle engine through suitable power- take off.</p> <p>o. Transmission: Manual and automatic transmission (Both).</p> <p>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</p>	
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		<p>Bottom : 5mm</p> <p>Sides/front/Rear/Top : 4mm</p> <p>Baffles : 3mm</p> <p>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"</p> <p>f. Baffle plates: longitudinal and transversal are required.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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/cm² pressure.</p> <p>k. Arrangement of lifting the tank without damage should be provided for repair and maintenance, etc.</p>	
9.	Foam system:	a. Material of tank: Tank shall be made of stainless steel of grade 304 as per IS 6603. The tank with its fitment shall be able to withstand hydrostatic pressure of 0.3 kg/cm ²	Shall be checked physically & tested and should meet the requirement as per relevant standards and QRs. Necessary certificates from

		<p>l. An external filling connection which can be approached at ground level shall also be provided to receive supply in tank with the help of foam pump.</p> <p>m. All pipelines shall be made of corrosion resistant material and dissimilar material that produces galvanic corrosion should not be used.</p>	
10.	Pump data	<p>a. The water pump shall be made of bronze/gunmetal and shall be multistage centrifugal type designed for dependable emergency service. The pump shall be CE approved; meet international standards, Comply EN 1028.</p> <p>b. Delivery/Discharge Rates: The pump shall be capable of discharging at a rate equal to or more than the total discharge from monitor and two side lines and shall not be less than 4000 l/min at 8.5 kg/cm² and 3 m static lift, pump shall also be capable of minimum output of 4000 ltrs/min at higher pressure of 10.5 to 12.5 Kgf/Cm² to suit monitor output for same suction.</p> <p>c. Type: Pump shall be Multi stage and closed impeller (stainless steel) type where impeller is dynamically balanced to reduce the thrust. Mechanical seal, self-adjusting type, shall be provided capable of running dry up to 1 minute without any damage. The pump shaft shall be held in heavy duty ball/roller bearing running in oil bath. The delivery manifold shall also be made of stainless steel.</p> <p>d. The entire pump assembly shall be hydraulically tested at 21.0 bar for at least 5 minutes.</p> <p>e. Pump shall be mid-ship mounted, Pump control panel shall be located on either side of appliance in addition to the one provided in cabin.</p>	<p>It shall be checked physically & tested and should meet the requirement as per relevant standards and QRs.</p> <p>Necessary certificates from statutory authority as per QRs, wherever necessary, shall also be checked and verified.</p>

12.	Monitor: Roof monitor with suitable control panel	<p>a - Location: Roof of the cabin.</p> <p>b . Operation: Electro pneumatic manual control by either driver or crew members.</p> <p>c . Monitor shall be capable of traversing 360⁰ horizontally and elevating not less than 45⁰ from horizontal axis and depression of 15⁰.</p> <p>d . Monitor shall be capable of discharging total rated water tank quantity in more than two to three minutes, and shall have a means provided for deflective pattern of foam dispersal. The dispersal. The discharge rate of monitor shall not be less than 3000L/min with expansion ratio of 1: (8-12).</p> <p>e . Range of throw shall be as follows: Straight stream at 45⁰ elevation not less than 60m Disbursed stream at 15⁰ depression Far point - 18m Width - 6 m Near point - 12 m</p>	It shall be checked physically, tested and should meet the requirement as per relevant standards and QRs.
13.	Handlines	<p>a. Numbers: Two side lines on each side, operable from both cabin and panel.</p> <p>b. Discharge rates: Each side line shall have minimum discharge capacity of 500 ltrs/min at 8.5 kg/cm² pressure on FMB 5X branch with an expansion ratio not less than 8 and minimum throw of 25 m when either all foam hand lines are used simultaneously (with monitor not operating) or two of them are used in combination with monitor.</p> <p>c. Control: Pneumatic ball valve type from cabin + additional manual control</p> <p>d. In addition, one first-aid hose reel connection shall also be provided with 100 m rubber hose, tested at 15 kg/cm², with discharge capacity of 120 l/min.</p>	It shall be checked physically, tested and should meet the requirement as per relevant standards and QRs.

