

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

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ENQUIRY

To - Enquiry No: Enq Date: Due Date: Delivery By:
330602231 18-AUG-06 21-SEP-06 30-NOV-06

Pin - PLEASE SUBMIT YOUR QUOTATION IN
SEALED COVER SUPERSCRIBED WITH
ENQUIRY NO, ENQUIRY DATE AND DUE DATE
SUBJECT TO OUR TERMS AND CONDITIONS
ENCLOSED, FOR THE FOLLOWING MATERIALS
SO AS TO REACH US ON OR BEFORE THE DUE
DATE BY 12 NOON. THE TENDERS WILL BE
OPENED AT 2 PM ON THE SAME DAY

Email :
Attn. .

PLEASE GIVE REFERENCE OF ENQ NUMBER , ENQ .DATE AND DUE DATE IN ALL YOUR
CORRESPONDENCE FOR PROMPT ACTION. IN CASE IF YOU ARE NOT MAKING THE OFFER
PLEASE POST A REGRET LETTER AND RETURN THE DOCUMENTS.

SL NO	DESCRIPTION / SPECIFICATION	UNIT	QTY
1	CONTROL HARDWARE FOR 1.8 MW DRIVE (SPECIFICATIONS AS PER ENCLOSURE) A) CONTROL HARDWARE: DSP BASED CONTROLER SUITABLE FOR THREE - LEVEL IGBT BASED INVERTER FED INDUCTION MOTOR FOR VVVF AND VECTOR CONTROL MODE OF OPERATION	NO.	3
2	CONTROL SOFTWARE: CONTROL HARDWARE COMPATIBLE APPLICATION SOFTWARE FOR VVVF/VECTOR CONTROL OF THREE LEVEL INVERTER FED KINDUCTION MOTOR DRIVE, DYNAMIC BRAKING, DRIVE SEQUENCE CONTROL, DRIVE DISPLAY, DIAGNOSTIC, PROTECTION AND OTHER FUNCTIONS ALONG WITH SOURCE CODE	NO.	1

NOTE: PLEASE SUBMIT YOUR OFFER IN TWO PARTS AS PER THE ENCLOSED ANNEXURE
"AA" IN SEPARATE SEALED COVERS AS DETAILED BELOW:

- 1) FIRST COVER CONTAINING TECHNICAL, COMMERCIAL AND UNPRICED PRICE BID ALONG
WITH COMPLIANCE STATEMENT, MENTIONING APPLICABLE DUTIES, TAXES ETC., AND
DELIVERY TIME CLEARLY.
- 2) SECOND COVER CONTAINING PRICE BID.
- 3) COMBINED BID OFFERS WILL BE REJECTED SUMMARILY.

AS WE ARE ENGAGED IN R&D ACTIVITY "C" FORM
WILL NOT BE ISSUED

PLEASE FILL UP THE ENCLOSED VENDOR
REGISTRATION FORM AND SEND IT ALONG WITH
YOUR QUOTATION. OTHERWISE YOUR QUOTATION
WILL NOT BE CONSIDERED. (IGNORE THIS IF YOU
HAVE ALREADY SUBMITTED THIS FORM)

Yours faithfully
for

BHARAT HEAVY ELECTRICALS LTD

N Narsimha Rao
Dy Manager

Technical Specifications of DSP based Controller for Medium Voltage Induction Motor Drive

Application

This specification is intended to define the technical requirements of the DSP based controller for three-level IGBT based Power Converter to be used in variable voltage variable frequency induction motor drive. The power rating of the drive shall be 2000Kw.

1.0 Scope of Supply:

Following shall be the scope of work covered under this specification

Sl. No.	Item Description	Quantity
a	Control Hardware: DSP based controller suitable for three-level IGBT based inverter fed induction motor for VVVF and vector control mode of operation	3 Nos.
b	Control Software: Control hardware compatible application software for VVVF / vector control of three level inverter fed induction motor drive, dynamic braking, drive sequence control, drive display, diagnostic, protection and other functions	1 Set

1.1 Suppliers shall quote for both items (a) and (b) . The cost of the items may be given separately.

1.2 The suitability of the DSP controller for application mentioned in this specification shall be demonstrated. Further, the required software development environment package should be included in the offer. The supplier should train BHEL personnel in application program development process.

1.3 Application software shall meet all the functional requirements(like sensing of

input analog/digital signals, control, gate pulses and output signals for relays, contactors ,contactors etc) of a three-level inverter fed induction motor drive with scalar and vector control. The required features of the drive will be provided at the time of placement of order. However, for quotation purpose, the supplier can take the features now being offered by a reputed medium voltage induction motor drive supplier, as reference.

1.4 The supplier shall include the following items in their offer as required.

a	Laptop based software tool for program development, downloading the software, viewing and changing the parameters, trouble shooting, along with user license.	1 Set
b	Installation Drawings, Maintenance and repair manual (hard copy and soft copy).	3 Sets
c	Supplier's Documentation and Spare Parts Catalogue, Consumable Data (Hard copy and soft copy)	3 Sets
d	Installation, testing and commissioning of the above equipment.	
e	Training on installation, testing, commissioning, operation, maintenance and repair	
f	Training in software parameter settings, fault diagnostic and analysis.	
g	Type test in one unit of all equipment.	
h	Routine test in balance units of all the equipment.	

