

**JUSTIFICATION OF DGS&D SPECIFICATIONS FOR 30M HYDRAULIC PLATFORM.
SIMILAR JUSTIFICATION APPLIES TO HIGHER HEIGHTS AS WELL**

DGS&D SPECIFICATION	COMMENTARY
<p>Tenderers to note:</p> <p>a) The items included in the tender are considered safety/difficult/ complaint-prone. Tenderers are advised to get themselves registered with DGS&D/NSIC for hydraulic platforms conforming to these specifications to qualify for participating in the tender. NSIC registration shall be considered valid only if it is based on capacity report from DGS&D QA Wing.</p> <p>b) Tenderers to confirm suitability of Platform truck to withstand wind speed up to 14m/sec. with operation at full load of 500kg in cage with maximum outreach along with other design conditions.</p> <p>c) Tenderers to furnish the detail of Qty/size/location of all hydraulic cylinders.</p> <p>d) Tenderers to furnish details of all operation and safety systems including CAN BUS system and their scope/function/working, backed by notes/diagrams where necessary for their understanding.</p> <p>e) Tenderers to furnish a detailed note as to how, in case of failure or malfunction of the on-board computer/s or sensors, the hydraulic platform will continue to function for fire fighting and rescue work at full load with automatic safety features.</p>	<p>a) We are well experienced in this field. Evidence of past supply of fire platforms enclosed. Our factory is based in Gurgaon (Haryana), India and as such, after sales service and spare parts availability is assured. We are registered with both DGS&D as well as with NSIC for the hydraulic platform. No change in specifications/conditions is needed.</p> <p>b) We confirm that Liftmak fire fighting and rescue platforms are designed to withstand wind speed of up to 14m/sec. at full reach and 500kg load. The wind speed is monitored by a sensor and the speed displayed on the monitor at cage. No change in specifications is needed.</p> <p>c) The quantity, size and location of all hydraulic cylinders can be provided by us. No change in specifications is needed.</p> <p>d) The computer aided CAN BUS system limits the reach and slew functions automatically as per design, based upon information received from the various sensors. The relevant information such as height, reach, wind speed cage angle, cage load etc. is dynamically displayed on the colour monitors at cage, outrigger control and turret. There are three monitors in our design; one at cage, the other at turret control and the third at outrigger control stations. No change in specifications is needed.</p> <p>e) In the event of failure of computer or sensors or monitor/s, the hydraulic platform can be operated in the CAN BUS bypass/override mode. Here, for example, the reach is controlled by allowing extensions to extend only above a predetermined angle of first boom. Range diagrams enclosed in this connection are self-explanatory. In the CAN BUS bypass mode, conventional mechanical, hydraulic and electrical safety systems control the movement of the booms to make the hydraulic platform automatically safe to operate. The difference of the safety systems in CAN BUS mode and in CAN BUS override mode is elaborated earlier in this letter. All functions related to safety can be controlled in CAN BUS override mode also.</p> <p><u>Please note that this is a very important India-centric specification.</u> In India, several imported platforms are lying idle for want of repairs and mostly, the problems stem from the fact that in the foreign machines, if the computer system fails then the hydraulic platform cannot be operated. The repairs of the electronic system invariably require the services of an overseas engineer, which is both time consuming as well as exorbitant in terms of expenditure. Meanwhile, the essential life saving equipment is idle. Hence, DGS&D has already provided for a CAN BUS override system, which allows the hydraulic platform to be operated with full safety (through an alternative safety system comprising of a combination of electrical, hydraulic and mechanical devices) in the event of computer malfunction. This is an important India-centric feature, already provided in the existing DGS&D specifications. No change in specifications is needed.</p>

