



**BHARAT HEAVY ELECTRICALS LIMITED**  
CORPORATE RESEARCH & DEVELOPMENT DIVISION  
VIKASNAGAR, HYDERABAD - 500 093, INDIA

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Ref: 621500561

**ENQUIRY**

Date 10-07-2015

**Enquiry for High Temperature PEM Fuel Cell Test station**

Enquiry No:621500561

Enquiry Date : 10-07-2015

Due Date: 11-08-2015

Indicative Delivery Date : 30-11-2015

Sl.No	Item Description	Unit	Qty
1	High Temperature PEM Fuel cell test station with Electrochemical Impedance Analyser	NO	1
2	High Temperature PEM Fuel cell test station	NO	1

Please submit your quotation for the above material in sealed cover superscribed with enquiry no, enquiry date and due date subject to our enclosed terms and conditions. The quotations shall reach us on or before the due date by 12 noon. The tenders can also be dropped in the tender box kept at the security gate,BHEL R&D. In case you are not in position to submit the offer,please send reply suitably specifying the reasons.

Sl.No	Description	Document Ref.
01	Enquiry, General Terms & Conditions, Commercial Terms & Conditions etc.	Volume - 1
02	Technical specifications, Scope of Supply etc.	Volume - 2

Nalini Thilak  
AGM ( Purchase )  
nalini@bhelrnd.co.in



## ENQUIRY & QUALIFYING CRITERIA

Volume - 1  
Enquiry No  
621500561

High Temperature PEM Fuel Cell Test station

1	Tendor inviting officer / Authority, Designation and Address	Additional General Manager(MM) BHEL R & D, Vikas Nagar (Near Balanagar), Hyderabad -500093
2	Item Description - Qty	1) High Temperature PEM Fuel cell test station with Electrochemical Impedance Analyser - 1 NO 2) High Temperature PEM Fuel cell test station - 1 NO
3	Enquiry Reference no.	621500561
4	Indicative Delivery Date	30-11-2015
5	Due date, Time and place for submission of tender	11-08-2015 upto 12 noon. Sealed Quotations shall be addressed to AGM(MM), BHEL R & D Division, Vikas Nagar (Near Balanagar), Hyderabad AP,India Pin - 500 093 Quotations can also be deposited in the Tender box located at Security Gate of BHEL R & D BHEL shall not be responsible for any postal/courier delay.
6	Place, Date and time of Tech.Bid opening	Tender Opening Cell (Sangam) BHEL R & D Office. 11-08-2015, 2 PM
7	Mode of Submission of Tender	<p>Please submit your offer in one common sealed cover containing two parts in separate sealed covers as detailed below.</p> <p>1) First Cover shall contain:</p> <ol style="list-style-type: none"><li>Signed General Terms &amp; Conditions (GTC)</li><li>Filled and Signed Commercial Terms &amp; Conditions (CTC)</li><li>Filled and Signed Vendor Specifications against BHEL Specifications (Item wise)</li><li>Signed commercial bid</li><li>Copy of Price-bid with price(s) cells blank (un-priced price bid)</li></ol> <p>2) Second cover shall contain Price Bid Containing Price quotes, applicable taxes, installation and/or commissioning charges shall be spelt out clearly taking into account total charges rather than quoting vaguely such as charges per man-day or charges per engineer per day etc.</p> <p>If the price bid was found later to be different from the unpriced pricebid format in any way, the offer will be rejected summarily. The rates shall be quoted both in figures and in words.</p> <p>The offers can also be submitted through e-mail and have to be sent in PDF format (files with PDF extension only). Files having extensions other than PDF like RAR, EXE, JPEG etc. and with external links will not be considered. They have to be sent to e-mail id: 'eoffers@bhelrnd.co.in' only. Copies should not be marked to anyone. If the offers are marked to anyone other than to eoffers, their offer will not be considered.</p> <p>The e-mail offers should have two attachments.</p> <p>1) One attachment shall contain</p> <ol style="list-style-type: none"><li>Signed General Terms &amp; Conditions (GTC)</li><li>Filled and Signed Commercial Terms &amp; Conditions (CTC)</li><li>Filled and Signed Vendor Specifications against BHEL Specifications (Item wise)</li><li>Signed commercial bid</li><li>Copy of Price-bid with price(s) cells blank (un-priced price bid)</li></ol> <p>2) Second attachment shall contain Price Bid Containing Price quotes, applicable taxes, installation and/or commissioning charges shall be spelt out clearly taking into account total charges rather than quoting vaguely such as charges per man-day or charges per engineer per day etc.</p> <p>The subject of the e-mail should contain Enquiry No, Enquiry Date and Due date.</p>



## GENERAL TERMS & CONDITIONS (GTC)

Volume - 1  
Enquiry No  
621500561

High Temperature PEM Fuel Cell Test station

SL.No.	Clause	BHEL REQUIREMENT
1	General	<p>a. All offers must include name of the contact person, phone no/mobile no, Fax no, email-id. Unsigned offers are liable for rejection.</p> <p>b. We, BHEL R&amp;D, is registered with Department of Scientific and Industrial Research (DSIR) for the purpose of availing Customs Duty exemption in terms of Government Notification no.24/2007-Customs dated 01-Mar-2007 &amp; Central Excise Duty Exemption in terms of Government Notification No. 16/2007-Central Excise dated 01-Mar-2007 as amended from time to time. Hence suppliers are requested to submit their bids clearly stating applicable taxes/duties. All foreign quotes will be evaluated with custom duty @ 5.15% for cost comparison.</p> <p>c. Taxes &amp; Duties quoted will be taken for evaluation of landed cost &amp; order placement and no change will be entertained later except in the case of changes made by the government. However please note that we are availing cenvat credit for service tax and hence service tax will be excluded in calculation of landed cost to BHEL.</p> <p>In case any Taxes/ Duties exempted, a self declaration for the same may be attached to the offer. Changes in taxes and duties because of the changes in turn over etc will be to supplier's account.</p> <p>d. Where ever vendor registration form and EFT details have been submitted earlier, the same need not be submitted again unless there is a change.</p> <p>e. BHEL R&amp;D do not issue 'C' form .</p> <p>f. L1 status shall be decided on Cost to BHEL Basis.</p>
2	Foreign Suppliers	<p>BHEL will deal directly with foreign vendors, where ever required, for procurement of goods. However, if the foreign principal desires to avail of services of an Indian agent, then foreign principal should ensure compliance to regulatory guidelines which require mandatory submission of agency agreement containing agency commission.</p> <p>Any supplier (Agents/distributors/representatives) desirous of quoting imported goods/services, they should submit the quote in foreign currency along with agency agreement copy, failing which their offer is liable for rejection. In case of non submission of agency agreement copy, the principal should submit the quotation to BHEL directly. Foreign supplier will also indicate in their offer Indian agent's name, if any, address and percentage of agency commission out of the quoted price.</p> <p>Fully owned Indian Subsidiaries/distributors of Foreign Companies shall quote in Foreign Currency on FOB basis only.</p>
3	Late Tenders	Tenders received after due date/time(12:00hrs) will not be considered
4	Discrepancy in words and figures	<p>(a) If, in the price structure quoted for the required goods/ Services/ works, there is discrepancy between the unit price and the total price (which is obtained by multiplying the unit price by the quantity), the unit price shall prevail and the total price corrected accordingly, unless in the opinion of the purchaser there is an obvious misplacement of the decimal point in the unit price, in which case the total price as quoted shall govern and the unit price corrected accordingly.</p> <p>(b) If there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail and the total shall be corrected; and</p> <p>(c). If there is a discrepancy between words and figures, the amount in words shall prevail, unless the amount expressed in words is related to an arithmetic error, in which case the amount in figures shall prevail subject of (a) and (b) above.</p> <p>(d) If there is such discrepancy in an offer, the same shall be conveyed to the bidder with target date upto which the bidder has to send his acceptance on the above lines and if the bidder does not agree to the decision of the purchaser, the bid is liable to be ignored.</p>
5	Two Part bid clarifications	In the case of Two-part bid, the vendor should furnish technical and commercial clarifications, if any, within stipulated time mentioned, failing which, it will be construed that the vendor is not interested in the tender and BHEL shall not consider the offer for further evaluation.
6	Price Impacts	In the event of any bidder, after finalizing the technical specifications and scope of supply, opting to revise their original bid, they have to submit the Price-Impact only. The Original price bid along with Price-Impact bid shall be opened during price bid opening. Unsolicited price impacts will not be considered.
7	Price bid evaluation	All offers in price bid opening or reverse auction shall be evaluated in Indian currency based on unit price, packing & forwarding, taxes/duties, freight charges if any, exchange rate. Loading due to non-acceptance of our standard commercial terms will be evaluated as per the LOADING FACTORS form as enclosed along with the enquiry. The exchange rate declared by State Bank of India under TT Selling rate on the technical bid open date shall be adopted for evaluating foreign currency bids.
8	Packing	The supplier shall be responsible for the goods being properly and adequately packed so as to prevent any loss, damage or deterioration during transit.
		In case the supplier withdraws their offer before placement of order, BHEL reserves the right not to

