Enquiry

Bharat Heavy Electricals Limited
Transmission Business Group
Materials Management

Project : NPGCPL NABHINAGAR STPP

Enquiry No	Enquiry Dt	Rev No	Rev Dt	PI No	Enquiry Type	Inspection by	Due Dt	Commercial Comments	Technical Comments	Signing Authority
333E299	21-Dec-13	0		342230255	Package		21-Jan-14	As per BHEL TBG GTC as enclosed with tender.	As per Technical specification no. TB-350-316-005.	ENGINEER/TBMM

Document Enclosed

- Technical Specifications
- Terms & Conditions for Indigenous Enquiry
- Activity Schedule
- Schedule of Information (checklist) to be furnished
- Schedule of Commercial Deviation
- Schedule of Technical Deviation

SN	Equipment	Phy Unit	Qty	Plan Dt	Comments
1	OVER HEAD CONDUCTORS - ACSR MOOSE	MTR	172100	05-Feb-14	1400 M FOR NABINAGAR TPP

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 SO AS TO REACH US POSITIVELY BY 2 PM ON THE TENDER OPENING DATE AND TENDER WILL BE OPENED AT 2:30 PM WITH EFFECT FROM 15-SEP-09.

BHEL RESERVES THE RIGHT TO OPT FOR REVERSE AUCTION FOR OBTAINING BEST PRICES.

OFFERS THROUGH E-MAIL / FAX:

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 .

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'. procedure for giving a password to a file has been given below:

For saving Excel file with password

Steps to be followed:

1. Click on the FILE option in XP system and Start sign in Vista system then go to SAVE AS option.
2. Select the location to save and Click on the TOOLS box and go to GENERAL OPTION.
3. It will ask for the password, type the password into open or modify box or both as required.
4. Then click on the OK button it will ask for reenter of the password.
5. After reentering the password click on the save box.

For saving Word file with password

Steps to be followed:

1. Click on the FILE option in XP and Start sign in Vista then go to SAVE AS option.
2. Select the location to save and Click on the TOOLS box and go to SECURITY OPTION in XP system and GENERAL OPTION in Vista system.
3. It will ask for the password, type the password into open or modify box or both as required.
4. Then click on the OK button it will ask for reenter of the password.
5. After reentering the password click on the save box.

The venders who has sent offers with password,the passwords are to be forwarded to another email id:supplierinfo@bhelindustry.com

MSME STATUS

"THOSE INDUSTRIES WHO HAVE FILED A MEMORANDUM WITH THE CONCERNED AUTHORITIES AND REGISTERED AS MICRO & SMALL ENTERPRISE UNDER MICRO, SMALL AND MEDIUM ENTERPRISES DEVELOPMENT ACT 2006, HAVE TO SUBMIT A COPY OF SUCH REGISTRATION CERTIFICATE / MEMORANDUM TO BHEL FOR NECESSARY COMPLIANCES OF THE ABOVE ACT".

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

21/12/2013

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
Rajiv Ranjan
Dy 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

Ph: 0120-6748575
Fax: 0120-6748581

Signature and Seal of Tenderer

Enquiry No : 333E299 **Enquiry Dt :** 21-Dec-13

PQR

1. **The conductor shall be from the manufacture who must have manufactured, type tested and supplied in a single contract at least 50 km of ACSR Moose Conductor before 29.06.2011.**
2. **Bidder should be approved by NTPC/NPGC. In case bidder is not already approved, bidder is required to obtain NTPC/NPGC approval before price bid opening. As per the requirements of the project it is mandatory for the vendor to submit requisite details covering all the points as per annexure (to the extent available) per NTPC/NPGC format. The bidders will be required to take NTPC/NPGC approval based on above documents. Any cost incurred on account of physical assessment conducted by NTPC/NPGC, if required will be borne by bidder only.**
3. **Final acceptance of offer shall be subject to vendor approval from NTPC/NPGC. Price Bid will be opened/ RA will be conducted as the case may be, only for those bidders in respect of which vendor approval is received from NTPC/NPGC.**

Annexure to GTC (BHEL/TBG/GTC/02-07) (for Indian Vendors only)

Enquiry No.: 333E299 Dated 21.12.13

Mentioned clauses of General Terms and Conditions are to be read as follows:

Clause 1:

2. Bid submission time: upto 02:00 PM of the due date of opening

3. Bid opening time: 02:30 PM on the same day.

Clause 2: PRICES
A.1.: Not applicable

A.2.: Applicable

B.2. Not Applicable.

B.2. Applicable. Deemed Export .ED is exempted against PAC. PAC is issued by Customer(NPGC). Vendor shall be solely responsible for obtaining deemed export benefit from concerned authorities and in case of failure to receive such benefits , BHEL will not compensate them in any manner, Whatsoever.