<p>f) Tenderers to furnish complete set of operating diagrams of hydraulic platform along with the offer for each item quoted including the following. The drawings should indicate Overall length, height and width in transport position, general arrangement drawing showing Hydraulic Platform in fully extended and fully raised position with outriggers fully extended and distance between revolving superstructure from side of chassis.</p> <p>i) Hydraulic Platform in folded position mounted on chassis, outriggers stowed a) Side view and b) Rear view.</p> <p>ii) Hydraulic Platform with booms extended horizontal to ground and outriggers fully extended and deployed a) Side view b) Rear view c) Top view.</p> <p>iii) Hydraulic Platform with booms in fully elevated and extended position with outriggers fully extended and deployed. a) Side view and b) Rear view.</p> <p>v) Range Diagram in normal operation with CAN BUS system.</p> <p>vi) Range Diagram in operation without CAN BUS (i.e. with computer/electronic sensors by-passed but automatic mechanical and hydraulic safety in place).</p> <p>vii) Isometric drawing of cage showing monitor, controls etc.</p> <p>g) Deviations: Any deviation/departure from the above specifications shall be pointed out on a separate sheet titled 'Deviations' with detailed explanation.</p>	<p>f) Drawings enclosed indicating overall length, height and width in transport position, general arrangement drawing showing Hydraulic Platform in fully extended and fully raised position with outriggers fully extended and distance between revolving superstructure from side of chassis.</p> <p>No change in specifications is needed.</p> <p>i) enclosed, side and rear views for each chassis option</p> <p>ii) enclosed – side, rear and top views</p> <p>iii) enclosed, both booms fully elevated as well as extended and outriggers extended fully and deployed – both side as well as rear views</p> <p>v) enclosed</p> <p>vi) enclosed</p> <p>vii) Isometric drawing of cage enclosed, showing monitors, controls etc.</p> <p>g) Our fire platform has no deviations from tender specifications. No change in specifications is needed.</p>
<p>Detailed Specification Schedule1 Specification : Hydraulic Platform 30 m high for fire fighting and rescue comprising of main boom with telescopic extensions and a cage attached to an articulated boom built on chassis as per General Technical Requirement.</p>	<p>Schedule 1: No change in specifications/text is needed.</p>
<p>Hydraulic Platform for fire fighting and rescue(30m high) Add on Items to Hydraulic Platform for fire fighting and rescue(30m high)</p>	<p>Schedule 2: No change in specifications/text is needed.</p>
<p>Schedule2 Specification : As detailed in General Technical Requirements.</p> <p>1. General The Hydraulic Platform shall be designed specifically for fire fighting and rescue to suit the specified operating conditions. It shall comprise of one main boom with telescopic sections and an articulated boom with a cage mounted at the end to go up over and down the other side of obstruction. The entire unit is mounted on a turntable on a chassis. In stowed position, the cage shall rest on the vehicle deck.</p> <p>The Hydraulic Platform shall be capable of operation at any angle of elevation and reach without any reduction of</p>	<p>This is the basic boom geometry for such hydraulic platforms. Variations in boom geometry are ofcourse possible; for example the articulated boom can also have telescopic extensions, if needed by the user. However, broadly, the specification is correct and adequate.</p> <p>No change in specifications is needed.</p> <p>Conforms. Our hydraulic platform offers full 500kg cage capacity at full reach and full height as per tender</p>

<p>load capacity in the cage. It should be able to rotate 360 degree and beyond, unlimited and continuous at any angle of elevation as well as below ground level subject to boom remaining clear of vehicle body. The height of the cage floor when fully elevated should not be less than 30 m from the ground. The horizontal outreach (slew centre to cage far end) of the cage at full rated load shall not be less than 20.5 m.</p> <p>The booms and cage shall be hydraulically operated and shall permit precise and easy operations under the most difficult conditions with about 25 HP or more of reserve power. Full safety interlocks shall be incorporated in the design so as to ensure complete safety in operation.</p> <p>The Hydraulic Platform shall be equipped with accessories and features described hereinafter to make it suitable for fire fighting and rescue.</p> <p>The vehicle shall be equipped with all the accessories required for registration of the vehicle with District Transport Authority and the vehicle shall conform to Motor Vehicle Act and Motor Vehicle Rules.</p> <p>It is not the intended to specify herein all the details of design and construction of the equipment completely. However, the equipment shall conform in all respects to high standards of workmanship and shall be capable of continuous operation. The equipment shall be complete with all components necessary for effective trouble free operation. Such components shall be deemed to be within the scope of supply, irrespective of whether these are specifically brought out in this specification or not.</p> <p>2. Design parameters and conditions:-</p> <p>a) Operating conditions at maximum outreach with full working load Temperature -7°C to +60°C, Relative Humidity up to 95%, Wind Speed 14 m/sec.</p> <p>b) Safe working load in the cage: 500 kg minimum with dry monitor.</p> <p>c) Safe working load with monitor in the cage delivering up to 3000 lpm: 300 kg.</p> <p>d) Loading capacity of lifting-eye under the cage: 500 kg (with empty cage)</p> <p>e) Max. height to working cage floor from ground level: 30 m (or higher but not lower)</p> <p>f) Max. working outreach with 500 kg load in the cage (from centre of turn table to far end of cage): 20.5 m (or more but not less).</p> <p>g) Working cage floor depth below ground level with 500kg safe working load: 3.6m minimum</p> <p>h) Rotation continuous & unlimited in both directions: 360° +.</p> <p>General Technical requirement For TE :</p> <p>i) Maximum width without riggers extended: As per</p>	<p>technical specifications</p> <p>No change in specifications is needed.</p> <p>No change in specifications is needed.</p> <p>No change in specifications/text is needed.</p> <p>No change in specifications is needed.</p> <p>No change in text is needed.</p> <p>Other than wind speed, which is measurable and hydraulic platform equipped with an alarm and cut-off, other parameters are not inspection-verifiable; manufacturers certificate is all that can be provided.</p> <p>No change in specifications is needed, as 500kgs is the industry standard. However, in case you so desire, we can offer higher cage capacity of 600kgs</p> <p>No change in specifications is needed.</p> <p>No change in specifications is needed.</p> <p>No change in specifications is needed.</p> <p>No change in specifications is needed.</p> <p>No change in specifications is needed.</p> <p>No change in specifications is needed.</p> <p>We can offer up to 1000kgs test for stability and suggest</p>
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manufacturer's design to provide stability with 750 kg load in cage at full reach.

j) Shall be tested for stability with 750 kg in cage at full reach.

k) Speed of operations:-

- a. Max. Working height from resting and max. Height to resting: 90 sec max
- b. Turning through complete circle: 120 sec max
- c. Time to extend Outriggers on both sides: 30 sec max

l) In Transport position

- a. Height: 4.0 m max.
- b. Length: 12.0 m max.
- c. Width: 2.5 m max.