9	Withdrawal	send next enquiry(ies). In case the supplier withdraws the quotation after its acceptance by BHEL or fails to supply the goods as per the terms and conditions of contract, or at any time repudiated the contract wholly or in part, BHEL shall be at liberty to cancel the Purchase Order and to recover from the supplier the extra cost and other loss, incidentals due to the breach of contract on the part of the supplier through risk purchase.
10	Risk Purchase	In case of default/late delivery, BHEL reserves the right to make alternate arrangement for procurement at suppliers risk and cost.
11	Banned List	The offers of the bidders who are in the banned list and the offers of the bidders who engage the services of the banned firms, shall be rejected. The list of banned firms is available on BHEL website www.bhel.com. Guidelines for suspension of business dealings with suppliers/contractors are available on www.bhel.com under supplier registration page
12	Over All L1	Order will be placed on overall L1 basis. Vendors should quote for all items, otherwise the offer will be rejected.
13	Additional Information	Suppliers are requested to visit our web site regularly for any updates and additional information, "All corrigenda, addenda, amendments, time extensions clarifications, etc. to the tender will be hosted on BHEL website only". The corrigendum will not be published in news paper.
14	Destination	Indian Vendors: Destination shall be Stores, BHEL R&D, Hyderabad. Foreign Vendors: 1) BHEL R.O.D Office, Mumbai, India for sea consignments and 2) BHEL R&D, Hyderabad, India for air consignments.
15	Arbitration	Subject to the jurisdiction of Hyderabad/Secunderabad, Andhra Pradesh, India in respect of any suit or other legal proceedings relating this contract.
16	Micro Small Enterprises (MSEs)	<p>MSE suppliers can avail the intended benefits only if they submit along with offer, attested copies of either EM II certificate having deemed validity (Two years from the date of issue of acknowledgement in EM-II) or valid NSIC certificate or EM II certificate along with CA certificate (Format as below) applicable for the year, certifying quantum of investment in plant and machinery within the permissible limit as per the act for relevant status (Micro or small) Where the deemed validity of EM II is over. Date to be reckoned for determining the deemed validity will be the last date of technical bid submission. Non submission of such documents will lead to consideration of their bids at par with other bidders and MSE status of such suppliers shall be shifted to Non MSE supplier till the supplier submits these documents.</p> <p style="text-align: center;">Certificate by chartered Accountant on letter head</p> <p>This is to certify that M/s .....(hereinafter referred to as 'company') having its registered office at ..... is registered under MSMED Act 2006, (Entrepreneur Memorandum No(Part-II) ..... dtd....., Category..... (Micro/Small). (Copy enclosed).</p> <p>Further verified from the Books of Accounts that the investment of the company as on date..... as per MSMED Act 2006 is as follows :</p> <p>1. For manufacturing Enterprises : Investment in plant and machinery (i.e. Original cost excluding land and building and the items specified by the ministry of small Scale Industries vide its notification No.S.O.1722(E) dated October 5, 2006.</p> <p>2. For Service Enterprises : Investment in equipment (Original cost excluding land and building and furniture, fittings and other items not directly related to the service rendered or as may be notified under the MSMED Act, 2006: Rs..... Lacs</p> <p>The above investment of Rs..... Lacs is within permissible limit of Rs..... Lacs for.....Micro/Small (Strike off which is not applicable) Category under MSMED Act 2006.</p> <p>Date:</p> <p>(Signature) Name- Membership number -- Seal of Chartered Accountant</p>
17	Inspection	On receipt, the goods shall be subjected to inspection and our decision regarding the acceptability of the goods shall be final and binding on the suppliers.

**Signature of the bidder with Seal & Date**



## COMMERCIAL TERMS & CONDITIONS (CTC)

Volume - 1  
Enquiry No  
621500561

High Temperature PEM Fuel Cell Test station

SL.No.	Clause	BHEL REQUIREMENT	SUPPLIERS ACCEPTANCE / REMARKS
1	Reverse Auction	<p>BHEL reserves the right to go for Reverse Auction (RA) instead of opening the sealed envelope price bid, submitted by the bidder. This will be decided after techno-commercial evaluation. All bidders to give their acceptance for participation in RA. Non-acceptance to participate in RA may result in non-consideration of their bids, in case BHEL decides to go for RA.</p> <p>In case BHEL decides to go for Reverse Auction, only those bidders who have given their acceptance to participate in RA will be allowed to participate in the Reverse Auction. Those bidders who have given their acceptance to participate in Reverse Auction will have to necessarily submit „online sealed bid“ in the Reverse Auction. Non-submission of „online sealed bid“ by the bidder will be considered as tampering of the tender process and will invite action by BHEL as per extant guidelines in vogue.</p>	
2	Weight and Packing Dimensions.	The Supplier shall indicate the shipping weight (Kgs) and dimensions(L x W x H in cms) clearly along with offer.	
3	Validity of Offer	90 days from date of techno-commercial bid opening.	
4	Price basis	<p>The prices shall be firm for entire period of contract.</p> <p>The suppliers shall indicate packing and forwarding charges,if any, separately.</p> <p>All foreign suppliers shall quote the lowest prices on 'FOB-Nearest International Airport/Sea port' basis. An amount of 3% on basic value towards freight and insurance will be added for cost comparison.</p> <p>All Indian suppliers shall quote the lowest prices on 'free delivery at BHEL R&amp;D Stores or F.O.R destination' basis only.</p>	
5	LD Clause	Failure to supply the goods and/or carryout the services within the stipulated delivery date will attract a penalty of 0.5% per week or part thereof for the value of the undelivered portion of the purchase order subject to a maximum of 10% of the total order value.In case of non acceptance to this LD Clause, 10% of basic material cost will be loaded on the quoted prices while cost comparision.(Please refer the enclosed 'Loading Factors' sheet).	
6	Payment Terms	<p>a) For Indian Offers : BHEL standard payment term is "100% payment along with taxes by EFT/RTGS within 30 days of receipt and acceptance of material at BHEL R&amp;D Stores,Hyderabad". For other payment terms there will be a loading on the offer as mentioned in our 'Loading Factors' sheet which is enclosed to this enquiry.</p> <p>b) For Foreign Offers : BHEL standard payment term is "100% Invoice value by wire transfer within 30 days of receipt and acceptance of material at BHEL R&amp;D Stores,Hyderabad". For other payment terms there will be a loading on the offer as mentioned in our "Loading Factors" sheet which is enclosed to this enquiry.All bank charges inside India shall be to BHEL account and outside India shall be to supplier's account.</p>	
7	PBG	PBG of 10% of total order value is to be submitted by the successful vendor and shall be kept valid upto guarantee period with additional claim period of 2 months there after.The offers of the suppliers not accepting to this clause will be rejected.	
8	Freight & Insurance	Insurance will be arranged by BHEL in case of FCA / FOB basis supplies.In such cases ,an amount of 3% towards freight and insurance will be added for cost comparision.	
9	Agency Agreement	<p>Guidelines regarding dealing with Indian agents of foreign suppliers</p> <ol style="list-style-type: none"><li>1. BHEL shall deal directly with foreign vendors, wherever required, for procurement of goods. However, if the foreign principal desires to avail of services of an Indian agent, then the foreign principal should ensure compliance to regulatory guidelines which require mandatory submission of agency agreement.</li><li>2. It shall be incumbent on the Indian agent and the foreign principal to adhere to the relevant guidelines of government of India, issued from time to time.</li><li>3. The agency agreement should specify the precise relationship between the foreign oem and services to be rendered by agent / associate, whether general in nature or in relation to the particular contract, must clearly stated by the foreign supplier / Indian agent. Any payment, which the agent / associate receives in India or abroad from the oem, whether as commission or as a general retainer fee shall be brought out in record in the agreement and be made explicit in order to encurse compliance to the laws of the country.</li><li>4. Any agency commission to be paid by BHEL to the Indian agent shall be Indian currency.</li><li>5. When ever Indian agents are representing on behalf of their principals, the relevant authorization letter and agreement copy to be enclosed along with technical bid to consider the offer.</li></ol>	
		FOR INDIAN SUPPLIES : =====	

