

निविदा / Enquiry



भारत हेवी इलेक्ट्रिकल्स लिमिटेड
Bharat Heavy Electricals Limited
 पारेषण व्यापार समूह / Transmission Business Group
 सामग्री प्रबंधन / Materials Management

Project : NHPC PARBATI- III

Enquiry No	Enquiry Dt	Rev No	Rev Dt	PI No	Enquiry Type	Inspection by	Due Dt	Commercial Comments	Technical Comments	Signing Authority
09Q2000110	21-Aug-19	0		09I2000097	Package		03-Sep-19	BHEL NIT TERMS AND CONDITION ARE APPLICABLE	TECHNICAL SPECIFICATION IS APPLICABLE	BHAGCHAND KUMAWAT

Document Enclosed

SN	Equipment	HSN Code	Phy Unit	Qty	Plan Dt	Comments
1	SUPPLY- CLAMPS & CONNECTORS : 420KV 40KA FOR 1S 3150A CABLE- SEALING-END CONNECTOR SUITABLE FOR QUAD MOOSE	0	NO	3.0000		
2	SUPPLY- CLAMPS & CONNECTORS : 420KV CVT CONNECTOR SUITABLE FOR AL TUBE 4 INCH IPS, RIGID TYPE	0	NO	3.0000		
3	SUPPLY- CLAMPS & CONNECTORS : 420KV BPI CONNECTOR SUITABLE FOR AL TUBE 4 INCH IPS, RIGID/SLIDING THROUGH TYPE	0	NO	3.0000		
4	SUPPLY- CLAMPS & CONNECTORS : 420KV 40KA FOR 1S 3150A TEE CONNECTOR SUITABLE FOR AL TUBE 4 INCH IPS TO QUAD CONDUCTOR AS PER TS	0	NO	3.0000		
5	SUPPLY- CLAMPS & CONNECTORS : 420KV 40KA FOR 1S 3150A TEE CONNECTOR SUITABLE FOR QUAD MOOSE TO TWIN CONDUCTOR AS PER TS	0	NO	3.0000		
6	SUPPLY- CLAMPS & CONNECTORS : 420KV 40KA FOR 1S 3150A PG CLAMP SUITABLE FOR QUAD MOOSE TO QUAD CONDUCTOR	0	NO	3.0000		
7	SUPPLY- CLAMPS & CONNECTORS : 420KV 40KA FOR 1S 3150A RIGID SPACER SUITABLE FOR QUAD MOOSE	0	NO	3.0000		
8	SUPPLY- CLAMPS & CONNECTORS : 420KV 40KA FOR 1S 3150A RIGID SPACER SUITABLE FOR TWIN MOOSE	0	NO	3.0000		
9	CLAMPS & CONNECTORS PG CLAMP FOR SHIELD WIRES OF DIA 10.98MM	0	NO	3.0000		
10	SUPPLY- CLAMPS & CONNECTORS : STRAIN CLAMP FOR SHIELD WIRE 10.98MM DIA	0	NO	3.0000		
11	CLAMPS & CONNECTORS CLAMPS FOR 75X12MM EARTHING STRIP ON LATTICE/PIPE STRUCTURE	0	NO	3.0000		
12	SUPPLY- CLAMPS & CONNECTORS : CLAMPS FOR 50X6MM EARTHING STRIP ON LATTICE/PIPE STRUCTURE	0	NO	3.0000		
13	CLAMPS & CONNECTORS CLAMP FOR 10.98MM DIA SHIELD WIRE ON LATTICE / PIPE STRUCTURE	0	NO	3.0000		
14	CLAMPS & CONNECTORS PAD CONNECTOR TO SUIT 10.98MM DIA GS WIRE AND 75X12 MM GS FLAT	0	NO	3.0000		
15	SUPPLY- CLAMPS & CONNECTORS : 420KV 40KA FOR 1S 3150A TEE CONNECTOR SUITABLE FOR QUAD MOOSE TO QUAD CONDUCTOR AS PER TS	0	NO	3.0000		

You are requested to submit your most competitive offer so as to reach us positively by the tender opening date & time. THE TENDERS NOT RECEIVED WITHIN SCHEDULED DATE AND TIME ARE LIKELY TO BE IGNORED. BHEL shall not be responsible for any postal delay.

In your own interest, you are advised to carefully read "the instructions to bidders". Incomplete bids and/or bids not complying with tender conditions shall be treated as non-responsive and are likely to be ignored.

In case Tender Documents are not received within 7 days of this E-mail message, intimate BHEL accordingly. If no intimation is received, it will be considered that you have received tender enquiry and delay in submission offer due to late receipt of tender documents will not be entertained.

You are requested to submit your most competitive offer as stated in Terms & conditions.

BHEL reserves the right to opt for reverse auction for obtaining best prices.

Offers Through E-MAIL / FAX / E-Procurement Portal:

WHOSOEVER DESIRES TO SEND OFFERS ON THEIR OWN RISK (COMPLETE IN ALL RESPECTS) VIA E-MAIL or FAX HAVE TO SEND THE OFFERS TO THE COMMON E-MAIL ADDRESS tenderbox@bhel.in or 0120-6748581 FAX or bhel.abc.procure.com as instructed.

THE RECEIVED EMAIL OFFERS WILL BE PRINTED BY PURCHASE COORDINATOR AND PUT THEM INTO COVERS AS PER CONVENTIONAL METHOD FOR TENDER OPENING I.E., TECHNO COMMERCIAL & PRICE OFFER SHALL BE PUT INTO TWO SEPARATE COVERS AND BOTH THE COVERS ARE KEPT IN THIRD COVER DULY SUPER SCRIBING ENQY. NO. AND DUE DATE.

OFFERS SENT TO ANY OTHER E-MAIL ID or FAX NO AND INCOMPLETE OFFERS SHALL NOT BE CONSIDERED FOR EVALUATION PURPOSE.

It is suggested that the bidders are advised to send the files with 'password protection'.

The venders who has sent offers with password, the passwords are to be forwarded to another email id: tenderbox@bhel.in

Please acknowledge the receipt of tender enquiry and fax back this letter by ticking the appropriate item below.

भारत हेवी इलेक्ट्रिकल्स लिमिटेड के लिए / for BHARAT HEAVY ELECTRICALS LTD

21-8-19
21.08.19

We acknowledge the receipt of tender.

- (a) The offer against subject enquiry shall be submitted by the scheduled date and time.
- (b) We regret to quote. The item in reference is out of our manufacturing range.
- (c) We regret because of our prior commitments.
- (d) Any other reason.

To
A K Chowdhary
Sr Dy General Manager
BHARAT HEAVY ELECTRICALS LIMITED
TRANSMISSION BUSINESS GROUP
TOWER-A, 5th Floor,
Advant Navis IT Business Park,
Plot No-7, Sector-142, Expressway Noida
Noida-201305
Distt. Gautam BudhNagar, U.P

हस्ताक्षर और निविदाकार की सील / Signature and
Seal of Tenderer

Ph: 0120-6748129
Fax: 0120-6748581

Enquiry No : 09Q2000110 Enquiry Dt : 21-Aug-19

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SPECIAL TERMS & CONDITIONS FOR CLAMPS & CONNECTORS FOR NHPC PARBATI-III PROJECT

Enquiry No:, Dated.....

1. In case any discrepancy between the requirements mentioned under special terms & conditions and general terms & conditions, special terms and conditions shall prevail.
2. For any technical clarification, kindly contact **Mrs. Deepali Sharma, AE (TBEM) / Mr. Vijay Kumar, Mgr (TBEM)**
BHEL, Transmission Business Group
Tower-A, 5th Floor, Advant Navis IT Business Park
Plot-7, Sector-142, Expressway Noida, Noida-201305, UP, India
Phone: +91 (0) 0120- 6748597/8537
Fax: +91 (0) 0120 – 6748580.
e-mail : deepali@bhel.in /vijaykumar@bhel.in
3. For any commercial clarification, kindly contact **Rajeev Kumar Roy, Manager (TBMM);**
BHEL, Transmission Business Group
Tower-A, 5th Floor, Advant Navis IT Business Park
Plot-7, Sector-142, Expressway Noida, Noida-201305, UP, India
Phone: +91 (0) 0120- 6748484
Fax: +91 (0) 0120 – 6748580.
Contact No. 0120 6748484; e-mail: rajeevroy@bhel.in.
4. **Bidder to submit offer directly through E-PROCUREMENT MODE ONLY.** Bidder may visit <https://bhel.abcprocure.com>. No other mode for submission of tender is acceptable. Note: Both bids (Techno-commercial Bid & Price Bid) will be opened immediate after receipt of offer.
5. **Proposed delivery plan: IMMEDIATE.** However, vendor has to examine their best possible delivery plan & mentioned in **ACTIVITY SCHEDULE** to meet the tender delivery requirement. In case, BHEL's delivery requirement is not met by vendor(s), then a chance may be given to all such vendors to review their quoted delivery schedule in line with BHEL's delivery requirement. However, if vendor fails to meet the requisite delivery plan, then BHEL reserves the right not to consider the offer of such vendor(s).
6. **Technical specification No:** BHEL technical specification no: TB-300-316-006, REV-01 is applicable. No permissible Technical Deviation has been envisaged.
7. **PERFORMANCE BG (Refer Clause no-7 of General Terms and condition):** NOT APPLICABLE.
8. **7. Clause No. 2.1 of general Terms & Conditions for tender Enquiry / Contract should be as follows:**

PRICES: A. all prices shall be FIRM & Ex-works price including packing & forwarding charges. No enhancement of rate for whatsoever reasons unless and until asked by BHEL shall be allowed.

PROJECT STATUS: Domestic in nature. GST is applicable as per prevalent law.

SPECIAL TERMS & CONDITIONS
FOR CLAMPS & CONNECTORS FOR NHPC PARBATI-III PROJECT
Enquiry No:, Dated.....

9. Clause No. 33 for Reverse Auction of NIT shall be as follows:

"BHEL reserves the right to go for Reverse Auction (RA) (Guidelines as available on www.bhel.com) instead of opening the sealed envelope price bid, submitted by the bidder. This will be decided after techno-commercial evaluation. Bidders to give their acceptance with the offer 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.

Those bidders who have given their acceptance to participate in Reverse Auction will have to necessarily submit 'Process compliance form' (to the designated service provider) as well as 'Online sealed bid' in the Reverse Auction. Non-submission of 'Process compliance form' or 'Online sealed bid' by the agreed bidder(s) will be considered as tampering of the tender process and will invite action by BHEL as per extant guidelines for suspension of business dealings with suppliers/ contractors (as available on www.bhel.com).

The bidders have to necessarily submit online sealed bid less than or equal to their envelope sealed price bid already submitted to BHEL along with the offer.

The envelope sealed price bid of successful L1 bidder in RA, if conducted, shall also be opened after RA and the order will be placed on lower of the two bids (RA closing price & envelope sealed price) thus obtained. The bidder having submitted this offer specifically agrees to this condition and undertakes to execute the contract on thus awarded rates.

If it is found that L1 bidder has quoted higher in online sealed bid in comparison to envelope sealed bid for any item(s), the bidder will be issued a warning letter to this effect. However, if the same bidder again defaults on this count in any subsequent tender in the unit, it will be considered as fraud and will invite action by BHEL as per extant guidelines for suspension of business dealings with suppliers/ contractors (as available on www.bhel.com)."

As a reminder to the bidders, system will flash following message (in RED Color) during the course of 'online sealed bid': *"Bidders to submit online sealed bid less than or equal to their envelope sealed bid already submitted to BHEL.*

In addition to above RA guidelines, bidder note that

(A) In case where RA is conducted successfully Reverse auction shall be conducted as per existing procedure of BHEL. Ranking of bids shall be based on final price fed by respective bidder (including H1 bidder) in reverse auction process. If L1 bid is from a 'Local Supplier', L-1 bidder may be considered for further award of work. No other Bidder shall be invited to match price of L-1 Bidder

If L1 bid is not from a 'Local Supplier', the lowest evaluated bidder among the 'Local Suppliers' based on the ranking of the price after RA, will be invited to match the L1 price provided 'Local Supplier's price is within the Margin of Purchase Preference i.e. +20% of L1 price. In case such local supplier agrees to match the price of L-1 Bidder, such local supplier may be considered for further award of work. In case such lowest eligible 'Local Supplier' fails to match the L1 price,

SPECIAL TERMS & CONDITIONS
FOR CLAMPS & CONNECTORS FOR NHPC PARBATI-III PROJECT
Enquiry No:, Dated.....

the eligible 'Local Supplier' with the next higher bid within the Margin of Purchase Preference (i.e 20% of L-1 Price) as above shall be invited to match the L1 price, and so on, and may be considered for award of work accordingly. In case none of the 'Local Suppliers' within the Margin of Purchase Preference (i.e 20% of L-1 price) matches the L1 price, then the L1 bidder may be considered for award of work.

(B) In case where RA is failed, Price bid shall be opened as per reverse auction procedure of BHEL and based on the same make in India policy shall be implemented.

10. **PRICE BID FORMAT:** Vendor to quote as per specified price format of NIT, otherwise their offer shall be liable to be rejected.
11. **IMPORTANT INSTRUCTION:**
 - Final acceptance of technical qualified vendor for placement of order is subject to customer approval.
 - Bidder who are not approved by customer, needs to submit complete credential for approval from CUSTOMER & placement of order is subject to approval of CUSTOMER.
 - All boxes / Containers are to be distinctly marked with boldly written "TBG" mark on it.
 - PO/LOI shall be placed to L1 bidder project wise. However evaluation shall be done based on overall quantity as per NIT.
12. **Promotion of MAKE IN INDIA:** For this procurement, Public Procurement (Preference to Make in India), Order 2017 dated 15.06.2017 & 28.05.2018 and subsequent orders issued by the respective nodal ministry shall be applicable even if issued after issue of this NIT but before finalization of contract/PO/WO against this NIT.

In the event of any Nodal Ministry prescribing higher or lower percentage of purchase preference and/ or local content in respect of this procurement, same shall be applicable. Preference to Make in India will be as per the Public Procurement (Preference to Make in India), Order 2017 available in the following link:

http://dipp.nic.in/sites/default/files/publicProcurement_MakeinIndia_15June2017.pdf
http://dipp.nic.in/sites/default/files/Revised-PPP-MII-Order-2017_28052018.pdf

For this procurement, Public Procurement (Preference to Make in India) Order, 2017" dated 15/06/2017 & 28/05/2018 and subsequent orders issued by respective nodal ministry shall be applicable even if issued after issue of this NIT but before finalization of contract /PO/WO against this NIT.

In the event of any nodal ministry prescribing higher and lower percentage of purchase preference and/ or local content in respect of this procurement, same shall be applicable.

Note: Bidder to submit FORMAT duly filled & signed and stamped by their authorized persons. It is mandatory against this NIT. **Minimum Local content is 91% (being Thermal/Hydro Package).**

SPECIAL TERMS & CONDITIONS
FOR CLAMPS & CONNECTORS FOR NHPC PARBATI-III PROJECT
Enquiry No:, Dated.....

13. Following confirmation to be provided by vendor:

“We confirm that we have quoted as per specified price format provided along with this tender”.

Note: BHEL reserves the right to cancel this enquiry at any point of time. Bids of only customer approved vendors will be processed.

NAME AND SEAL OF TENDERER

Item Name :	CLAMPS & CONNECTROS
Enquiry No. :	
Project :	NHPC PARBATI-III
Type of project	Transmission / Thermal (Coal or Gas) / Hydro
Applicable percentage of Local Content	91 % (Minimum)

Format for Affidavit of Self certification regarding Minimum Local Content in line with PPP-MII order, 2017 if applicable, to be provided on a non-judicial stamp paper of Rs. 100/-.

Date: / /2019

I _____ S/o, _____ D/o, _____ W/o, _____ Resident of _____ hereby solemnly affirm and declare as under:

That I will agree to abide by the terms and conditions of the Public Procurement (Preference to Make in India) Order, 2017 (*hereinafter PPP-MII order*) of Government of India issued vide Notification No: P-45021/2/2017 -BE-II dated 15/06/2017, its revision dated 28/05/2018 and any subsequent modifications/Amendments, if any and

That the information furnished hereinafter is correct to the best of my knowledge and belief and I undertake to produce relevant records before the procuring entity/BHEL or any other Government authority for the purpose of assessing the local content of goods/services/works supplied by me for (*Enter the name of the Equipment/Item for Project*).

That the local content for all inputs which constitute the said goods/services/works has been verified by me and I am responsible for the correctness of the claims made therein.

That the goods/services/works supplied by me for (*Enter the name of the Equipment/Item for Project*) meets the 'Minimum Local Content' as defined in the PPP-MII order.

That the value addition for the purpose of meeting the 'Minimum Local Content' has been made by me at (*Enter the details of the location(s) at which value addition is made*).

That in the event of the local content of the goods/services/works mentioned herein is found to be incorrect and not meeting the prescribed Minimum Local Content criteria, based on the assessment of procuring agency (ies)/BHEL/Government Authorities for the purpose of assessing the local content, action shall be taken against me in line with the PPP-MII order and provisions of the Integrity pact/ Bidding Documents.

I agree to maintain the following information in the Company's record for a period of 8 years and shall make this available for verification to any statutory authority.