B.3. Not applicable

Clause 3: TERMS OF PAYMENT
100% payment along with taxes, duties, Freight & Insurance within 60 days from the date of receipt of invoice. The invoice must contain following documents in 3 sets (Original + 2 copies).

- Receipted LR
- Excise invoice (if applicable)
- Delivery Challan or Packing list (casewise)
- Transit insurance certificate from under writers or Copy of Intimation of Transit Insurance duly endorsed by under writers,
- MICC issued by BHEL,
- Guarantee certificate,
- copy of Performance Bank Guarantee
- All Test reports and inspection reports, (Not to be given to Finance)

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Annexure to GTC (BHEL/TBG/GTC/02-07) (for Indian Vendors only)

Enquiry No.: 333E299 Dated 21.12.13

Clause 16: ARBITRATION

The arbitration shall be under **'The Arbitration and Conciliation act 1996'.**

For said/subject procurement, BHEL reserves the right to go for Reverse Auction (RA) instead of opening the sealed envelope price bid, submitted by the bidder. This will be decided after techno-commercial evaluation. All bidders to give their acceptance for participation in RA. Non-acceptance to participate in RA may result in non-consideration of their bids, in case BHEL decides to go for RA.

In case BHEL decides to go for Reverse Auction, only those bidders who have given their acceptance to participate in RA will be allowed to participate in the Reverse Auction. Those bidders who have given their acceptance to participate in Reverse Auction will have to necessarily submit 'online sealed bid' in the Reverse Auction. Non-submission of 'online sealed bid' by the bidder will be considered as tampering of the tender process and will invite action by BHEL as per extant guidelines in vogue.

Proposed Loading for commercial deviation will be as per annexure-1.

All remaining terms which are not mentioned here shall remain unchanged.

Note-

1. Proposed delivery plan is as follows: 5th -FEB-2014.

However vendor has to quote their best delivery plan in activity schedule.

2. Supplier has to specifically indicate/ tick mark their preference for Performance Bank Guarantee out of the Two (B&C)options (option A is not applicable) mentioned in clause no.6 of the General terms and conditions (BHEL/TBG/GTC/02-07).

Annexure to GTC (BHEL/TBG/GTC/02-07) (for Foreign Vendors only)

Enquiry No.: 333E299 Dated 21.12.13

Mentioned clauses of General Terms and Conditions are to be read as follows:

Clause 1:

2. Bid submission time: up to 02:00 PM of the due date of opening.

3. Bid opening time: 02:30 PM on the same day.

Clause 2: PRICES

A.1.: Not applicable

A.2.: Applicable

B.2. Not Applicable.

B.2. Applicable. Deemed Export .ED is exempted against PAC. PAC is issued by Customer(NPGC). Vendor shall be solely responsible for obtaining deemed export benefit from concerned authorities and in case of failure to receive such benefits , BHEL will not compensate them in any manner, Whatsoever.

B.3. Not applicable

Clause 3: TERMS OF PAYMENT

100% payment along with taxes, duties, Freight & Insurance within 60 days from the date of receipt of invoice. The invoice must contain following documents in 3 sets (Original + 2 copies).

- Receipted LR
- Excise invoice (if applicable)
- Delivery Challan or Packing list (casewise)
- Transit insurance certificate from under writers or Copy of Intimation of Transit Insurance duly endorsed by under writers,
- MICC issued by BHEL,
- Guarantee certificate,
- copy of Performance Bank Guarantee
- All Test reports and inspection reports,

LR to be read as Bill of Lading/AWB.

Clause 16: ARBITRATION

The arbitration shall be under **'The Arbitration and Conciliation act 1996'.**

Cont to Page 2

Cont from Page 1

Annexure to GTC (BHEL/TBG/GTC/02-07) (for Foreign Vendors only)

Enquiry No.: 333E299 Dated 21.12.13

For said/subject procurement, BHEL reserves the right to go for Reverse Auction (RA) instead of opening the sealed envelope price bid, submitted by the bidder. This will be decided after techno-commercial evaluation. All bidders to give their acceptance for participation in RA. Non-acceptance to participate in RA may result in non-consideration of their bids, in case BHEL decides to go for RA.

In case BHEL decides to go for Reverse Auction, only those bidders who have given their acceptance to participate in RA will be allowed to participate in the Reverse Auction. Those bidders who have given their acceptance to participate in Reverse Auction will have to necessarily submit 'online sealed bid' in the Reverse Auction. Non-submission of 'online sealed bid' by the bidder will be considered as tampering of the tender process and will invite action by BHEL as per extant guidelines in vogue.

Proposed Loading for commercial deviation will be as per annexure-1.

All remaining terms which are not mentioned here shall remain unchanged.

