Bharat Heavy Electricals Limited

(High Pressure Boiler Plant**)**
Tiruchirappalli – 620014, TAMIL NADU, INDIA
An ISO 9001 Company
CAPITAL PURCHASE / MATERIALS MANAGEMENT / MANUFACTURING

ENQUIRY	Phone: +91 431 257 75 75 Fax : +91 431 252 07 19 Email : rrmanohar@bheltry.co.in Web : www.bhel.com

	Enquiry Number:	**Enquiry Date:**	**Due date for submission of quotation:**
	2620600045	**03.07.2006**	**31.07.2006**
Your are requested to quote the Enquiry number date and due date in all your correspondences. This is only a request for quotation and not an order			

Item	**Description**	**Quantity**	**Delivery Schedule**
10	50 Ton powered trolley. Detailed technical specification & commercial conditions applicable (to be downloaded from web site **www.bhel.com**)	2 Nos.	30.04.2007

Note:

(1) The detailed Technical Specification along with technical point-by-point confirmation, Commercial Terms & Conditions applicable for this Enquiry, Confirmation of acceptance for BHEL commercial terms & conditions and Price Bid formats have been posted in BHEL Corporate web site www.bhel.com under Enquiry reference "2620600045". Your offer should be based on all the above documents.

(2) Also, you are requested to fill in the Supplier Registration formats available in www.bhel.com (under Advancement – Supplier Registration) and send it along with your offer.

Tenders should reach us before 14:00 hours on the due date Tenders will be opened at 14:30 hours on the due date Tenders would be opened in presence of the tenderers who have submitted their offers and who may like to be present	Yours faithfully, For BHARAT HEAVY ELECTRICALS LIMITED Dy. Genl. Manager / Capital Purchase / MM / Manufacturing

PART A.

QUALIFYING CRITERIA FOR THE SUPPLY OF *BATTERY POWERED TRANSFER CARS*

SECTION – I

The BIDDER / VENDOR has to necessarily provide the following details, for making an assessment of the firm's capability and competency for the supply :

[The BIDDER is expected to give complete details against each clause in the table given below and wherever necessary an additional sheet may be attached (giving clear reference number) to cover the required details]

S.No.	PARTICULARS	VENDOR's RESPONSE
1.0	Number of Years of Experience of the BIDDER / VENDOR in the TRANSFER CAR Field [Design, Manufacture & Supply]	
2.0	Number of Powered Transfer Car supplied, assembled & commissioned till date with CAPACITY, VOLTAGE: a) BATTERY OPERATED b) POWER OPERATED [without battery]	
3.0	Number of Transfer Cars supplied, erected & commissioned till date for the following category of CUSTOMERS : a) Central Government Organisations b) Public Sector Enterprises c) Private Sector Companies [Large Scale Industries]	
4.0	Details of Design Set-Up [Design Personnel's qualification and experience, Engg. Software and Hardware used, etc.]	
5.0	Details on International & Indian Standards or Codes followed in the Design	
6.0	Details of Manufacturing Facilities for Transfer Car Structures and Components a) Fabrication Facilities b) Machining Facilities c) Transfer Car Assembly & Testing	
7.0	Details on Heat-Treatment Facilities	
8.0	Details on Shopfloor & Handling Facilities	
9.0	Comprehensive Details on Load Testing	
10.0	Details of Quality System followed	
11.0	Details on Stages of Internal Inspection and Inspection by External Agencies [other than Customer Inspection]	

S.No.	PARTICULARS	VENDOR's RESPONSE
12.0	Details of NDT Facilities – like X Ray, MPI and Ultrasonic Testing	
13.0	Details of Electrical Panel Manufacturing and Testing Facilities	
14.0	The Areas of Sub-Contracting Works and the Percentage of Sub-Contracting Works	
15.0	Type of Quality Audit and Routine Inspection Procedures for jobs loaded on the Sub-Contractors	
16.0	Details on AFTER-SALES-SERVICE Set-Up	
17.0	Any Additional Data to supplement the manufacturing capability of the BIDDER	

SECTION – II

The BIDDER / VENDOR has to compulsorily meet the following requirements to get qualified for submitting an offer for the CRANES :