The stability of the vehicle (in travelling position) when fully equipped and loaded (excluding crew member), with hydraulic platform resting on the resting stand and without extending the Stability jacks, shall be such that it shall remain stable and shall not overturn even if the surface on which the vehicle moves has gradient equal to an angle of 20 degree on either side from the horizontal. The manufacturer shall furnish a certificate to the effect at the time of supply, substantiated with calculations.

3. Chassis:-

The chassis shall be ARAI certified, of 2-axle 16 T GVW (4x2) or 3-axle, 25 T GVW (6x2 or 6x4) or 4-axle, 31 T GVW (8x2 or 8x4) configuration and BS3 or BS4 compliant as applicable and shall have adequate engine horsepower. It shall be Right Hand Drive fitted with power steering. External PTO for driving hydraulic pump shall be provided. The distance between back of driver's cabin and end of chassis frame shall be at least 7000 mm.

4. Construction:-

The appliance shall be of robust construction. Materials used in construction shall be carefully selected for durability. Ferrous metal parts shall be treated for anticorrosion by rust inhibition chemical treatment.

a) Main Frame: The main frame shall be a fully welded steel structure. It shall be fixed at the chassis frame with bolts and springs so as to allow performance and durability of the chassis, avoiding stress concentration in the chassis beams.

b) Stabilizing System: The standard stabilizing system shall comprise of four hydraulically operated outriggers in 'H' configuration, out and down. Complete controls shall be situated in the dust and water-resistant enclosures at the rear of the vehicle, making all the outriggers visible to the operator. Individual controls shall be given for moving of each outrigger, for adjusting the vehicle on an uneven surface by means of a level indicator.

Each outrigger shall have two separate hydraulic cylinders, the first of which shall push the horizontal outrigger beam out and the second shall push the vertical jack down. The vertical jack shall be provided with self-aligning ground contact footplate (by means of movable

that if DGS&D feels fit, test load should be enhanced to 1000kgs instead of 750kgs. In our opinion, test load should be for twice the safe working load.

We request change in l) and j) from 750 kgs. to 1000kgs.

No change in specifications/speeds is needed.

The stowed length can ofcourse be reduced further by making front overhang as zero but the specifications, as they stand are adequate. It is counterproductive to reduce the stowed length beyond a point as the number of telescopic extensions would then need to increased to reduce stowed length.

No change in specifications is needed.

No change in specifications is needed.

The chassis are of right hand drive with power steering. External PTO is used where available, otherwise transfer case fitted on the propeller shaft is used.

Back of driver's cabin and end of chassis frame is at least 7000 mm. in all models.

No change in specifications is needed for reasons as elaborated previously at start of this letter under 'Overview'.

No change in specifications is needed.

No change in specifications is needed.

No change in specifications is needed.

joint) capable of lifting the unit completely off the ground, level the machine and keep it in its position even under continuous load conditions. Each jacking cylinder should be attached to a lock valve that prevents creeping in case of pressure failure.

The outrigger control should include two systems: manual and automatic. When in automatic control mode, one button controls to automatically stabilize vehicle in safe working condition (i.e., levelling function is automatic). When in manual control mode, the vertical jacks and outriggers can be controlled, one by one, independently or simultaneously.

The jacks shall be correctly in position and vehicle levelled before the booms are allowed to operate. The jacking system shall be isolated when the booms are elevated with a suitable-inter-locking system to prevent retracting till the booms are stowed.

Each vertical jacking cylinder should be equipped with a grill protected red blinking light, which is automatically switched on when the PTO control in the truck cab is engaged.

The lockable outrigger control box should be located at the rear of the chassis. In addition, a hand pump (or other suitable means) shall be provided for emergency retraction of the boom and outriggers. The control box should include a spirit levelling gauge, a green indicator light 'platform system on', a pushbutton control for the activation of the stand-by electro-hydraulic pump and the emergency engine.

The penetration of the outriggers should be sufficient and such that it should be possible to level the vehicle on inclination of 7 degrees (fore and aft)

The system shall also allow the booms to be elevated and slewed on one side when the unit is jacked on one side only; i.e. jacks on one side fully extended and jacks on the other side flushed with vehicle. The system shall be such that it shall operate only on the side of the unit with full jack spread and full movement shall be allowed on that side only to ensure stability.

A visual indication shall be installed at the outrigger control panel, showing the operator the outrigger deployment. This system is to include normal jacking and one sided jacking.

In order to confirm the transport stowage of the outriggers from the cab before departure, an indicator light should be provided on the cab dashboard, which indicates to the driver that the outriggers have been retracted and are in the transport position.

The stabilizing system control panel shall have following additional control devices:

- i) Control lever for horizontal/vertical movement of outriggers
- ii) Main current switch with indicator lamp
- iii) Operating Hour Meter
- iv) Visual levelling sensors for longitudinal and transversal levelling
- v) Switch for the battery driven backup hydraulic system

No change in specifications is needed. This is the accepted industry standard for outrigger control.

