

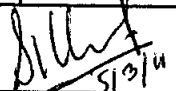
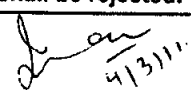
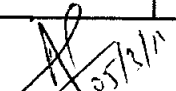
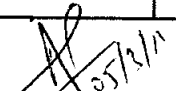
BHARAT HEAVY ELECTRICAL LIMITED, JHANSI			
		Specification No	10583
		Item No	MH-1/7/6304
		Location	LOCO
		Quantity	One number
SPECIFICATION CUM COMPLIANCE CERTIFICATE OF 15 TON TROLLEY			
Note :			
1	VENDOR must submit complete information against clause No-17.0 (Qualifying Condition). The offer meeting this clause would only be processed		
2	The "Specified/to be confirmed by vendor/Offered" Column and where applicable, the "Deviations" Column of the format shall be filled in by the Vendor and submitted along with the offer. Technical details also submitted with the offer. Inadequate/ Incomplete. Ambiguous, of unsustainable information against any of the clauses of the specification / requirement shall be treated as non-compliance.		
3	The offer and all documents enclosed with offer should be in English language only.		
SCOPE:			
DESIGN, MANUFACTURING, SUPPLY, ERECTION & COMMISSIONING OF 15 TON MOTORISED TROLLEY AS PER SPECIFICATION BELOW			
S.NO.	DESCRIPTION FOR BHEL REQUIREMENT	SPECIFIED / TO BE CONFIRMED BY VENDOR	DEVIATIONS
1.0	PURPOSE & WORK PIECE MATERIAL:		
1.1	Motorised rail trolley is required for the inter bay material transfer. The payload on trolley will be 15 ton. Trolley should move on prepared rail track.	VENDOR TO CONFIRM	
2.0	SPECIFICATION		
2.1	Capacity of trolley (Payload) : 15 Ton	VENDOR TO CONFIRM	
2.2	Trolley platform size : L-5000 MM X W-3000 MM	VENDOR TO CONFIRM	
2.3	Track gauge (Rail) : 1676 mm	VENDOR TO CONFIRM	
2.5	Track length : Max. 100 meter	VENDOR TO CONFIRM	
2.6	Trolley movement required : Max. 100 meter (forward & reverse)	VENDOR TO CONFIRM	
2.8	Trolley speed per minute : Max. 40 meter (Variable speed)	VENDOR TO CONFIRM	
2.9	Platform Height from rail top : Max. 1300 mm (loaded condition)	VENDOR TO CONFIRM	
2.10	Wheel base :	VENDOR TO SPECIFY	
2.11	Wheel - Forged steel having 600-800 mm dia	VENDOR TO SPECIFY	
2.12	Approximate tare weight of trolley in Ton :	VENDOR TO SPECIFY	
2.13	Number of Axle : 2 Nos	VENDOR TO CONFIRM	
2.14	Number of bogies	VENDOR TO SPECIFY	
2.15	Motor rating in KW	VENDOR TO SPECIFY	
2.16	Rail size- 90 LBS (Provided) (However it may change depending upon actual site condition).	VENDOR TO CONFIRM	
2.17	Operation - Through control desk operated from both end of the trolley.	VENDOR TO CONFIRM	
3.0	CONSTRUCTION		
	Motorised rail trolley consist of under frame & bogie, suspension, wheel axle arrangement, motor, gear box assembly, electric brakes, and speed control system assembled in control panel, operation control board etc. Necessary inter-connection cable shall be part of the trolley.	VENDOR TO CONFIRM	
3.1	UNDER FRAME		
3.1.1	The under frame and bogie of the motorised trolley shall be made out of rolled steel section and beams. The beams and sections shall be welded adequately.	VENDOR TO CONFIRM	
3.1.2	The under frame top be covered with steel plate of adequate thickness. Chequered plates strips shall be welded on top of the platform to avoid slippage over platform.	VENDOR TO CONFIRM	
3.1.3	The main members of the platform shall be suitably reinforced to withstand shock loads encountered in service.	VENDOR TO CONFIRM	
3.1.4	Four nos spring buffers shall be provided on the trolley (two on both side)	VENDOR TO CONFIRM	
3.1.5	One No hook type coupling shall be provided on both side of trolley	VENDOR TO CONFIRM	
3.1.6	Suitable provision shall be provided to climb up of down the trolley for a man on either side.	VENDOR TO CONFIRM	

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3.1.7	Lifting lugs of adequate strength shall be provided for lifting the trolley (without load) by EOT crane.	VENDOR TO CONFIRM	
3.2	SUSPENSION		
3.2.1	The suspension shall consist of Silico maganese steel coil spring.	VENDOR TO CONFIRM	
3.3	WHEEL AXLE ARRANGEMENT		
3.3.1	The wheels shall be made out of EN9 forged steel suitable for IRS 52 or cast steel wheel to IS 2702 Gr II	VENDOR TO CONFIRM	