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16	Additional accessories fitted on vehicle	<ul style="list-style-type: none"> a. Siren: 95 decibel sound output at 100 m ahead and not less than 90° within side at a distance of 100 m, siren shall be mounted on cabin roof top and shall be fully protected from foam spills, rain water, dust and any damage due to monitor rotation. It shall be battery operated 24V. b. Fog lamp: Two nose on front side c. Reversing light: To assist reversing d. Airfield obstruction marking lamp e. A flashing ray light or light bar on cabin roof top. f. Wind screen wiper g. Search light h. Spot light i. VHF telephone set j. Trafficator k. Trickle battery charger (with quick release plug/socket arrangement, 5m HT cable, 10MLT end high current cable). l. Public Address System. m. External compressed air supply system mounted on rear side n. Any other lighting system as per BIS 951. 	It shall be checked physically, tested and should meet the requirement as per relevant standards and QRs.
17	Additional accessories (Kit)	<ul style="list-style-type: none"> a. PVC suction hose 140mm dia 2.5 mtr length -IS 2410, Qty - 4 Nos. b. Suction strainer (foot valve strainer), IS 907, Qty 1 c. Suction basket strainer, 3532, Qty 1 Nos. d. Suction wrenches, IS 4643, Qty 1 No. e. Rubberised hose 63mm and 22.5 mtrs long with GM coupling, IS marked, IS 636, type-B Qty-10 lengths. 	It shall be checked physically, tested and should meet the requirement as per relevant standards and QRs. Necessary certificates from statutory authority as per QRs, wherever necessary, shall also be checked and verified.


		<p>ag. Compressed Air carbon composite Breathing Apparatus set positive pressure 45 min duration complete with 4 spare cylinders as per EN:137 - 4 set. (Technical specifications enclosed).</p> <p>ah. Medical First Aid Kit – 01 set.</p> <p>ai. Special DCP Fire extinguisher for metal Fire-5 Kgs Capacity : 02 Nos. (IS:15683) IS marked.</p>	
18	SPECIAL FEATURES:	<p>a. Automatic lubrication system</p> <p>b. 2x250 high pressure- LED lamp with remote control.</p> <p>c. Rescue Tools:</p> <p>i) Hydraulic Combi Tool-01 No.</p> <p>ii) Self-rescue automatic escape (standard size): 01 No.</p> <p>iii) Shovel, Spades, Pick Axe with handle, Axes Crow Bar 1 Meter long, Hammer - 10 Kg. Sledge Hammer 01 No. Each.</p> <p>iv) Long line 100 m size 50mm circumferences.</p> <p>v) Rescue saw for laminated glass, metal and wood with charger and replaceable spare blades</p> <p>vi) Hydraulic door opener-01 No.</p> <p>vii) Safety Belt – full body harness with hook & rope -02Nos.</p> <p>viii) Rescue Rams with accessories -01 No.</p> <p>ix) Hydraulic cutter – 01 No.</p> <p>x) Hydraulic spreader with pulling chains and adaptors- 01 No.</p> <p>d. External power supply drive end plug for 220V</p> <p>e. Material use of ABS (Acrylic Based Synthetic plastic) for weight reduction of accessories fittings.</p>	<p>It shall be checked physically, tested and should meet the requirement as per relevant standards and QRs. Necessary certificates from statutory authority as per QRs, wherever necessary, shall also be checked and verified.</p>


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	<p>e. General arrangement drawings showing layout of equipment, piping, fluid flow control, electrical/structural design.</p> <p>f. Spares parts list (with cost) for 2 years maintenance support.</p> <p>g. Details of tools for maintenance/repairs/overhaul.</p> <p>h. The manufactures shall guarantee the materials, workmanship and operation for a period of 24 months from the receipt of equipment.</p> <p>i. Practical operation training to certain assemblies of specialized nature to be arranged</p> <p>j. The supplier shall provide a list of customers with details to whom such equipment was supplied during past 3 years.</p>	
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(Nancy Singla)
 AC/SSB
 Member

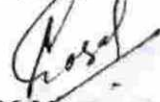

(Dayavir Singh)
 Team Comdr/NSG
 Member


(Naresh Namdev)
 AC/ITBP Member

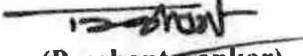

(Neeraj Shahi)
 AC/CRPF
 Member



(Kailash Yadav)
 DC/BSF
 Member

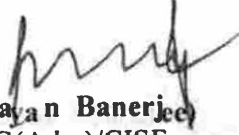

(S.K. Tomar)
 DO/DFS
 Co-opt Member



(Dr. M.M. Gosal)
 SSO(T)BPR&D
 Member


(A.K. Verma)
 AIG/Fire(CISF)
 Member


(Prashant Tonkar)
 Scientist (E)/DRDO
 Co-opt Member


(Rajnath Singh)
 IG(Fire)/CISF
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(Udayan Banerjee)
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(Alok Kumar Pateria)
 SDG(HQ)/CISF
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