No change in specifications is needed. This is a basic safety system

No change in specifications is needed.

No change in specifications is needed.

No change in specifications is needed.

Of course, it is possible to keep increasing the level of sophistication in jacking, such as variable jacking for example, in which the position of each of the outriggers may be different and the computer automatically restricts reach accordingly. However, this feature is not necessary and in fact may be counterproductive as the operator would not then know at time of vehicle/outrigger deployment if the cage can reach the desired coordinate or not. Hence, **no change in specifications is needed.**

No change in specifications is needed. The outrigger position is in fact displayed on a graphic colour monitor.

No change in specifications is needed. This is a safety system.

No change in specifications is needed.

(for stowage)

vi) Battery driven back up hydraulic system (for stowage)
The enclosure containing outriggers controls shall be fitted with automatically operating driven switch and light for night operation.

c) Turn Table: The turn-table shall be of rugged construction and be mounted on chassis to distribute the proper load. Welded steel plate turn-table shall be fastened to the main frame by means of slewing ring or fabricated slewing bearing assembly. The swivel in the line of hydraulic oil and electrical wiring shall be inside the turntable and shall enable unlimited rotation of the turntable and the booms in both directions enabling working on all sides of the vehicle. Reduction gear assembly shall control the movement with brake, driven by hydraulic motor. The gear unit shall be suitably fastened to the turntable for easy manoeuvrability and unrestricted movement in both directions.

d) Booms: Of the two booms, the main boom shall have telescopic extensions to make the unit compact for storage and transportation. The extension of main boom shall be through a hydraulic cylinder attached to chains (or wire ropes), which are in turn linked to the extension booms for quick extension and retraction of the boom extensions. The movement angle of the main boom shall be at least +80 degree to 0 degree from horizontal. The second articulated boom shall be about 5m length and shall fold/unfold giving a total movement angle with reference to the main boom of about 175° or more. The arrangement shall allow second boom with cage to be pivoted back under/by the side of the first-boom, which in turn shall be pivoted to a horizontal position along the length of the vehicle.

The Boom shall be a box-type section and made of corrosion resistant high strength steel grade ST55 or superior. The boom sections shall be internally and externally chemically treated against corrosion. The service points on chain-wheels (or on wire rope pulley system) and adjusting devices for the extending chain (or wire rope) shall be easily accessible and provided with necessary safety covers. All the piping and wiring shall be provided with adequate protection against heat and mechanical damage.

Where the hydraulic booms are projected beyond the turning circle of the appliance, the front portion of the hydraulic booms shall not protrude more than 1 m beyond the bumper front plane.

e) Escape ladder: Telescopic rescue ladder system shall be attached on the side of the booms. It should be 490 mm in width, 250 mm in railing height. The distance between each rung should be 280 mm minimum. The railing height shall be 250mm. The design shall be such that it shall form a direct continuous rescue way with no cross over platform or similar obstacle. The ladder shall be attached on to boom structure at several points throughout its length resulting in extreme stability even when operated in windy conditions. Extension movements of the ladder shall be automatically synchronized with the telescopic movement of the first boom and shall not require self control device. There shall be a step at the turn table to provide a safe access from the ladder down to the decking, so as to provide continuous way from the maximum height down to the ground for high capacity

No change in specifications is needed.

No change in specifications is needed. It is of course possible to have different designs such as telescopic extensions in the articulated boom as well but the existing specifications are adequate and represent the design present in most of the modern fire platforms today.

No change in specifications is needed.

It is of course possible to reduce the front overhang from 1m to Nil but the specifications, as they stand are also adequate.

No change in specifications is needed.

No change in specifications is needed.

rescue operations.

f) Body Work, Equipment Lockers and other general requirements:-

The frame of the bodywork shall be made of welded steel profile sections bolted together for easy maintenance. The frame shall be covered by 3mm thick (min.) non-slip aluminium plate to allow free movement of persons in it. Removable panel shall be provided as necessary at each side and the rear of the body work to afford access to the hydraulic system for maintenance.

No change in specifications is needed.

To provide easy access from the ground level, there shall be steps provided and covered by non-slip aluminium plate at each side of the vehicle. At the end of the steps there shall be railing and grab handles made of stainless steel/aluminium to assist when climbing.

No change in specifications is needed.

The body work shall not reduce the road clearance to less than chassis ground clearance.

No change in specifications is needed.

Hydraulic oil-tank shall be suitably mounted for good protection and transfer of heat. The tank shall be fitted with oil-level gauge at easy accessible position, suction connection with closing valves for easy maintenance and draining outlet with closing valves.

No change in specifications is needed.

At each end of the main-frame, there shall be integral housing for outriggers.

No change in specifications is needed.

Storage lockers (or a suitable storage arrangement) shall be sufficient for all equipments, which are required to be carried on the appliance including the IC Engine, portable pump (if ordered) and at least four 100mm diameter suction hoses of 3m length each and two Nos. canvas delivery hoses of 63mm diameter of 15m unfolded length each, tools and tackles etc.

No change in specifications is needed.

Doors of the lockers shall be fitted with automatic switches activating the lights as soon as the door is opened and also activating the warning light in driver's cabin.

No change in specifications is needed.