10	Delivery Period	<p>Suppliers are requested to quote within the delivery date mentioned in the enquiry. They shall also mention one of the following delivery periods compulsorily.</p> <p>1) Delivery Period from date of Purchase order =====</p> <p>2) Delivery Period from receipt of material / input data / drawings etc. from BHEL===== (if applicable)</p> <p>3) Delivery Period from receipt of approval of design documents / drawings etc. by BHEL===== (if applicable)</p> <p>However BHEL shall inform the vendor about rejection of the offer before price bid opening in case of not meeting the delivery requirements of BHEL.</p> <p><b>FOR FOREIGN SUPPLIES :</b> =====</p> <p>Suppliers are requested to quote within the delivery date mentioned in the enquiry. They shall also mention one of the following delivery periods compulsorily.</p> <p>1. Delivery Period from date of Purchase order :=====</p> <p>2. Delivery Period from receipt of input data / drawings etc. from BHEL===== (if applicable)</p> <p>3. Delivery Period from receipt of approval of design documents / drawings etc. by BHEL===== ( if applicable )</p> <p>4. Delivery Period from date of LC Opening ===== ( if applicable)</p> <p>5. Delivery Period from date of PO acceptance =====</p> <p>However BHEL shall inform the vendor about rejection of the offer before price bid opening in case of not meeting the delivery requirements of BHEL.</p> <p>Pl. mention any other issues/constraints like export clearance etc. explicitly, if any =====</p>
11	Taxes and duties	<p>All Indian suppliers shall clearly mention current sales tax/VAT,Excise duty and Service Tax etc, if any,payable in addition to the quoted price and indicate applicable rates/percentage,item-wise clearly.The vendors should mention applicable Registration Number(s) specifically in their quotation.The suppliers are requested to submit their bids clearly stating applicable taxes and duties.The quoted taxes/duties will be taken for cost evaluation and order placement and no change will be entertained later except in the case of changes made by the government. Please note that we are availing cenvat credit for service tax and hence service tax will be excluded in calculation of landed cost to BHEL. However Proof of payment of service tax is required to be submitted for reimbursement of the same.</p>
12	Annual Maintenance Contract (AMC) Charges	<p>AMC charges exclusive of service tax to be quoted as a percentage of basic cost of the main equipment on per year basis. The Total AMC charges for the number of years mentioned in the tender will be taken into consideration while evaluating the lowest (L1) bidder. The AMC payment will be made once in 6 months within 45 days after on satisfactory completion of service. BHEL reserves the right to issue separate AMC order after completion of warranty period.</p>

**Note :** All the clauses of the above format should be filled and submitted with the Techno Commercial Bid (Part-1). The filled in BHEL Commercial terms & Conditions format submitted with technical bid, responding to all the clauses duly signed with seal **only shall be considered**. Any other Commercial terms & conditions of bidders entered else where in their offer shall not be considered and are liable for rejection.

**Signature of the bidder with Seal & Date**



## ITEM SPECIFICATIONS

Volume - 2  
Enquiry NO  
621500561

High Temperature PEM Fuel Cell Test station

SL.No.	Item		
1	<b>High Temperature PEM Fuel cell test station with Electrochemical Impedance Analyser</b>		
sl no	Descriptions	BHEL Specifications	Vendor Specifications/ Deviations
1	Fuel Cell Test Station with Electrochemical Impedance Analyser	Fuel Cell Test Station is required for testing single cells of High Temperature Proton Exchange Membrane (HTPEM) Fuel Cells. It should have an integrated PLC/equivalent functional system to provide highly accurate, noiseless, reliable data acquisition, precise, real time control loop operation and 3-level alarm management for maximum operational safety. Fully reliable and programmable, automated operation in hydrogen safe area. It should also have a provision for conducting the impedance analysis testing while the single cell is under testing.	
2	Typical test ratings of electronic load box	Maximum power: 250 Watt. Voltage : 0- 3 VDC • Accuracy : $\pm 0.06$ % of the selected value over the range Current : 0-150 A • Accuracy : $\pm 0.1$ % of the selected value over the range Load box should be capable of drawing current up to 150 A at 0.2 VDC	
3	Modes of testing requirements	Test equipment should have provision for the following operating modes o Constant current o Constant voltage o Constant resistance o Constant power	
4	Range of gas mass flow controllers	• Anode gas flow range : 0.05 to 3 NI/min for hydrogen • Cathode gas flow range : i) 0.05 to 3 NI/min for oxygen and ii) 0.2 to 15 NI/min for Air (Zero Air) • Nitrogen gas flow range: Provision for supply of Nitrogen either cathode or anode side with a flow range of 0.1 to 10 NI/min Accuracy of Mass flow controllers: $\pm 0.3$ % FS $\pm 1$ % of actual value.	
5	Onboard Nitrogen Storage tank	Test station should comprise an onboard SS tank of volume capacity not lower than 5 lts with provision for automatic filling of Nitrogen gas from supply line provided with 3-5 bar pressure.	
		Provision for Nitrogen purging on anode and cathode sides during	

6	Nitrogen purging	emergency shut down with predefined flow ranges of 5 to 10 lpm from onboard Nitrogen storage tank	
7	Preheating of anode and cathode side gases with integrated temperature control loops	Trace heating: Individual Heating hoses to be provided between the mass flow meter and test item of anode/ cathode inlet port with precise gas temperature control. Temperature control : <ul style="list-style-type: none"> <li>• Precise temperature controller to be provided for preheating the anode and cathode feed gases to a desired set temperatures(upto 180 Deg C) by using feedback signals of Pt 100/ K type thermocouple temperature sensors</li> <li>• Thermocouples OD size of 2 mm or 2.5 mm tip diameter with a probe length of 60 to 80 mm having a cable length of 0.6 to 1 meter</li> <li>• Total thermocouples required - 6 Nos. (4 Nos. thermocouples required for monitoring the local temperatures and 2 No. for monitoring the ambient temperatures</li> </ul>	
8	Auxiliary temperature controllers	2 nos. of onboard temperature controllers with temperature sensors having provision for onboard plugin power supply of 220 VAC and 250 to 500 W rating suitable for cooling / heating the test cell to maintain set point temperature of single cell	
9	Requirements of temperature control range	Gas temperature control range : Ambient to 180 Deg.C for maximum rated gas flow rates as mentioned in the gas flow specifications  <ul style="list-style-type: none"> <li>• Preheating gas temperature control accuracy : <math>\pm 1</math> Deg.C of set point value at steady state</li> </ul>	
10	Control and Display of Back Pressure	Onboard front (inlet) and back (outlet) pressure local displays for anode and cathode side gases <ul style="list-style-type: none"> <li>o Monitoring differential pressures between anode and cathode inlet and outlets respectively via programmable software</li> <li>o Manual back pressure control range at cathode and anode : 1.1 to 1.5 bar</li> <li>o Control and measurement points : Anode and cathode outlets</li> <li>o Accuracy in pressure displays: <math>\pm 10</math> mbar</li> <li>o Accuracy in pressure control: <math>\pm 25</math> mbar (steady state)</li> </ul>	
11	Safety requirements of test station	<ol style="list-style-type: none"> <li>1. Onboard Hydrogen leak detector with 3-level alarm management system for 24/7 safe &amp; trouble free operation</li> <li>2. Provision for external emergency shut-down of test station</li> <li>3. Piping Material : SS316 for all parts of internal piping</li> <li>4. Test station should meet all the standards of CE Certification and a copy CE certification has to be</li> </ol>	