2.0 References to Various Specifications:

The controller should meet IEC standards, IEC 61800-3, 4, and 5 applicable for industrial drives and other standards applicable for industrial electronics.

3.0 General Description of the Drive System

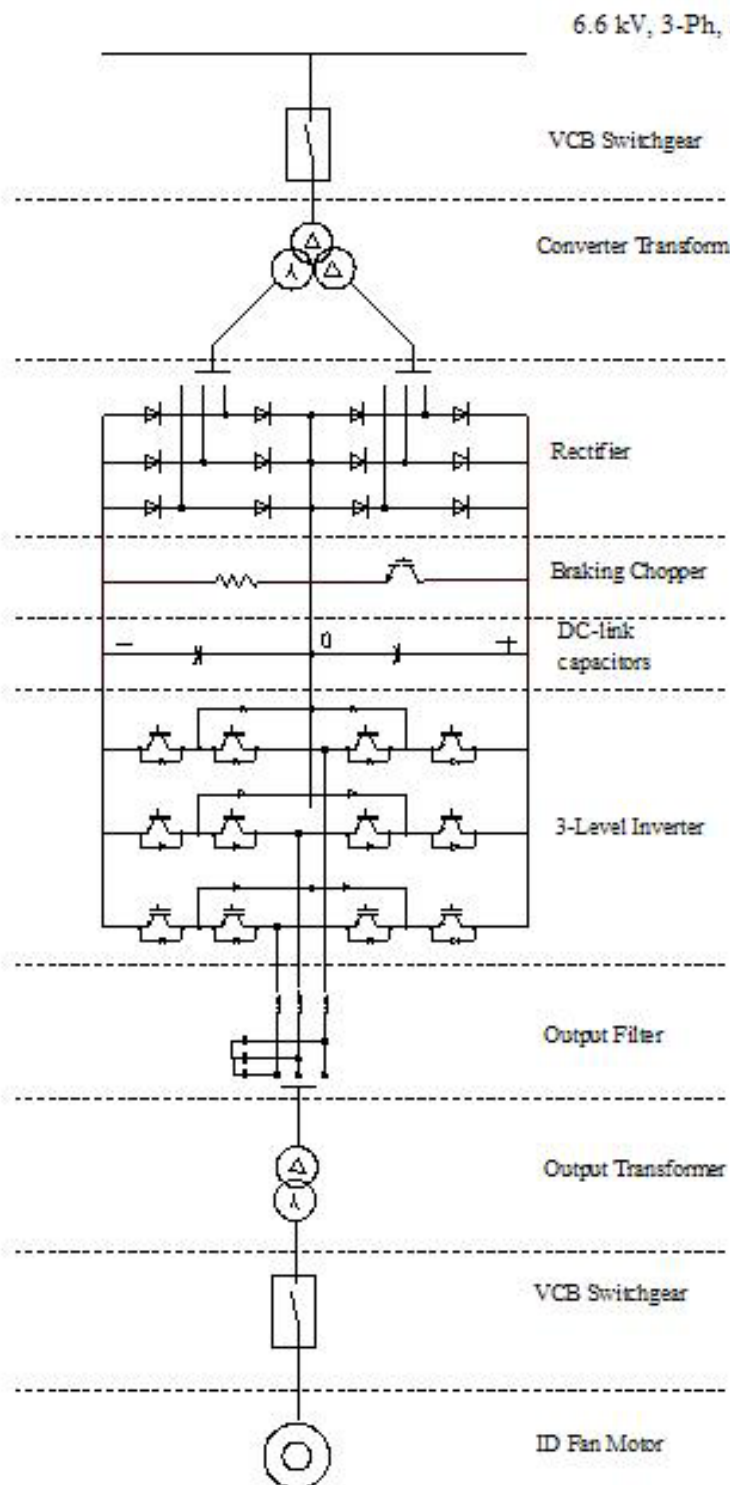
The induction motor drive system consists of a step-down transformer(6.6 kV / 2 * 500 V),12-pulse diode bridge rectifier,braking chopper, Dclink filter,three-level inverter, sine filter, output step-up transformer and switchgears.

The two secondaries of the input transformer are connected to two three-phase diode bridge rectifiers to form a twelve-pulse rectifier. The output of the rectifier,through a braking chopper circuit , is filtered by a capacitor filter. The filtered DC voltage is given to a three-level IGBT inverter . The IGBTs in the inverter are switched with PWM switching pattern to obtain variable

voltage variable frequency output supply according to the set speed. The output of the inverter is filtered by three-phase LC filter to obtain sine wave with 5% total harmonics distortion. The filtered output voltage of the inverter is stepped up to motor rated voltage of 6.6 kV and fed to the motor.

During braking, the motor will act as a generator. The kinetic energy of the rotor and connected load will be converted into electrical energy and will result in higher DC link voltage. An IGBT-based chopper and loading resistor is connected across the DC link. The IGBT is switched on during braking as well during fast deceleration.