X _____



- i. Name and details of the Local Supplier
(Registered Office, Manufacturing unit location, nature of legal entity)
- ii. Date on which this certificate is issued
- iii. Goods/services/works for which the certificate is produced
- iv. Procuring entity to whom the certificate is furnished
- v. Percentage of local content claimed and whether it meets the Minimum Local Content prescribed
- vi. Name and contact details of the unit of the Local Supplier (s)
- vii. Sale Price of the product
- viii. Ex-Factory Price of the product
- ix. Freight, insurance and handling
- x. Total Bill of Material
- xi. List and total cost value of input used to manufacture the Goods/to provide services/in construction of works
- xii. List and total cost of input which are domestically sourced. Value addition certificates from suppliers, if the input is not in-house to be attached
- xiii. List and cost of inputs which are imported, directly or indirectly

For and on behalf of..... (Name of firm/entity)

Authorized signatory (To be duly authorized by the Board of Directors)

<Insert Name, Designation and Contact No.>

**BHARAT HEAVY ELECTRICALS LTD.
(TRANSMISSION BUSINESS GROUP)**

GENERAL TERMS AND CONDITIONS FOR TENDER ENQUIRY / CONTRACT

This is to be submitted duly signed by bidder in original. Clause-wise deviations and / or additional conditions / clarifications, if any, are to be brought out clearly in "Schedule of Commercial Deviation". Deviations and / or additional conditions / clarifications, if any, mentioned elsewhere in the bid / offer, shall not be considered.

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1.	INSTRUCTION TO BIDDERS : 1.1 Sealed bids are invited for the items mentioned in the tender enquiry conforming to the NIT including Technical Specifications. Bids should be typed and free from overwriting and erasures. Corrections or additions / deletions, if any, must be clearly written and attested, otherwise offer may be rejected. 1.2 Bidder must ensure that their bid is submitted / dropped in the tender box on or before 14-00 Hrs. IST on the due date of opening, unless otherwise specified in the NIT, at the address as follows :- Tender Box, Materials Management, Transmission Business Group, Bharat Heavy Electricals Limited, 5th Floor, Tower-A, Advant Navis IT Business Park, Plot-7, Sector-142, Noida Expressway, Noida, Dist. G. B. Nagar, U. P. – 201305 1.3 In case tender enquiry is floated through the e-procurement system, offer / bid has to be submitted through the e-procurement system ONLY as per instructions given in the e-procurement portal (https://bheleps.buyjunction.in). 1.4 The bids shall be opened at 14-30 Hrs. IST on the due date of opening, in the presence of participating bidders who may like to be present, unless otherwise specified in the NIT. Bids received late are liable for rejection. Bidders sending bids by courier or post will have to ensure that it is timely delivered at the above address. 1.5 Bids are to be submitted duly signed with seal in two parts :- a) Techno-commercial Bid (Part-I) – To be submitted in 2 sets (original + copy). A copy of Price Bid (Part-II) clearly mentioning all the necessary information as per format without prices "Un-Priced Bid" is also to be enclosed in Part-I Bid. b) Price Bid (Part-II) – To be submitted only in one set in a separate sealed envelope. This should not contain any Technical and / or Commercial Terms and Conditions. The rates should be quoted both in figures and words. 1.6 The Part-I and Part-II Bids are to be sealed in separate envelopes and

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	marked as "Techno-commercial Bid (Part-I)" and "Price Bid (Part-II)" respectively. Both the envelopes are to be kept in another common envelope and marked as "BID". Each envelope should be sealed and superscribed with tender enquiry no., item / package name, project name and due date of opening. Bidder's name and address shall also be mentioned on each envelope. 1.7 For any technical clarification, please contact official mentioned in the tender enquiry / NIT. 1.8 For any commercial clarification please contact official issuing tender enquiry / NIT. 1.9 Price bid (Part-II) should not contain any additional information / description other than given in "Un-Priced Bid" submitted with "Techno-commercial Bid (Part-I)" except prices, otherwise bid is liable for rejection. 1.10 Price Bid submitted along with the bid shall remain valid up to validity of offer. Any discount / revised offer submitted by the bidder on its own shall be accepted provided it is received before the due date and time of offer submission (i.e. Part-I Bid). The discount shall be applied on pro-rata basis to all items including optional items, if any, unless specified otherwise by the bidder. Discount offered shall be valid for full duration of validity of the offer including extension of validity, if any. Unsolicited Supplementary / Revised Price Bid submitted after the due date and time of offer submission (i.e. Part-I Bid), during validity period of offer, unless asked by BHEL, shall not be considered. Withdrawal of quotation by the bidder, at any stage after its opening, may entail suitable action against such bidder by BHEL. 1.11 The consultants / firm (and any of its affiliates) shall not be eligible to participate against tender enquiry for the related goods or works or services for the same project, if they were engaged by BHEL-TBG for the consultancy services. 1.12 In case any Foreign OEM / Foreign Principal insists on engaging the services of an agent, such agent shall not be allowed to represent more than one manufacturer / supplier in the same tender. Moreover, either the agent could bid on behalf of the manufacturer / supplier or the manufacturer / supplier could bid directly but not both. In case bids are received from the manufacturer / supplier and the agent, bid received from the agent shall be ignored. 1.13 Non-conformities / errors / discrepancies in quoted prices in price bids shall be dealt as follows :- 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 BHEL 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. 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.

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	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 to (a) and (b) above. d) If there is such discrepancy in an offer as mentioned in (a), (b) & (c) above, 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 BHEL, the bid is liable to be ignored. 1.14 In case the scope of the successful bidder / supplier against this tender enquiry includes Erection, Testing and Commissioning (ETC) of the equipment / material at site in addition to Supply, Purchase Order shall be placed for Supply Portion and Contract shall be separately awarded for ETC at Site Portion. General Terms and Conditions for Tender Enquiry / Contract mentioned herein shall be applicable for both Supply & ETC at Site. Additional Terms and Conditions for Tender Enquiry / Contract for Erection, Testing and Commissioning at Site "BHEL/TBG/GTC-ETC/2016 REV01" shall be applicable for ETC at Site only which is to be read in conjunction with General Terms and Conditions for Tender Enquiry / Contract mentioned herein. However, any breach of either the Purchase Order or the Contract shall be deemed to be breach of the other. 1.15 Taxes and Duties payable extra as per Clause No. 2.3 in NIT, if not specified/quoted clearly as extra shall be considered as included in Ex-works Price and therefore shall not be reimbursed. Taxes and duties not payable extra as per NIT shall be deemed to be included in Ex-works Price. 1.16 If the rates for taxes and duties in respect of the quoted materials and / or services assumed by the Supplier are less than the tariff prevailing at the time of tendering, Supplier will be responsible for such under quotations. However if the rates assumed are higher than the correct rates prevailing at the time tendering, the difference will be to the credit of BHEL. Note : Representative / official deputed by the bidder to witness tender opening must produce authorization letter for the same.
2.	PRICES : 2.1 Unless specifically indicated in the NIT, all prices shall be FIRM. No enhancement of rate for whatsoever reasons unless and until asked by BHEL shall be allowed. 2.2 Unless specifically indicated in the NIT, the prices shall be on INR basis. 2.3 Unless specifically indicated in the NIT, the prices are to be quoted on FOR (Site / Destination) basis excluding GST. The break-up of prices shall be as under :- a) Ex-works Price: Ex-works price including packing & forwarding charges.

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	b) Freight: Freight for door delivery up to destination / site / store are to be quoted separately. c) Insurance: Insurance for door delivery up to destination / site / store are to be quoted separately. d) Type Test Charges: If asked in the technical specification, it is to be quoted separately for each test. e) Charges for Supervision of Erection, Testing & Commissioning (ETC) at Site: To be quoted separately if specified in NIT/Price Schedule. f) Charges for Testing & Commissioning at Site: To be quoted separately if specified in NIT/Price Schedule. g) Charges for Erection, Testing & Commissioning at Site: To be quoted separately if specified in NIT/Price Schedule. h) Training Charges: To be quoted separately if specified in NIT/Price Schedule. 2.4 GST rates along with HSN/SAC code as applicable on Sr No (a) to (h) above is to be mentioned separately in percentage in both un-priced bid and price bid. Note : i) Unless otherwise specified in the NIT, the purchase order shall be placed on Ex-works basis for Indian bidders. ii) Prices quoted by Indian bidders shall be in Indian Rupees only. iii) In case Supervision of Erection, Testing & Commissioning (ETC) at Site or Testing & Commissioning at Site or Erection, Testing & Commissioning at Site is also in scope of the bidder along with supply, bidder has to ensure that prices quoted for such services also are in line with special terms & conditions of the NIT, if any. iv) Unless otherwise specified in the NIT, Unloading at Site / Destination shall not be in the scope of the supplier. v) Prices in respect of Sr No (a) to Sr No (h) of Clause 2.3 above are to be quoted inclusive of all taxes & Duties, charges, Levies , royalty etc if any, excluding GST.
3.	TERMS OF PAYMENT : 3.1 For Supply only in scope of the supplier 100% of payment within 60 days from the date of receipt of complete invoice along with documents in 3 sets (original + 2 copies) as follows : • LR / GR duly endorsed by BHEL Site Official. • Material Receipt Certificate issued by BHEL Site Official. • GST Compliant Tax Invoice • Packing List (Case-wise) • Copy of Transit Insurance Certificate from underwriters. • Material Inspection Clearance Certificate (MICC) issued by BHEL Quality Management • Guarantee Certificate • Copy of Performance Bank Guarantee (PBG) • Certificate of acceptance of Type Test Reports issued by BHEL Engineering Management wherever specifically mentioned in the Purchase Order.

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	3.2 For Supply where Supervision of Erection, Testing & Commissioning (ETC) at Site is in scope of the supplier or Supply where Testing & Commissioning at Site is in scope of the supplier a) 95% of payment within 60 days from the date of receipt of complete invoice along with documents in 3 sets (original + 2 copies) as follows : · LR / GR duly endorsed by BHEL Site Official. · Material Receipt Certificate issued by BHEL Site Official. · GST Compliant Tax Invoice · Packing List (Case-wise) · Copy of Transit Insurance Certificate from underwriters. · Material Inspection Clearance Certificate (MICC) issued by BHEL Quality Management · Guarantee Certificate · Copy of Performance Bank Guarantee (PBG) · Certificate of acceptance of Type Test Reports issued by BHEL Engineering Management wherever specifically mentioned in the Purchase Order. b) 5% of payment within 60 days from the date of receipt of complete invoice along with documents in 3 sets (original + 2 copies) as follows : · Certificate of successful completion of Supervision of Erection, Testing & Commissioning at Site if it is in the scope of the supplier or Certificate of successful completion of Testing & Commissioning at Site if it is in the scope of the supplier. · Certificate of completion of final documentation as per Purchase Order / Technical Specification issued by BHEL Engineering Management 3.3 For Supply where Erection, Testing & Commissioning (ETC) at Site is in scope of the supplier a) 90% of payment within 60 days from the date of receipt of complete invoice along with documents in 3 sets (original + 2 copies) as follows : · LR / GR duly endorsed by BHEL Site Official. · Material Receipt Certificate issued by BHEL Site Official. · GST Compliant Tax Invoice · Packing List (Case-wise) · Copy of Transit Insurance Certificate from underwriters. · Material Inspection Clearance Certificate (MICC) issued by BHEL Quality Management · Guarantee Certificate · Copy of Performance Bank Guarantee (PBG) · Certificate of acceptance of Type Test Reports issued by BHEL Engineering Management wherever specifically mentioned in the Purchase Order b) 10% of payment within 60 days from the date of receipt of complete invoice along with documents in 3 sets (original + 2 copies) as follows : · Certificate of successful completion of Erection, Testing & Commissioning at Site issued by BHEL Site Official / Construction Management · Certificate of completion of final documentation as per Purchase Order / Technical Specification issued by BHEL Engineering Management 3.4 For Type Test Charges 100% payment along with applicable GST within 60 days from the date of receipt

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	of complete GST compliant Tax invoice along with copy of Certificate of acceptance of Type Test Reports issued by BHEL Engineering Management in 3 sets (original + 2 copies) on completion of delivery (at site, if F&I is in scope of supplier) of main supplies (excluding spares) for which Type Tests are applicable. List of main supplies (excluding spares) for which Type Tests are applicable shall be certified by BHEL Engineering Management. 3.5 For Charges for Supervision of Erection, Testing & Commissioning at Site 100% payment along with applicable GST within 60 days from the date of receipt of complete GST compliant Tax invoice along with certificate of successful completion of Supervision of Erection, Testing & Commissioning at Site issued by BHEL Site Official / Construction Management in 3 sets (Original + 2 copies). 3.6 For Charges for Testing & Commissioning at Site 100% payment along with applicable GST within 60 days from the date of receipt of complete GST compliant Tax invoice along with certificate of successful completion of Testing & Commissioning at Site issued by BHEL Site Official / Construction Management in 3 sets (Original + 2 copies). 3.7 For Training Charges 100% payment along with applicable GST within 60 days from the date of receipt of complete GST compliant Tax invoice along with certificate of completion of training issued by BHEL Engineering Management in 3 sets (original + 2 copies). Note : i) Supplier has to submit invoice(s) as per PO or approved billing break-up of prices (if applicable as per NIT). ii) In case of supplies for overseas project, Material Receipt Certificate issued by BHEL Authorized Representative shall also be acceptable. iii) In case of Transit Insurance under Open Insurance Policy, Intimation / Declaration of Transit Insurance as per terms of the relevant Open Insurance Policy along with copy of Open Insurance Policy from underwriters shall also be acceptable. iv) Supplier has to ensure commencement of transit insurance from the date not later than LR / GR date. v) Supplier has to submit Tax Invoice(s). Supplier should ensure that Tax Invoice should comply all statutory requirements under GST Law to enable BHEL to avail input credit vi) MSMED Act, 2006 and the rules made thereunder as amended from time to time shall be applicable for release of payment to suppliers qualified & registered as Micro & Small Enterprises based on documents mentioned in the NIT for MSME. vii) Supplier has to submit PBG (as per BHEL format) & Guarantee Certificate as per

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	PO terms. viii) In case any shortages and / or damages in supplies, an amount calculated based on comments against Material Receipt Certificate issued by the BHEL Site Official shall be withheld from the supply payment against 3.1(a) or 3.2(a) above to be deemed fit by BHEL subject to a minimum of 10% of the total ex-works value of the invoice corresponding to the LR / GR against which any shortages and / or damages are reported. The withheld amount shall be released after the shortages and / or damages in supplies are supplied / replenished against Certification by BHEL Site Official. ix) Payment of GST component shall be made only if vendor has deposited the Tax and credit for the same is reflected in GSTN (GST Network). In case credit of the same is not reflected in GSTN , vendor may alternatively furnish BG of GST Amount for a period valid for not less than 1 month .In case of disallowance of credit /non reflection of credit in GSTN , amount will be recovered from supplier along with applicable Interest , penalty etc from any of his dues. x) If GST is payable by BHEL on reverse Charge Mechanism basis, vendor should ensure the submission of GST compliant Tax invoice immediately on dispatch/ performance of service. In case of non-compliance any additional charges towards interest , penalty etc , will be to vendors account. xi) TDS under GST Act, if applicable, shall be deducted unless Exemption Certificate If applicable, from the appropriate authority is furnished to BHEL along with Invoice.
4.	INTEREST LIABILITY : In case of any delay in payment due to any reason, BHEL shall not pay any interest on delayed payment. Also, no interest shall be payable by BHEL on the bank guarantee / deposit amount or balance payment or any other money which may become due owing to difference or misunderstanding or any dispute before any quasi judicial authority between BHEL and the Supplier / Contractor.
5.	GUARANTEE : The equipment / material supplied and services rendered (if applicable) shall be guaranteed to be free from all defects and faults in design & engineering, material, workmanship & manufacture and in full conformity with the Purchase Order / Contract, Technical Specifications & approved drawings / data sheets, if any, for 18 months from the date of last delivery or 12 months from the date of commissioning, whichever is earlier. Wherever Erection, Testing & Commissioning at Site are also in the scope of the Supplier, the guarantee period shall be 18 months from the date of last delivery or 12 months from the date of commissioning, whichever is later. The defective equipment / material / component shall be replaced free of cost at site. Freight & Insurance during transit shall also be in the scope of the supplier / contractor. Any expenditure for dismantling and re-erection of the replaced equipment / material / component shall be to supplier's / contractor's account. All replacements during the guarantee period shall be delivered at site promptly and satisfactorily within a period not more than 45 days from the date of reporting the defect / rejection etc. In the event of the supplier / contractor failing to replace the defective equipment / material / component within the time period mentioned above, BHEL may proceed to