		submitted along with offer	
12	Programming requirements	<p>PLC or any Industrial equivalent functional control system has to be used in programming application. Test station should have the following provisions for testing the cell performance characteristics.</p> <ol style="list-style-type: none"> <li>1. Continuous test cycle: Life time testing under constant load and variable load profiles of ramp, step and random at various intervals of time.</li> <li>2. ON/OFF test cycles : It has to be programmed such that once the cell temperature meets the specified value the electronic load, reactants supply, reactant gas preheaters, test load driving profiles etc. have to be active during "ON" mode. Also, after completion of test driving it has to be maintained in "OFF" mode over a period of time wherein all variables as aforesaid have to be inactive during "OFF" mode until the cell temperature meets a lower specified set value.</li> <li>3. Provision for feeding minimum of 6 different test driving load profiles at different time scales</li> <li>4. All supply subsystems of fuel and power to the test Cell have to be turned "OFF" after completion of test load profiles and they have to be turned "ON" once the test cell monitoring temperature meets the minimum startup temperature as specified.</li> <li>5. Items 2 &amp; 4 is considered as one cycle, such cycles have to be repeated for specified number of cycles with an inbuilt program as input.</li> <li>6. Save and recall facility of driving load profiles.</li> <li>7. Should have separate functional program call for ON/OFF and life time testing.</li> </ol>	
13	Load & voltage sensing cables	Vendor is required to supply set of load cables and voltage sensing cables of length not less than 60 cm to 80 cm for establishing the electrical connection between proto test cell and test station	
14	Generation of time based cell performance/ efficiency curves on single plot over period of time	<p>Time based Cell performance characterization plots for Time Vs Current-Voltage-Efficiency for the following operating mode conditions.</p> <ul style="list-style-type: none"> <li>o Constant current</li> <li>o Constant voltage</li> <li>o Constant power</li> </ul> <p>The above generated plots have to be continuous in nature between each ON/OFF cycle</p>	
15	Manufacturers Test Certificate	<p>Manufacturer's test Certificate for 1000 hours of continuous operation has to be provided along with the offer. Continuous operation of test station by connecting with single cell will be validated at BHEL during warranty period.</p>	

16	Data logging & Display	Display monitor not less than 24" or higher size and compatible software to be provided by the vendor to supervise the key process variables and to monitor the complete system process and to store the data of key parameters (storage capacity not less than 1 tb, RAM : 4 GB; processor: IntelR i5 – 3.1 GHZ) of make DELL/ Lenova / Apple Data storage should be in the format of Excel table	
17	Integrated Electrochemical Impedance Analyser (EIA)	<ul style="list-style-type: none"> <li>• Impedance range: 100 <math>\mu</math>Ohm to 1.5 Ohm</li> <li>• Cell/Stack Max. Input conditions <ul style="list-style-type: none"> <li>* DC Current: 150 A</li> <li>* DC Voltage : 5 V</li> </ul> </li> <li>• Frequency range: 100 <math>\mu</math>Hz to 100 kHz.</li> <li>• Amplifier Modulation Range <ul style="list-style-type: none"> <li>Current <math>\pm</math> 2.5A (limiting current <math>\pm</math> 7.5A)</li> <li>Voltage <math>\pm</math> 15V (limiting voltage <math>\pm</math> 5V)</li> </ul> </li> <li>• Accuracy: <math>\pm</math> 0.5 % of reading value. Completely integrated system, measurement under electronic load test conditions to give full Nyquist plot over a range of frequency band.</li> </ul>	
18	Extension of EIA for Cyclic Voltametry / Linear sweep experiments	<p>Configuration of electrodes: 3 Nos (Working, reference and counter electrode)</p> <p>Voltage range: 0-3V</p> <p>Current: +/- 50A or 2000mA/cm<sup>2</sup> for test cell of active area 25 cm<sup>2</sup></p> <p>Sampling time: 10ms to 100 ms</p> <p>Voltage scanning rate :10mV/s to 100mV/s</p>	
19	Accessories & consumables	Offer shall include all the accessories required for operation of test station, also consumables like fuses, seals, filters etc.	

2

**High Temperature PEM Fuel cell test station**

sl no	Descriptions	BHEL Specifications	Vendor Specifications/ Deviations
1	Fuel Cell Test Station without Impedance Analyser	<p>Fuel Cell Test Station is required for testing single cells of High Temperature Proton Exchange Membrane (HTPEM)Fuel Cells. It should have an integrated PLC/equivalent functional system to provide highly accurate, noiseless, reliable data acquisition, precise, real time control loop operation and 3-level alarm management for maximum operational safety. Fully reliable and programmable, automated operation in hydrogen safe area.</p>	
		<p>Maximum power: 250 Watt.</p> <p>Voltage : 0- 3 VDC</p> <ul style="list-style-type: none"> <li>• Accuracy : <math>\pm</math> 0.06 % of the selected value over the range</li> </ul>	

2	Typical test ratings of electronic load box	<p>Current : 0-150 A</p> <ul style="list-style-type: none"> <li>• Accuracy : <math>\pm 0.1\%</math> of the selected value over the range</li> </ul> <p>Load box should be capable of drawing current up to 150 A at 0.2 VDC</p>
3	Modes of testing requirements	<p>Test equipment should have provision for the following operating modes</p> <ul style="list-style-type: none"> <li>o Constant current</li> <li>o Constant voltage</li> <li>o Constant resistance</li> <li>o Constant power</li> </ul>
4	Range of gas mass flow controllers	<ul style="list-style-type: none"> <li>• Anode gas flow range : 0.05 to 3 NI/min for hydrogen</li> <li>• Cathode gas flow range : i) 0.05 to 3 NI/min for oxygen and ii) 0.2 to 15 NI/min for Air (Zero Air)</li> <li>• Nitrogen gas flow range: Provision for supply of Nitrogen either cathode or anode side with a flow range of 0.1 to 10 NI/min</li> </ul> <p>Accuracy of Mass flow controllers: <math>\pm 0.3\%</math> FS  <math>\pm 1\%</math> of actual value.</p>
5	Onboard Nitrogen Storage tank	<p>Test station should comprise an onboard SS tank of volume capacity not lower than 5 lts with provision for automatic filling of Nitrogen gas from supply line provided with 3-5 bar pressure.</p>
6	Nitrogen purging	<p>Provision for Nitrogen purging on anode and cathode sides during emergency shut down with predefined flow ranges of 5 to 10 lpm from onboard Nitrogen storage tank</p>
7	Preheating of anode and cathode	<p>Trace heating: Individual Heating hoses to be provided between the mass flow meter and test item of anode/ cathode inlet port with precise gas temperature control.</p> <p>Temperature control :</p> <ul style="list-style-type: none"> <li>• Precise temperature controller to be provided for preheating the anode and cathode feed gases to a desired set temperatures(upto 180 Deg C) by using feedback signals of Pt 100/ K type thermocouple temperature sensors</li> <li>• Thermocouples OD size of 2 mm or 2.5 mm tip diameter with a probe length of 60 to 80 mm having a cable length of 0.6 to 1 meter</li> <li>• Total thermocouples required - 6 Nos. (4 Nos.</li> </ul>

		thermocouples required for monitoring the local temperatures and 2 No. for monitoring the ambient temperatures	
8	Auxiliary temperature controllers	2 nos. of onboard temperature controllers with temperature sensors having provision for onboard plugin power supply of 220 VAC and 250 to 500 W suitable for cooling / heating the test cell to maintain set point temperature of single cell	
9	Requirements of temperature	Gas temperature control range : Ambient to 180 Deg.C for maximum rated gas flow rates as mentioned in the gas flow specifications <ul style="list-style-type: none"> <li>• Preheating gas temperature control accuracy : <math>\pm 1</math> Deg.C of set point value at steady state</li> </ul>	
10	Control and Display of back pressure	Onboard front (inlet) and back (outlet) pressure local displays for anode and cathode side gases <ul style="list-style-type: none"> <li>o Monitoring differential pressures between anode and cathode inlet and outlets respectively via programmable software</li> <li>o Manual back pressure control range at cathode and anode : 1.1 to 1.5 bar</li> <li>o Control and measurement points : Anode and cathode outlets</li> <li>o Accuracy in pressure displays: <math>\pm 10</math> mbar</li> <li>o Accuracy in pressure control: <math>\pm 25</math> mbar (steady state)</li> </ul>	
11	Safety requirements of test	1. Onboard Hydrogen leak detector with 3-level alarm management system for 24/7 safe & trouble free operation. 2. Provision for external emergency shut-down of test station 3. Piping Material : SS316 for all parts of internal piping 4. Test station should meet all the standards of CE Certification and a copy CE certification has to be submitted along with offer	
		PLC or any Industrial equivalent functional control system has to be used in programming application. Test station should have the following provisions for testing the cell performance characteristics. 1. Continuous test cycle: Life time testing under constant load and variable load profiles of ramp, step and random at various	