S.No.	REQUIREMENTS	VENDOR's COMMENTS
18.0	The BIDDER / VENDOR shall have a minimum of TEN Years of Continuous Experience of in the Transfer car Field [Design, Manufacture & Supply]	
19.0	The BIDDER / VENDOR might have supplied at least FIVE numbers of Battery Operated Transfer Car of Capacity 50 Tons and above.	
20.0	The bidding FIRM should have 'in-house' or 'self-owned' facility for FABRICATION and TESTING the rated capacity	
21.0	Reference List of Customers and Performance Certificate from CUSTOMERS (minimum 2 to 3 Customers) with details of CONTACT PERSON, for whom Battery Operated Transfer Cars of Capacity 50 Ton and above might have been supplied	
22.0	The BIDDER / VENDOR should have sound financial position and should furnish the Finance Statements (Summary of P & L Statement and Balance Sheet) for the immediate past three years.	
23.0	In case of short listing by the Purchaser, the BIDDER / VENDOR has to co-ordinate for the visit of BHEL Assessing Team, to the WORKS of the BIDDER / VENDOR with a notice period of 10 Days.	

SECTION – III

The BIDDER / VENDOR has to comply with the following, for accepting the Technical Offer for scrutiny by the Purchaser :

S.No.	REQUIREMENTS	VENDOR's COMPLIANCE
24.0	The BIDDER / VENDOR shall submit the offer in TWO BIDS -Technical & Commercial Bid [**including PART A and PART B** of Technical Specifications] and Price Bid. The Technical Offer shall be in line with the BHEL Technical Specifications and the Guidelines or Annexures mentioned, wherever applicable.	
25.0	The Technical Offer shall contain a comparative statement of Technical Specifications given by BHEL and the Offer Details submitted by the Bidder, against each clause of the specifications.	
26.0	A just 'CONFIRMED' or 'COMPLIES' or 'YES' or 'NO-DEVIATION' or similar words in the technical comparative statement may lead to disqualification of the Technical Offer .	
27.0	The Technical Offer shall be supported by Product Catalogue and Data Sheets in ORIGINAL and complete technical details of 'Bought-Out-Items' with copies of Product Catalogue and Selection Criteria	
28.0	The Commercial Offer (given with the Technical Offer) shall contain the Scope of Supply and the Un-Priced Part of the Price-Bid, for confirmation	
29.0	The reference List of Customers shall be accompanied with the details (Phone Number / E-Mail ID) of the CONTACT PERSON for cross reference by BHEL.	
30.0	The Performance Feedback of Powered Trolleys supplied to any of BHEL Units (if any) on earlier occasions, will be a reckoning factor for the BIDDER Qualification on Technical Grounds.	

PART B.

TECHNICAL SPECIFICATIONS for BATTERY POWERED TRANSFER CAR
[CARRYING CAPACITY : 50 Tons] – MA STER & SLAVE SYSTEM

S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR's TECHNICAL OFFER (With Complete Details)
1.0.0	APPLICATION	a. The proposed Transfer Car is intended for job/material handling in the open atmosphere and subject to rain and sun (within an open steel storage yard) on the embedded steel rails . b. The Transfer Car will be put to use for continuous duty [three shifts in a day and for all the 365 days in an year]. c. The operational environment will be dust prone, humid, tough due to loading of heavy steel pipes and ambient temperature going upto 60° C. d. The offered transfer car shall be of Master & Slave concept, so that the Master Trolley will be the Drive Trolley and the Slave will be the Idler Trolley. e. The Master and Slave Trolleys shall be connected by a Tie-Bar of length 3 M & 5 M, with suitable end connections.	
2.0.0	SCOPE OF SUPPLY	a. Design and Manufacture as per BHEL Tender Specifications. b. Assembly and Load Testing before Despatch, at Supplier's Works. c. Supply in Modules / Sub-Assemblies d. Commissioning and Performance Prove-Out at BHEL Works e. Mechanical & Electrical Spares	