3.3.2	The wheel tread and flange and axle bore portion shall be machione finished.	VENDOR TO CONFIRM	
3.3.3	The running tread and flange portions shall be induction hardended to give extended life.	VENDOR TO CONFIRM	
3.3.4	The wheel tread and flange shall be machined to indian Railway standard.	VENDOR TO CONFIRM	
3.3.5	The wheel shall be pressed on the axle by force for (by hydraulic press)	VENDOR TO CONFIRM	
3.3.6	The axle shall be made out of alloy steel forging	VENDOR TO CONFIRM	
3.3.7	The wheel axle assebmly shall run on antifriction spherical roller bearings housed in cast steel.		
3.3.8	The bearing used shall be of SKF/FAG make only.	VENDOR TO CONFIRM	
3.3.9	Provision shall be made topping up of grease in service.	VENDOR TO CONFIRM	
3.4	GEAR BOX ARRANGEMENT		
3.4.1	Case hardened, single helical gear box arrangement of splash lubrication, shall be provided, Over and above it shall be a product of suprier design, latest manufacturing technology and best quality of material.	VENDOR TO CONFIRM	
3.4.2	The bearing used shall be of SKF/FAG make only.	VENDOR TO CONFIRM	
3.4.3	The gear box shall be axle monted and shall be fitted with torque	VENDOR TO CONFIRM	
3.5	DRIVE SYSTEM		
3.5.1	The drive system shall consist of an A.C.motor coupled to the gear box.		
3.5.2	The motor shall be mounted on the gear box base and assembly shall be suspended from the frame through torque arm.		
3.6	MOTOR		
3.6.1	Motor should be suitable for the trolley (A.C.Motor)	VENDOR TO CONFIRM	
6.6.2	Motor shall sonfirm to IEC indian standards.	VENDOR TO CONFIRM	
3.6.3	Following details are to be given by vender:		
3.6.3.1	Motor Voltage	VENDOR TO SPECIFY	
3.6.3.2	Motor rating in KW	VENDOR TO SPECIFY	
3.6.3.3	Type	VENDOR TO SPECIFY	
3.6.3.4	Make of the motor	VENDOR TO SPECIFY	
3.6.3.5	Model of the motor	VENDOR TO SPECIFY	
3.7	CONTROL PANEL		
3.7.1	The electrical system shall consist of control panel, down lead (cable drum type), Suitable rating variable frequency drive and speed control system.	VENDOR TO CONFIRM	
3.7.2	The system shall includes protection against over current, short circuit, earth fault, phase failure protection, motor over load, over voltage, under voltage, over temperature etc.		
3.7.3	Variable frequency drive arrangement with control switch gear shall provided for suitable rating motor.		
3.7.4	The system shall includes protection against over current, short circuit , earth fault proction, motor over load, over voltage, under voltage, over temprature etc.	VENDOR TO CONFIRM	
3.7.5	Speed control arrangement with control switch gear shall be provided for suitable rating of motor.	VENDOR TO CONFIRM	
3.7.6	Trolley shall be operated form driver desk (both end of the trolley) with speed control, start/ stop (ON/OFF), Forward/ reverse push buttons. As emergency push button shall also be provided for stopping the trolley in emergency	VENDOR TO CONFIRM	

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3.7.7	All electrical & electronic control cabinets & panels should be dust and vermin proof.	VENDOR TO CONFIRM	
3.7.8	The complete control circuit for the system shall be housed in a common control panel suitable located on the frame base plate. All indicating instruments necessary for monitoring the system shall be suitably located on the control panel. The panel shall be complete with MCCB/ ICTPN switch for incoming supply. All contractors, relays, starter, timer, single phasing preventor, HRC fuses, step down transformer for control voltage etc.	VENDOR TO CONFIRM	
3.7.9	Trolley shall also be operated from operator desk having forward and reverse operation with emergency stop.	VENDOR TO CONFIRM	
3.8	BRAKE SYSTEM		
3.8.1	Fail safe electro magnetic/ Electro hydraulic thuster brake shall be provided on the gear box shaft.	VENDOR TO CONFIRM	
3.8.2	Provision shall be made for manual release of brake, if needed.	VENDOR TO CONFIRM	
3.9	LIMIT SWITCH		
3.9.1	Lever type limit switch shall be provided to on both side of trolley to stop the lever over travel.	VENDOR TO CONFIRM	