The inverter shall be switched with space vector PWM switching pattern. The DSP based controller is desired to generate PWM pattern as per the set speed. The motor controller is to be designed both with variable voltage variable frequency and vector control mode without sensor. Several other features like automatic restart after mains restoration, skip frequency (to avoid resonance), start on the fly, automatic restart after fault clearance etc. shall be provided. In case of fault, the drive shall be switched off and type of fault, and date and time of occurrence of the fault shall be recorded. The fault data shall be stored for subsequent downloading and analysis. The controller shall be capable of storing data for last four weeks or 100 faults. The start-up process, sequence control, protections and fault diagnostics and display shall be provided by the offered controller. The schematic of the drive is shown below.



Schematic of 3 level Induction Motor Drive

4.0 Technical Requirements

4.1 The DSP based controller should be housed in a control rack suitable for industrial applications. The control rack shall contain one or more CPU card, analogue to digital converter card, digital to analogue converter card, digital input and output card, timer / counter card, optical interface card for gate drives, to perform control functions required for a three-level inverter fed vector controlled induction motor drive. **The control power supplies shall also be provided in the control rack** . The control rack offered should contain one or more of the following cards for implementing application control software.

- (a) DSP based processor card: The CPU card shall be based on advanced DSP chip operating at clock frequency of more than 33 MHz. The DSP shall be suitable for field oriented control of induction motor.
- (b) ADC card: The ADC card should contain minimum 6 channels of 12 bit ADC channel with simultaneous sampling. The conversion time should be of the order of 3 microseconds.
- (c) DAC Card: The DAC card shall contain minimum 4 channels of 12 bit DAC.
- (d) Digital Input card: The digital input card shall contain galvanically isolated digital input channels. Each digital input card may contain more than 16 channels.
- (e) Digital Output Card: The digital output card shall contain galvanically isolated output channels. Each card may contain 16 digital output channel. 8 numbers of the channels should be relay (230 V AC). Rest of the digital input channels may be optically isolated.
- (f) Timer / Counter card: The timer / counter card shall contain minimum 6 numbers of 16 bit timer / counters. This card will be used for measurement of motor speed with absolute encoder and generation of hardware interrupt signal.
- (g) Optical interface card: For transmitting PWM signals to IGBT Gate Drives and receiving error signals from the gate drives through HP-make Optical Fiber Cables. (BHEL is using gate drives with HP make transmitter HFBR-1524 and receiver HFBR-2524.). The card shall contain 13 transmitters (12 for 3-level inverter and one for braking chopper) and 13 optical receivers (12 for 3-level inverter IGBTs and one for braking chopper)
- (h) Interface Card : This card along with associated hardware and software shall be capable of interfacing the drive to (i) external PLC, (ii) personal computer for remote operation and performance monitoring and (iii) MODBUS / PROFIBUS / CAN OPEN connectivity.
- (i) The supplier may quote for each module separately so that the BHEL may decide about the configuration and spares for the drive.

- (j) - PRE DELIVERY INSPECTION shall be carried out by BHEL at the supplier's premises and the supplier shall provide necessary support for the training in testing the hardware and software.

5.0 General

The DSP based controller will be used for drive sequence control (Initialisation & self-test, Set-up, Prepare pre-charging, Shutdown, Protective turning –off, Isolation etc.), dc-link pre-charge control, three-level inverter PWM signal generation, inverter control, dynamic braking circuit control, monitoring of commands to the control units, diagnostics, protection etc. It is desirable that majority of control and monitoring functions are implemented by software so as to reduce hardware. **All electronic cards shall be housed in a suitable rack/ enclosure and suitably protected against EMI/EMC ,dust and moisture.** The bidder shall furnish the protection level and the arrangement. The electronics shall be tested for its functionality in a dusty and humid environment. The electronics and other equipment shall be suitably protected against mould or fungus growth.

5.1 DSP and associated hardware shall perform the task of fault diagnostics and display in addition to control task. The DSP and associated hardware shall be capable of monitoring the status of the drive. The DSP and associated hardware shall also take appropriate action and wherever necessary, shut down the drive.

5.2 The control philosophy for the induction motor shall be such as to Control Philosophy to achieve best suited results for industrial applications, like minimum device losses, high dynamic response, stable constant speed operation, dynamic braking control etc. Vector Control, Direct Self Control, Slip Frequency Control etc. are some of the popular control strategies used for induction motor drives. The supplier shall furnish the details of control strategy being adopted.

5.3 The DSP based controller shall have features for interfacing with external switchgear, voltage and current sensors, external PLC, transformer and motor protection relays etc with the necessary isolation provided in the controller.

5.4 The faults shall also be stored in the memory of the DSP based controller and it shall be possible to download the same by means of serial interface to personal computer. The various important parameters of the equipment as well as relevant data at the time of occurrence of the faults shall also be recorded with to enable proper fault analysis.