All locker's interiors shall have aluminium finish. The lockers shall be weather proof and the doors shall have efficient flush fitting with spring loaded door handles.

No change in specifications is needed.

The design of the driver's compartment shall offer maximum possible provision and the window of adequate size shall be provided in the back of the cab to facilitate view for easy reversing of the appliance. If the doors of the driver's cabin are hinged, they shall open forward. The doors and door locks shall be so designed as to prevent their being, inadvertently, opened from inside.

No change in specifications is needed.

All electrical instruments, switches and gauges shall be adequately illuminated so that there is no difficulty in night operation.

No change in specifications is needed.

All gauges shall be calibrated in Metric Units.

No change in specifications is needed.

Lubrication: The components of the hydraulic platform shall be provided with an efficient means of lubrication. Also, a simple means for checking the oil level shall be provided.

No change in specifications is needed.

Means for draining the oil shall be provided by a single

No change in specifications is needed.

plug, which shall be easily accessible and positioned so as to drain the reservoir completely.

5. Hydraulic systems and controls:-

Hydraulic cylinders shall be fitted with lock valves so as to prevent booms working cage from lowering or the outriggers from retracting in case of pipe or hose failure. The cylinders shall be provided with automatic dampers in the articulated boom to prevent the pressure shocks and dampen the movement when a mechanical stop is reached. Additionally the movement speed of the first-boom for lowering an extension shall be automatically reduced at maximum outreach. The first-boom lifting speed shall be automatically reduced before the maximum height.

No change in specifications is needed.

All the movements shall be automatically limited in their extreme position to prevent the working cage from moving outside the permissible working range. An emergency stop switch on both control panels shall switch off the hydraulic pressure of all movements and stop the vehicle engine. The unit shall be equipped with Bleed Down System and Emergency Hydraulic Back-up Systems.

No change in specifications is needed.

Hydraulic pumps which shall be driven by vehicle power take off. The pump shall operate on minimum flow and minimum pressure when hydraulic platform is not in operation. When one of the booms or slew movements is operated, the control valve shall automatically increase the pressure to a preset level and oil flow to the extent needed for the movement activated. The system shall be such as to avoid the loss of power in the hydraulic system due to overheating of hydraulic oil and minimum stresses shall be caused to vehicle transmission and PTO, keeping fuel consumption and exhaust emissions to the minimum.

No change in specifications is needed.

The hydraulic system control shall be suitably located at cage and turn-table. They shall be simple and safe. By operating several movements simultaneously the oil flow shall increase automatically according to the need of the system, making all movements speed independent of each other. There shall be constant pressure system with maximum pressure setting, which shall prevent overloading of the system and its components. Hydraulic oil reservoir of suitable capacity shall also be provided.

No change in specifications is needed.

Inside the turn-table and at the lower valve compartment, there shall be instant couplings of the manometer in each pressure line. The manometer shall be fitted as standard equipment.

No change in specifications is needed.

The filtration of the oil shall, consist of suction strainer in the suction line pressure. In each pressure circuit, return filter in return line and air filter on the reservoir shall be provided to maximize reliability by protecting the hydraulic system against foreign particles. The hydraulic cylinder shall be double acting with hard chrome plated piston rod.

No change in specifications is needed.

All booms and rotational movements shall be controlled electro-hydraulically. The control functions shall not be sensitive to changes in ambient or oil temperatures, thus providing safe and very accurate movements even in most severe operating conditions (i.e.-7°C to +60°C).

No change in specifications is needed. (without electro-hydraulic valves, the CAN BUS system cannot function in any case)

The lever controls for boom and slew functions shall be joystick type proportional controls, ergonomically positioned in weather proof and water resistant control

No change in specifications is needed.

box. Easy interpretable symbols identifying the function of each control lever/button, in English Language or without language barrier shall be displayed on panel.

The main platform control levers should allow for a progressive control at infinite variable speed from creep to maximum and proportional to the lever position. All main controls should be capable of being operated with single motion or simultaneously. The system should be equipped with an automatic speed ramp to provide damping to sudden start or stop controls for relatively jerk-free operation, providing automatically for an adjustable, progressive acceleration or deceleration of the main platform movements. Other controls are to be controlled by an additional control lever or switch control. All controls should be of 'Deadman' type and return automatically to neutral position, stopping the motion, if the control is abandoned. Deadman switch, either integrated in the joystick or through a foot pedal, which needs to be pressed before actuating any platform function shall be provided at cage control station.

Two permanently fixed oil pressure gauges shall be provided between each of the two hydraulic pumps and turntable control valve, located at a convenient location at turntable control station.

Four pressure tap points will be provided at each of the four outrigger circuits, between pump/s and outrigger control valves, which can be tested with a portable oil pressure gauge attached to 1m long hydraulic hose.

Backup Hydraulic Systems (for stowage purpose): There shall be separate internal combustion engine driven hydraulic pump which shall provide a complete independent means of power in case of failure of the main engine to stow the hydraulic platform.

In addition, a 24 volt/12 volt (chassis dependent) DC battery driven standby pump as backup system shall be incorporated to allow all the booms and outriggers movements to be operated for housing purpose, in the event of failure of all other systems. All backup systems shall be capable of starting from both the control panels.