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	undertake the replacement of such defective equipment / material / component at the risk and cost of the supplier / contractor without prejudice to any other rights under the contract and recover the same from PBG / other dues of this Purchase Order / Contract or any other Purchase Order / Contract executed by the supplier / contractor. Note : i) In case of Illumination System, items viz. Lamps, Tubes, Ballast, Starters, Capacitors & Fuses will not be under Guarantee after commissioning. ii) In addition to the above guarantee period, Extended Guarantee / Warranty, if any, shall be as per NIT / Technical Specifications. iii) In case offer of agent of Foreign OEM / Foreign Principal is considered, as per Clause No. 1.12 above, Guarantee as mentioned above has to be provided by the Foreign OEM / Foreign Principal also.
6.	LATENT DEFECT : Liability for latent defects shall be for defects inherently lying within material or arising out of design deficiency which does not manifest itself during guarantee period but later and shall be limited to five years from the expiry of the guarantee period.
7.	PERFORMANCE BANK GUARANTEE (PBG) : Supplier shall arrange to submit Performance BG / deposit on a non-judicial stamp paper of appropriate value along with first invoice or within 60 days from placement of Purchase Order (PO) whichever is earlier, in line with one of the applicable options as follows :- <u>Option "A"</u> A single rolling PBG for Rs. 50 Lakhs initially valid for 18 months with claim period of 3 months extra over and above 18 months for all the Purchase Orders being executed for Transmission Business Group, BHEL. However, validity of the PBG shall be extended till 18 months from the date of last delivery with 3 months claim period extra over and above 18 months. Single Rolling PBG option shall not be applicable in case Ex-works value of the PO at the time of placement of PO exceeds Rs. One Crore. <u>Option "B"</u> PBG for 10% of the total Ex-works PO value, valid for 18 months from the date of last delivery with claim period of 3 months extra over and above 18 months. Ex-works PO value at the time of placement of PO shall be considered for calculation of the PBG amount. <u>Option "C"</u> In case the total Ex-works PO value at the time of placement of PO does not exceed Rs. Ten Lakhs, interest free Deposit of 10% of the total Ex-works PO value at the time of placement of PO in form of Demand Draft favouring "Bharat Heavy Electricals Limited" and payable at New Delhi / Delhi / Noida shall also be acceptable to BHEL in lieu of PBG, which shall be released after expiry of 21 months from the date of last delivery after deduction, if any, within 60 days from receipt of invoice in 3 sets (original + 2 copies) to be submitted by the supplier. Note : i) The Bank Guarantee shall be from any bank as per Annexure for List of Banks (32 Nos.). The original PBG should be sent by issuing Bank directly to AGM (Finance), TBG, BHEL, Noida. ii) Extension of validity of the PBG in original, as per above clause, should be sent by issuing Bank directly to AGM (Finance), TBG, BHEL, Noida at least 45 days

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	before expiry of validity of the PBG. iii) Unless otherwise specified in the NIT, deviation taken for non-submission of PBG / Deposit, as applicable, shall not be accepted. iv) Supplier has to confirm one of the applicable options for submission of PBG / Deposit before placement of PO. v) In case of non-submission PBG / Deposit, as applicable, BHEL reserve the right for Risk Purchase as per terms of the NIT and impose Suspension of Business Dealings with the Supplier / Contractor. vi) BHEL reserve the right to encash the Bank Guarantee and forfeit the amount in the event of any default, failure or neglect on part of the Supplier in fulfilment of performance of the Purchase Order. vii) Value of the Bank Guarantee (at the time of submission) shall remain unchanged for any subsequent variations in Purchase Order value up to $\pm 20\%$. Beyond this variation of $\pm 20\%$, the Supplier shall arrange to enhance or may reduce the value of the Bank Guarantee accordingly for the total variation promptly. viii) Vendor to ensure submission of Certificate of Final Documentation / Confirmation regarding Non applicability of Final Documentation, as the case may be, as referred in clause No 9 regarding Final Documentation. BG shall be released only after submission of the same to BHEL TBMM.
8.	SUBMISSION OF DRAWINGS / DOCUMENTS FOR APPROVAL : Supplier shall submit the master document list within 7 days from date of Purchase Order / Contract, unless otherwise specified in the NIT, with planned dates for submission which shall be in line with activity schedule as per Purchase Order / Contract and shall be finalized with BHEL Engineering Management. Date of first submission of drawings / documents shall be certified by BHEL Engineering Management after the receipt of applicable drawings / documents (e.g. project specific cover sheet, GTP, OGA drawings, schemes, type test reports etc.) by BHEL. During detailed engineering stage, necessary hard copies of the engineering drawings / documents shall also be submitted by the supplier as per the Purchase Order / Contract requirement. The supplier shall also submit the packing drawings as per technical specifications. In case item(s) offered require any interface details of other item (not in the scope of supplier & required for operating the equipment), the supplier has to submit interfaces schedule along with submission of engineering drawings / documents. It shall be responsibility of the supplier to get the details of the interfaced item from BHEL before manufacturing to avoid any mismatch at site.
9.	FINAL DOCUMENTATION : Final documentation as called in the Technical /contract specification is to be submitted within 3 months from the date of first delivery of respective equipment, item/material. After submission of Final Documentation, BHEL Engineering Management (TBEM) will issue a Certificate of Completion of Final Documentation. Wherever Final Documentation is not applicable, BHEL Engineering Management (TBEM) will issue confirmation regarding the same, Vendor to submit the Certificate of Final Documentation / Confirmation regarding Non applicability of Final Documentation, as the case may be, to BHEL TBMM. In case of Non Submission of Certificate of Final Documentation / Confirmation regarding Non applicability of Final Documentation, BG will be liable for encashment.
10.	INSPECTION : BHEL / customer / third party shall inspect equipment / material before despatch. Stage inspection during manufacturing may also be carried out. Material to be despatched only after getting Material Despatch Clearance Certificate (MDCC) / MICC issued by BHEL. Supplier shall send inspection call on prescribed format / web site only, with an

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	advance notice of 15 days. Supplier to ensure submission of all routine / acceptance test reports, inspection reports and all other documents related to inspection, immediately to BHEL. BHEL representative is authorised to carry out audits along with Third Party Inspection Agency at vendor's / supplier's works before clearing the items for despatch.
11.	DESPATCH DOCUMENTS : Despatch documents to be immediately sent to BHEL on despatch are as follows :- • Copy of Invoice • Copy of LR / GR in case of Indian suppliers or BL / AWB in case of foreign suppliers • Copy of Packing List (Case-wise) • Copy of Transit Insurance Certificate from underwriters • Copy of Guarantee Certificate
12.	DELIVERY PERIOD : Delivery / Completion requirement shall be mentioned in the NIT. Bidder to specify best delivery / completion period possible in weeks from the date of LOI / PO as per activity schedule for consideration by BHEL. Time required for type test, if applicable, is to be separately indicated. Note : LR / GR date or invoice date (whichever is later) for indigenous supplies and BL / AWB date for FOB / CIF (if applicable) contracts shall be considered as delivery date.
13.	LIQUIDATED DAMAGES FOR DELAYED DELIVERY: In case of delay in execution of Purchase Order beyond the contractual delivery time, an amount of 0.5% of the total Purchase Order value for supply (incl. taxes and duties, freight & insurance as applicable) per week of delay or part thereof subject to a maximum of 10% of the total Purchase Order value for supply (incl. taxes and duties, freight & insurance as applicable) shall be deducted as Liquidated Damages (LD) along with applicable GST (if any) on LD. However, in case of staggered (lot-wise) contractual delivery schedule, an amount of 0.5% of the total Purchase Order value for supply (incl. taxes, duties, freight & insurance as applicable) of delayed lot per week of delay or part thereof subject to maximum of 10% of the total Purchase Order value.(Incl taxes, duties, Freight & Insurance as applicable) shall be deducted as Liquidated Damages (LD) along with applicable GST (if any) on LD. Note : i) In case of any amendment / revision in P.O./WO, the LD shall be linked to the amended / revised Purchase Order / Contract value and delivery / completion time / schedule, if applicable. ii) LR / GR date or invoice date (whichever is later) for indigenous supplies and BL / AWB date for FOB / CIF (if applicable) for imported supplies shall be treated as the date of dispatch for levying LD as above. iii) However, for indigenous supply, if time period between date of receipt of material at site / destination by Site Official & the date of LR / GR or invoice (whichever is later) is more than 30 days, where distance from place of despatch as per LR / GR is upto 1000 Kms or if time period between date of receipt of material at site / destination by Site Official & the date of LR / GR or invoice (whichever is later) is more than 45 days, where distance from place of despatch as per LR / GR is more than 1000 Kms, such excess period shall also be considered for LD

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	purpose. iv) If, as per supplier, delay is not attributable to the supplier, delay analysis with documentary evidence may be submitted by the supplier at the earliest but not later than six months from the end of the financial year in which the payment is withheld. Based on the above details / documents submitted by the supplier, BHEL shall take final decision and if considered appropriate by BHEL, withheld amount (full or part as the case may be) shall be released, otherwise, full or balance withheld amount shall be treated as deduction of Liquidated Damages (LD) towards delayed delivery.
14.	VALIDITY OF OFFER : The offer shall be valid for 120 days from the due date of opening of tender (i.e. techno-commercial bid unless otherwise specified in the NIT). Prices of Spares, wherever they optional items, shall be valid till two years from the date of placement of PO.
15.	ACCEPTANCE / REJECTION OF TENDER : BHEL reserve the right to reject in full or part, any or all tender without assigning any reason thereof. BHEL also reserve right to vary the quantities as mentioned in the NIT. Acceptance of offer is subject to vendor approval by customer before opening of price bid. BHEL shall not be bound by any power of attorney granted by tenderer or by changes in composition of the firm made subsequent to award of order / contract. BHEL may however recognize such power of attorney and changes after obtaining proper legal advice, cost of which will be chargeable to the seller / contractor concerned. If the tenderer deliberately gives wrong information, BHEL reserves the right to reject such an offer at any stage or cancel the order / contract, if awarded, and forfeit the security deposit and bank guarantee.
16.	DEVIATION : The bids having deviation(s) w.r.t. tender are liable for rejection. However, BHEL, at its discretion, may load the prices for evaluation of offer with prior intimation to bidder.
17.	TENDER EVALUATION : Comparative statement shall be prepared and evaluated on total cost basis at destination/site (as per terms of NIT) considering overall quantity indicated in NIT unless contrary to same is specifically mentioned in the tender enquiry / NIT. Total cost for this purpose shall include cost of scope of work as mentioned in NIT along with applicable taxes & duties, and other services etc. (if applicable). GST input credit available to BHEL shall be reduced from prices while determining L1 status. In case all bidders are foreign & Port of Import (destination port) is same for all the bidders, evaluation of offers shall be done on CIF (Port of Import) basis. Otherwise, evaluation of offers shall be done on the basis of delivered cost at site /destination to BHEL. Further, in case of foreign bidders, marine freight & insurance are to be quoted separately & the purchase order may be placed on FOB basis with an option for delivery on CIF / CFR basis, if required, later. In case of foreign bidders, Exchange Rate (TT selling rate of State Bank of India) as on date of tender opening (Part-I Bid in case of two part bid) shall be considered. If the relevant day happens to be a bank holiday, then the forex rate as on the previous bank (SBI) working day shall be taken for tender evaluation.
18.	LOADING CRITERIA : List of permissible deviations & loading criteria thereof are as follows :- a) Payment Terms Base rate of SBI (as applicable on the date of bid opening / techno-commercial bid opening in case of two part bids) + 6% shall be considered for loading for the

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	period of relaxation sought by bidder(s) against terms of payment in the NIT. b) Liquidated Damages (LD) for Delayed Delivery Loading on LD clause shall be to the extent to which it is not agreed to by the bidder (at offered value). c) In case of foreign bidders, if the quoted prices is on CIF basis only, it shall be loaded to arrive at total FOR (Site / Destination) price, as applicable, by factors as follows :- i) Port handling / clearing charges: @ 1% of CIF value to arrive at Customs Assessable Value. ii) Custom Duty (including CVD & SAD) as per NIT prevailing on date of price bid opening. iii) Inland Freight & Transit Insurance: @ 5% of CIF value where distance between site / destination and Port of Discharge is upto 1000 Kms or @ 7% of CIF value where distance between site / destination and Port of Discharge is more than 1000 Kms. Note : Additional deviations (if considered acceptable by BHEL) & the loading criteria shall be communicated to all the qualified bidders before price bid opening.
19.	ARBITRATION : In the event of any dispute emanating from and relating to this contract, the matter shall be referred to the sole arbitration of the person appointed by the competent authority of BHEL. Subject to aforesaid, the provisions of "The Arbitration and Conciliation Act, 1996" and the rules made thereunder as amended from time to time in India shall apply to the arbitration proceedings. The venue of arbitration shall be in New Delhi. Further there shall be no claim for any pre-reference or pendente-lite interest on the claims and any claim for such interest made shall be void. However, in case of contract with Public Sector Enterprise / Undertaking (PSE/PSU) or Govt. Dept., the extant guidelines of Govt. of India shall be followed.
20.	LEGAL SETTLEMENT : Indian Courts at New Delhi / Delhi shall have exclusive jurisdiction to decide the dispute, if any, arising out of or in respect of the contract(s) to which these conditions are applicable. Contract, including all matters connected with contract, shall be governed by the Indian Law, both substantive and procedural, for the time being in force including modification thereto.
21.	SUB-CONTRACTING : In case further subcontracting of BHEL Purchase Order / Contract or part thereof is envisaged by supplier, the same can be done after written permission is obtained from BHEL. However it shall not absolve the Supplier / Contractor of the responsibility of fulfilling BHEL Purchase Order / Contract requirements. In case of subcontracting of Purchase Order / Contract awarded by BHEL or part thereof without such permission, BHEL reserve the right to cancel the Purchase Order / Contract and source such material / component / equipment / system from any other agency at the risk and cost of the Supplier / Contractor. If Supplier / Contractor is an individual or proprietary concern and the individual or the proprietor dies or the partnership is dissolved or substantially affected, then unless BHEL is satisfied that legal representative of individual Supplier / Contractor or proprietor of proprietary concern and surviving partners of partnership firm are capable of carrying out and completing the Purchase Order / Contract, BHEL shall be entitled to cancel the Purchase Order / Contract as to its incomplete portion and without being in any way liable to payment of any compensation to legal

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	representative of Supplier / Contractor and / or to surviving partners of Supplier's / Contractor's firm on account of cancellation of the Purchase Order / Contract. Decision of BHEL that legal representatives of deceased Supplier / Contractor or surviving partners of the Supplier's / Contractor's firm cannot carry out and complete the Purchase Order / Contract shall be final and binding on the parties hereto. Terms and Conditions shall not get affected in case of de-merger / amalgamation / taking-over / re-constitution etc.
22.	RISK PURCHASE : In case the Supplier / Contractor fails to supply or fails to comply with terms & conditions of the Purchase Order / Contract or delivers equipment / material not of the contracted quality or fails to adhere to the contract specifications or fails to perform as per the activity schedule and there are sufficient reasons even before expiry of the delivery / completion period to justify that supplies shall be inordinately delayed beyond contractual delivery / completion period, BHEL reserve the right to cancel the Purchase Order / Contract either in whole or in part thereof without compensation to Supplier / Contractor and if BHEL so desires, may procure such equipment / material / items not delivered or others of similar description where equipment / material / items exactly complying with particulars are not readily procurable in the opinion of BHEL which is final and in such manner as deemed appropriate, at the risk and cost of the Supplier / Contractor and the Supplier / Contractor shall be liable to BHEL for any excess cost to BHEL. However, the Supplier / Contractor shall continue execution of the Purchase Order / Contract to the extent not cancelled under the provisions of this clause. Recovery amount on account of purchases made by BHEL at the risk and cost of Supplier / Contractor shall be the difference of total value of new Purchase Order (PO) value and total value of old Purchase Order for applicable items, where the total value of new PO is more than total value of old PO for applicable items, plus additional 15% of the total ex-works value of new PO as overheads. The Supplier / Contractor shall on no account be entitled to any gain on such risk & cost purchase. In case the purchase order (PO) value of the new PO is less than the PO value of the old PO, 15% of the total ex-works value of the new PO shall be recovered as overheads and the difference between the PO value of the old PO and the new PO shall not be considered for calculation of the recovery amount.
23.	ADJUSTMENT OF RECOVERY : Any amount payable by the Supplier / Contractor under any of the condition of this contract shall be liable to be adjusted against any amount payable to the Supplier / Contractor under any other Purchase Order / Contract awarded to him by any BHEL unit. This is without prejudice to any other action, as may be deemed fit, by BHEL.
24.	FORCE MAJEURE CONDITION : If by reason of war, civil commotion, act of god, Government restrictions, strike, lockout which are not in control of Supplier / Contractor the deliveries / services are delayed, Supplier / Contractor shall not be held responsible. If at any time during the continuance of the Purchase Order / Contract, the performance in whole or in part by either party of any obligations under the Purchase Order / Contract is prevented or delayed by reason of any war hostilities, acts of the public enemy, restrictions by Govt. of India, civil commotion, sabotage, fires, floods, explosion, epidemics, quarantine restrictions, strike, lock-outs or acts of God (hereinafter referred to as "event"), which are not in control of Supplier / Contractor or BHEL, then provided notice of the happening of such event is given by either party to the other within fifteen (15) days from the date of occurrence thereof, neither party shall by reason of such event be entitled to terminate the Purchase Order /