12	Programming requirements	<p>intervals of time.</p> <p>2. ON/OFF test cycles : It has to be programmed such that once the cell temperature meets the specified value the electronic load, reactants supply, reactant gas preheaters, test load driving profiles etc. have to be active during "ON" mode. Also, after completion of test driving it has to be maintained in "OFF" mode over a period of time wherein all variables as aforesaid have to be inactive during "OFF" mode until the cell temperature meets a lower specified set value.</p> <p>3. Provision for feeding minimum of 6 different test driving load profiles at different time scales</p> <p>4. All supply subsystems of fuel and power to the test Cell have to be turned "OFF" after completion of test load profiles and they have to be turned "ON" once the test cell monitoring temperature meets the minimum startup temperature as specified.</p> <p>5. Items 2 &amp; 4 is considered as one cycle, such cycles have to be repeated for specified number of cycles with an inbuilt program as input.</p> <p>6. Save and recall facility of driving load profiles.</p> <p>7. Should have separate functional program call for ON/OFF and life time testing.</p>	
13	Load and voltage sensing cables	Vendor is required to supply set of load cables and voltage sensing cables of length not less than 60 cm to 80 cm for establishing the electrical connection between proto test cell and test station	
14	Generation of time based cell performance/ efficiency curves on single plot over period of time	<p>Time based Cell performance characterization plots for Time Vs Current-Voltage-Efficiency for the following operating mode conditions.</p> <ul style="list-style-type: none"> <li>o Constant current</li> <li>o Constant voltage</li> <li>o Constant power</li> </ul> <p>The above generated plots have to be continuous in nature between each ON/OFF cycle</p>	
15	Manufacturers Test Certificate	<p>Manufacturer's test Certificate for 1000 hours of continuous operation has to be provided along with the offer. Continuous operation of test station by connecting with single cell will be validated at BHEL during warranty period.</p>	
16	Data logging & Display	<p>Display monitor not less than 24" or higher size and compatible software to be provided by the vendor to supervise the key process variables and to monitor the complete system process and to store the data of key parameters (storage capacity not less than 1 tb, RAM : 4</p>	

		GB; processor: IntelR i5 – 3.1 GHZ) of make DELL/ Lenova/ Apple Data storage should be in the format of Excel table	
17	Accessories & consumables	Offer shall include all the accessories required for operation of test station, also consumables like fuses, seals, filters etc.	

G

<b>General Specifications</b>			
sl no	Descriptions	BHEL Specifications	Vendor Specifications/ Deviations
1	Predispatch Inspection (PDI)	Continuous operation of fuel cell test station at OEM site with their test sample cell for a minimum period of 100 Hrs. as part of PDI in the presence of BHEL executives at the manufactures site.	
2	Training of Fuel cell test station & EIS	Vendor is required to provide the practical training for BHEL executives at OEM site with their standard test module of Fuel cell. The training should cover the following operations as listed below 1. Basic operation, saftety and script programing for custom driving cycles 2. Electrochemical impedence spectroscopy with live test cell and analysis of practical nyquist plots and applications 3. Cyclic voltametry for various scanning rates of voltages with test cell and interpration of results related to electrochemical surface area measurements etc.	
3	Intimation & readiness for Predispatch Inspection	Supplier should intimate the readiness of equipment before PDI. Inspection of equipment will be carried out at supplier's works by two BHEL engineers. The Vendor shall give minimum of 45 days notice for PDI. Travel and hospitality for two BHEL engineers will be to BHEL account.	
4	List of tasks to be carried out at BHEL under annual maintainance of equipment contract (AMC)	1. Calibration of mass flow controllers once in year 2. Contineous/ cyclic operation of fuel cell test station for minimum period of 100 hrs 3. Generation of performance characterization plots for Time Vs Current-Voltage-Efficiency for the following operating mode conditions. o Constant current o Constant voltage o Constant power The above tasks have to be carried twice in 6 months to ensure maximum availability of test station for trouble free operation	
5	Erection and Commissioning	Supplier is responsible for erection & commissioning of the entire system at BHEL R&D premises. E & C charges shall be quoted separately.	

6	Warranty of equipment	The equipment should be under warranty for a period of 1 year from the date of commissioning or 18 months from dispatch, whichever is earlier. During warranty period, if there is any repair to be carried out at the supplier's works, transportation cost of equipment/component besides repair / replacement charges, if any, should be borne by the supplier.
7	Annual maintainance contract (AMC)	After completion of standard warranty period, OEM/Authorized Indian Agent should provide AMC for a period of 3 years. BHEL reserves the right to release separate AMC order after completion of standard warranty period as per the charges quoted in this bid.
8	Recommended makes	1. Fuelcon 2. Greenlight Innovation 3. Jhonson & Mathew 4. Magnum 5. Scribner
9	Ambient temperature for test station	20 to 40 Deg C
10	Gas end connection of test station	Both the test stations gas inlet ports should be provided with the 1/4" or 1/2" BSP Male fittings for connecting the gas supply line having tube diameter of OD 8mm for Hydrogen, Air/Oxygen and Nitrogen from main supply line to the test station
11	Foot print & Electrical power rating	The vendor should indicate regarding electrical power source requirement, footprint dimensions and weight of equipment

\* Vendors are advised to write specifications in detail and not to write like 'Complied/ Yes / No ' etc. in specifications.

Signature of the bidder with Seal & Date

BHEL R&D  
RD:DP:MPX:F-22

## LOADING FACTORS



NOTE : IN CASE OF DEVIATION TO BHEL TENDER SPECIFIED TERMS, LOADING FACTOR INDICATED IN FOLLOWING TABLE WILL BE APPLIED TO QUOTED PRICE WHILE EVALUATING THE LOWEST QUOTE

A. FOR INDIGENOUS PURCHASES					
SLNO	SCOPE	COMMERCIAL TERMS	BHEL STANDARD TERM	AS OFFERED	LOADING FACTOR FOR NON COMPLIANCE TO BHEL STANDARD TERMS
A.1	SUPPLY OF EQUIPMENT	PAYMENT TERMS	100% PAYMENT, WITH IN 30 DAYS FROM THE DATE OF RECEIPT AND ACCEPTANCE OF MATERIAL AT BHEL R & D	SAME	NIL
				PAYMENT AGAINST PROFORMA INVOICE / DESPATCH DOCUMENTS	LOADING @ (SBI BASE RATE ON TENDER OPENING DATE+ 6% ) ON THE TOTAL PO VALUE FOR ONE MONTH
				FULL ADVANCE PAYMENT WITH BANK GUARANTEE	LOADING @ ( SBI BASE RATE ON TENDER OPENING DATE+ 6% ) ON THE TOTAL PO VALUE FOR THE DELIVERY PERIOD (Rounded off to nearest month) + 1 MONTH
				PART ADVANCE (X%) PAYMENT WITH BANK GUARANTEE AND BALANCE PAYMENT WITH IN 30 DAYS FROM THE DATE OF RECEIPT AND ACCEPTANCE OF THE MATERIAL	LOADING @ ( SBI BASE RATE ON TENDER OPENING DATE+ 6% ) ON PART ADVANCE AMOUNT (X%) FOR THE DELIVERY PERIOD (Rounded off to nearest month) + 1 MONTH
				PART ADVANCE (X%) PAYMENT WITH BANK GUARANTEE AND BALANCE PAYMENT ON RECEIPT AND ACCEPTANCE OF MATERIAL	LOADING @ (SBI BASE RATE ON TENDER OPENING DATE+ 6% ) ON PART ADVANCE AMOUNT (X%) FOR THE DELIVERY PERIOD (Rounded off to nearest month) + 1 MONTH AND LOADING @ (SBI BASE RATE ON TENDER OPENING DATE+ 6% ) ON BALANCE AMOUNT FOR ONE MONTH
				SAME	NIL
				100% PAYMENT WITH IN 30 DAYS AFTER COMPLETION OF SUPPLIES AND E&C	NIL
				90% PAYMENT AGAINST PROFORMA INVOICE/ DESPATCH DOCUMENT AND	LOADING @ (SBI BASE RATE ON TENDER OPENING DATE+ 6% ) ON 90% OF THE VALUE OF PO FOR ONE