6. Cage:-

Working cage shall be made of light metal construction with outer dimensions approx. 0.9m wide, 2.0m long and 1.1m high provided with two inward opening doors. The safe working load shall not be less than 500 kg when no water is discharged from the monitor and not less than 300 kg with monitor delivering up to 3000 litres per minute.

The control panel shall be fitted in such a way that the booms are clearly visible to the operator and that all three main working sides of the cage shall be left free for working. The working cage levelling system shall comprise of an automatic hydraulic levelling device while carrying the safe working load.

There shall be provision for working cage slewing to enable the cage to be placed exactly according to working object and the cage shall independently rotate 45° in either direction around its vertical axis. A drop down platform/stretcher carrier of suitable size in the front of the cage shall be fitted having a load carrying capacity

No change in specifications is needed.

No change in specifications is needed.

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of 180 kg. The corners of the platform shall be rounded to provide easy and safe access directly from the building into the cage. Controls for the operations of the booms, communication systems, lighting etc. shall be suitably installed in the cage. The control levers in the cage shall give precise and immediate control over all booms and rotational movements. Operating speeds are infinitely variable and several movements shall be engaged simultaneously without decreasing operating speeds. The entire cage shall be covered with non-slip Aluminium plates with drainage holes. The cage should be level in all operating positions through a hydraulic cum mechanical (or electronic) system. In case of any malfunction of the cage levelling system, it should be possible to hydraulically correct the cage level through a control lever provided in the cage.

7. Computer controlled intelligence (CAN BUS) System:-

All the main systems in the platform shall be controlled by CAN BUS System which will provide intelligence to operate safely and to minimize human error. Following processes shall at least be controlled by CAN BUS.

- a) Auto-levelling of vehicle through single push button
- b) Allows outriggers fully left only with right outriggers activated, flushed with vehicle and slew restricted to left side of vehicle only
- c) Allows outriggers fully right only with left outriggers activated, flushed with vehicle and slew restricted to right side of vehicle only
- d) All outriggers extended fully on both sides with full platform functions
- e) Interlock to prevent boom operation, unless outriggers are deployed and vehicle levelled
- f) Display indicating chassis level position at outrigger station
- g) Outreach management as per manufacturer's design controlled automatically by computer
- h) Display of height/remaining height, reach/remaining reach, wind speed, cage load, on graphic panel as well as at turret/base control station
- i) Cage collision guard with automatic cut off and possibility to over-ride the cutoff as decided by operator in cage
- j) Interlock to prevent outrigger movement unless platform is stowed
- k) Display of cage load
- l) Automatic cage overload warning and stop beyond a certain amount of overload permitted as per manufacturer,s design
- m) Diagnostic tool, to locate which sensor or line/circuit has failed/malfunctioned
- n) Indication in drivers cabin for PTO, locker open, outrigger stowed position so that driver knows that it is safe to drive after completion of all operations
- o) Any other function/s the bidder wishes to explain as per their design (the above are indicative functions).

8. Hydraulic/Mechanical/Electric Safety Features:

The following hydraulic/mechanical/electric safety features shall be provided in addition to the CAN BUS control, hydraulic as well as electronic .

- a) To prevent the booms, cage, outriggers from retracting in case of any hose or pipe failure. All load bearing hydraulic cylinders shall have lock valves.

The software can vary from manufacturer to manufacturer. By providing additional sensors and modifying the software, it is feasible to have additional functions such as ground pressure sensing for example. However, the basic functions defined in the specification are adequate for the application.

No change in specifications is needed. It is possible to modify the software and add additional sensors to display other information apart from what has been mentioned here but the features listed are adequate and in line with the best international practice. It is not advisable to increase the level of sophistication beyond a point.

No change in specifications is needed.

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<p>d) Manual operation lever to hydraulically adjust cage levelling at cage control station.</p> <p>e) Deadman switch</p> <p>f) Override push button for cage collision sensor</p> <p>g) Intercom (hands free at cage and through instrument at turn table)</p>	<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>
<p>The display panels, both at turntable and at cage, shall indicate the following –</p>	<p>No change in specifications is needed.</p>
<p>a) Audio cum visual warning for exceeding safe working load.</p> <p>b) Audio cum visual warning for collision guard system of working cage.</p> <p>c) Visual indication for fully extended outriggers (left and right separate, at stabilizer control station)</p> <p>d) Visual indication for position of booms and working cage, dynamically displaying position of cage as it moves. Height and reach shall be displayed.</p> <p>e) Main boom length</p> <p>f) Main boom angle</p> <p>g) Tip boom (horizontal) angle</p> <p>h) Cage load</p> <p>i) Wind speed</p> <p>j) A menu on the graphic display panel should incorporate a fault detection system through which diagnostics are possible to identify the fault.</p>	<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>
<p>Controls and Display in Driver's control Panel: The following indicators and control shall be incorporated in driver's cab:</p>	<p>No change in specifications is needed.</p>
<p>a) Visual warning for booms and outriggers not in travelling position.</p> <p>b) Visual indications for any of the locker not in closed position.</p> <p>c) Visual indication for engagement of P.T.O.</p>	<p>✓</p> <p>✓</p> <p>✓</p>
<p>Controls and Display in Outrigger Control Panel (located at vehicle rear):</p>	<p>No change in specifications is needed.</p>
<p>The controls shall incorporate:</p> <ol style="list-style-type: none"> 1. Outriggers out and in as well as up and down movement 2. Single push button vehicle auto levelling, electronically controlled 	<p>No change in specifications is needed.</p>
<p>Display panel shall indicate at least:</p> <ol style="list-style-type: none"> 1. Outrigger position 2. Vehicle level in fore and aft planes, digitally displayed 3. Audio visual signal if vehicle level is inaccurate beyond permissible limit 	<p>No change in specifications is needed.</p>
<p>11. Other systems: -</p>	<p>No change in specifications is needed.</p>
<p>a) The Water System: The nominal diameter of the waterway shall be 100mm. There shall be 63 mm inlet with closing valves on each side at the rear of the vehicle, from where the line leads through the centre post, turntable up into the working cage, where the water monitor is fitted. Alongside the booms; the piping should be fitted in well protected position. The centre post, which is mounted in the centreline of the turntable, shall provide continuous rotation even if water supply is used. The piping shall simultaneously be protected from possible over pressure by means of relief valves mounted underneath the turntable.</p>	<p>No change in specifications is needed.</p>
<p>A telescopic water pipe shall be provided on the side of</p>	