Adequate redundancy shall be built in the DSP based controller. It shall be possible to download the major diagnostic messages. The diagnostic messages of at least last 4 weeks shall be available in its memory. Pre and post fault parameter logging and downloading of same for fault analysis shall be provided.

5.5 It shall be possible for the BHEL to execute any modification through software or otherwise, if so required in future in order to improve/modify the performance of drive. Supplier shall supply all necessary software/hardware tools required for the purpose.

5.6 The system and equipment will represent proven latest technology specially adopted for application to meet the performance requirements under environmental conditions specified. Adequate margin shall be built in the design to take care of the high ambient temperatures, dusty condition, high humidity, etc. prevailing in India.

5.7 Modular constructions should be adopted, whenever considered possible, for achieving the above requirements. Easy access for inspection / maintenance and low maintenance requirement shall be given special consideration in design and layout. Tenderer shall confirm support for the components used in the controller for a minimum period of 10 years.

5.8 Wherever possible, redundancy can be provided for reliable operation of the induction motor drive.

5.9 Successful tenderer shall furnish all the relevant design details of control hardware and software, **for approval by BHEL**, before commencement of manufacture.

5.10 Reliability of MV induction motor drive is of paramount consideration. Tenderers shall submit reliability calculations indicating MTBF for different devices, cards sub-assemblies. Adequate margin shall be provided to take into account ambient conditions prevailing in India.

5.11 The control software along with the application software and development tools shall be proven before dispatch to BHEL.

5.12 The successful tenderer shall provide technical support, if necessary, to carry out relevant modifications in the software during the integrated testing and commissioning of the drive system in BHEL.

6.0 Climatic & Environmental Conditions

6.1 Operating Temperature : **0 - 50 Deg C**

6.2 Humidity: Upto 90 % during rainy season.

6.3 Altitude: Upto 1000 m above mean sea level.

6.4 Operating Environment: The drives are normally required to operate in industrial and power stations. The equipment may be required to operate in coastal area where severe environmental parameters like (a) Maximum pH value : 8.5, (b) Sulphate : 7 mg per liter, (c) Max. concentration of chlorine: 6 mg per liter, (d) Maximum conductivity: 130 micro siemens /cm.

6.5 Electromagnetic Pollution : Normally, high degree of electromagnetic pollution is expected in the power stations, where the equipment will be mounted. Necessary precaution may be taken in this regard.

7.0 Tests on DSP Control Hardware

DSP control hardware shall be tested as per IEC standards applicable both for type and routine tests. The supplier may indicate the details of tests that will be conducted on the equipment

7.1 Burn in test -- The cards used on the equipment will be subjected to burn-in test. The cards will be kept energized during the test. Functional test of each card will be carried out after the burn in test. (Pl. refer Clause 10.2.13 of IEC 60571). This will be part of internal test by manufacturer, whose results will be submitted during routine test.

7.2 Damp heat test – Function test of each card will be carried out after the damp heat test.

8.0 Documentation

8.1 Following documents shall be submitted along with the offer for evaluation:

- ❖ Schematic circuit
- ❖ Functional description
- ❖ Mechanical interface diagram (Outline General Arrangement)
- ❖ Clause-by-clause compliance
- ❖ Credentials with details of supply made of such items world wide.
- ❖ Data sheets for devices and other equipment proposed
- ❖ Salient features and advantages of the offered system
- ❖ Recommended list of spares with cost for 3 year maintenance after warranty

- ❖ List of special tools, jigs and fixtures needed for assembly, testing, commissioning, maintenance and repair.
- ❖ Logistics proposed for warranty support.

8.2 Following documents shall be submitted by the successful tenderer after award of contract.

- ❖ Technical documentation explaining the complete scheme, characteristics, diagnostics, protection and control etc.
- ❖ Detailed drawings of each system/sub-system with interface details.
- ❖ Vendor list for sub-systems
- ❖ Procedure for parameter alteration, software downloading, diagnostic uploading, analysis etc.
- ❖ Maintenance, trouble shooting and repair manual and spare catalogue

9.0 Training and Technical Support

(a) Technical support and training offered should cover familiarisation with equipment, its installation, commissioning, trouble shooting, software support for medium voltage induction motor drive, support for adoption of control H/W for traction converter control, maintenance and repair requirements etc.

(b) Long term support proposed by the tenderer for series manufacture in case BHEL decides to adopt the scheme on a regular basis.

10.0 Infringement of patent rights:

BHEL shall not be responsible for infringement of patent rights arising due to similarity in design, manufacturing process, components used in design, development and manufacturing of inverter and any other factor which may be cause such dispute. The responsibility to settle any issue lies with the manufacturer.

11.0 Warranty

The supplier shall warrant that everything to be furnished under the contract shall be free from defects and faults in design, material, workmanship and manufacture and shall be of the highest grade and consistent with the established and generally accepted standards for materials of the type ordered and in full conformity with the contract and samples, if any, and shall, if operable, operate properly according to the contract for a period of 18 months from date of commissioning.

The supplier shall immediately on receipt of notice of defect depute his engineer to start action for rectification of defects under warranty. In the eventuality of major design modifications during the currency of the warranty period, the warranty for such components shall be extended for such period as is mutually agreed upon.