A.2	SUPPLY OF EQUIPMENT INCLUDING ERECTION AND COMMISSIONING (E&C)	PAYMENT TERMS	90% PAYMENT, WITH IN 30 DAYS FROM THE DATE OF RECEIPT AND ACCEPTANCE OF MATERIAL AND BALANCE 10% WITH IN 30 DAYS OF COMPLETION OF E&C.	BALANCE 10% WITH IN 30 DAYS AFTER COMPLETION OF E&C.	MONTH
				90% PAYMENT AGAINST PROFORMA / DESPATCH DOCUMENT AND BALANCE 10% AFTER COMPLETION OF E&C	LOADING @ (SBI BASE RATE ON TENDER OPENING DATE+ 6% ) ON TOTAL VALUE OF THE PO FOR ONE MONTH
				90% ADVANCE PAYMENT WITH BANK GUARANTEE AND BALANCE 10% PAYMENT WITH IN 30 DAYS AFTER COMPLETION OF E&C	LOADING @ (SBI BASE RATE ON TENDER OPENING DATE+ 6% ) ON 90% OF THE PO VALUE FOR DELIVERY PERIOD(ROUNDED OFF TO THE NEAREST MONTH) + 1 MONTH
				PART ADVANCE (X%) PAYMENT WITH BANK GUARANTEE AND (90 -X) % PAYMENT ON RECEIPT AND ACCEPTANCE OF THE MATERIAL AND 10% PAYMENT WITH IN 30 DAYS AFTER COMPLETION OF E&C	LOADING @ (SBI BASE RATE ON TENDER OPENING DATE+ 6% ) ON THE PART ADVANCE AMOUNT (X%) FOR THE DELIVERY PERIOD(ROUNDED OF TO THE NEAREST MONTH)+ 1 MONTH AND LOADING @ ((SBI BASE RATE ON TENDER OPENING DATE+ 6% ) ON BALANCE (90-X)% AMOUNT FOR ONE MONTH
				PART ADVANCE (X%) PAYMENT WITH BANK GUARANTEE AND BALANCE (90 - X) % PAYMENT AFTER RECEIPT AND ACCEPTANCE OF THE MATERIAL AND 10% PAYMENT AFTER COMPLETION OF E&C	LOADING @ ( (SBI BASE RATE ON TENDER OPENING DATE+ 6% ) ON THE PART ADVANCE AMOUNT (X%) FOR THE DELIVERY PERIOD(ROUNDED OFF TO THE NEAREST MONTH)+ 1 MONTH AND LOADING @ (SBI BASE RATE ON TENDER OPENING DATE+ 6% ) ON BALANCE AMOUNT (100-X)% FOR ONE MONTH

**B. FOR FOREIGN PURCHASES (IMPORTED)**

SLNO	SCOPE	COMMERCIAL TERMS	BHEL STANDARD TERM	AS OFFERED	LOADING FACTOR FOR NON COMPLIANCE TO BHEL STANDARD TERMS
B.1	SUPPLY OF EQUIPMENT	PAYMENT TERMS	100% PAYMENT BY WIRE TRANSFER WITHIN 30 DAYS FROM THE DATE OF RECEIPT AND ACCEPTANCE OF MATERIAL AT BHEL R&D. (DESPATCH DOCUMENTS WILL BE SENT TO BHEL R&D DIRECTLY ALONG WITH BANK DETAILS)	SAME	NIL
				SIGHT DRAFT ON PRESENTATION OF DESPATCH DOCUMENTS VIZ INVOICE, AWB ETC TO OUR BANKERS	LOADING @ (SBI BASE RATE ON TENDER OPENING DATE+6%) ON THE BASIC VALUE FOR ONE MONTH PLUS PAYMENT RELATED BANK CHARGES INCURRED BY BHEL
				LC PAYMENT AGAINST DESPATCH DOCUMENTS	LOADING @ (SBI BASE RATE ON TENDER OPENING DATE+ 6% ) ON THE BASIC VALUE FOR ONE MONTH PLUS LC RELATED BANK CHARGES INCURRED BY BHEL
				FULL ADVANCE PAYMENT BY WIRE TRANSFER /LC WITH BANK GUARANTEE	LOADING @ (SBI BASE RATE ON TENDER OPENING DATE+ 6% ) ON THE BASIC VALUE FOR DELIVERY PERIOD(Rounded off to nearest month) + 1 MONTH PLUS LC RELATED BANK CHARGES INCURRED BY BHEL
				PART ADVANCE (X%) PAYMENT BY WIRE TRNSFER/LC WITH BANK GUARANTEE AND BALANCE PAYMENT WITH IN 30 DAYS FROM THE DATE OF RECEIPT AND ACCEPTANCE OF THE MATERIAL	LOADING @ (SBI BASE RATE ON TENDER OPENING DATE+ 6% ) ON THE PART ADVANCE AMOUNT (X%) FOR THE DELIVERY PERIOD (Rounded off to nearest month) + 1 MONTH PLUS LC RELATED BANK CHARGES INCURRED BY BHEL
PART ADVANCE (X%) PAYMENT BY WIRE TRNSFER/LC WITH BANK GUARANTEE AND BALANCE PAYMENT ON RECEIPT AND ACCEPTANCE OF MATERIAL	LOADING @ (SBI BASE RATE ON TENDER OPENING DATE+ 6% ) ON THE PART ADVANCE AMOUNT (X%) FOR THE DELIVERY PERIOD (Rounded off to nearest month) + 1 MONTH AND LOADING @ (SBI BASE RATE ON TENDER OPENING DATE+ 6% ) ON BALANCE AMOUNT FOR ONE MONTH PLUS LC RELATED BANK CHARGES INCURRED BY BHEL				

**B. FOR FOREIGN PURCHASES (IMPORTED)**

SLNO	SCOPE	COMMERCIAL TERMS	BHEL STANDARD TERM	AS OFFERED	LOADING FACTOR FOR NON COMPLIANCE TO BHEL STANDARD TERMS
B.2	SUPPLY OF EQUIPMENT INCLUDING ERECTION AND COMMISSIONING (E&C)	PAYMENT TERMS	90% PAYMENT BY WIRE TRANSFER WITH IN 30 DAYS FROM THE DATE OF RECEIPT AND ACCEPTANCE OF THE MATERIAL AND BALANCE 10% WITH IN 30 DAYS AFTER COMPLETION OF E&C	SAME	NIL
				SIGHT DRAFT ON RESENTATION OF DESPATCH DOCUMENTS VIZ INVOICE, AWB ETC TO OUR BANKERS	LOADING @ (SBI BASE RATE ON TENDER OPENING DATE+6%) FOR ONE MONTH PLUS PAYMENT RELATED BANK CHARGES INCURRED BY BHEL
				90 PAYMENT BY WIRE TRANSFER /LC AGAINST DESPATCH DOCUMENTS BALANCE 10% WITH IN 30 DAYS AFTER COMPLETION OF E&C	LOADING @ (SBI BASE RATE ON TENDER OPENING DATE+6%) ON 90% OF BASIC VALUE FOR ONE MONTH PLUS LC RELATED BANK CHARGES INCURRED BY BHEL
				90% PAYMENT BY WIRE TRANSFER / LC AGAINST DESPATCH DOCUMENTS, BALANCE 10% AFTER COMPLETION OF E&C	LOADING @ (SBI BASE RATE ON TENDER OPENING DATE+6%) ON THE BASIC VALUE FOR ONE MONTH PLUS LC RELATED BANK CHARGES INCURRED BY BHEL
				90% OF BASIC VALUE AS ADVANCE PAYMENT BY WIRE TRANSFER /LC WITH BANK GUARANTEE AND BALANCE 10% WITH IN 30 DAYS AFTER COMPLETION OF E&C	LOADING @ (SBI BASE RATE ON TENDER OPENING DATE+6%) ON 90% OF THE BASIC VALUE FOR DELIVERY PERIOD (Rounded off to nearest month) + ONE MONTH PLUS LC RELATED BANK CHARGES INCURRED BY BHEL
				PART ADVANCE (X%) PAYMENT BY WIRE TRANSFER /LC WITH BANK GUARANTEE AND BALANCE (90-X)% PAYMENT BY WIRE TRANSFER /LC AFTER RECEIPT AND ACCEPTANCE OF THE MATERIAL AND 10% PAYMENT WITH IN 30 DAYS AFTER COMPLETION OF E&C	LOADING @ (SBI BASE RATE ON TENDER OPENING DATE+ 6% ) ON THE PART ADVANCE AMOUNT (X%) FOR THE DELIVERY PERIOD(Rounded off to the nearest month) + ONE MONTH AND LOADING @ (SBI BASE RATE ON TENDER OPENING DATE+ 6% ) ON BALANCE (90-X)% FOR ONE MONTH
PART ADVANCE (X%) PAYMENT BY WIRE TRANSFER /LC WITH BANK GUARANTEE AND BALANCE (90-X)% PAYMENT BY WIRE TRANSFER /LC AFTER RECEIPT AND ACCEPTANCE OF THE MATERIAL AND 10% PAYMENT AFTER COMPLETION OF E&C	LOADING @ (SBI BASE RATE ON TENDER OPENING DATE+ 6% ) ON THE PART ADVANCE AMOUNT (X%) FOR THE DELIVERY PERIOD(Rounded off to the nearest month) + ONE MONTH AND LOADING @ (SBI BASE RATE ON TENDER OPENING DATE+ 6% ) ON BALANCE AMOUNT (100-X)% FOR ONE MONTH				