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	Contract nor shall have any claim for damages against each other in respect of such non-performance and delay in performance. Performance under the Purchase Order / Contract shall be resumed immediately after such event has come to an end or ceased to exist and decision of BHEL as to whether the deliveries have to be resumed or not shall be final, conclusive and binding on the parties hereto. In the event of the parties hereto not able to agree that a force majeure event has occurred, the parties shall submit the disputes for resolution pursuant to the provisions hereunder, provided that the burden of proof as to whether a force majeure event has occurred shall be upon the party claiming such an event. Notwithstanding above provisions, BHEL shall reserve the right to cancel the Purchase Order / Contract, wholly or partly, in order to meet the overall project schedule and make alternative arrangements for completion of delivery and other schedules.
25.	MANUFACTURING QUALITY PLAN (MQP) : Supplier to submit approved MQP in line with requirement of BHEL/customer.
26.	SUPPLIER PERFORMANCE MONITORING AND RATING SYSTEM : BHEL reserve the right for evaluation of Supplier Performance Rating as per Supplier Performance Monitoring and Rating System of BHEL for necessary action. Details are available at BHEL Website www.bhel.com for reference.
27.	DEALING WITH BANNED SUPPLIERS / CONTRACTORS IN BHEL : Offers of the bidders, who are on the banned list, as also 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 for reference.
28.	ORDER OF PRECEDENCE : The order of precedence shall be as follows :- a) Special Terms & Conditions (STC) for Tender Enquiry / Contract, if any b) General Terms & Conditions (GTC) for Tender Enquiry / Contract & Additional General Terms & Conditions (GTC) for Tender Enquiry / Contract for Erection Testing & Commissioning (ETC) at Site, if applicable Provisions in (a) above shall prevail over (b). In case of conflict, between Technical Specifications and STC / GTC, bidder to seek necessary clarifications from BHEL concerned official as specified in NIT.
29.	PACKING : Packing shall be in conformity with specifications and shall be such as to ensure prevention of damages, corrosion, deterioration, shortages, pilferage and loss in transit or storage. In case of shipment by sea or air, the packing shall be sea-worthy or air-worthy respectively and of international standards. Different types of spares i.e. start-up / commissioning spares and initial spares (mandatory spares and recommended O&M spares) are to be packed separately. Packing List shall be submitted as per standard format along with advance set of documents for claiming payment which shall also indicate :- a) Case / Packing size (as applicable). b) Gross weight and net weight of each package. c) Detailed contents of the package with quantity of each item separately. Project, Item / Package Description, BHEL's PO No. with date & Case / Packing Mark should also be clearly mentioned on the Case / Packing and Packing List for identification. Also, Packing List must be duly signed & should include respective Invoice No. & LR No. Note : Foreign suppliers to furnish details to arrange inland transportation by BHEL, if applicable, as follows :-

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	i) No. of Packages ii) Size with Weight (Gross & Net) of each Package iii) No. of Containers with type & size required for inland transportation iv) Type of Cargo (Break Bulk / LCL / FCL) v) Customs Tariff No.
30.	COLOUR CODING : Aluminium stickers are required to be attached to large components but plastic sheet tags should be tied with small components, giving details like purchase order, description of the component, quantity etc. Tags should be of the colour as follows :- a) Main equipment : Yellow or White tag b) Start-up / Commissioning spares : Blue tag c) Mandatory spares : Pink or Red tag d) Recommended / O&M spares : Green tag
31.	MICRO, SMALL & MEDIUM ENTERPRISES (MSME) : MSMED Act 2006 as amended from time to time & extant regulations of Govt. of India for MSME will be applicable. Micro & Small Enterprises (MSE) can avail the intended benefits only if they submit along with the offer / bid, attested copies of either Acknowledgement of Entrepreneur Memorandum Part-II (EM-II certificate) having deemed validity (five years from the date of issue of acknowledgement in EM-II) or valid NSIC certificate or EM-II certificate along with attested copy of a CA certificate (As per BHEL format where deemed validity of EM-II certificate of five years have expired) applicable for the relevant financial year (latest audited). Date to be reckoned for determining the deemed validity will be the date of opening (for Techno-commercial Bid : Part-I in case of two part bid). Non-submission of such documents will lead to consideration of their bid at par with other bidders. No benefit shall be applicable for this enquiry if any deficiency in the above required documents are not submitted before price bid opening. If the tender is to be submitted through e-procurement portal, then the above required documents are to be uploaded on the portal. Documents should be notarized or arrested (in original) by a Gazetted officer. Copy of Udyog Aadhaar Memorandum with Acknowledgement of Ministry of Micro, Small & Medium Enterprises should also be furnished.
32.	BUSINESS ETHICS / SUSPENSION OF BUSINESS DEALINGS WITH SUPPLIERS / CONTRACTORS : If any bidder / supplier / contractor during pre-tendering / tendering / post tendering / award / execution / post-execution, indulges in malpractices cheating, bribery, fraud or other misconduct or formation of cartel so as to influence the bidding process or influences the price or fails to perform or is in default without any reasonable cause etc or performs any act considered objectionable as per extant guidelines, action may be taken against such bidders/supplier/contractor as per extant "Guidelines for Suspension of Business Dealings with Suppliers/Contractors". Abridged version of same is available at BHEL website (www.bhel.com) on "Supplier Registration" Page.
33.	REVERSE AUCTION : BHEL reserve the right to go for Reverse Auction (RA) instead of opening the sealed envelope price bid, submitted by the bidder or price bid submitted by the bidder through e-procurement system. 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. In case BHEL decides to go for Reverse Auction, only those bidders who have given their unconditional 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

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	considered as tampering of the tender process and will invite action by BHEL as per extant guidelines in vogue. General Terms and Conditions of RA are available at Annexure. Business Rules for RA shall be sent to the bidders before conducting RA. Abridged Version of "Common Guidelines for Conducting Reverse Auction" may also be seen at BHEL website (www.bhel.com) on "Supplier Registration" Page & "Tender Notifications" Page.
34.	INTEGRITY PACT : Bidders shall have to enter into Integrity Pact with BHEL, duly signed with seal in original, if specified in NIT / RFQ failing which bidder's offer shall be liable for rejection.
35.	TERMINATION OF CONTRACT : BHEL shall have the right to cancel the Purchase Order / Contract without any financial implication to BHEL if vendor approval by end user / customer is withdrawn or in case of Suspension of Business Dealings with the Suppliers / Contractors by BHEL. BHEL shall have the right to cancel Purchase Order / Contract, wholly or in part, in case they are obliged to do so on account of any decline, diminution, curtailment or stoppage of their business and in that event, the Supplier's / Contractor's compensation claim shall be settled mutually. In case of cancellation of Purchase Order / Contract for main supply, all other associated Purchase Orders / Contracts like those for Mandatory Spares / Recommended Spares / Erection, Testing & Commissioning (ETC) / Supervision of ETC, if any, would also get cancelled.
36.	SHELF LIFE : Supplier has to inform the list of the items / sub-items which have limited shelf life like consumables or those required for the first fill and shall indicate the corresponding shelf life period in the offer. Such items / sub-items shall be manufactured / despatched only after getting formal clearance from BHEL.
37.	LIMITATION OF LIABILITY : Notwithstanding any other provisions, except in cases of wilful misconduct and / or criminal negligence / acts, a) Neither the Supplier / Contractor nor BHEL shall be liable to the other, whether in Purchase Order / Contract, tort, or otherwise, for any consequential loss or damage, loss of use, loss of production or loss of profits or interest costs, provided however that this exclusion shall not apply to any obligation of the Supplier / Contractor to pay Liquidated Damages to the BHEL and b) Notwithstanding any other provisions incorporated elsewhere in the contract, the aggregate liability of the Contractor in respect of this contract, whether under the Contract, in tort or otherwise, shall not exceed total Contract Price, provided however that this limitation shall not apply to any obligation of the Vendor to indemnify BHEL with respect to Patent Infringement or Intellectual Property Rights.
38.	SHORTAGES / DAMAGES : a) Against Supply only or Supply where Supervision of Erection, Testing & Commissioning (ETC) at Site or Supply where Testing & Commissioning at Site is in scope of the supplier : Any shortages and / or damages in supplies shall be supplied / replenished free of cost by the supplier as early as possible but not later than 30 days from the date of intimation by BHEL to the supplier.

Sr. No.	
	b) Against Supply where Erection, Testing & Commissioning (ETC) at Site is in scope of the supplier : Any shortages and / or damages in supplies and during handling / storage, erection, testing and commissioning at site shall be supplied / replenished free of cost by the Supplier / Contractor, as early as possible, to meet the contractual completion time / schedule. Note: There shall not be any extension in the contractual delivery time / schedule due to any shortages and / or damages in supplies.
39.	VARIATION OF CONTRACT VALUE / QUANTITY VARIATION : BHEL shall have the right to variation in quantities of items within $\pm 30\%$ of the total Purchase Order / Contract value at the time of placement of PO or award of Contract on overall basis for all amendments together within two years from the date of original Purchase Order / Contract or completion of execution of the Purchase Order / Contract whichever is earlier but quantities of individual items may vary to any extent or may get deleted unless otherwise specified in the technical specifications. No compensation is payable due to variation in the quantities and the Supplier / Contractor shall be bound to accept the same the contracted prices / rates without any escalation. However, if the Purchase Order / Contract is on "Lumpsum" basis, no variation of Purchase Order / Contract value shall be admissible to the Supplier / Contractor within the scope of Purchase Order / Contract, as long as the inputs remain unchanged.
40.	STATUTORY VARIATION : GST rates prevailing at the time of dispatch of goods/ completion of services shall be payable by BHEL. All other taxes, duties, charges, royalty, cess, other levies shall be deemed to be included in the Ex Works Prices /Charges quoted by bidders and no variations shall be payable in respect thereof . No other variations such as on customs duty, exchange rate, minimum wages, prices of controlled commodities, any other input etc. shall be payable by the BHEL. Notwithstanding anything above, where the actual completion of the supply / services occurs beyond the period stipulated in the Purchase Order / Contract or any extension thereof, variations referred to above, will be limited to the rates prevailing on the dates of such agreed completion periods only. For variations after the agreed completion periods, the Supplier / Contractor alone shall bear the impact for the upward revisions and for downward revisions BHEL shall be given the benefit of reduction in applicable taxes /GST. This will be without prejudice to the levy of liquidated damages for delay in delivery / completion. If new tax is introduced by Central/ State Govt/ Municipality becomes directly applicable on items specified in Bill of Quantities/Purchase Order/Contract, full reimbursements shall be made provided it becomes applicable on items specified in Bill of Quantities. However, any additional tax implication due to delay in delivery, beyond the Contractual Delivery, attributable to supplier shall be borne by supplier.
41.	MODE OF PAYMENT : Payment shall be made directly to the Supplier / Contractor by BHEL through NEFT / RTGS.
42.	CONFIDENTIALITY : Supplier / Contractor shall, at all times, undertake to maintain complete confidentiality of all data, information, software, drawings & documents etc. belonging to BHEL and also of systems, procedures, reports, input documents, manuals, results and any other BHEL documents discussed and / or finalized during the course of execution of Purchase Order / Contract.

Sr. No.	
43.	INDEMNIFICATION : The Supplier / Contractor shall indemnify and keep indemnified and hold harmless BHEL and its employees and officers from and against any and all claims, suits, actions or administrative proceedings, demands, losses, damages, costs and expenses and any other claim of whatsoever nature in respect of the death or injury of any person or loss of or damage to any property arising during the course and out of the execution of the Purchase Order / Contract.
44.	TITLE OF GOODS : a) Ownership of the equipment / material procured in India, shall be transferred to BHEL upon loading on to the mode of transport to be used for transportation of the said equipment / material from the works to the site / destination and upon endorsement of the dispatch documents in favour of BHEL. b) Ownership of the equipment / material to be imported into the country where the site is located, if not procured in India, shall be transferred to BHEL upon loading on the mode of transport to be used for transportation of the equipment / material from the country of origin to that country / destination and upon endorsement of despatch document in favour of BHEL. c) Notwithstanding the transfer of ownership of the equipment / material, the responsibility for care and safe custody thereof together with the risk of loss or damage thereto for whatsoever reason shall remain with the Supplier.
45.	COMPLIANCE OF STATUTORY REQUIREMENTS : The vendor shall comply with all State and Central Laws / Acts, Statutory Rules, Regulations etc., as may be enacted by the Government during the tenure of the Purchase Order / Contract and having in force and applicable to the Purchase Order / Contract and nothing shall be done by the Supplier / Contractor in contravention of any Law / Act and / or Rules / Regulations, thereunder or any amendment thereof. The Supplier / Contractor shall pay all taxes, fees, licence charges / deposits, duties, tolls, royalty, commissions or other charges which may be levied on account of any of his operations connected with the Purchase Order / Contract. In case BHEL is constrained to make any of such payments, BHEL shall recover the same from the Supplier / Contractor either from moneys due to him or otherwise as deemed fit.
46.	ACCEPTANCE OF ORDER : Supplier should acknowledge and accept the Letter of Award / Purchase Order issued by BHEL within 7 days of the issue of Letter of Award / Purchase Order. In case of any discrepancy / typographical error in issue of Purchase Order / Contract, the agreed terms & conditions, scope of work, rates / prices for placement of PO / award of contract shall be applicable and BHEL reserves the right to issue amendment(s) to PO / Contract for correction of discrepancies / typographical errors in the PO / Contract at a later date.
47.	FRAUD PREVENTION POLICY : The Bidder along with its associate / collaborators / sub-contractors / sub-vendors / consultants / service providers shall strictly adhere to BHEL Fraud Prevention Policy displayed on BHEL website http://www.bhel.com and shall immediately bring to the notice of BHEL Management about any fraud or suspected fraud as soon as it comes to their notice.

Signature of Bidder (Authorized Signatory) with Date & Seal

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SCHEDULE OF TECHNICAL DEVIATION

This Format is to be submitted in original duly signed by bidder.
The following are the deviations/variations/exceptions from the Terms and Conditions :-

S N	CLAUSE NO. OF TERMS AND CONDITIONS	STATEMENT OF DEVIATION

In case, this schedule is not submitted, it will be presumed that the equipment /material to be supplied under this contract is deemed to be in compliance with the Terms and Conditions.

If there is NIL deviation,even then the format to be filled as NIL DEVIATION.

Note : Continuation Sheets of like size and format may be used as per the Bidder's Requirement and shall be annexed to this schedule.

Place :
Date :

Signature of the authorised representative of

Bidder's name :.....
Designation:.....
Company Seal:.....

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SCHEDULE OF COMMERCIAL DEVIATION

This Format is to be submitted in original duly signed by bidder.
The following are the deviations/variations/exceptions from the Terms and Conditions :-

S N	CLAUSE NO. OF TERMS AND CONDITIONS	STATEMENT OF DEVIATION

In case, this schedule is not submitted, it will be presumed that the equipment /material to be supplied under this contract is deemed to be in compliance with the Terms and Conditions.

If there is NIL deviation,even then the format to be filled as NIL DEVIATION.

Note : Continuation Sheets of like size and format may be used as per the Bidder's Requirement and shall be annexed to this schedule.

Place :
Date :

Signature of the authorised representative of

Bidder's name :.....
Designation:.....
Company Seal:.....

ACTIVITY SCHEDULE FOR CLAMPS & CONNECTORS

ENQUIRY NO:....., Dated.....

SN	ACTIVITY	TIME ALLOTTED [in weeks]	CUMULATIVE TIME FROM RECEIPT OF INPUTS FROM BHEL [in weeks]	SCOPE
1.	Submission of Documents necessary for getting manufacturing clearance like drawings, Data sheet.	2	2	BY SUPPLIER
2.	Review and Approval of documents from BHEL/Customer and issue of manufacturing clearance.	2	4	BHEL SCOPE
3.	Manufacturing Time	6	10	BY SUPPLIER
4.	Inspection call	1	11	BY SUPPLIER
5.	Inspection by BHEL/Customer	1	12	BHEL SCOPE
6.	Issue of Dispatch clearance	2	14	BHEL SCOPE
7.	Dispatch	2	16	BY SUPPLIER

1. Inspection call to be issued 2 weeks in advance.
2. Supplier must ensure the completeness and correctness of the requisite documents before submission for approval. Delay in approval on account of incomplete / inadequate information shall be the responsibility of supplier. Bidder to comply the comments/revised drawing within 7 to 10 days.
3. Inspection call should be given in the prescribed format only. Inspection calls not in the prescribed format shall not be entertained.
4. Qty to be offered for inspection should be in accordance within Delivery-schedule – lot. BHEL reserves the right not to entertain multiple inspection calls for a Delivery – lot and delay on this account shall be the responsibility of Supplier.