BHARAT HEAVY ELECTRICALS LIMITED

CORPORATE R&D DIVISION, VIKAS NAGAR, HYDERABAD – 500 093, AP, India

Ph: 0091-40 – 23778474, FAX: 0091-40 – 23770698

General Terms and Conditions of Enquiry & Contract for the Purchase of Goods/ Services

1. The quotation and any order resulting from this enquiry shall be governed by these General Terms and Conditions of enquiry and contract for the supply of goods and the supplier quoting against this enquiry shall, unless specifically stipulates any different terms or conditions, be deemed to have read and agreed to the same.
2. Sealed quotations in double cover with tenderer's distinctive seal, superscribing enquiry number, date and due date are to be submitted so as to reach on or before due date & time, addressed to **Additional General Manager(MM), Bharat Heavy Electricals Limited, Corporate Research & Development Division, Vikasnagar, Hyderabad, Andhra Pradesh, India – PIN-500 093, India.**

In the case of **Two-part bid**, each inner cover shall clearly be labeled as a) **Technical & Commercial Bid** containing technical data/ drawings/ catalogues/ quality plans along with commercial terms and conditions & copy of the price bid with the price columns left blank (unpriced price bid), b) **Price bid** containing prices quotes. Installation and/or Commissioning charges shall be spelt out in absolutely lucid terms, taking into account total charges, rather than quoting vaguely, such as charges per man-day or charges per engineer per day etc. **If the price bid was found later to be different from the unpriced price bid in any way, the offer will be rejected summarily.**

3. **Tender/ Technical bid Opening:** Unless specified otherwise, tenders/ technical bids will be opened on appointed date and time as mentioned in the enquiry or as communicated changed date/time, if any, in the presence of such of those tenderers who may be present.
4. **Delayed/ Late Tender:** Tenders, which have been posted by registered post through the postal department in time before opening date but received after tender opening, shall be treated as regular tenders. Other tenders received after tender opening time shall be treated as late tenders and normally they may be rejected.
5. The Quotation should be free from overwriting and erasures. Corrections and additions, if any, must be attested. Supplier should indicate in the quotation dimensions (Size), weight, rate etc., in the metric system unless the enquiry calls for different unit.
6. **Validity of Quotation:** All quotations shall be kept open for acceptance for a period of ninety days from the date of opening of Tenders/ Technical bid and this shall be deemed to be an express condition of all quotations. The rate shall be quoted in both figures and in words.
7. In the case of Two-part bid, the vendor should furnish technical 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.
8. **Revision of Pricebid:** In the event of any bidder, after finalizing the technical specifications and scope of supply, opting to revise and submit their latest price bid, then BHEL reserves the right to open their original / previous price bid also while evaluating revised bid.
9. **Pricebid Opening:** Unless specified otherwise in the enquiry, the Price bids of technically qualified vendors shall be opened with prior intimation in the presence of such of those tenderers who may be present.
10. **Conformity to Specifications:** The material should be of the best quality and shall be conforming to our specification given in our enquiry. Unless otherwise agreed upon by BHEL, no payment shall be due by BHEL in respect of any sample. Offers without details of specifications/ applicable catalogues will not be considered and are liable to be rejected.
11. **Terms of Delivery:** All suppliers shall quote the lowest prices on ex-works and FOB/FCA basis. Foreign suppliers will also indicate their Indian agent's name and address with percentage of agency commission out of the quoted price, if any. Name and Address of the supplier's Bankers address should also be given. Indian suppliers for the indigenously manufactured/ imported stock shall quote on Ex-works /Free-on-Rail/Road /FOR-destination basis, indicating packing & forwarding charges, if any, separately.
12. **Taxes and Duties:** Unless specified otherwise in the enquiry, BHEL do not provide "C" or "D" Form as it is engaged in R&D. All Indian suppliers shall clearly mention 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. It will be paid

only if Registration Number under State(TIN)/ Central Sales Tax or Service Tax is specifically mentioned in the Bill/Invoice. Vendors without a Sales Tax/VAT registration and applicable Service Tax registration will not be considered.