**C. PENALTY FOR DELAYED DELIVERY (COMMON FOR INDIGENOUS AND IMPORTS)**

SLNO	COMMERCIAL TERMS	BHEL STANDARD TERM	AS OFFERED	LOADING FACTOR FOR NON COMPLIANCE TO BHEL STANDARD TERMS
C	LD CLAUSE	IN THE EVENT OF DELAY IN AGREED CONTRACTUAL DELIVERY, PENALTY OF 0.5% ( HALF PERCENT) PER WEEK BUT LIMITED TO A MAX OF 10% OF TOTAL ORDER VALUE WILL BE APPLICABLE	AGREED	NIL
			IF NOT AGREED	LOADING @ 10% OF THE BASIC MATERIAL COST
			IF AGREED FOR X%	LOADING @ ( 10-X)% OF THE BASIC MATERIAL COST

**D. GUARANTEE/WARRANTY PERIOD (COMMON FOR INDIGENOUS AND IMPORTS)**

SLNO	COMMERCIAL TERMS	BHEL STANDARD TERM	AS OFFERED	LOADING FACTOR FOR NON COMPLIANCE TO BHEL STANDARD TERMS
D	GUARANTEE/WARRANTY PERIOD	STIPULATED OR REQUIRED GUARANTEE/ WARRANTY PERIOD (X)  MINIMUM ACCEPTABLE GUARANTEE / WARRANTY PERIOD (Y)	AGREED	NIL
			NOT AGREED FOR STIPULATED BUT AGREED FOR MINIMUM GUARANTEE/WARRANTY(Y)	LOADING @ 10 % OF THE ORDER VALUE PER ANNUM FOR THE REDUCED GUARANTEE PERIOD (X-Y)

## Terms & Conditions of Reverse Auction



Against this enquiry for the subject item/ system with detailed scope of supply as per enquiry specifications, BHEL may resort to “REVERSE AUCTION PROCEDURE” i.e., ON LINE BIDDING (THROUGH A SERVICE PROVIDER). The philosophy followed for reverse auction shall be English Reverse (No ties).

1. For the proposed reverse auction, technically and commercially acceptable bidders only shall be eligible to participate.
2. Those bidders who have given their acceptance for Reverse Auction (quoted against this tender enquiry) will have to necessarily submit „online sealed bid? in the Reverse Auction. Non-submission of „online sealed bid? by the bidder for any of the eligible items for which techno-commercially qualified, will be considered as tampering of the tender process and will invite action by BHEL as per extant guidelines in vogue.
3. BHEL will engage the services of a service provider who will provide all necessary training and assistance before commencement of on line bidding on internet.
4. In case of reverse auction, BHEL will inform the bidders the details of Service Provider to enable them to contact & get trained.
5. Business rules like event date, time, bid decrement, extension etc. also will be communicated through service provider for compliance.
6. Bidders have to fax the Compliance form (annexure IV) before start of Reverse auction. Without this, the bidder will not be eligible to participate in the event.
7. In line with the NIT terms, BHEL will provide the calculation sheet (e.g., EXCEL sheet) which will help to arrive at “Total Cost to BHEL” like Packing & forwarding charges, Taxes and Duties, Freight charges, Insurance, Service Tax for Services and loading factors (for non-compliance to BHEL standard Commercial terms & conditions) for each of the bidder to enable them to fill-in the price and keep it ready for keying in during the Auction.
8. Reverse auction will be conducted on scheduled date & time.
9. At the end of Reverse Auction event, the lowest bidder value will be known on auction portal.
10. The lowest bidder has to fax/e-mail the duly signed and filled-in prescribed format for price breakup including that of line items, if required, (Annexure VII) as provided on case-to-case basis to Service provider within two working days of Auction without fail.
11. In case BHEL decides not to go for Reverse Auction procedure for this tender enquiry, the Price bids and price impacts, if any, already submitted and available with BHEL shall be opened as per BHEL?s standard practice.
12. Bidders shall be required to read the “Terms and Conditions” section of the auctions site of Service provider, using the Login IDs and passwords given to them by the service provider before reverse auction event. Bidders should acquaint themselves of the „Business Rules of Reverse Auction?, which will be communicated before the Reverse Auction.
13. If the Bidder or any of his representatives are found to be involved in Price manipulation/ cartel formation of any kind, directly or indirectly by communicating with other bidders, action as per extant BHEL guidelines, shall be initiated by BHEL and the results of the RA scrapped/ aborted.
14. The Bidder shall not divulge either his Bids or any other exclusive details of BHEL to any other party.
15. In case BHEL decides to go for reverse auction, the H1 bidder (whose quote is highest in online sealed bid) may not be allowed to participate in further RA process.



**AUTHORISATION LETTER FOR E-PAYMENT/ NEFT / RTGS**  
(PLEASE FILL UP THE FORM COMPLETELY IN CAPITAL LETTERS ON YOUR COMPANY LETTERHEAD ONLY)

Vendor Code (to be filled by BHEL)	
------------------------------------	--

Type of Request (Tick one)	NEW	CHANGE
1 Company Name		
2 Address		
3 City with PIN Code		
4 State		
5 PAN Number		
6 TIN/ VAT No.		
7 CST No.		
8 Service Tax No.		
9 Name of Contact Person		
10 Mobile number		
11 Ph. no. with STD Code		
12 Fax No. with STD Code		
13 Email ID		
14 Website (URL)		

**BANK DETAILS FOR EFT / RTGS**

1	Bank Name	
2	Branch	
3	Branch Code	
4	Branch Address	
5	Branch Phone No	
6	Account No.	
7	Account Type: SB/ Current/ other (Specify)	
8	MICR Code	
9	IFSC Code	

I, as an authorized representative / owner of the above named company, hereby state as under:

1. Enclosed here with a cancelled cheque in support of our company's bank details.
2. Authorize BHEL R&D Hyderabad, to electronically make payments to the designated bank account with bank charges, if any, to our account.
3. If the transaction is delayed or not effected at all for reasons of incomplete or incorrect information, I would not hold BHEL / transferring Bank responsible.
4. I hereby certify that the particulars given above are true, complete and correct.
5. This authority remains in full force until BHEL receives and acknowledge written notification requesting change or cancellation.