Signature & Seal of

Supplier

Date:

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SCHEDULE OF PRICE BID

Enquiry No:

Date:

(BIDDERS TO STRICTLY ENSURE SUBMITTING THE PRICE BIDS IN THIS FORMAT)

PROJECT: NHPC PARBATI-III PROJECT
ITEM: CLAMPS & CONNECTORS

SN	DESCRIPTION OF ITEM (As per Tech Spec. TB-317-316-022A)	UNIT	QTY	HSN CODE	UNIT PRICE EX. WORKS (Rs.)	TOTAL EX. WORKS (Rs.)	UNIT FREIGHT & INSURANCE UP TO SITE (Rs.)	TOTAL FREIGHT & INSURANCE UP TO SITE (Rs.)	GST @.....% OF TOTAL EX- WORKS (Rs.)	GST @.....% OF (TOTAL FREIGHT & INSURANCE UP TO SITE)	TOTAL F.O.R. DESTINATION PRICE
1	SUPPLY- CLAMPS & CONNECTORS : 420KV 40KA FOR 1S 3150A TEE CONNECTOR SUITABLE FOR QUAD MOOSE TO TWIN CONDUCTOR AS PER TS	NO	3								
2	SUPPLY- CLAMPS & CONNECTORS : 420KV 40KA FOR 1S 3150A TEE CONNECTOR SUITABLE FOR QUAD MOOSE TO QUAD CONDUCTOR AS PER TS	NO	3								
3	SUPPLY- CLAMPS & CONNECTORS : 420KV 40KA FOR 1S 3150A TEE CONNECTOR SUITABLE FOR AL TUBE 4 INCH IPS TO QUAD CONDUCTOR AS PER TS	NO	3								
4	SUPPLY- CLAMPS & CONNECTORS : 420KV 40KA FOR 1S 3150A RIGID SPACER SUITABLE FOR TWIN MOOSE	NO	3								
5	SUPPLY- CLAMPS & CONNECTORS : 420KV 40KA FOR 1S 3150A RIGID SPACER SUITABLE FOR QUAD MOOSE	NO	3								
6	SUPPLY- CLAMPS & CONNECTORS : 420KV 40KA FOR 1S 3150A PG CLAMP SUITABLE FOR QUAD MOOSE TO QUAD CONDUCTOR	NO	3								
	SUPPLY- CLAMPS & CONNECTORS : 420KV 40KA FOR 1S 3150A CABLE-SEALING-END CONNECTOR SUITABLE FOR QUAD MOOSE	NO	3								
8	SUPPLY- CLAMPS & CONNECTORS : 420KV CVT CONNECTOR SUITABLE FOR AL TUBE 4 INCH IPS, RIGID TYPE	NO	3								
9	SUPPLY- CLAMPS & CONNECTORS : 420KV BPI CONNECTOR SUITABLE FOR AL TUBE 4 INCH IPS, RIGID/SLIDING THROUGH TYPE	NO	3								
10	SUPPLY- CLAMPS & CONNECTORS : STRAIN CLAMP FOR SHIELD WIRE 10.98MM DIA	NO	3								
11	SUPPLY- CLAMPS & CONNECTORS : CLAMPS FOR 50X6MM EARTHING STRIP ON LATTICE/PIPE STRUCTURE	NO	3								
12	CLAMPS & CDNECTORS PG CLAMP FOR SHIELD WIRES OF DIA 10.98MM	NO	3								
13	CLAMPS & CONNECTORS PAD CONNECTOR TO SUIT 10.98MM DIA GS WIRE AND 75X12 MM GS FLAT	NO	3								
14	CLAMPS & CDNECTORS CLAMPS FOR 75X12MM EARTHING STRIP ON LATTICE/PIPE STRUCTURE	NO	3								
15	CLAMPS & CONNECTORS CLAMP FOR 10.98MM DIA SHIELD WIRE ON LATTICE / PIPE STRUCTURE	NO	3								
A	TOTAL DELIVERED COST TO BHEL=										

NOTE:

1. PLEASE NOTE THAT UNPRICED COPY OF PRICE BID (i.e. WITH ALL PRICES BLANKED) SHALL BE FURNISHED ALONG WITH TECHNO-COMMERCIAL BID.
2. REQUIRED COPIES OF FORMAT BE MADE & DETAILS MAY BE ANNEXED.
3. THE PRICES MUST BE QUOTED IN THE PRESCRIBED UNIT ONLY.
4. BHEL STANDARD SPECIFICATION NO:TB-300-316-006, REV-01 IS APPLICABLE

SIGNATURE & SEAL OF TENDERER

BHARAT HEAVY ELECTRICALS LIMITED TRANSMISSION BUSINESS ENGINEERING MANAGEMENT NEW DELHI																																																																											
DOCUMENT No.		TB-300-316-006		Rev	01	Prepared	Checked	Approved																																																																			
CUSTOMER Doc. No.						NAME	DS	MVK	SKS																																																																		
TYPE OF DOC.		TECHNICAL SPECIFICATION				SIGN	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>																																																																		
TITLE CLAMPS & CONNECTORS						DATE	15.07.19	15.07.19	15.07.19																																																																		
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PROJECT		4 x 130 MW PARBATI-III HYDROELECTRIC PROJECT – 400 kV POTHEAD YARD																																																																									
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SECTION - 1

1.1 SCOPE

This technical specification covers the requirements of design, manufacture, testing at works, packing and dispatch of Clamps & Connectors to site.

This section covers the scope, quantities, Specific Technical Requirements for Clamps & Connectors as specified by the customer (NHPC). The offered equipment shall also comply with the General Technical Requirements for the project as detailed under section-3 of this specification.

In case of any discrepancies between the requirements mentioned under Section-1/Section-2 and those specified in the Section-3, the specifications given under Section-1 shall prevail and shall be treated as binding requirements.

The equipment is required for the following project:

Name of the Customer : NHPC
Name of the Project : 4x130 MW Parbati-III Hydroelectric Project - 400 kV
Pothead Yard.

The scope of supplies shall be as per commercial terms and conditions enclosed separately with the enquiry.

1.2 SPECIFIC TECHNICAL REQUIREMENTS

The connectors used in the pothead yard shall be made of Aluminium alloy not to cause corona, radio and audible noise, interference in the HV installations. The connectors shall conform to NEMA 107 and tested accordingly to have maximum noise level not exceeding 54dB. The fasteners shall conform to ISO 3506 and having minimum mechanical strength of class 70. The tensile strength/electrical characteristics of the hardware shall be in accordance to NEMA CCI publications

(a) SYSTEM PARAMETERS

The clamps & connectors shall comply with requirements in the following table:

Sl. No	Technical Parameters	
1.	Nominal Voltage (kV)	400
2.	Highest Voltage (kV)	440
3.	Rate Voltage (kV)	400
4.	Rated Short Time Current (kA for sec)	40 kA for 1 Sec
5.	Rated Frequency (Hz)	50
6.	Basic Insulation level	1550 kVp

7.	Visual Corona withstand voltage	320kV
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1.3 BILL OF QUANTITIES

The estimated quantities in the scope of supply are as per enclosed Annexure.

- 1) Annexure-I - Parbati-III
- 2) Annexure-II - Terminal details

The scope of supply shall also include:

- i) All connector hardware along with bimetallic washers / strip as required.
- ii) All hardware required for connecting to the respective equipment terminals.
- iii) Minimum 5 % extra hardware and bimetallic strips of each type.
- iv) Anti - oxidation grease-as required.

Note: The quantities mentioned in enclosed Annexure are subject to 30% variations.

1.4 TYPE TESTING

Bidder shall submit valid type test reports (as per relevant IEC/IS Standard) for approval. The type test reports submitted shall be of tests conducted within last 10 years prior to the date of bid opening. The bidder should have conducted type test on identical or similar equipment/ components to those offered. In case type test reports are found to be technically unacceptable to BHEL/NHPC, the type test shall be conducted without cost and delivery implication to BHEL.

1.5 QUALITY PLAN

BHEL Standard Quality Plan as agreed upon with NHPC shall be applicable.

-- X X --

Sl No	EKD BOQ NO	CONNECTOR TYPE	Unit	Total Qty
1	1A	420kV Cable Sealing End Connector: Suitable for quad moose ACSR horizontal approach (3150A) (1A)	No	3
2	2A	420kV CVT Connector: Suitable for 4" IPS Al Tube through type (2A)	No	3
3	3A	420kV PI Connector: Suitable for 4" IPS Al Tube through type (Rigid/Sliding) (3A)	No	3
4	21	420kV T-CONN: Quad - Quad ACSR moose (3150A) (21)	No	3
5	22	420kV T-CONN: Suitable for 4" Al. Tube run & quad ACSR moose tap (3150A) (22)	No	3
6	23	420kV T-CONN: Quad ACSR moose run - Twin ACSR moose tap (2000A) (23)	No	3
7	31	420kV PG Clamp: Quad - Quad ACSR moose (31)	No	3
8	41	Rigid spacer for quad moose ACSR conductor (subconductor spacing shall be 450mm) (41)	No	3
9	42	Rigid spacer for twin moose ACSR conductor (subconductor spacing shall be 450mm) (42)	No	3
10	51	PG Clamp for 2 Nos. shield wires of dia 10.98mm each (51)	No	3
11	52	Strain Clamp for shield wire (Wire dia 10.98mm) (52)	No	3
12	53	Clamp for shield wire on structure (Cleat type) for dia 10.98mm (53)	No	3
13	54	Clamp for 10.98mm dia shield wire and 75x12mmGI Strip (Pad type) (54)	No	3
14	55	Clamp for 75x12mm GI Strip & Lattice Structure (55)	No	3
15	56	Clamp for 50x6 mm GI Strip & Lattice Structure (56)	No	3
Note:-				
1. Outer Dia. of 4" IPS Al Tube = 114.2 mm				
2. Inner Dia. of 4" IPS Al Tube = 97.18 mm				
3. Dia. of ACSR Moose = 31.77 mm				
4. Spacing between sub conductors of the 400kV bus = 450 mm				

Annexure-II
Terminal Pad Details for Equipments

400 kV Potheadyard at Parbati-III Project

Sl.No.	Equipment Details	Make	Terminal pad material *	Terminal pad type
1	400 kV Cable Sealing End	-	Hot dip galvanised cast iron	Stud type
2	400 kV C.V.T	BHEL	Tinned MS rod	100mm long, 30dia stud
3	400 kV Bus Post Insulators	-	Hot dip galvanised cast iron	Cap type (4x127PCD)

Note: 1. Terminal Pad Drawings and balance details for the equipments shall be furnished at contract stage.
2. The above details are tentative and are subject to variation depending upon finalisation of respective equipment supplier.

SECTION 2

STANDARD SPECIFICATION

2.1 GENERAL

This section covers the general technical requirements of spacers and clamps & connectors. In case of any discrepancies between the requirements mentioned in this section and those specified in other section of this specification, the latter shall prevail and shall be treated as binding requirements.

2.1.1 Technical Particulars for spacers and Clamp & Connectors

Nominal system voltage :	400kV	220 kV	132 kV	33kV
Highest system voltage :	420kV	245 kV	145 kV	36kV
Current Rating :	Compatible With Conductor rating			
Short circuit current for :	40kA for 1 sec (as per Section-1)	40 kA for 1 sec	31.5kA for 1 sec	25kA for 1 sec
Frequency :	50 Hz $\pm$ 5%	50 Hz $\pm$5%	50 Hz $\pm$5%	50 Hz $\pm$5%
Basic insulation level : (1.2/50 microsecond wave)	1550 kVp	1050 kVp	650 kVp	170 kVp
Switching surge withstand : voltage ((250/2500 micro sec.) dry & wet	1050 kVp	---	---	---
System Earthing :	--- Effectively earthed ---			
Spacing between sub- conductors of the bus :	450mm	250mm	250mm	150/250mm
Maximum working tension :				
a) Twin Conductor (Kg):	2000	2000	2000	400
b) Quad Conductor (Kg):	4000	4000	4000	800
Visual Corona withstand V :	320 kV	156 kV	105 kV	---

2.2 Applicable Standards

The spacers and clamps & connectors shall strictly conform to the following Indian and International standards as appropriate :

List of Standards :

IS 617:1994	Aluminium and aluminium alloy ingots and castings for general engineering purposes.
IS 1363 (All Parts):2002	Hexagon head bolts, screws and nuts of product grade C
IS 1364 (All Parts):2002	Hexagon head bolts, screws and nuts of product grades A and B
IS 1367 (Part 1):2002	Technical Supply Conditions for threaded fasteners.
IS 1367 (Part 2):2002	Technical Supply Conditions for threaded fasteners.
IS 1367 (Part 3):2002	Technical Supply Conditions for threaded fasteners.
IS 1367 (Part 13):1983	Technical Supply Conditions for threaded fasteners.
IS 2121:1981 (Part -1 & 2)	Specification for conductors and earthwire accessories for overhead power lines
IS 2121:1992 (Part -3)	Specification for conductors and earthwire accessories for overhead power lines.
IS 2121:1991 (Part -4)	Specification for conductors and earthwire accessories for overhead power lines
IS 5561:1970	Electric power connectors.
IS 2633:1986	Methods for testing uniformity of coating of zinc coated articles.
IS 1573:1986	Electroplated coating of Zinc on Iron and Steel
IS 3138:1966	Hexagonal Bolts & Nuts (M42 to M150)
IS 4218 (Parts 1.2 & 4) 2001	Metric Screw Threads
IS 4218:(Part 3):1999	Metric Screw Threads

IS 4218:(Part 6):1978	Metric Screw Threads
IS 10162:1982	Spacers & spacer dampers for twin horizontal bundle conductors
ISO 272	Fasteners: Hexagonal Products -Width across Flats.
ISO 898	Fasteners, Screws & Studs
NEMA CC1	Electric power connectors for sub-station
NEMA CC3	Connectors for use between Aluminium or Aluminium-Copper Overhead Conductors.
IS 816:1969	Code of practice for use of metal arc welding for general construction in mild steel.
IS 4759:1996	Hot dip zinc coatings on structural steel and other allied products.
IS 2633:1986	Methods for testing uniformity of coating of zinc coated articles.
IS 2629:1985	Recommended practice for hot dip galvanising of iron and steel.

2.3 Clamps and Connectors

All the current carrying parts shall be designed and manufactured to have minimum resistance. Maximum tension per conductor is expected to be 1000kg in case of 220kV and 2000kg in case of 400kV. Clamps and fittings shall be so designed that the equipment shall not be subject to any abnormal stresses due to thermal changes in conductor. All the clamps and fittings shall enable the connection to be as short as possible. Wherever possible they shall be in two separate halves. No U bolts shall be used. Corona control ring shall be of such design and shape that they will prevent visual discharge forming on the hardware assemblies. They shall have minimum thickness of 2.5mm. All similar parts, particularly the removable one shall be interchangeable with one another.

- 2.3.1 All power clamps and connectors shall conform to IS:5561 & NEMA CC1 and shall be made of materials listed below:

- | | | |
|----|---|---|
| a) | For connecting ACSR conductors/Aluminium tube | Aluminum alloy casting, conforming to designation A6 of IS:617 and all test shall conform to IS:617 |
| b) | For connecting equipment terminals made of copper with ACSR conductors/Aluminium tube | Bimetallic connectors made from aluminum alloy casting, conforming to designation A6 of IS:617 with 2mm thick bimetallic liner/strip and all test shall conform to IS:617 |
| c) | For connecting G.I | Galvanised mild steel shield wire |
| d) | i) Bolts, nuts & Plain. washers | i) Electro-galvanised for sizes below M12, for others hot dip galvanised. |
| | ii) Spring washers for items 'a' to 'c' | ii) Electro-galvanised mild steel suitable for atleast service condition-3 as per IS:1573 |
- 2.3.2 Necessary clamps and connectors shall be supplied for all equipment and connections. The requirement regarding external corona and RIV as specified for any equipment shall include its terminal fittings. If corona rings are required to meet these requirements they shall be considered as part of that equipment and included in the scope of work.
- 2.3.3 Where copper to aluminum connections are required, bi-metallic clamps shall be used, which shall be properly designed to ensure that any deterioration of the connection is kept to a minimum and restricted to parts which are not current carrying or subjected to stress.
- 2.3.4 Low voltage connectors, grounding connectors and accessories for grounding all equipment as specified in each particular case, are also included in the scope of Work.
- 2.3.5 No current carrying part of any clamp shall be less than 10 mm thick. All ferrous parts shall be hot dip galvanised. Copper alloy liner of minimum 2 mm thickness shall be cast integral with aluminum body or 2 mm thick bi-metallic strips shall be provided for Bi-metallic clamps.
- 2.3.6 All casting shall be free from blow holes, surface blisters, cracks and cavities. All sharp edges and corners shall be blurred and rounded off.
- 2.3.7 Flexible connectors, braids or laminated straps made for the terminal clamps for bus posts shall be suitable for both expansion or through (fixed/sliding) type connection of 4" IPS AL. tube as required. In both the cases the clamp height (top of the mounting pad to centre line of the tube) should be same.
- 2.3.8 Clamp shall be designed to carry the same current as the conductor and the temperature rise shall be equal or less than that of the conductor at the specified ambient temperature. The rated current for which the clamp/connector is designed with respect to the specified reference ambient temperature, shall also be indelibly marked on each component of the clamp/connector, except on the hardware.
- 2.3.9 All current carrying parts shall be designed and manufactured to have minimum

contact resistance.

- 2.3.10 Clamps and connectors shall be designed to be corona controlled.
- 2.3.11 Bolts and nuts shall have hexagonal heads and threads as per Indian standard. Rated torque of the nuts shall be indicated on drawing.
- 2.3.12 For flexible connectors, braids or laminated straps shall be made from tinned copper strips or aluminium laminates depending upon the clamp. All Aluminium conductors of adequate current, mechanical stability & flexibility can also be provided.
- 2.3.13 Each clamp/ connector shall be identified with respective BOM & Drawing number.
- 2.3.14 **Designs:**

Responsibility of satisfactory design of the clamps/connectors to safely withstand the specified mechanical stresses and carry the rated current without exceeding the temperature rise specified, shall solely rest with the bidder.
- 2.3.15 **Clamps and Connectors-Tests**

A. Type Tests

The clamps and connectors shall be subject to type tests as per IS-5561-1970. Type tests shall be carried out on three clamps and connectors of each type and design. All clamps and connectors shall also be type tested as per applicable clause no. as indicated against each test for the following in addition to the other tests indicated in IS-5561.