S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR's TECHNICAL OFFER (With Complete Details)
3.0.0	**TECHNICAL SPECIFICATIONS**		
3.1.0	Master Trolley Capacity	30,000 kgs. [30 Tons] – Carrying Capacity	
3.2.0	Slave Trolley Capacity	30,000 kgs. [30 Tons] – Carrying Capacity	
3.3.0	Haulage Capacity of Master / Drive Trolley	50 Tons for Master Trolley (with Idler Trolley connected through Tie – Bar also)	
3.4.0	Haulage Speed	Upto 30 mtrs. / min.	
3.5.0	Rail Track Gauge	1676 mm [Broad Gauge]	
3.6.0	Trolley Platform Length	6,000 mm [6 Mtrs.] for Master Trolley 4,500 mm [4.5 Mtrs.] for Idler Trolley	
3.7.0	Trolley Platform Width	2500 mm - Common for Master & Slave	
3.8.0	Height from Rail Level	1000 mm [Loading Platform Level]	
3.9.0	No of Axles	Two - Common for Master & Slave	
3.10.0	Wheel Diameter	600 mm [Desired Dimension]	
3.11.0	Tie – Bar Length	In TWO Lengths – 3 M and 5 M [one each]	
3.12.0	Tie – Bar Design	Fabricated out of Steel Rolled Sections with required cross-section to transmit the load and also provided with suitable end couplings, for easy tie-up between the two Trolleys	
4.0.0	**CONFIGURATION & CONSTRUCTION**		
4.1.0	Basic Design	The transfer car shall be configured to run on BG [Broad Gauge] track with a sturdy steel structure, powered with a suitable DC motor (in conjunction with a gearbox and battery) and provided with controls, operator console, battery charger, etc., as per the details given under the following clauses.	

S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR's TECHNICAL OFFER (With Complete Details)
4.2.0	**TRANSFER CAR CARRIAGE**	a. The under frame shall be fabricated out of steel rolled beams and sections by welding. b. The top shall be covered with chequered steel plates of adequate thickness (not less than 8 mm) to withstand load capacity of the transfer car. c. The main members shall be adequately reinforced to withstand shock loads encountered in service.	
4.2.1	Raw Material	a. Only steel plates, tested and certified for quality by reputed inspection authorities, shall be used. b. Test Certificates to be produced for BHEL verification and form part of the documentation.	
4.2.2	Welding Electrodes	a. For all Horizontal Welding E 7018 Electrode only should be used. b. For all Vertical Welding E 7048 Electrode only should be used.	
4.2.3	Welded Joint Testing	All Butt Welded Joints (if carried out/though not preferred by BHEL) shall be subjected to 100% X-Ray Testing and X-Ray Films to be produced for BHEL evaluation and form part of the documentation.	
4.2.4	Bottom Clearance	The bottom most part of the components mounted under the trolley carriage shall have a minimum ground clearance of 150 mm.	

S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR's TECHNICAL OFFER (With Complete Details)
4.2.5	Suspension system	The transfer car frame shall rest on the axle box through a suspension system with helical coil springs to eliminate shocks being transferred from rail to the under frame during operation.	
4.2.6	Battery Compartment	The battery compartment shall be protected from damage by means of guard plates	
4.2.7	Attachments	The below listed attachments are to be compulsorily provided with the Transfer Car.	
4.2.8	Buffers	Two each of spring loaded buffers with rubber pads shall be provided at both ends of the transfer car.	
4.2.9	Coupler	Hook type couplers are to be provided at both ends, for shunting purposes, in addition to those couplers provided for fixing the Tie-Bar (between the Master & Idler Trolleys).	
4.2.10	Lifting Hooks	Adequate number of lifting hooks shall be provided for transporting / lifting the transfer car by means of overhead cranes	
4.2.11	Side Supports	4 Nos. of support pockets with inside dimension of 75 mm x 75 mm shall be provided on each side of the trolley to accept side-support pipes	
4.3.0	**DRIVE SYSTEM**	a. The drive shall consist of DC Series motor coupled to the totally enclosed gearbox and drive the wheel through axle-mounted heavy duty gearbox. b. The power to the motor shall be supplied from the batteries mounted on the trolley itself.	