<p>the first boom, which shall be made of stainless steel/aluminium. Moving sections of this pipe shall be thoroughly ground and chromium plated to provide reliable function and long life. Seals between these sections shall be of low friction type.</p>	
<p>On the side of the second boom, a fixed stainless steel/aluminium pipe shall be installed and in boom pivoting points, flexible, specially reinforced, pressure hose shall be used.</p>	ok
<p>An additional outlet with 63mm closing valve and coupling for water supply from the cage through an extension shall be provided. There shall be drain cock fitted in the pipe to enable it to drain the water after use.</p>	ok
<p>On the front underneath of the cage nozzles shall be provided for water spray curtain system to protect the cage occupants from the radiant heat. Control valve of water spray curtain system shall be located at convenient place inside the cage.</p>	ok
<p>Water monitor shall be connected on to the piping system and it shall be placed suitably in order to provide appropriate operations and wide range of movements. Furthermore, monitor shall be located at the front of the cage (on the left hand side) just outside of the rails, so that the front side of the whole cage is free for effective fire fighting by crew members. The monitor shall be placed outside of the cage so that the entire cage floor area can be fully utilized in extreme rescue situation. The monitor shall be made of light alloy and its size shall be 75mm so as to discharge as much as 3000 LPM with virtually no friction loss at the monitor. The monitor shall be manually operated with jet/fog nozzle.</p>	ok
<p>Suitable pressure gauge shall be provided near the inlet.</p>	
<p>b) Inter-Communication System: There shall be inter-communication system fitted between the turn-table and the cage. The main station of the intercom with a loudspeaker and movable microphone shall be fitted in waterproof box at the turntable. The combined microphone and loud speaker for free hands operation shall be located in the cage.</p>	No change in specifications is needed.
<p>c) Siren and Public Address System: There shall be an electric siren unit with hooter fitted on the roof of the vehicle cab. Control panel of the system shall be conveniently located in the driver,s cab and it shall include switches for the fast (Yelp) and slow (wail) sounds. Command microphone with push to talk switch shall allow the public address message to override the siren function. Operation shall be controlled by the lighted push buttons of different colours.</p>	No change in specifications is needed.
<p>d) Breathing Air System: Compressed breathing air supply from turntable to the cage shall be provided through a four way manifold at the cage. There should be four breathing air masks at cage. Four 6 litres 300 bar air cylinders shall be provided at turntable. It should be possible to change the cylinders without interrupting the air supply. Pressure regulator shall also be incorporated in the system.</p>	No change in specifications is needed.
<p>e) Electric System: The electric supply shall be taken from the chassis battery, which is charged when the engine is running. The voltage of the system shall be 24 volt</p>	No change in specifications is needed.

DC/12volt (as per design/chassis) and all circuits shall be fitted with specific fuses. When the main current is on, yellow flashing warning lights, located on each outrigger boom pivoting point and underneath working cage, shall automatically get switched on.

12. Fixtures, Accessories and Marking:-

a) Spot Light: There shall be two spotlights suitable for 24 volts/12 volts (as per design/chassis) fitted with swivel mounting bracket at the cage railing to provide extra safety in night operation. Two more spotlights shall be installed at the rear of the body to provide ground lighting.

b) Rotating Beacons: Two rotating beacon lights, one on each side of the driver cab roof shall be provided. The colour of the light shall be blue. The switch for the beacon light with pilot lamp shall be fitted inside the cab preferably on Dash Board.

c) Portable pump (optional): A light weight pump weighing around 90-110 kg shall be housed in the body and shall be capable of delivering water @ 1600 lpm (or 2300 lpm as specified) at 7 bar. It should be possible to quickly connect the pump to water inlets provided at rear of vehicle.

d) Water tank (optional): A 3000 litre water tank constructed of 3 mm MS steel duly reinforced and provided with baffles as well as overhead manhole shall be provided, integrated with the sub-frame of the hydraulic platform.