13. **Insurance:** Insurance will be arranged by BHEL in case of Ex-Works as well as FOB basis supplies.
14. **Terms of Payment:** Full payment will be made within 30 days after receipt, inspection and acceptance of the material (and where involved, Erection and commissioning of the material/ equipment at BHEL/Destination) by Crossed cheque and no Bank commission charges are admissible. The Cheque will be sent by registered post and BHEL is in no way responsible if loss occurs due to delay by postal authorities and cheques falling into improper hands or through forgery or fraud. Suppliers having RBI-SEFT-enabled accounts can seek payment through Electronic Fund transfer. For foreign suppliers, the preferred payment term will be on Sight Draft basis and bank charges inside India will be to BHEL account and outside India will be to supplier's account.
15. Suppliers shall quote competitive price and best delivery for all the items mentioned in the enquiry. BHEL reserves the right to reject partial quotations and to place order on overall landed cost basis. Correct date of effecting supplies in the event of an order should be indicated in the offer. If the supplier's quoted terms are different from BHEL standard payment terms, interest @10.5% per annum (or as indicated in the enquiry) will be loaded to the quoted prices for difference of payment period.
16. **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 and indicate packing charges, if any, separately.
17. **Part/ Split Ordering:** BHEL reserves right to Order part of the item/ quantity of the enquiry and split the order among qualified vendors.
18. In case the goods enquired are on Rate Contract basis with any other unit of BHEL, such fact should be clearly indicated in the quotation giving full particulars of Rate Contract number, validity and price and also your willingness to comply with order if placed against such Rate Contract. A true copy of Rate contract signed by the supplier should be sent with the quotation.
19. **Inspection:** On receipt, the goods shall be subjected to inspection and also test, if necessary, and our decision regarding the acceptability of the goods shall be final and binding on the suppliers.
20. **Consequences of Failure To Deliver:** The time stipulated for delivery of goods shall be deemed to be the essence of the contract and delivery must be completed within the stipulated date/s. In the event of supplier's failure to supply the goods by the stipulated date/s, BHEL shall be entitled to levy a penalty of ½% per week for the delayed no of weeks or part thereof for the undelivered portion of PO subject to a maximum of 10% total order value.
21. **Withdrawal from the Contract:** 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 incidental to the breach of contract on the part of the supplier.
22. **Guarantee/ Warranty certificate and Manufacturer's Test report:** Invariably in all cases where it is so stipulated, the supplier should furnish Guarantee/ Warranty certificate valid for a period of 18 months from date of supply or 1 year from the date of receipt, acceptance and commissioning(or more, if provide by oem) whichever earlier and manufacturer's Test report along with the goods, failing which, BHEL shall have the right to reject the goods.
23. All ferrous/ non-ferrous items shall be colour coded as per bureau of Indian standards/ or IS standards/ BHEL Standards.
24. **Recovery of Dues:** BHEL shall recover any amount due from the supplier or any amount outstanding to the credit of the supplier with BHEL R&D unit or any other BHEL unit(s) and/or by legal action.
25. **Arbitration & Forum for Legal Proceedings:** All disputes arising in connection with indigenous/ foreign supplies shall be settled through arbitration held at Hyderabad, AP, India and arbitration shall be appointed by Arbitration Tribunal of the Federation of Andhra Pradesh Chambers of Commerce and Industry, Hyderabad, AP, India. The Courts at Secunderabad/ Hyderabad, AP, India shall have jurisdiction in respect of any suit or other legal proceeding arising from or relating to this contract

The rights and remedies of BHEL stated in these General terms and conditions shall be in addition and supplemental to its rights and remedies under law and custom or usage of trade or business and shall in no way be deemed to limit, curtail, supercede or derogate from its said rights and remedies.



ANNEXURE “AA
BHARAT HEAVY ELECTRICALS LIMITED
CORPORATE RESEARCH & DEVELOPMENT DIVISION
VIKASNAGAR, HYDERABAD – 500 093. INDIA

MATERIALS MANAGEMENT DEPARTMENT
(Information for Technical & Commercial bids with general terms)

ENCLOSURE TO ENQ No:

DATE:

- a) Please indicate(_/) for applicable or (X) for not applicable against each clause of the enquiry
- b) Vendor shall confirm their compliance for applicable clauses (_/) in their offer without deviation.

1) Technical offer:-

- a) Vendors to confirm compliance to all points of specifications, attached if any. Deviations if any should be specified in the offer.
- b) Vendors shall furnish relevant technical Documents / Catalogues. Drawings and Quality plan duly taking care of Purchase Specification and Quality requirements along with their offer in duplicate for Purchaser’s review / Verification.

2) Two Part Bid:-

Vendor shall submit their offer in 2 parts.

2.1 Technical Bid:- Containing relevant technical data, drawings, catalogues, Quality Plan etc, along with Commercial Terms and Conditions and a copy of the price bid with the price columns left blank (unpriced price bid). If the price bid was found later to be different from the unpriced price bid in any way, the offer will be rejected.

2.2 Price Bid:- Containing the Price(s) quoted. Installation and or commissioning charges shall be spelt out in absolutely lucid terms taking into account the total charges rather than quoting vaguely such as charges as per man day or charges per Engineer per day etc.,

Technical bids will be opened on the due date of the enquiry or any other date fixed by BHEL. Further, vendor should furnish clarifications, if any, required within seven days after the same is sought by Purchaser. If no clarifications/reply received within 7 days, it will be construed that vendor is not interested in the tender and Purchaser will finalise tender accordingly. Price bids received on due date along with technical offers will be recorded and opened subsequently with due intimation to vendors after finalising of technical scope of supply.

These bids shall be submitted in separate sealed covers superscribing the nature of the offer (technical bid or price bid). BHEL Enq No. Due date etc.

Note: In case of non-compliance with the TWO_-PART-BID ie.. clause number 2 and subclauses 2.1 and 2.2. Purchaser reserves the right to summarily reject all such offers.

3) Delivery:-

Vendor shall confirm supply of materials as per the delivery schedule indicated in the enquiry.