S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR's TECHNICAL OFFER (With Complete Details)
4.3.1	Motor	a. DC Series motor of suitable capacity having adequate starting torque shall be used. b. The motor shall be totally enclosed. c. The speed control shall be through armature resistance control. d. Three-step speed in either direction shall be provided. e. DC magnetic brake shall be provided.	
4.3.2	Traction Motor Make	Motor make shall be of reputed make. BIDDER has to specify make and rating.	
4.3.3	Track Rail Size	ISR 90 Lbs./Yard	
4.3.4	Brake	Fail safe electro-magnetic brake shall be provided for instantaneous stopping.	
4.3.5	Wheel and Axle	a. Die-Forged wheels of defect free and finish machined on running tread, flange and bore shall be provided. b. The tread shall be induction hardened to 300 to 350 BHN. c. Axles shall be of forged steel.	

S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR's TECHNICAL OFFER (With Complete Details)
4.3.6	Gear-Box	a. The gearbox casing shall be fabricated out of steel plates and stress relieved after fabrication to eliminate the internal stresses developed during welding and also to maintain the dimensional accuracy in service. b. The housing shall be of split design to facilitate easy assembly & maintenance c. The mating joint faces shall be of accurate finish, blue matched & lapped together to ensure leak proof joint. d. The gears shall be made out of alloy steel forging. e. The gear tooth size and face width shall be ample design with adequate factor of safety for severe shocks while in service during stall condition of motor as while braking under load. f. The gear geometry shall be designed as per IS and shall be heat treated for strength and wear resistance. g. The gear shafts shall be accurately machined before hardening for strength.	
4.4.0	**CONTROL SYSTEM**	a. DC Motor shall be used with resistance for speed and torque control. b. The resistance value shall be selected so tat the motor delivers required torque while starting and current is kept within the permissible safe limit.	

S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR's TECHNICAL OFFER (With Complete Details)
4.4.0	**CONTROL SYSTEM**	c. Heavy-duty electro magnetic contactors shall be used to include and remove the resistance in the circuit. d. The control shall be by push buttons mounted in the control console. e. The driver console shall be provided with cover and lock and key to avoid unauthorized operation.	
4.4.1	Main Control	Master controller with Dead-Man handle mounted at the driver's platform at one end of the trolley.	
4.4.2	Remote Control	Pendant type hand held Remote Control Unit with 5 mtr. long cable with quick-fix end connectors.	
4.5.0	**BATTERY**	a. Battery shall be accommodated in the transfer car suitably for easy maintenance, charging & replacement. b. Battery shall be Iron clad, heat sealed polypropylene classic motive power battery and assembled in steel trays duly FRP lined, including inter cell connectors, terminal take off, charging socket and harness, complete with all components, conforming to IS: 5154 of 1980 & Amendment-1.	
4.5.1	Battery Initial Charging	Supplier shall charge the battery at site. Sufficient quantity of electrolyte and suitable Charger shall also be supplied along with the battery.	

S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR's TECHNICAL OFFER (With Complete Details)
4.5.2	Battery Power Rating	36 V DC, 300 AH Storage Type, Traction Duty, Lead Acid Battery	
4.5.3	Battery Make	Storage Battery shall be of internationally reputed make only. BIDDER has to specify make & power rating of the Battery.	
4.6.0	**BATTERY CHARGER**	Suitable for 36 V DC, 300 AH Lead Acid Battery. Charger shall have the following features : a. Constant current equalizing facility with auto cut-off. b. Protection for reverse battery, over current and short circuit. c. Free standing, self – compensating, and 100% automatic charging. d. Charging current and charging voltage indication. e. On delay start.	
4.6.1	Input Electric Power	The battery charger shall be suitable for input electric supply through a 415VAC ± 10%, 50Hz ± 3% from 3 Phase, 3 Wire System. [No neutral conductor]	
4.6.2	Power Cable	10 mtr. long charging cable of adequate size, with end connectors, shall be supplied	
4.7.0	**SURFACE CLEANING**	All the fabricated parts shall be de-rusted and degreased (by shot blasting or chemical treatment for surface cleaning), after completion of all operations but prior to painting.	