3.10	WARNING SYSTEM.		
3.10.1	Electric hooter and gong bell/hutter shall be provided. The electric hooter shall be activated automatically at the time of trolley movement.	VENDOR TO CONFIRM	
3.11	ELECTRICAL SYSTEM		
3.11.1	415 Volt +1-% -10%, 50HZ+/-3%, 3 phase A.C. power supply source will be provided by BHEL at a single point.	VENDOR TO CONFIRM	
3.11.2	TROPICALISATION : All electrical /electronic equipment shall be tropicalized.	VENDOR TO CONFIRM	
3.11.3	All electrical & electronics cabinets & panel should be dust and varmin proof.	VENDOR TO CONFIRM	
3.11.4	All electrical components in the cabinets should be mounted on DIN rail	VENDOR TO CONFIRM	
3.12	PAINTING		
3.12.1	Two coats of red oxide metal primer followed by two coats of synthetic enamel paint of deep orange colour shall be done.	VENDOR TO CONFIRM	
4.0	AMBIENT CONDITIONS & THERMAL STABILITY		
4.1	Total system including all supplied items should work trouble free and efficiently under following operating conditions to achieve specified accuracies. Ambient conditions : Temperature =5 to 50 degree C	VENDOR TO CONFIRM	
4.2	Weather conditions are tropical. Atmosphere may be dust laden during some part of the year. System shall be kept in the normal shop floor conditions. Max. temperature variations is 25 deg. C in 24 hours. (Vendor to confirm the system is suitable for above and details of provision on the system for the same are to be furnished by VENDOR)	VENDOR TO CONFIRM	
5.0	DOCUMENTATION:		
5.1	Three sets of following documents (Hard copies) in English language should be supplied along with the system.	VENDOR TO CONFIRM	
5.2	Operation and maintenance manuals	VENDOR TO CONFIRM	
5.3	Details Maintenance manual of the system with all drawing of assemblies/ sub-assemblies/ parts including Electrical/ Pneumatic/ Coolant/ Hydraulic circuit diagrams. All assembly/ sub-assembly Drawings shall be supplied with the part list also.	VENDOR TO CONFIRM	
5.4	Catalogues, O & M manual of all bought out items including drawings.	VENDOR TO CONFIRM	
6.0	MAINTENANCE:		
6.1	We would stress the need of adequate maintenance facility for all gearboxes and working mechanism which shall be located below platform level and shall be easily	VENDOR TO CONFIRM	
7.0	SPARES:		

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7.1	Itemised breakup of mechanical, hydraulic, electrical and electronic spares used on the trolley in sufficient quantity as per recommendation of Vendor for 2 years for trouble free operation on three shifts continuous running basis should be offered by vendor. The list to include following, in addition to other recommended spares:(Unit Price of each item of spare should be offered).	VENDOR TO CONFIRM	
7.2	Mechanical & Hydraulic Spares: Thrusters Brake, Gears, Pinions, Shafts, Wheels, Hydraulic Seals for Gear Boxes etc.	VENDOR TO CONFIRM	
7.3	Electrical /Electronic Spares	VENDOR TO CONFIRM	
7.4	Vendor to confirm that complete list of spares for the trolley and its controls along with specification / type / model, and name & address of the spare supplier shall be furnished along with documentation to be supplied with the Trolley.	VENDOR TO CONFIRM	
8.0	SAFETY ARRANGEMENTS: Following safety features in addition to other standard safety features should be provided on the Trolley.	VENDOR TO CONFIRM	
8.1	Trolley should have adequate and reliable safety interlocks / devices to avoid damage, work piece and the operator due to the malfunctioning or mistakes. Trolley functions should be continuously monitored and alarm / warning indications through lights/ alarms should be available.	VENDOR TO CONFIRM	
8.2	A detailed list of all alarms / indications provided on trolley should be submitted by the supplier.	VENDOR TO CONFIRM	
8.3	All the pipes, cables etc. on the trolley should be well supported and protected.	VENDOR TO CONFIRM	
8.4	All the rotating parts used on trolley should be statically & dynamically balanced to avoid undue vibrations. Open gears, couplings, fans/ rotating parts should be provided with suitably guarded.	VENDOR TO CONFIRM	
8.5	Suitable Lifting arrangement like Lifting Hooks, Jacking pads, Eye Bolts etc is required for lifting of Motors, other subassemblies or heavier structures.	VENDOR TO CONFIRM	
8.6	Emergency Switches should be provided at suitable locations.	VENDOR TO CONFIRM	