- i) Temperature Rise test (Clause 12)
- ii) Short time current test (Cl.No.13)
- iii) Resistance test (Cl.No. 11)
- iv) Tensile test (Cl. No. 10)
- v) Dimensional Check (Cl. No. 14)
- vi) Galvanization Test (Where applicable)(Cl. 15)
- vii) Visual Corona & RIV test (for 400 & 220 kV systems)

B. Acceptance Test

Following acceptance tests shall be carried out as per applicable clause no. of IS:5561:1970 indicated against each test :

- i) Resistance test (Cl.No. 11)

- ii) Tensile test (Cl.No. 10)
- iii) Dimensional Check (Cl.No. 14)
- iv) Galvanization Test (Where applicable) (Cl.15)

C. Routine Test

Following Routine tests shall be carried out as per applicable clause no. of IS:5561:1970 indicated against each test :

- i) Visual Check
- ii) Dimensional Check (Cl.No.14)

2.4 SPACERS

2.4.1 General :

Spacer shall conform to IS : 10162. The spacers are to be located at a suitable spacing to limit the short circuit forces as per IEC -60865. For strung buses, flexible type spacers shall be used whereas for jumpers and other connections rigid type spacers shall be used.

2.4.2 Constructional Features

- a) No magnetic material shall be used in the fabrication of spacers except for GI bolts and Nuts.
- b) Spacer design shall be made to take care of fixing and removing during installation and maintenance
- c) The design of the spacers shall be such that the conductor does not come in contact with any sharp edge.

2.4.3 Tests

Each type of spacer shall be subjected to at least the following type tests, acceptance tests and routine tests in addition to all other tests specified in IS 10162:

A. Type Tests: Following type test reports shall be submitted for approval as per clause 1.4 of Section-1.

a) Clamp slip tests

The sample shall be installed on test span of twin conductor bundle string or quadruple conductor bundle string (as applicable) at a tension of 44.2kN. One of the clamps of the sample when subjected to a longitudinal pull of 2.5kN parallel to the axis of the conductor shall not slip on the conductor. The permanent displacement

between the conductor and the clamp of sample measured after removal of the load shall not exceed 1.0 mm. Similar tests be performed on the other clamps of the same sample.

b) Fault current test as per CI 5.14.2 of IS : 10162.

c) Corona Extinction Voltage test (Dry)

This test shall be performed as per procedure mentioned at Annexure-A section –2. Minimum corona extinction voltage shall be 320kV (rms) line to ground for 400 kV , 156kV (rms) line to ground for 220kV spacers respectively.

d) RIV Test (Dry)

This test shall be performed as per procedure mentioned at Annexure-A. Section-2. Max. radio interference voltage for frequency between 0.5 MHz and 2 MHz at 320KV rms for 400KV system (1000 micro volts) and 156kV rms for 220kV system (1000 micro volts)

e) Resilience test (if applicable)

f) Log decrement test (applicable only for spacer dampers)

g) Compression test.

h) Galvanising test.

i) Movement test

j) Clamp bolt torque test

k) Assembly torque test

l) Tensile load test

m) Compression and pull off test.

n) Vibration test

o) Magnetic power loss test

B. Acceptance Test (As per IS : 10162 (Latest Version))

a) Visual examination

b) Dimensional verification

c) Movement test

- d) Clamp slip test
- e) Clamp bolt torque test (if applicable)
- f) Assembly torque test
- g) Compression test
- h) Tension test
- i) Galvanising test
- j) Hardness test for neoprene (if applicable)

The shore hardness of different points on the elastometer surface of cushion grip clamp shall be measured by shore hardness meter. It shall be between 65 to 80.

- k) Ultimate Tensile Strength Test

The UTS of the retaining rods shall be measured. It shall not be less than 35 kg/Sq. Mm.

C. Routine test

- a) Visual examination
- b) Dimensional verification

ANNEXURE-A

CORONA AND RADIO INTERFERENCE VOLTAGE (RIV) TEST

1. General

Unless otherwise stipulated, all equipment (except Auto Transformer & Shunt Reactor) together with its associated connectors, where applicable, shall be tested for external corona both by observing the voltage level for the extinction of visible corona under falling power frequency voltage and by measurement of radio interference voltage (RIV).

2. Test Levels:

The test voltage levels for measurement of external RIV and for corona extinction voltage are listed under the relevant clauses of the specification.

3. Test Methods for RIV:

- 3.1 RIV tests shall be made according to measuring circuit as per International Special-Committee on Radio Interference (CISPR) Publication 16-1(1993) Part -1. The measuring circuit shall preferably be tuned to frequency with 10% of 0.5 Mhz but other frequencies

in the range of 0.5 MHz to 2 MHz may be used, the measuring frequency being recorded. The results shall be in microvolts.

- 3.2 Alternatively, RIV tests shall be in accordance with NEMA standard Publication No. 107-1964, except otherwise noted herein.
- 3.3 In measurement of, RIV, temporary additional external corona shielding may be provided. In measurements of RIV only standard fittings of identical type supplied with the equipment and a simulation of the connections as used in the actual installation will be permitted in the vicinity within 3.5 meters of terminals.
- 3.4 Ambient noise shall be measured before and after each series of tests to ensure that there is no variation in ambient noise level. If variation is present, the lowest ambient noise level will form basis for the measurements. RIV levels shall be measured at increasing and decreasing voltages of 85%, 100%, 115% and 130% of the specified RIV test voltage for all equipment unless otherwise specified. The specified RIV test voltage for 400 kV, 220 KV is listed in the detailed specification together with maximum permissible RIV level in microvolts.
- 3.5 The metering instruments shall be as per CISPR recommendation or equivalent device so long as it has been used by other testing authorities.
- 3.6 The RIV measurement may be made with a noise meter. A calibration procedure of the frequency to which noise meter shall be tuned shall establish the ratio of voltage at the high voltage terminal to voltage read by noise meter.

4. Test Methods for Visible Corona

The purpose of this test is to determine the corona extinction voltage of apparatus, connectors etc. The test shall be carried out in the same manner as RIV test described above with the exception that RIV measurements are not required during test and a search technique shall be used near the onset and extinction voltage, when the test voltage is raised and lowered to determine their precise values. The test voltage shall be raised to 130% of RIV test voltage and maintained there for five minutes. In case corona inception does not take place at 130 %, test shall be stopped, otherwise test shall be continued and the voltage will then be decreased slowly until all visible corona disappears. The procedure shall be repeated at least 4 times with corona inception and extinction voltage recorded each time. The corona extinction voltage for purposes of determining compliance with the specification shall be the lowest of the four values at which visible corona (negative or positive polarity) disappears. Photographs with laboratory in complete darkness shall be taken under test conditions, at all voltage steps i.e. 85%, 100%, 115% and 130%. Additional photographs shall be taken at corona inception and extinction voltages. At least two views shall be photographed in each case using Panchromatic film with an ASA daylight rating of 400 with an exposure of two minutes at a lens aperture of f/5.6 or equivalent. The photographic process shall be such that prints are available for inspection and comparison with conditions as determined from direct observation. Photographs shall be taken from above and below the level of connector so as to show corona on bushing, insulators and all parts of energised connectors. The photographs shall be framed such that test object essentially, fills the frame with no cut-off.

- 4.1 The test shall be recorded on each photograph. Additional photograph shall be taken from each camera position with lights on to show the relative position of test object to

facilitate precise corona location from the photographic evidence.

- 4.2 In addition to photographs of the test object preferably four photographs shall be taken of the complete test assembly showing relative positions of all the test equipment and test objects. These four photographs shall be taken from four points equally spaced around the test arrangement to show its features from all sides. Drawings of the laboratory and test set up locations shall be provided to indicate camera positions and angles. The precise location of camera shall be approved by Purchaser's inspector, after determining the best camera locations by trial energisation of test object at a voltage which results in corona.
- 4.3 The test to determine the visible corona extinction voltage need not be carried out simultaneously with test to determine RIV levels.
- 4.4 However, both test shall be carried out with the same test set up and as little time duration between tests as possible. No modification on treatment of the sample between tests will be allowed. Simultaneous RIV and visible corona extinction voltage testing may be permitted at the discretion of Purchaser's inspector if, in his opinion, it will not prejudice other test.

5. Test Records:

In addition to the information previously mentioned and the requirements specified as per CISPR or NEMA 107-1964 the following data shall be included in test report:

- a) Background noise before and after test.
- b) Detailed procedure of application of test voltage.
- c) Measurements of RIV levels expressed in micro volts at each level.
- d) Results and observations with regard to location and type of interference sources detected at each step.
- e) Test voltage shall be recorded when measured RIV passes through 100 microvolts in each direction.
- f) Onset and extinction of visual corona for each of the four tests required shall be recorded.

SECTION - 3

GENERAL TECHNICAL REQUIREMENTS

3.0 GENERAL

This section stipulates the General Technical Requirements under the Contract and will form an integral part of the Technical Specification.

The provisions under this section are intended to supplement general requirements for the materials, equipments and services covered under other sections and are not exclusive. However in case of conflict between the requirements specified in this section and requirements specified under other sections, the requirements specified under respective sections shall hold good.

3.1 SITE INFORMATION

	Particular																							
a)	Customer/ Owner	NHPC LIMITED																						
b)	Purchaser	Bharat Heavy Electricals Limited																						
c)	Project Title	Parbati Hydroelectric Project Stage-III(H.P.) India																						
d)	Location	Located in Kullu District of Himachal Pradesh. Project Headquarter is proposed at Sainj which is about 258 kM from Chandigarh on Chandigarh-Manali National Highway NH-21.																						
e)	Transport Facilities	The nearest broad gauge railhead is at Kiratpur, which is 190 kM away. The nearest Airport is located at Bhuntar. The approximate distance of Sainj (Project Headquarter) from different important towns is as follows: <table><tr><td>From Bhuntar(Airport)</td><td>36 kM</td></tr><tr><td>From Delhi</td><td>508 kM</td></tr><tr><td>From Chandigarh</td><td>258 kM</td></tr><tr><td>From Kiratpur</td><td>190 kM</td></tr><tr><td>From Shimla</td><td>208 kM</td></tr></table> Parbati H.E.Project, Stage-III is connected by 172 kMs long National Highway(NH-21) from nearest broad gauge railhead Kiratpur sahib upto Aut and thereafter by the existing 3/5 M wide state PWD road 21 kMs in length upto dam proposed at village Suind and other components of the project. The maximum permitted size of bulkiest package for transportation upto project site is as under: <table><tr><td>Length</td><td>-</td><td>6.0 M</td></tr><tr><td>Width</td><td>-</td><td>4.5 M</td></tr><tr><td>Height (including trailer bed</td><td>-</td><td>5.5 M</td></tr><tr><td>Height above ground)</td><td></td><td></td></tr></table>	From Bhuntar(Airport)	36 kM	From Delhi	508 kM	From Chandigarh	258 kM	From Kiratpur	190 kM	From Shimla	208 kM	Length	-	6.0 M	Width	-	4.5 M	Height (including trailer bed	-	5.5 M	Height above ground)		
From Bhuntar(Airport)	36 kM																							
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Length	-	6.0 M																						
Width	-	4.5 M																						
Height (including trailer bed	-	5.5 M																						
Height above ground)																								
f)	Postal Address	To follow																						

SITE CONDITIONS		
a)	Mean Max. Ambient air temp.	46°C
b)	Mean Min. ambient air temp.	-4°C
c)	Design Ambient Temperature	50°C
d)	Maximum Relative Humidity	98.8%
e)	Minimum Relative Humidity	4.40%
f)	Maximum height above sea level	1000 M for GIS and 1087 for Potyard
g)	Pollution Severity	Heavily Polluted (Creepage 25 mm/kV)
h)	Basic horizontal Seismic Co-efficient	Zone V Peak ground acceleration 0.36g for Maximum Credible Earthquake(MCE) and 0.18g for Design Basis Earthquake(DBE)
i)	Average number of thunder storm days per annum	
j)	Average Soil resistivity	
k)	Average rainfall	
l)	Maximum wind speed	
m)	Prevailing Wind Direction	

3.2 GENERAL TECHNICAL REQUIREMENT

3.2.1 GENERAL

This part covers technical conditions which form integral part of the Contract. The following provisions shall supplement all the detailed technical specifications and the requirements brought out in the various sections of this specification.

3.2.2 CODES AND STANDARDS

All materials and equipment shall generally comply in all respect with the latest edition of relevant international electro-technical commission (IEC) or any other internationally accepted standard which ensure equal or better quality or relevant Indian standard(IS) mentioned against each equipment and this specification.

The equipment are also to comply with latest and revised Indian electricity act and electricity rules and any other electrical statutory and provisional rules and regulations. In the event of supply of equipment conforming to any international or internationally recognised standard which will ensure equal or better than those standards specified for each equipment in this specification, salient features of comparison shall be brought out and furnish along with bid in English language. However, in case of standard other than IS & IEC or CBIP, if requested by the Engineer the supplier shall supply at his own expense three copies of the adopted standard in English language and one in original language. Brief detail of relevant standards has been given in section 2 for reference.

3.2.3 TYPE TESTS

All equipment/systems to be supplied shall conform to type tests as per relevant standards and proven type.

The Bidder / Contractor shall furnish the reports of all the type tests carried out in within last five years as listed in relevant clauses in respective electrical specification and relevant standards for all components / equipment / systems. These reports should be for the tests conducted on identical/similar components/equipment/systems to those offered/proposed to be supplied under this contract.

In case Contractor is not able to submit report of type test(s) conducted in last five years, or in case type test report(s) are not found to be meeting the specification/relevant standard requirements, then all such tests shall be conducted under this contract by the Bidder free of cost to Employer, and reports shall be submitted for approval. No charges shall be paid under this contract.

Irrespective of the Contractor furnishing valid test report as indicated above, Employer will get some type test conducted under this contract specified as Mandatory Tests in other sections of this specification. The charges for each of these type tests shall be given in the offer.

All acceptance and routine tests as per relevant standards and specification shall be deemed to be included in the bid price.

3.2.4 DOCUMENTATION TO BE FURNISHED BY THE BIDDER

The number of copies/ prints/ reproducibles, manuals, computer CD-ROM's/ manuals to be furnished for various types of document is given in ANNEXURE-A.

The documentation shall include but not limited to the following as applicable, in addition to the documents if specified in Sections 1 and 2.

3.2.4.1 DETAILED ENGINEERING

1. Layout, General Arrangements, Elevations and Cross Section drawings of all equipment and facilities of the plant.
2. Flow diagram, Process & Instrumentation Diagrams
3. Technical data Sheets.
4. Detail design calculations for components, system, piping etc. wherever applicable including sizing calculations.
5. Characteristic Curves/ Performance Correction Curves.
6. Power Supply Single Line Diagram, Block logic, Control Schematics, Electrical Schematics etc.
7. Protection System Diagrams and Relay Settings.
8. Cable Schedules and interconnection diagrams
9. Cable Routing Plan
10. Instrumentation schedule, measuring point list, functional write ups, installation drawings for field mounted instruments, wiring and tubing diagrams of the panels and enclosures etc. Drawings for open and closed loop controls (both hardware and software). Motor list and valve schedule including type of actuator etc.
11. Alarm and annunciation/ Sequence of Event (SOE) list and trip set points.

-
12. Sequence and protection interlock schemes.
 13. Type test reports (of tests conducted within 5 years)
 14. Control system configuration diagrams and card circuit diagrams and maintenance details.
 15. Detailed software manuals and software listing.
 16. Detailed flow chart for digital control system.
 17. Mimic diagram Layout
 18. Civil drawings consisting of foundation and structural work, civil calculation sheets including structural analysis and design.
 19. Model study reports wherever applicable
 20. Documentation in respect of Quality Assurance System as listed out elsewhere in this specification.

3.2.4.2 INSTRUCTION MANUALS

The instruction manuals shall contain full details required for erection, commissioning, operation and maintenance of each equipment. The manual shall be specifically compiled for this project. The instruction manual shall comprise of the following-

ERECTION MANUALS

The minimum contents of Erection Manual shall be as follows -

1. Erection Strategy
2. Sequence of Erection
3. Erection Instructions
4. Critical checks and permissible deviations/tolerances.
5. List of tool, tackles, heavy equipment like cranes, dozers etc.
6. Bill of Material
7. Procedure for erection
8. Procedure for initial checking after erection.
9. Procedure for testing and acceptance norms.
10. Procedure / Check List for pre-commissioning activities.
11. Procedure / Check List for commissioning of the system.
12. Safety precautions to be followed in electrical supply distribution during erection.

OPERATION AND MAINTENANCE MANUALS

The operating and maintenance instructions together with drawings (other than shop drawings) of the equipment, as completed shall be in sufficient detail to enable the Owner to operate, maintain, dismantle, reassemble and adjust all parts of the equipment. They shall give step by step procedure for all operations likely to be carried out during the life of the plant/equipment including operation, maintenance, dismantling and repair. Each manual shall also include a complete set of drawings

together with performance / rating curves of the equipment and test certificates wherever applicable.