e) Motorised Hose Reel (optional): A motorised hose reel with 25 mm dia canvas delivery hose 40 m long complete with suitable connectors, shall be fixed to cage for convenient deployment inside the affected area.

f) Other Accessories: The following accessories shall be provided along with the vehicle for use as and when required:-

a. Four flexible rubber suction hoses of 100 mm dia each of 3 m length

b. Two canvas delivery hoses of 63mm dia and each of 15 m unfolded length

c. Wooden/metal/plastic outrigger ground plates with brackets: 4 Nos

d. Portable oil pressure gauge attached to 1 m long hydraulic hose: 1 no.

e. Working range diagram, one at the turn-table, and one in the working cage, hard copy: 2 Nos.

f. Plug for 24 volts working light at the turn-table and in the cage: 1 No. at each place

g. Lifting hook under the working cage 500 kg capacity: 1 No.

h. Spare wheel with tyre supplied with chassis: 1 No.

g) Markings: Following markings shall be provided

a. Warning labels and instruction plates

b. Marking of safe working load in cage

c. Unit type marked on the boom

13. Painting and finish:-

Before painting all surfaces of steel structure shall be carefully chemically treated, after which they shall be primed. All booms shall be painted to same specification from inside as well. Hollow structures such as steel profile of the working cage, working cage support, cage, boom

No change in specifications is needed.

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and outrigger beams and housing shall be treated with anti-corrosion protection, to provide very high corrosion resistance.

The following paint shades shall be used:

- a) Working cage: White aluminium fluorescent
 - b) Working cage support, second boom, first boom, turntable and related cylinders:
White fluorescent
 - c) Moving boom sections: Dark Grey/black
 - d) Main frame, outriggers and body work: Fire Brigade red
- The underside of the body and chassis shall be finished in petroleum product resistant paint.

14. Pre-despatch inspection: -

The inspection and the testing of the Hydraulic Platform shall be carried out at the suppliers, works by the Inspecting officer to check that the equipment fulfils the requirements of the specifications. The inspection shall include:

- a. Check on Assemblies, welds etc.
- b. Check of vital dimensions as per design.
- c. Check of operation and safety devices.
- d. Functional check & performance tests of all equipment/parts
- e. Check for stability with 1000 kg in cage at maximum outreach
- f. Any other tests as considered necessary by the inspection team.

It shall be obligatory on part of the supplier to provide all the assistance and equipment for the inspection and testing of the Hydraulic Platform at their premises.

15. Instruction Manuals and other documents to be submitted:-

- The Contractor shall provide up-to-date documentation including the following along with the equipment:
- a) An operating manual with instructions for start-up and users instructions (three copies with each Platform).
 - b) Maintenance manual with details of maintenance schedules and repair procedure for all systems, sub-systems, chassis, other important equipments, summary of circuits, functions and adjustments and a lubrication manual including location of lubricating points, type of lubricants, frequencies and quantities(three copies with each Platform).
 - c) List of mechanical and electrical parts illustrated and itemized in accordance with the diagrams and drawings mentioned above and including the addresses of various contractors.
 - d) The list of general drawings and detailed drawings of electrical and electronic diagrams with complete nomenclature.
 - e) General nomenclature of supply including the list of subcontractors.
 - f) Complete documentation of equipments from subcontractor.
 - g) Spare part list with quantities for five years after handover of the Hydraulic Platform, anticipated frequency of replacement and prices with one-year validity period.

16. Training: -

The manufacturer shall impart training to a group of three

No change in specifications is needed.

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officers deputed by the purchaser at the factory premises of manufacturer for period of one week in the operation and maintenance of the hydraulic platform. The purchaser will bear the cost of travel and stay for the officers deputed and no extra charges shall be payable for the training.

17. Warranty: -

The manufacturers, suppliers shall furnish a warranty for the complete unit including chassis for a period of 12 months or 1200 hours of running whichever is earlier from the date of acceptance of the vehicle by the consignee. The manufacturer shall also have to guarantee for the supply of spare-parts for chassis, aerial ladder platform for a period of minimum 10 years from the date of supply of the vehicle.

Eligibility Criteria Ref.No. DQA/MECH/154 Date 23-11-2009

1. The tender is open to either

(i) Indian manufacturers of fire fighting platforms

(ii) Indian Companies who are the authorized distributors/service centres

of overseas fire platform manufacturers, with established facility and trained manpower for rendering after sales service, who

a> Should have been in existence for at least 3-years* (*on the date of tender opening) .

b> Should have supplied at least 1 no. Telescopic cum articulated design fire fighting hydraulic platform of the same make and brand as quoted of 21M (30m±33%) or higher working height to any Govt. organisation in India during the last 5 years*. (*on the date of tender opening)

2. To substantiate this, bidder shall furnish certified copies of order and either performance report or training/commissioning report of at least 1 no. fire fighting platform of design and height as above. In addition, in case of hydraulic platforms of foreign origin, evidence of established service base, spare parts stock held and the Indian bidding company shall furnish trained manpower in India.

No change is needed.

No change in specifications is needed. This is the minimum and yet adequate eligibility and consistent with DGS&D policy to encourage wide participation from genuine manufacturers.