4) Negotiations:-

Vendor shall quote competitive price and best delivery to avoid negotiations.

5) Commercial Terms & Conditions:-

Terms of Delivery:

- a) **Vendors shall clearly indicate terms of delivery Viz: Ex-Works/FOR Despatching station/FOR Despatching station FOR Destination/FOB port of loading/FAS Port of loading in their offer. If the terms of delivery is Ex-Works, then vendors shall clearly indicate the following:**
 - 1. Packing and forwarding charges.**
 - 2. Documentation / Handling charges if any**
 - 3. FOB FAS charges (Inland Freight & Insurance charges from vendor works to port of Loading).**
- b) **All Indian Vendors shall clearly specify the Excise Duty in percentage applicable for their supplies. Offers containing expressions such as “Extra as applicable” or “As applicable at the time of Delivery” will be summarily rejected.**
- c) **CST/Local Sales Tax in percentage shall be clearly indicated.**

6) Validity of Quotation:-

Validity of offer should be 90 days after the opening of price bid.

7) Part or split ordering:-

Purchaser reserves the right to order part of item / quantity of the enquiry.

8) For clauses not mentioned in this document see the enclosed “GENERAL TERMS AND CONDITIONS OF ENQUIRY AND CONTRACT FOR THE PURCHASE OF GOODS”

- 9) In case your terms of payment are different from our standard payment terms, interest at the rate of 10.5% per annum (or BHEL’s standard rate of interest) will be loaded to your prices for the difference of period of payment.**



BHARAT HEAVY ELECTRICALS LIMITED
CORPORATE R&D Division
Vikasnagar, Hyderabad – 500093, India.

Suppliers' compliance statement to basic conditions of enquiry

(In case Order to be placed on Indian supplier in Indian currency)

Condition	BHEL R& D's terms	Supplier's compliance (indicate Yes/No. if 'No', state terms desired)
1) Validity of offer	90 days from the tender opening date	
2) Delivery requirements	Free delivery at our stores or FOR destination (as indicated in the enquiry)	
3) Warranty	Unless specifically mentioned in the enquiry, all supplied items to be provided with warrantee for one year (or more, if provided by the OEM) from the date of acceptance/commissioning. In case of equipment involving erection and commissioning, warrantee shall be for 18 months from the date of dispatch or 12 months from the date of commissioning, whichever is earlier	
4) Terms of payment	Full payment will be made within thirty days after receipt, inspection and acceptance of the material at BHEL R&D (and where involved, erection and commissioning of the material/equipment at BHEL/destination), by Crossed Cheque and no Bank commission charges are admissible.	
5) Taxes & Duties	Unless specifically mentioned in the enquiry, we do not provide 'C' or 'D' form. Supplier to specify rates of taxes and duties element wise and related percentages.	
6) Penalty for late delivery	0.5% per week beyond the delivery date as mentioned in the Purchase order on undelivered portion subject to a maximum of 10% of the total order value	

* BHEL R&D reserves the right to reject any offer due to non-compliance with the above conditions and/or non-receipt of this form in duly filled condition

* Any other elements of cost in addition to the above may please be specified in detail

(Signature and Stamp/Seal of Vendor)



BHARAT HEAVY ELECTRICALS LIMITED
CORPORATE R&D Division
Vikasnagar, Hyderabad – 500093.

IMPORTED

Suppliers' compliance statement to basic conditions of enquiry

(In case Order to be placed on the Principal and foreign currency)

Condition	BHEL R& D's terms	Supplier's compliance (indicate Yes/No. if 'No', state terms desired)
01) Validity of offer	90 days from the tender opening date (or as per enquiry)	
02) Delivery requirements	FCA – Nearest International Airport (or as indicated in the enquiry)	
03) Warranty	Unless specifically mentioned in the enquiry, all supplied items to be provided with warrantee for one year (or more, if provided by the OEM) from the date of acceptance/ commissioning. In case of equipment involving erection and commissioning, warrantee shall be for 18 months from the date of dispatch or 12 months from the date of commissioning, whichever is earlier	
04) Terms of payment	Sight draft. All bank charges inside India will be to BHEL R&D account and out side India will be to suppliers account. Documents through State Bank of India, HAL Complex, Balanagar, Hyderabad, AP, India-500 042.	
05) Agency commission	Pl specify percentage charges, if any. Indian agency/agent commission will be in Indian Currency only.	
06) Erection/ Commission	As per enquiry	
07) Documentation	As per enquiry	
08) Insurance	BHEL will arrange Insurance based on intimation to our Insurance agency, United India Insurance Co., DO-2, Secunderabad, AP, India.	
09) Penalty for late delivery	0.5% per week beyond the delivery date as mentioned in the Purchase order on undelivered portion subject to a maximum of 10% of the total order value	

* BHEL R&D reserves the right to reject any offer due to non-compliance with the above conditions and/or non-receipt of this form in duly filled condition

* Any other elements of cost in addition to the above may please be specified in detail

(Signature and Stamp/ Seal of Vendor)