If after the commissioning and initial operation of the plant, the manuals require any modification/ additions/ changes the same shall be incorporated and the updated instruction manuals shall be submitted to the Owners for records.

A separate section of the manual shall be for each size / type of the equipment and shall contain a detailed description of construction and operation, together with all relevant pamphlets and drawings.

The manuals shall include the following -

1. List of spare parts along with their drawings and catalogues and procedure for ordering spares.
2. Lubrication Schedules including charts showing lubrication checking, testing and replacement procedure to be carried out daily, weekly, monthly and at longer interval to ensure trouble free operation.
3. Wherever applicable, fault location charts shall be included to facilitate finding the cause of the mal-operation or break down.

Detailed specifications for the consumables including lubricant oils, greases, chemicals etc. shall be required for the complete plant.

3.2.4.3 DRAWINGS

1. All drawings shall be made in Autocad 2006 or latest Version. All drawings shall be plotted in ink. All dimensions and data shall be in SI metric units. All items of the equipment should be clearly identified by proper part numbers in the contract drawings. Such parts which are to be dispatched to site from works in dispatchable units and are re-assembled at site, should be marked by proper identification marks at works and indicated in the drawings and quantified. All the items of the shipping list should be identified in the drawing. The language for all inscriptions shall be English.
2. All drawings submitted by the contractor including those submitted at the time of bid shall be in sufficient detail indicating the type, size, arrangement, weight of each component for packing and shipment, external connection, fixing arrangement required, the dimensions required for installation and interconnections with other equipment and materials clearances and spaces required between various portions of equipment.
3. Each drawing shall bear a title block at the right hand bottom corner with clear mention of the name of the Owner, the System designation, specifications title, specifications number the name of the Projects drawing number and the revisions. If standard catalogue pages are submitted the applicable items shall be indicated there. All titles, noting, markings and writings on the drawing shall be in English. All the dimensions should be metric units. **The title block for the drawings and documents and the numbering system shall be furnished to the successful bidder, which has to be strictly followed.**
4. The furnishing of detailed engineering data and drawings by the Contractor shall be in accordance with the time schedule for the Project. The review of these

- documents /data/ drawings by the Owner will cover only general conformance of the data/ drawings/documents to the specifications and contract, interfaces with the equipment provided by others and external connections of the dimensions which might affect plant layout. The review by the Owner should not be construed to be thorough review of all dimensions, quantities and details of the equipment, material, any devices or items indicated or the accuracy of the information submitted. The review and/or approval by the Owner shall not relieve the Contractor of any of his responsibilities and liabilities under the contract.
5. After the approval of the drawings, further work by the Contractor shall be in strict accordance with these approved drawings and no deviation shall be permitted without the written approval of the Owner.
 6. All manufacturing, fabrication and execution of the work in connection with the equipment/system, prior to the approval of the drawings shall be at Contractor's risk. The Contractor is not expected to make any change in the design of the equipment/system, once they are approved by the Owner. However, if some changes are necessitated in the design of the equipment/ system at a later date, the contractor may do so, but such change shall be promptly be brought to the notice of Owner indicating the reasons for the change and get the revised drawing approved again.
 7. Drawing shall include all installation and detailed piping drawings. All piping of 100 mm and larger diameter shall be routed in detail and smaller pipe shall be shown schematically or by isometric drawing.
 8. As Built Drawings - After final acceptance of individual equipment/ system by the Owner the contractor will update all original drawings and documents for the equipment /system to "As Built" conditions.
 9. Drawings must be checked by the contractor prior to submission to the Owner. In case drawings are found to be submitted without proper checking by the contractor, the same shall not be reviewed and returned to the contractor for re-submission.
 10. The Bidder shall submit the specified number of prints of drawings /data/ document **along with soft copy** for Owner's review and approval. The Owner shall review the drawings and return one (1) copy to the contractor authorizing either to proceed with manufacture or fabrication or marked to show changes desired. When changes are required, drawings shall be resubmitted promptly, with revisions clearly marked for the final review. Any delays arising out of the failure of the contractor to submit /rectify in time shall not be accepted as a reason for delay in the contract schedule.
 11. The Bidder shall submit to the employer for approval within the time given in the contract or in the Program such drawing , samples , models or information as may be called for therein , and in the number therein required .During the progress of the works , such drawings of the general arrangements and details of the works as specified in the Contract. The Employer shall signify his approval or disapproval within 30 days. Approve drawings samples and models shall be signed or otherwise identified by the employer. The Contractor shall supply additional copies of drawings in the form and number stated in the contract.

12. The following Schedule and procedure of drawing approval to be followed:

Sl. No.	Steps	Action/Approved status Duration
1.	First Submission by Bidder (as per approved program)	COMMENTED 1- "Approved" 2- "Approved- Except As Noted" 3- "not Approved" 4- "For Information Only" 21 Days
2.	Second submission by Bidder within 10 days	For '1' –Approved drawings Resubmitted with incorporation of comments/modifications with revision no. For '3' –Returned with corrections/changes with Revision no. 15 Days
3.	third submission by Bidder within 07 days	For '1' Approved 15 Days

Note-

Resubmission of '2' category and '3' category shall be within 7 days 10 days respectively to be recorded from the date of return of such drawings.

Approval of any drawing by the Employer shall not relieve the Bidder of his responsibility for the accuracy thereof or modification required during actual execution or for any deviation in scheme from Technical specification with accepted deviation if there by any.

3.2.5 QUALITY ASSURANCE PROGRAMME

To ensure that the equipment and services under the Scope of Contract, whether manufactured or performed within the Contractor's works or at his Sub-Contractor's premises or at the Owners' site or at the other place of work are in accordance with the specifications, the Contractor shall adopt suitable quality assurance programme to control such activities at all points, as necessary. Such programme shall be outlined by the Contractor and finally accepted by the Owner/ Authorized representative after discussions before the award of Contract. The QA programme shall be generally in line with ISO-9001/IS-14001. A quality programme shall be generally cover the following:

1. His Organization structure for the management and implementation of the proposed quality assurance programme.
2. Quality System Manual
3. Design Control System
4. Documentation Control System

-
5. Qualification data for Bidder's key personnel
 6. The procedure for purchase of materials, parts, components, and selection of Subcontractor's services including vendor analysis, source inspection, incoming raw material inspection, verification of material purchased etc.
 7. System for shop manufacturing and site erection control including process controls and fabrication and assembly controls.
 8. Control of non-conforming items and system for corrective actions.
 9. Inspection and test procedure both for manufacture and field activities.
 10. Control of Calibration and testing of measuring, testing equipment.
 11. System for quality audits.
 12. System for indication and appraisal of inspection status.
 13. System for authorizing release of manufactured product to the Owner.
 14. System for handling, stores and delivery
 15. System for maintenance of records.
 16. Furnishing of quality plans for manufacturing and field activities detailing out the specific quality control procedure adopted for controlling the quality characteristics relevant to each item of the equipment/ component as per format enclosed in SCHEDULE-4 & 5 of section -5.

QUALITY ASSURANCE DOCUMENTS

The Contractor shall submit the following Quality Assurance documents within three weeks after dispatch of the equipment.

1. Material mill test reports on components as specified by the specification and approved Quality Plans.
2. The inspection plan with verification, inspection plan check points verification sketches, if used and methods used to verify that the inspection and testing points in the inspection plan were performed satisfactorily.
3. Sketches and drawings used for indicating the method of traceability of the radiographs to the location on the equipment.
4. Non-destructive examination results reports including radiography interpretation reports.
5. Factory tests results for testing required as per applicable codes and standard referred in the specification and approved Quality Plans.
6. Inspection reports duly signed by QA personnel of the Owner and Contractor for the agreed customer hold points

During the course of inspection, the following will also be recorded.

- (A) When some important repair work is involved to make the job acceptable and
 - (B) The repair work remains part of the accepted product quality
7. All the accepted deviations shall be included with complete technical details.

INSPECTION, TESTING AND INSPECTION CERTIFICATES

1. The word 'Inspector' shall mean the Owner and/or his authorized representative and/or an outside inspection agency acting on behalf of the Owner to inspect and examine the materials and workmanship or the works during its manufacture or erection.
2. The Owner, his duly authorized representative and or an outside inspection agency acting on behalf of the Owner shall have access at all reasonable times to inspect and examine the materials and workmanship of the works during its manufacture or erection and if part of the works is being manufactured or assembled on other premises or works, the contractor shall obtain for the Owner and for his duly authorized representative permission to inspect as if the works were manufactured or assembled on the contractors own premises or works.
3. The contractor shall give the Owner/inspector fifteen (15) days written notice of any material being ready for testing. Such tests shall be to the contractor's account except for the expenses of the inspector's. The Owner/inspector, unless the witnessing of the tests is virtually waived, will attend such tests within fifteen (15) days of the date on which the equipment is noticed as being ready for tests/inspection and he shall forthwith forward to the inspector duly certified copies of test reports.
4. The Owner or inspector shall within fifteen (15) days from the date of inspection as defined herein give notice in writing to the contractor, or any objection to any drawings and all or any equipment and workmanship which is in his opinion not in accordance with the contract. The contractor shall give due consideration to such objections and shall either make modifications that may be necessary to meet the said objections or shall confirm in writing to the Owner/inspector giving reasons therein, that no modifications are necessary to comply with the contract.
5. When the factory tests have been completed at the contractor's or subcontractors works the Owner/inspector shall issue a certificate to this effect fifteen (15) days after completion of tests but if the tests are not witnessed by the Owner/inspectors the certificates shall be issued within fifteen (15) days of the receipt of the contractor's test certificate by the Owner/inspector. Failure of Owner /inspector to issue such a certificate shall not prevent the contractor from proceedings with the works. The completion of these tests, or the issue of the certificates shall not bind the Owner to accept the equipment should it, on further tests after erection be found not to comply with the contract.
6. In all cases where the contract provides for tests whether at the premises or works of the contractor or any sub contractor, the contractor except where otherwise specified shall provide free of charges such items as labour, materials, electricity, fuel, water, stores, apparatus and instruments as may be reasonably demanded by the Owner/inspector or his authorized representatives to carry out effectively such tests on the equipment in accordance with the contract and shall give facilities to the Owner/inspector or to his authorized representative to accomplish testing.
7. The inspection by Owner and issue of inspection certificate there on shall in no way limit the liabilities and responsibilities of the contractor in respect of the agreed quality assurance programme forming a part of the contract.
8. To facilitate advance planning of inspection in a addition to giving inspection notice as per clause 3 of 3.2.8. the contractor shall furnish quarterly inspection

programme indicating schedule dates of inspection at customer hold point and final inspection stages. Updated quarterly inspection plans will be made for each three consecutive months and shall be furnished before beginning of each calendar month.

9. All inspection, measuring and test equipment used by contractor shall be calibrated periodically depending on its use and criticality of the test/measurement to be done. The contractor shall maintain all the relevant records of periodic calibration and instrument identification and shall produce the same for inspection by Owner. Wherever asked specifically the contractor shall recalibrate the measuring test equipment in the presence of Owner engineer.

FIELD INSPECTION & TESTS

The following field inspections and tests will be carried out in the sequence detailed below, and the successful performance and completion of all the tests taken together shall constitute the OWNER ACCEPTANCE TESTS -

1. On completion of erection of the equipment and before start-up, each item of the equipment shall be thoroughly cleaned and then inspected jointly by the Owner and the contractor for correctness and completeness of installation and acceptability for start-up, leading to initial pre-commissioning tests at site. The list of pre-commissioning tests to be performed shall be as mutually agreed and included in the contractor's quality assurance programme.
2. The contractor's commissioning/start-up engineers, specially identified as far as possible shall be responsible for carrying out all the pre-commissioning tests at site. On completion of inspection, checking and after the pre-commissioning tests are satisfactorily over the complete equipment shall be placed on initial operation during which period the complete equipment shall be operated integral with sub-systems and supporting equipment as a complete plant.
3. All piping system shall be flushed steam blown as required and cleanliness demonstrated using acceptable industry standards procedures to accomplish this work shall be submitted for approval to the Owner six months prior to the respective implementations. The Owner will approve final verification of cleanliness.
4. The time consumed in the inspection and checking of the units shall be considered as a part of the erection and installation period.
5. The check outs during the pre-commissioning period should be programmed to follow the construction completion schedule. Each equipment/system, as it is completed in construction and turned over to Owners commissioning (start-up) Engineer(s) should be checked out and cleaned. The checking and inspection of individual system should then follow a prescribed schedule to be agreed by Owner.
6. The contractor during trial operation and performance testing conduct vibration testing to determine the base line of performance of all plant rotating equipment. These tests shall be conducted when the equipment is running at the base load, peak load as well as lowest sustained operating condition as far as practicable.

MATERIAL AND WORKMANSHIP

All material used for the construction of equipment shall be new and shall be in

accordance with the requirement of this specification. Material utilized for various components shall be those which have established themselves for use in such applications.

All castings shall be true to pattern, free from defects and of uniform quality and condition. The surfaces of castings, which do not undergo machining, shall be free from foundry irregularities. The casting shall be tested for NDT, chemical, mechanical and metallographic tests. This shall be specified in quality plan for the specific equipment. All components machined or fabricated from plate, sheet or bar stock shall meet the material requirements of ASTM. Structural steel rolled shapes, bars, etc. shall comply with the latest ASTM.

All or a representative number of such components shall be subjected to one or more of the tests: visual, dye penetration, magnetic particle (transverse and longitudinal), ultrasonic or radiograph. These tests shall be in accordance with the ASTM. The acceptance shall be as per ASTM Specifications.

All joints and fastening shall be so designed, constructed and registered that the component part may be accurately positioned and restrained to fulfil their required function. The heads of all bolts shall register flush on the surfaces, which they fasten.

All the information concerning materials or components to be used in manufacture, machinery, equipment, materials and components supplied, installed or used shall be submitted for approval. Without such approval the Contractor shall run risk of subsequent rejection. The cost as well as time delay associated with such rejection shall be borne by the Contractor.

All components exposed to rain shall be designed with sloped upper surface to avoid water pools.

AUXILIARY SUPPLY

The sub-station auxiliary supply is normally met through a system indicated under section-5 having the following parameters. The auxiliary power for station supply, including the equipment drive, cooling system of any equipment, air-conditioning, lighting etc shall be designed for the specified Parameters as under. The DC supply for the instrumentation and PLCC system shall also conform to the parameters as indicated in the following.

<i>Normal Voltage</i>	<i>Variation</i>	<i>in Frequency</i>	<i>in Phases</i>	<i>Neutral connection</i>
<i>415V</i>	<i>+/- 1 0%</i>	<i>50 +I- 5%</i>	<i>3/4-Wire</i>	<i>Solidly</i>
<i>240V</i>	<i>+/- 1 0%</i>	<i>50 +/- 5%</i>	<i>1 /2-wire</i>	<i>Earthed.</i>
<i>220V</i>	<i>+/- 1 0%</i>	<i>DC</i>	<i>2-wire</i>	<i>Isolated</i>
<i>50 V</i>	<i>+/-1 0%</i>	<i>DC</i>	<i>2-wire</i>	<i>Isolated</i>

Combined variation of voltage and frequency shall be limited to +/- 10%.

BOLTS, NUTS AND WASHERS

Bolts, nuts and plain washers of size M12 and above shall be hot-dip galvanized, while

sizes below M12 shall be electro-galvanized or stainless steel. Bolts and nuts shall be hexagonal or socket headed. All spring washers shall be electro-galvanized mild steel suitable for at least service condition. The shall supply the net quantities plus 5 percent of all permanent bolts, screws and other similar items and materials required for installation at site.

In general, screw threads shall be standard ISO metric threads. The use of other thread form will be used only after prior approval. The Contractor shall furnish locking devices for threaded fasteners, which will lock them in such a manner so as to prevent them from coming loose in transport and in service.

NOISE LEVEL

The noise level caused by the installed Works shall not exceed the following values if not otherwise stated in the particular technical specification:

- Machine hall, workshop, etc. max. 85 dB (A) at any place 1 M distant from operating equipment.
- Offices, control rooms, first aid max. 55 dB (A) rooms, canteens, etc.
- Residential areas, daytime max. 50 dB (A) night time max. 35 dB(A)

The noise level definition and measurement shall be in accordance with ISO and IEC. The values stated shall be adhered to taking a normal civil construction into account.

“Not withstanding reference made to various standards all equipment and works as per provisions and requirements of relevant and latest Indian Standards shall be acceptable.

PROTECTION

All coated surfaces shall be protected against abrasion, impact, discoloration and any other damages. All exposed threaded portions shall be suitably protected with either metallic or a nonmetallic protection device. All ends of valves and piping and conduit equipment connections shall be properly sealed with suitable devices to protect them from the damage. The parts which are likely to get rusted, due to exposure to weather, should also be properly treated and protected in a suitable manner. All primers/ paints / shall take into account the hot humid, corrosive and saline atmospheric conditions applicable for a coastal area.

All exposed metallic surfaces subject to corrosion shall be protected by the shop application of suitable coatings. All surfaces which will not be easily accessible after the shop assembly, shall be treated beforehand and protected for the life of the equipment. All surfaces shall be thoroughly cleaned of all mill scales, oxides and other coatings and prepared in the shop. The surfaces that are to finish painted after installation or require corrosion protection until installation, shall be shop painted with atleast two coats of primer.