Date :  
Company  
Seal

Authorised Signatory  
Designation :



Corp. R&D  
DIVISION  
VIKAS  
NAGAR,

RD:MPX:F-13

# Bharat Heavy Electricals Limited

HYDERABAD- 500 093 (INDIA)

Ph: 040 - 23772704, Fax: 040 - 23770698, email: mpx@bhelrnd.co.in

## VENDOR REGISTRATION FORM

(Indigenous supplier)

[FORM TO BE SUBMITTED\* BY THE BIDDER ALONG WITH TECHNICAL-BID]

Before filling, please refer to instructions on page-4

### 1.0 VENDOR PROFILE:

1.1 Name and address of the vendor:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Phone Nos.:

Fax No.:

Email: 1. \_\_\_\_\_ 2. \_\_\_\_\_

1.2 Local representative name & address in Hyderabad/Secundrabad :

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Phone Nos.:

Fax No.:

Email:

Contact Person:

Mobile No:

### 2.0 TYPE OF ORGANISATION:

PROPRIETORSHIP	Company:	Sister Concern ( mention vendor registration number of main organization)	
Partnership	CORPORATION	Small Scale Industry	ANY OTHER(Please specify)

In case of SSI unit, copy of registration to be enclosed. It is requested that MSME registration certificate to be enclosed

**3.0 ANNUAL TURN OVER:**

#	Year	Turn-Over, Rs.
1	Current Year(budgeted)	
2	Previous year ( 200 - 0 )	
3	Prior Year ( 200 - 0 )	

**4.0 NAME AND ADDRESS OF THE BANKER:**

- 4.1 Bank Name  
 4.2 Branch name  
 4.3 Account number  
 4.4 Account Type  
 4.5 MICR Code:  
 4.6 IFSC Code(RTGS/NEFT):  
 4.7 Bank Phone number(s),

Blank cheque, duly cancelled, to be enclosed.

Please note that all payments shall be made through Electronic clearance services to your above account against the orders executed, if any.

**5.0 REGISTRATION PARTICULARS**(relevant copies to be enclosed)

- 5.1 IT Permanent Account No.(PAN):  
 5.2 State Sales Tax/VAT Registration No:  
 5.3 Central Sales Tax Registration No:  
 5.4 ED Registration No:  
 5.5 Service Tax Registration No:  
 5.6 PF Account No:  
 5.7 Labour Licence No:  
 5.8 ESI Account No:

**6.0 CONTACT PERSON:** S/Sri:

Designation:

Phone / Mobile No:

**7.0 TOTAL NUMBER OF EMPLOYEES:**

Graduates(Engr/Scientists/Mgmt/Fin.)	Consultants	Workers		
		Sup./Skilled	Semiskilled	Unskilled

**8.0 LIST OF PRODUCTS/ SERVICES OFFERED:**

#	Products/ Services	Capacity
1		
2		
3		
4		
5		
6		

**9.0 REFERENCE LIST :**

(Only recognized public and private sector companies, attach if printed copy available)

#	Customer	Volume / Year
1		
2		
3		
4		
5		
6		
7		

**10.0 INFRASTRUCTURE / FACILITIES:**

#	Facility (with specifications)	Age/ Year procured

1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

**11.0 REGISTRATION WITH OTHER BHEL UNIT/UNITS:**

#	Unit	Registration No	Year
1			
2			
3			
4			

**12.0 ANY OTHER INFORMATION :**

**DECLARATION:**

The information furnished above is true and authentic.

**(CEO / PROPRIETOR)**

**SEAL:**

**DATE:**

Note:

1. Registered bidders, having BHEL (R&D) registration no. or have submitted this format for registration, need not furnish this information again.
2. The competent authority reserves the right to accept or reject the registration.
3. Vendors approved for registration will be informed by mail / email, as convenient. A separate communication will be sent in case of non-registration also, citing reasons thereof.
4. BHEL reserves the right to take penal action as deemed fit if any of the information provided by the vendor(s) is found to be incorrect.
5. AGM, Head (MM) may be contacted for clarification/additional information on registration.

**Instructions**

1. Fill all items. Please mention "N.A." for items/ clauses not applicable.
2. Use A4 sheets for this document and the enclosures. Use of additional sheets is permitted if space provided is not adequate.
3. Attach copies of latest documents in respect of items 5.0 (Registration no.s)
4. Photographs of registered office and the chief executive/proprietor shall be furnished.



RD:MPX:F-14

# Bharat Heavy Electricals Limited

Corp. R&D DIVISION

VIKAS NAGAR,

HYDERABAD- 500 093 (INDIA)

## SUPPLIER REGISTRATION FORM

(FOREIGN SUPPLIER)

ALL COLUMNS SHOULD BE PROPERLY FILLED IN THE SPACE PROVIDED FOR. WHEREVER IT IS NOT APPLICABLE PLEASE WRITE "NOT APPLICABLE". INCOMPLETE OR INCORRECT FORMS MAY NOT BE CONSIDERED.

### 1.0 GENERAL INFORMATION:

1.1 NAME OF COMPANY

1.2 DETAILS OF HEAD OFFICE:

ADDRESS :  
TELEPHONE :  
FAX :  
EMAIL :  
WEB SITE :

1.3 DETAILS OF FACTORY/WORKS:

ADDRESS :  
TELEPHONE :  
FAX :  
EMAIL :  
WEB SITE :

1.4 DETAILS OF MARKETING AGENT

ADDRESS :  
TELEPHONE :  
FAX :  
EMAIL :  
WEB SITE :

1.5 CHIEF EXECUTIVE

1.6 CONTACT PERSON(S)

FOR PRODUCT OFFERED

NAME(S) :  
OFFICIAL CPACITY :  
ADDRESS :  
TELEPHONE :  
FAX :  
EMAIL :

1.7 YEAR OF ESTABLISHMENT

1.8 PRODUCTION CAPACITY PER ANNUM

1.9 PARTICULARS OF PRODUCT INCLUDING  
SPECIFICATION AND RANGE OFFERED

FOR REGISTRTRION

(Attach brochures and catalogues)

1.10 NAME(S) OF BANKERS

1.11 BANKER'S CERTIFICATE

1.12 PORT OF LOADING

1.13 NEAREST AIRPORT

1.14 NAME OF THE INDIAN AGENT, IF ANY  
WITH AUTHORIZATION LETTER

**2.0 FINANCIAL INFORMATION:**

2.1 TOTAL CAPACITY

2.2 ANNUAL TURN OVER FOR LAST 3 YEARS

2.3 WHEHER CREDIT LICENSE ACCEPTABLE      YES/NO

**3.0 QUALITY MANAGEMENT SYSTEMS**

ENCLOSED FORMAT PART-B

3.1 EXPERIENCE LIST FOR SAME/ SIMILAR ITEMS  
TO BE ENCLOSED

**4.0 FUTURE EXPANSION PLANS:**

(Give details)

**5.0 LIST OF ENCLOSURES:**

(Including brochures, catalogues, technical literature etc)

**6.0 ANY OTHER INFORMATION:**

SIGNATURE OF SUPPIER (Authorized signatory)

NAME :

DESIGNATION :

DATE :

OFFICIAL SEAL

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Note:

1. BHEL Reserves the right to take penal action as deemed fit if any of the information provided by the vendor is found to be incorrect.
2. Please attach separate sheets, if space found is inadequate



# **Bharat Heavy Electricals Limited**

**Corp. R&D DIVISION**

**VIKAS NAGAR,**

**HYDERABAD- 500 093 (INDIA)**

**Ph: 040 – 23772704, Fax: 040 – 23770698, email: mpx@bhelrnd.co.in**

RD:MPX:F-13

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## **GUIDE LINES REGARDING DEALINGS WITH INDIAN AGENTS OF FOREIGN SUPPLIERS**

- i. BHEL shall deal directly with foreign vendors, wherever required, for procurement of goods. However, if the foreign principal desires to avail of the services of an Indian agent, then the foreign principal should ensure compliance to regulatory guidelines - which require mandatory submission of an Agency Agreement.
- ii. It shall be incumbent on the Indian agent and the foreign principal to adhere to the relevant guidelines of Government of India, issued from time to time.
- iii. The Agency Agreement should specify the precise relationship between the foreign OEM / foreign principal and their Indian agent and their mutual interest in the business. All services to be rendered by agent/ associate, whether of general nature or in relation to the particular contract, must be clearly stated by the foreign supplier/ Indian agent. Any payment, which the agent or associate receives in India or abroad from the OEM, whether as commission or as a general retainer fee should be brought on record in the Agreement and be made explicit in order to ensure compliance to laws of the country.
- iv. Any agency commission to be paid by BHEL to the Indian agent shall be in Indian currency only.
- v. Whenever Indian agents are representing on behalf of their principals the relevant authorisation letter and agreement copy to be enclosed along with Technical bid to consider the offer.