S.No.	PARTICULARS	BHEL SPECIFICATIONS	VENDOR's TECHNICAL OFFER (With Complete Details)
4.8.0	**PAINTING**	The Steel fabricated parts are to be painted as follows : a. One coat of Primer with 25 microns of DFT (Dry Film Thickness) and 48 hours of compulsory curing after painting. b. Two coats of Enamel Paint (Colour – Golden Yellow) each with a DFT of 25 microns and intermittent curing of minimum 16 hours. c. The front and rear portions shall be painted yellow and black strips.	
4.9.0	**SAFETY PROTECTIONS**	The following safety protections shall be compulsorily provided: 1. Overload Protection. 2. Short Circuit Protection. 3. Dead Man Control. 4. Key Switch. 5. Hooter. 6. Charger Isolation. 7. Reverse Interlock. 8. Over Speed Protection. 9. Emergency Stop. 10. Carrying Capacity of each Trolley shall be clearly shown by fixing an engraved steel sign-board on either sides of the Trolley.	

S.No.	PARTICULARS	BHEL SPECIFICATIONS	BIDDER/VENDOR's OFFER
5.0.0	**SPARES**	The BIDDER has to compulsorily list down the Mechanical, Electrical and Electronic Spares with Unit Rate, which are to be procured for three years of continuous operation of the Transfer Car with the Remote Control Unit.	
6.0.0	**DOCUMENTS/DETAILS for APPROVAL**	The following documents and details are to be submitted for BHEL Approval, prior to taking up the manufacture of the Transfer Car.	
6.1.0	Drawings and Documents	a. GA Drawing of the Transfer Car / Trolley. b. Trolley Dimensional Drawing. c. Sub-Assembly Drawing for Wheel & Axles, Gear Boxes, etc. d. Calculations for Selection of Electric Motor and Gear-Box. e. Electrical Drawings. f. Schematic Drawing of Trolley Controls. g. Battery Charger Schematic Drawing. h. Total Weight of the Transfer Car including all Electrical Equipment.	
7.0.0	**O & M MANUALS**	Each Transfer Car shall be provided with a. Complete set of Tools required for Operational Maintenance, b. 3 Copies of Operation & Maintenance Manual hard copy & one soft copy in CD, [containing the following technical details, given under Clause **Sl. No. 7.1.0**]	

S.No.	PARTICULARS	BHEL SPECIFICATIONS	BIDDER/VENDOR's OFFER
7.1.0	Drawings & Details	a. Trolley General Arrangement Drawing b. Assembly Drawing for Wheel & Axle, Gear-Box Assembly, etc. c. Electric Wiring Schematics d. Detailed Wiring Diagram for Sub-Systems / Control Panels e. Battery Charger Schematic Drawing. f. Specifications / Ratings of All Bought-Out Items g. Warranty / Guarantee Card for all the Bought-Out Items h. Trouble Shooting Chart for all Systems i. List of Spares – both Mechanical and Electrical	
8.0.0	**INSPECTION**	Schedule of Inspection : a. Verification of Test Certificate for Raw Materials used for fabrication. b. Verification of X-Ray Report of Butt-Joints and Random Testing of the Welds, by physical examination. c. Verification of Transfer Car Dimensions, Checking of Wheel Alignment, Mechanical Assemblies and Total Alignment. d. Full / Rated Load Test and Deflection Test. e. Deflection and Permanent Setting Measurement f. Speed / Traverse Motion Testing with and without load g. 10% OVER-LOAD Carrying Ability Check.	

S.No.	PARTICULARS	BHEL SPECIFICATIONS	BIDDER/VENDOR's OFFER
9.0.0	**ERECTION & COMMISSIONING**		
9.1.0	Mechanical Erection / Assembly	Erection / Assembly of the Transfer Car has to be done by the Representative of the Supplier, at BHEL Works	
9.2.0	Commissioning	Commissioning of the Transfer Car and Performance Prove –Out for the Trolley's Capacity and Smooth Running (at BHEL Works) shall be the RESPONSIBILITY of the supplier.	
10.0.0	**PERFORMANCE GUARANTEE**	The Performance of the Transfer Car and/or the Components / Sub-Assemblies / Bought-Out-Items shall be guaranteed for a minimum period of twenty-four months from the date of performance acceptance at BHEL Works.	