Shop primer for all steel surfaces which will be exposed to operating temperature below 95 degrees Celsius shall be selected by the Contractor after obtaining specific approval of the Owner regarding quality of the primer proposed to be applied. Special high temperature primer shall be used on surfaces exposed to temperature higher than

95 degrees Celsius and such primer shall also be subject to the approval of the Owner.

All other steel surfaces which are not to be painted shall be coated with suitable dust preventive compound subject to the approval of the Owner.

All piping shall be cleaned after shop assembly by shot blasting or other means approved by the Owner. Lube oil piping or carbon steel shall be pickled.

All metal surfaces shall be treated to provide anti-corrosion protection. All ferrous surfaces for external use shall be hot-dip galvanized after fabrication. High Tensile steel nuts and bolts and spring washers shall be electro-galvanized to service condition 4. All steel conductors including those used for earthing / grounding (above ground level) shall also be galvanized according to IS- 2629.

FUNGISTATIC VARNISH -Special moisture and fungus resistant varnish shall be applied to parts, which may be subjected or predisposed to the formation of fungi due to the presence or deposit of nutrient substances. The varnish shall not be applied to any surface or part where the treatment will interfere with the operation or performance of the equipment. Such surfaces or parts shall be protected against the application of the varnish.

All Switchgear panels and Control / Relay Panels shall be painted by powder coating. Paint shade for electrical equipment shall be 692 for indoor and 631 of IS : 5 for outdoor equipment. However paint shade has to be matched with existing equipments. which shall be furnished at the detailed design engineering stage.

GALVANIZING

The galvanized surfaces shall consist of a continuous and uniform thick coating of zinc, firmly adhering to the steel by dry process. The finished surface shall be clean and smooth and shall be free from defects like discoloured patches, bare spots, unevenness of coating, spelter which is loosely attached to the steel globules, spiky deposits, blistered surfaces, flaking and peeling off, etc.

Unless otherwise specified in Section 1 or 2, the minimum weight of the zinc coating shall be as follows –

It shall be 610 gm/sq.m and minimum thickness of coating shall be 85 microns for all items thicker than 6 mm. The average coating thickness shall be 95 microns. For items less than 6 mm, requirements of coating thickness shall be as per clause 4.1 of IS 4759, 1984. For surfaces which will be embedded in concrete, the zinc coating shall be 900 gm/sq.m minimum. Galvanizing of each member shall be carried out in one complete immersion.

After galvanizing, no drilling or welding shall be performed on the galvanized parts of the equipment.

1. All bolts, nuts, lock nuts, washers, etc. shall be hot dip galvanized. Nuts, however, may be tapped, but not to cause
2. Adhesion test as per IS 2629 :1985
3. Mass of zinc coating as per IS 6745 :1972

3.3 SEISMIC WITHSTAND TEST

The seismic withstand test on complete equipment shall be carried out along with the supporting structure.

The Contractor shall arrange to transport the structure from the structure Contractor's works/ project site or alternatively arrange the structure as per approved drawings for the purpose of seismic withstand test only.

The seismic level specified shall be applied at the base of the structure. The accelerometers shall be provided at the terminal pads of the equipment and any other point as agreed by the Owner. The seismic test shall be carried out in all possible combinations of the equipment. The seismic test procedure shall be furnished for approval of the Owner.

3.4 TOOLS AND TACKLES

The Contractor shall supply with the equipment one complete set of all special tools and tackles and other instruments required for the erection, assembly, disassembly and proper maintenance of the plant and equipment and systems (including software). These special tools will also include special material handling, jigs and fixtures for maintenance and calibration/ readjustment. Checking and measurement aids etc. A list of such tools and tackles shall be submitted by the Bidder alongwith the offer.

The prices of each tool/ tackle shall be deemed to have been included in the total bid price. The tools and tackles shall be separately packed and sent to site. This set of tools and tackles shall not be used during erection and trial operation. For this purpose a separate set of tools and tackles shall be brought/ supplied by the Contractor. In case the above mentioned set is used during erection, commissioning or trial operation the same shall be refurbished repaired/ replaced as required to the satisfaction of the Owner before handing over. All tools and tackles shall be of reputed make acceptable to the Owner.

3.5 PACKING AND TRANSPORTATION

All the equipment shall be suitably protected coated covered or boxed and crated to prevent damage or deterioration during transit, handling and storage at site till the time of erection. While packing all the materials, the limitation from the point of view of the sizes of railway wagons available in India should be taken account of. The contractor shall be responsible for any loss or damage during transportation, handling and storage due to improper packing.

PACKING IN CRATES

For the equipment packed in crates, the packing wood shall be as per relevant Indian/ International standards. The base of the crate shall be made of wooden batons and planks giving necessary reinforcement, so that the bottom of the equipment is at a height of 100mm minimum from the ground level. The size of the plank shall be decided by the sub-contractor to suit the weight of equipment. Minimum thickness of the plank shall be 25mm and minimum width shall be 150mm. Crate shall be made while keeping the gap from 25mm to 200mm depending upon the size of equipment and weight. However, the responsibility of proper packing and safe delivery of the equipment to site lies with the supplier

3.6 DEVIATIONS FROM SPECIFICATIONS

Deviation, if any, from any of these specifications shall be listed out separately. Bidder shall attach a separate sheet titled as "DEVIATIONS FROM SPECIFICATIONS" and list all deviations details of each deviation Section wise and Clause wise. In absence of any deviation listed out separately, adherence to the specifications shall be assumed.

3.7 INFORMATION TO BE FURNISHED BY THE CONTRACTOR/ SUB CONTRACTOR

Information/ documents to be furnished at the TENDER / CONTRACT STAGE shall be as given below: (marked 'X' in the appropriate column)

DETAILS OF DOCUMENTATION TO BE FURNISHED	At Tender Stage	At Contract Stage
Technical offer with details of equipment, scope etc	X	
Guaranteed Technical particulars	X	X
Schedule of Tests to be conducted	X	
Schedule of deviations, if any, Section wise, clause wise, with respect to technical specifications	X	
List of past supplies complete with purchase & project ref., quantity, order ref., etc. where identical equipment have been supplied.	X	-
Manufacturing Quality Plan/ Standard Check List	X	X
Field Quality Plan	X	X
GA drg with dimensions & weight and foundation/ fixing details	X	X
Drg & Data submission schedule (to be furnished at contract stage shall be specified date-wise here).	X	X
Type test Reports.	X	X
Bar chart showing the time schedule indicating the timer required for design submission of drawing, manufacture of eqpt, test and inspection.	X	
Routine / Acceptance test reports.		X
Installation , Operation & Maintenance Manual	X	X
Field Quality Plan for receipt and storage, installation, testing and commissioning with details of test equipment, tests to be conducted and acceptance values	X	X

ANNEXURE-A

NUMBER OF COPIES AND MODES OF DOCUMENTATION TO BE SUBMITTED

Sl. No.	DESCRIPTION	TENDER STAGE	CONTRACT STAGE		
		PRINTS	PRINTS	CD-ROM	MANUALS
1.	Drawings & GTP data sheets for approval	2	7		
2.	Drawings & GTP data sheets after revision for approval		7		
3.	Drawings & GTP data sheets after revision for approval (Final)		12		
4.	Drawings and GTP-data sheets as build		12	4	
5.	RTFs of approved drawings		3		
6.	Test Procedures for approval	1	7		
7.	Type Test & Routine test Reports for approval	1	7		
8.	Type Test & Routine test Reports for after approval		12		
9.	Draft copies of the following for approval				
9.1	Erection Manual		7		
9.2	O & M Manual		7		
9.3	Commissioning and Performance procedure manual		7		
10.	Approved final copies of the following				
10.1	Erection Manual			4	12
10.2	O & M Manual			4	12
10.3	Commissioning and Performance procedure manual			4	12
11.	Draft copies of the following for approval				
11.1	Manufacturing Quality Plan		7		
11.2	Field Quality Plan		7		
12.	Approved final copies of the following				
12.1	Manufacturing Quality Plan				12
12.2	Field Quality Plan				12
13.	Inspection and Test Reports		7		12

NOTE:

Quality Documentation shall be arranged in plastic folders in the same order as they appear in the QP, with cover sheet and index with QP itself as the first document at the top.

Final Documentation shall be submitted in bound volumes with Customer & Project etc. written on top.

ANNEXURE - A
SCHEDULE OF TECHNICAL DEVIATIONS

Bidder shall list below all technical deviation clause wise w.r.t. tender specifications:

<u>S.No.</u>	<u>Page No.</u>	<u>Clause No.</u>	<u>Deviation</u>	<u>Reason / Justification</u>
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Any deviation not specifically brought out in this section shall not be admissible for any commercial implication at later stage. Except to the technical deviations listed in this schedule, bidder's offer shall be considered in full compliance to the tender specifications irrespective of any such deviation indicated / taken elsewhere in the submitted offer.

Date:

Tenderer's Stamp & Signature

ANNEXURE – B.1

GUARANTEED TECHNICAL PARTICULARS FOR SPACERS (To be submitted by the supplier at the contract execution stage)

Sr. Description	Spacers for ACSRMOOSE Quadruple conductor with sub- conductor spacing of 450 mm	Spacers for ACSR MOOSE Twin conduc- tor or with sub-conductor spacing of 250mm
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1. Maker's Name and country
2. Type
3. Suitable for (type of conductor bundle)
4. Spacing between subconductors
 - i) Along run of line mm
 - ii) At suspension insu- mm
lator string
 - iii) At jumpers
5. Distance between support clamps and first spacer.
 - i) At tension point mm
 - ii) At suspension position mm
 - iii) At jumpers.
6. Minimum number of spacers
 - i) Per span
 - ii) Per jumper
7. Maximum distance between adjacent spacer of each phase.
 - i) Along run of line (meters)

- ii) In jumper connections (metres)
- 8. Whether the spacer performs satisfactorily.
 - i) Under normal full load current.
 - ii) Under fault conditions.
- 9. Ultimate strength
 - i) Compression load in kg.
 - ii) Tensile load in kg.
- 10. Movement which can be accommodated by the unit :
 - i) Longitudinal mm
 - ii) Vertical mm
 - iii) Torsional (Angular) (degree)
- 11. a) Corona extinction voltage (kV)
 - i) Dry
 - ii) Wet
 - b) Core loss per unit in watts at rated voltage:
 - i) Dry condition:
 - ii) Wet condition:
 - c) Corona interference voltage at one mega hertz:
 - c1 Dry conditions at-
 - i) Normal rated line voltage.
 - ii) 20% above rated line voltage
 - c2 Wet condition:
 - i) Normal rated line voltage

- ii) 5% above the rated line voltage.
- 13. Weight
- 14. Magnetic power loss in watts at 600A, A.C. at 50 C.S.
- 15. Standards to which materials will be manufactured and listed.
- 16. Any other useful information.
- 17. Packing details.
- 18. Complete dimensioned drawing enclosed (Yes/No)

Name of firm:-----

Signature of
Tenderer : -----

Designation :-----

Place :-----

Date :-----

ANNEXURE – B.2

GUARANTEED TECHNICAL PARTICULARS FOR CLAMPS AND CONNECTORS (To be submitted by the supplier at the contract execution stage)

1. Tenderers Name and address.
2. Manufacturer's Name and address.
3. Applicable Technical Standards.
4. Application.
5. Manufacturer's type
6. For connection to-
 - 6.1 Conductor size and arrangement
 - 6.2 Equipment terminal size and terminal.
7. Material of clamps/fittings (state percentage composition of constituents and impurities present).
 - 7.1 Clamp body.
 - 7.2 Bolts, nuts & plain washers.
 - 7.3 Spring washers.
 - 7.4 Liners if any.
8. Maximum contact resistance (ohms)
Continuous current rating of the clamps/fittings
9. Maximum temp. rise of the clamps/fittings over ambient temp (50°C) when carrying full load current (°C)
10. Maximum temp. rise of the clamps/fittings over ambient temp. (50°C) when carrying an estimated fault current of 40KA for 1 sec. (°C)
 - i) Rated terminal load
 - ii) Minimum failing load.
11. Factor of safety
12. Minimum thickness of any part.

13. Weight of each type of clamp complete with hardware fittings (KG)
14. Machining accuracy of matching surface.
15. Service Indoor/outdoor.
16. Major dimensions of the clamps/fittings (with accompanied drawings).
17. Mechanical test.
 - i) Heat run test
 - ii) Material Composition tests.
 - iii) Tests for checking blow, holes cracks etc.
18. List of routine test to be carried out.
19. Whether the type tests are already carried out
if Yes, enclose the type test certificates.
20. Details of the type tests to be carried out
if not carried out earlier.
21. List of testing facilities available at your works for
carrying out above type tests & routine tests &
mechanical tests. If facilities not available
at your works, please indicate the name and
address of the firm/institute where these shall
be carried out.

Name of the firm:-----

Signature of the Tenderer:-----

Designation:-----

Place :-----

Date :

ANNEXURE – C

CHECK LIST FOR INFORMATION TO BE FURNISHED WITH OFFER RETURN THIS CHECKLIST AS PART OF THE OFFER DULY SIGNED

The offer may not be considered if the following information and this Checklist are not enclosed with the Offer.

BHEL ENQUIRY. NO:

BIDDER OFFER REFERENCE:

Separate Checklist shall be submitted for each voltage Class i.e. 400,220,132 and 33 kV

1A. TECHNICAL REQUIREMENTS (FOR CLAMPS & CONNECTORS)

(1)	(2)/(3)	(4)	(5)
S.No.	Parameter/ Requirement	Yes / No	Remarks in case reply in Col (4) is <i>NO</i>
1.	Material of Clamps/Fittings		
a)	Clamp body (Designation A6 of IS 617 :1994)	YES/NO	
b)	Bolts, nuts and plain washers (Hot dip galvanized)	YES/NO	
c)	Spring washers (Spring steel -E.G)	YES/NO	
d)	Bi-metallic clamps - Copper alloy liner of min 2mm thickness shall be cast intergral with aluminum body or 2 mm thick bi-metallic strips shall be provided	YES/NO	
2.	Continuous current rating of the clamps/fittings (Is it compatible with the conductor rating/ equipment rating)	YES/NO	
3.	Maximum temperature rise (35°C) of the clamps/fittings over ambient temperature (50°C) when carrying estimated fault current of ----- kA for ----- sec	YES/NO	
4.	Rated terminal load (Suitable for 12.5 mtrs. tube/conductors)	YES/NO	
5.	Nominal Breaking load of conductor is minimum 1100 kg and tensile load is 55 kg	YES/NO	
6.	Minimum thickness of any part is 10 mm	YES/NO	
7.	Min Corona extinction voltage (kV)		
Applicable for 400, & 220 kV.	a) 320 kVrms for 400 kV Voltage Class	YES/NO	
	b) 156 kVrms for 220 kV Voltage Class	YES/NO	NA

1B. TECHNICAL REQUIREMENTS (FOR SPACERS)

(1)	(2)/(3)	(4)	(5)
S.No.	Parameter/ Requirement	Yes / No	Remarks in case reply in Col (4) is NO
1.	Spacing between sub-conductors 450mm (400kV)	YES/NO	
2.	Ultimate strength		
a)	Compressive load of 1500 kg for 40 kA fault current	YES/NO	
b)	Tensile load of 750 kg for 40 kA fault current	YES/NO	
3.	Movement which can be accommodated by the unit		
a)	Longitudinal movement parallel to the conductor ± 50 mm	YES/NO	
b)	Vertical movement in a vertical direction at right angle to the conductor ± 25 mm	YES/NO	
c)	Torsional movement /angular movement in a vertical plane parallel to the conductor $\pm 5^\circ$	YES/NO	
Applicable for 400, & 220 KV	4.	Min Corona extinction voltage (kV)	
	a)	320 kVrms for 400 kV Voltage Class	YES/NO
	b)	156 kVrms for 220 kV Voltage Class	YES/NO
			NA

2. TYPE TESTS

Whether Type test reports of the tests conducted earlier (not more than ten years earlier) on similar material submitted. **YES/NO**

If type test report submitted, indicate report number.

If the valid type test reports are not available with the bidder then the following tests shall be conducted by the bidder free of cost **YES/NO**

FOR CLAMPS & CONNECTORS

Sl. No.	TESTS	REPORT NO.	YES/NO
A	Type tests		
1.	Temperature rise test (maximum temperature rise allowed is 35°C over 50°C ambient)		
2.	Short time current test		
3.	Resistance test		
4.	Tensile test		
5.	Galvanization test		
6.	Measurement of RIV (dry) and Corona extinction voltage test (dry).		

FOR SPACERS

Sl. No.	TESTS	REPORT NO.	YES/NO
A	Type tests		
1.	Clamp slip test		
2.	Fault current test		
3.	Resilience test		
4.	Movement test		
5.	Compression test.		
6.	Galvanization test		
7.	Clamp bolt torque test		
8.	Assembly torque test		
9.	Tensile load test		
10.	Compression and pull off test		
11.	Vibration test		
12.	Log decrement test (for spacer damper)		
13.	Magnetic Power Loss test		
14.	Measurement of RIV (dry) and Corona extinction voltage test (dry).		