8.7	Electrical cable & signalling cables should be suitably separated.	VENDOR TO CONFIRM	
9.0	ENVIRONMENTAL PERFORMANCE:		
9.1	The trolley shall conform to following factors related to environment:	VENDOR TO CONFIRM	
9.2	Maximum noise level shall be 85 dB(A) at normal load condition, 1 M away from the trolley with correction factor for back ground noise, if necessary. This will be measured as per international standards like DIN 45635-16. Supplier to demonstrate compliance to noise level.	VENDOR TO CONFIRM	
9.3	If any safety / environmental protection enclosure is required it should be built on the trolley by the vendor.	VENDOR TO CONFIRM	
9.4	Paint of the trolley should be applied only after providing rust-preventer (primer) coat.	VENDOR TO CONFIRM	
9.5	Oil / Grease should not dip/ fall from the trolley.	VENDOR TO CONFIRM	
10.0	ERECTION & COMMISSIONING:		
10.1	Supplier to take full responsibility for carrying out the erection, start up., testing of system, its control system & all type of other supplied equipment. Power, air & water shall be provided by BHEL at only one point to be indicated by Supplier.	VENDOR TO CONFIRM	
10.2	The trolley is to be Erected at site by the supplier with their own labour, tools and tackles. All equipments shall be brought by the supplier on returnable basis.	VENDOR TO CONFIRM	
10.3	The load test shall be performed at BHEL site for proving of the trolley w.r.t technical, Safety Parameters etc the trolley shall be commissioned.	VENDOR TO CONFIRM	
10.4	Commissioning-spares, required for commissioning of the trolley shall be brought by the supplier on returnable basis.	VENDOR TO CONFIRM	

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10.5	Portion, if any, of the trolley / sub- assemblies / panel or other accessories where paint has rubbed off or peeled during transit or erection should be repainted and merged with the original surrounding paint by the vendor. For this purpose, the vendor should supply sufficient quantity of touch-up paint of various colours of paint used.	VENDOR TO CONFIRM	
10.6	Schedule of Erection and Commissioning shall be submitted before starting of erection work	VENDOR TO CONFIRM	
10.7	Charges, duration, terms & conditions for E&C should be furnished in detail separately by vendor along with offer.	VENDOR TO CONFIRM	
11.0	TRAINING:	VENDOR TO CONFIRM	
11.1	Vendor to impart training to BHEL personnel for operation & for maintenance at BHEL works after Erection, Commissioning and handing over of the trolley. Supplier should arrange for training of BHEL personnel free of cost for the system.	VENDOR TO CONFIRM	
12.0	DOCUMENTATION : Three sets of following documents (Hard copies) in English language should be supplied along with the crane.	VENDOR TO CONFIRM	
12.1	During participation in technical Bid.	VENDOR TO CONFIRM	
12.1.1	G.A. Drawing.	VENDOR TO CONFIRM	
12.1.2	Wheel Load Diagram (Wheel Distance & Wheel Load).	VENDOR TO CONFIRM	
12.1.3	Vendor to submit appropriate Q.A. Plan.	VENDOR TO CONFIRM	
12.2	After Receipt of Order: (For approval)	VENDOR TO CONFIRM	
12.2.1	Calculation for under frame & bogie, suspension, wheel axle arrangement, Wheel Load calculation & Calculation for selection of Diameter of Wheel, Motor, Gearbox and Brake etc.	VENDOR TO CONFIRM	
12.2.2	3 - sets of followings documents like G. A Drawings, Structural drawings, Assembly Drawings/ Sub- assembly Drawings, Gear Box Drawings (specially of Typical Gears having Helix Angle, Pressure Angles, Modules etc.), Electrical Drawings comprising Power , Control Circuits, Electronic Circuitry diagram for remote etc. No fabrication / purchase of BO. Items should be taken up before the approval of the drawings.	VENDOR TO CONFIRM	
12.2.3	Q.A.Plan		
12.3	With the supply of trolley	VENDOR TO CONFIRM	
12.3.1	Operating manuals of trolley - 3 Sets.	VENDOR TO CONFIRM	
12.3.2	Detailed Maintenance manual of trolley. Spares- part list / concerned drawing of the spares -3 Sets.	VENDOR TO CONFIRM	
12.3.3	Maintenance, Interface & commissioning manuals for Controller	VENDOR TO CONFIRM	
12.3.4	Catalogues, O&M Manuals of all bought out items including drawings, wherever applicable.	VENDOR TO CONFIRM	
12.3.5	Detailed specification of all rubber items like Oil- Seals / O- Rings etc.	VENDOR TO CONFIRM	