BHARAT HEAVY ELECTRICALS LTD.
Corp. R&D DIVISION
VIKAS NAGAR,
HYDERABAD-500 093 (INDIA)

VENDOR REGISTRATION FORM

[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 & 1.2 Name and address of the vender:

Phone Nos.:

Fax No.:

Email:

1.4 Local representative of the vender in India/ Hyderabad:

Phone Nos.:

Fax No.:

Email:

Contact person:

Mobile No.:

2.0 & 2.1 Type of Organisation:

PROPRIETORSHIP	COMPANY	SISTER CONCERN	ANY OTHER (Please specify)
PARTNERSHIP	CORPORATION	Small Scale Industry	

3.0 Annual Turn Over:

Name and address of the Banker:

Sr.No.	Bank	Address

4.0 REGISTRATION PARTICULARS

4.1 IT Permanent Account No.(PAN):

4.2 & 4.3 State and central sales tax Registration No.:

4.4 ED/ Service Tax Registration No.:

PF Account No.:

Labour Licence No.:

ESI Account No.:

5.2 Contact person:

Mobile No. :

5.3 Total Number of employees:

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

6.0 Wish to register for supplies/ services other than one bidding for :

<u>Sr.No.</u>	<u>Service/Supplies</u>	<u>Capacity</u>
<u>1</u>		
<u>2</u>		
<u>3</u>		
<u>4</u>		
<u>5</u>		
<u>6</u>		
<u>7</u>		

6.1 Reference list :

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

<u>Sr.No.</u>	<u>Customer</u>	<u>Volume / Year</u>
<u>1</u>		
<u>2</u>		
<u>3</u>		
<u>4</u>		
<u>5</u>		
<u>6</u>		
<u>7</u>		

7.0 & 8.0 Infrastructure / facilities :

<u>Sr.No.</u>	<u>Facility (with specifications)</u>	<u>Age/ Year procured</u>
<u>1</u>		
<u>2</u>		
<u>3</u>		
<u>4</u>		
<u>5</u>		
<u>6</u>		
<u>7</u>		
<u>8</u>		
<u>9</u>		
<u>10</u>		

9.0 Registration with other BHEL Unit/Units:

<u>Sr.No.</u>	<u>9.1.1 Unit</u>	<u>9.1.2 Registration No.</u>
<u>1</u>		
<u>2</u>		
<u>3</u>		
<u>4</u>		

Any Other information :

Declaration:

The information furnished above is true and authentic.

(CEO / Proprietor)

SEAL:

Date:

The competent authority reserves the right to accept or reject the registration. Registered vendors will be informed by mail / email, as convenient. Contact Sr.DGM (MM) for clarification/ additional information on registration.
A separate communication will be sent to you in case of non-registration, citing reasons thereof.

Instructions

1. Answer all items, use NA for items not applicable.
2. BHEL units do not require this registration.
3. Submit the form in duplicate.
4. Use additional sheets for want of space if required.
5. Attach copies of latest documents in respect of items 4.0 (Registration no.s)
6. Photographs of registered office and the chief executive/proprietor shall be furnished.
7. Use A4 sheets for this document and the enclosures.

* REGISTERED BIDDERS, HAVING BHEL (R&D) REGISTRATION NO./ HAVE SUBMITTED THIS FORMAT EARLIER, NEED NOT FURNISH THIS INFORMATION SECOND TIME (UNLESS DESIRE TO UPDATE IT).



BHEL CORPORATE R & D
VIKAS NAGAR- HYDERABAD - 500 093
ANDHRA PRADESH – 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

NOTE: PLEASE ATTACH SEPARATE SHEETS, IF SPACE FOUND IS INADEQUATE

AUTHORISED SIGNATORY



BHEL CORPORATE R & D
VIKAS NAGAR – HYDERABAD – 500 093
ANDHRA PRADESH – INDIA

SUPPLIER REGISTRATION FORM

(FOREIGN SUPPLIER)

- 1.6 CONTACT PERSON(S)
FOR PRODUCT OFFERED
NAME(S)
OFFICIAL CAPACITY
ADDRESS:
TELEPHONE
FAX
E-MAIL
- 1.7 YEAR OF ESTABLISHMENT
- 1.8 PRODUCTION CAPACITY PER ANNUM
- 1.9 PARTICULARS OF PRODUCT INCLUDING
SPECIFICATION AND RANGE OFFERED
FOR REGISTRATION
(ATTACH BROCHERS AND CATALOGUE)
- 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 AUTHORISATION LETTER
- 1.15 ANY OTHER INFORMATION:

AUTHORISED SIGNATORY



BHEL CORPORATE R & D
VIKAS NAGAR – HYDERABAD – 500 093
ANDHRA PRADESH – INDIA

SUPPLIER REGISTRATION FORM

(FOREIGN SUPPLIER)

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 BROUCHERS, CATALOGUES, TECHNICAL
LITERATURE etc...

6.0 ANY OTHER INFORMATION

SIGNATURE OF SUPPLIER
NAME
DESIGNATION
DATE
.....OFFICIAL SEAL

AUTHORISED SIGNATORY