12.3.6	Chemical & Proof load certificates of Forgings, wheels - Chemical composition, UV test report , Weld joints X- ray Test reports, Test report of Structural material, Electrical components, Brakes, Spring Loaded Buffers etc shall also be furnished.	VENDOR TO CONFIRM	
13.0	TROLLEY ACCEPTANCE: (Tests/Activities to be Performed by Vendor)	VENDOR TO CONFIRM	
13.1	At Vendor Works: Inspection And Test.	VENDOR TO CONFIRM	
13.1.1	Inspection at manufacturing works will be done as per Q.A. Plan.	VENDOR TO CONFIRM	
13.1.2	Load Test : Will be done at manufacturing works before dispatch, the supplier shall assemble the complete trolley and arrange for its physical inspection and load test.	VENDOR TO CONFIRM	
13.2	At BHEL Works: Inspection And Test	VENDOR TO CONFIRM	
13.2.1	Dimensions shall be examined.	VENDOR TO CONFIRM	

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13.2.2	Load Test : Overload test at 125% shall be conducted . Operational Speed & braking shall be tested. For load test the required load will be provided by BHEL. Remote operation, interlocking, Performance of motors with current measurement, etc shall be carried out. Test- Reports & other documents shall be examined/ verified. If found satisfactory, the crane shall be accepted and considered as Handed Over.	VENDOR TO CONFIRM	
13.2.3	Load Test shall be performed at BHEL site for proving of the trolley w.r.t technical, Safety Parameters etc the trolley shall then only be considered commissioned & handed over.	VENDOR TO CONFIRM	
14.0	MISCELLANEOUS :		
14.1	All gear boxes should have oil level indicator to show the level and condition of the oil in gear box.	VENDOR TO CONFIRM	
14.2	All material used should be of the best of their respective kinds and should of the appropriate I.S. Specification & all workman ship should be of best quality.	VENDOR TO CONFIRM	
14.3	PAINTING : The structural steel work should be given one coat of suitable primer with 25 micron of DFT (Dry film Thickness) and 48 hours of compalsory curing after painting. Final paint should be done with two coats of light orange synthetic enamel paint each with a DFT of 25 microns and intermittent curing of minimum 16 hours..	VENDOR TO CONFIRM	
14.4	First fill oil, grease etc. for the commissioning of the trolley shall be provided by the supplier.	VENDOR TO CONFIRM	
14.5	Tool box with standard tools shall be supplied with the trolley.	VENDOR TO CONFIRM	
14.6	Supplier shall inform BHEL in advance to witness assembly and load test.	VENDOR TO CONFIRM	
15.0	GUARANTEE:		
15.1	24 Months form the date of acceptnce of the trolley	VENDOR TO CONFIRM	
16.0	GENERAL: The VENDOR should submit the following informaiton:		
16.1	Model of the offered trolley	VENDOR TO SPECIFY	
16.2	Total connection load (KVA)	VENDOR TO SPECIFY	
16.3	Floor area required (Length, width, Height) for complete system & accessories)	VENDOR TO SPECIFY	
16.4	Total Weight of the system	VENDOR TO SPECIFY	
17.0	QUALIFYING CONDITION		
17.1	Only those venders, wffo have supplied at least one motorised trolley of 15 Ton or higher capicity in the past ten years and such trolleys are presently working satisfactorily for more then one year after commissioning, should quote . The following information is to be submitted by the Vendor about the compnies where trolleys have been supplied. This is required form all the vendors for qualification of their offer.	VENDOR TO CONFIRM	
	1 . Name of the customer / company where similar trolley is installed. (copy of purchase order to be furnished)	VENDOR TO SPECIFY	
	2 . Complete postal address of the customer.	VENDOR TO SPECIFY	
	3. Year of suppling / commissioning.	VENDOR TO SPECIFY	
	4. Name and designation of the contact person the costomer.	VENDOR TO SPECIFY	
	5 . Phone. FAX, no andE-mail address of the contact person of fhe customer.	VENDOR TO SPECIFY	
	6. Performance certificate from the customer regarding satisfactory performance of trolley supplied to them	VENDOR TO SUBMIT	
18.0	BHEL reserves the right to verify information submitted by vendor. In case the information is found to be false/ incorrect, the offer shall be rejected.	VENDOR TO CONFIRM	
 S.J. CHAKRABORTY SR. DGM (WE&S)		 K.D. MANJHI DGM (LMM & LMP)	 INDER MATHUR SR. MANAGER (WE&S)
		 MOHD ARSHAD MANAGER (LMM)	