Note-

1. Proposed delivery plan is as follows: 05th -FEB-2014..
   However vendor has to quote their best delivery plan in activity schedule.
2. Supplier has to specifically indicate/ tick mark their preference for Performance Bank Guarantee out of the Two(B&C) options (Option A is not applicable) mentioned in clause no.6 of the General terms and conditions (BHEL/TBG/GTC/02-07).

3. Price Break up should consist of the following breakup :-
   a- FOB port of Loading.
   b- Marine Freight from load port to discharge port i.e. any Indian port.
   c- Marine Insurance from load port to discharge port i.e. any Indian port.

   Marine Freight and Insurance to be quoted separately.

   BHEL may arrange Marine Shipment or exercise option for shipment by vendor at quoted F&I rates.

   Freight & Insurance from discharge port to site – BHEL's scope. Rates will be based on BHEL's applicable rate contract for arriving at landed cost to BHEL. However vendor may also quote for the same.

   Freight and Insurance to be quoted separately.

BHARAT HEAVY ELECTRICALS LTD.
(TRANSMISSION BUSINESS GROUP)
TERMS AND CONDITIONS FOR INDIGENOUS TENDER ENQUIRY

This Format is to be submitted in original duly signed by bidder. Deviation, if any, is to be brought out clearly in Schedule of Commercial deviation giving clause wise deviation. Any condition / clarification / deviation mentioned elsewhere may not be accepted.

Sr. No	Terms & Conditions ENQUIRY NO. 333E299 DATED 21.12.13
1.	1. Sealed quotations are invited for the items mentioned in the enquiry. Quotations should be typed and free from over writing and erasures, corrections or additions must be clearly written both in words and figures and attested, otherwise offer may be rejected. 2. Bidder must ensure that their quotation is received / dropped in the tender box on or before 10.00 AM of the due date of opening in **Tower A, 5TH FLOOR, ADVANT NAVIS IT BUSINESS PARK,** **PLOT No-7, Sector-142, EXPRESSWAY NOIDA,** **NOIDA-201305,** **DISTT- GAUTAM BUDH NAGAR, UP** 3. The same shall be opened at 10.30 AM on the same day. Tenders received late may be rejected. Bidders sending tenders by courier or post, to ensure that it is delivered one day before as same day delivery may not reach above office by due time. 4. Bids are to be submitted in Two parts: i) Techno-commercial bid (Part I) – To be submitted in duplicate. A copy of price bid (Part II) (without prices) is also to be enclosed in Part I bid. ii) Price bid (Part II) – To be submitted only in one copy in a separate sealed envelope. This should not contain any Technical or Commercial Terms. The rates should be quoted both in figures and words. In case of any difference between figures and words, the quoted rate in words will prevail over figure. Both Part I and Part II bids are to be sealed in separate envelope and both envelops to be kept in another common envelope. Each envelope should be sealed and super scribed with enquiry no., item / package name, project name and due date of opening. 5. For any Technical clarification, please contact Mr. Muneet Mehta (ENGINEER-TBEM) BHEL, Noida Phone : 0120-6748518 e-mail : **muneet@bhel.in** For any commercial clarification please contact person issuing enquiry. 6. Price bid should not contain any information / description / terms & condition other than given in Part-I of the bid except prices, otherwise bid is liable for rejection. **7. Price bid submitted along with the bid shall remain valid up to validity of offer. Unsolicited Supplementary / Revised price bid submitted during validity period of offer, unless asked by BHEL, shall not be considered. With-drawl of**

Sr. No	Terms & Conditions ENQUIRY NO. 333E299 DATED 21.12.13
	quotation by the bidder, at any stage after its opening, may entail blacklisting of vendor. **8. Enquiry condition for where the scope against this tender includes Installation and Commissioning of the equipment / material** There will be separate contract awarded for Supply portion and Site execution portion. For Supply portion General Terms and Conditions mentioned here shall be applicable for Site execution portion, Terms and conditions for Installation services shall be applicable. However, any breach in either of the contract shall be deemed as the breach of other contract also.
2.	**PRICES:** **<RELEVANT OPTION TO BE SELECTED BEFORE ISSUE OF ENQUIRY>** **A.1.** Unless specifically indicated, all prices shall be **FIRM.** No enhancement of rate for whatever cause unless and until asked by BHEL will be allowed. **A.2. PVC (if indicated)** The prices to be quoted are with **PVC** with following formula. *As enclosed sheet for ACSR Moose Conductor .* The base indices in the formula shall be applicable on 01.12.13 as per CACMAI Circular dated 02.12.13. The date of delivery shall be PO delivery date or date of actual despatch, whichever is earlier. **B** The prices shall be quoted by the vendors considering following. **B.1.** Unless specifically indicated, the prices shall be on **Domestic basis.** **B.2. Deemed export (if indicated)** i) Prices are to be quoted considering following benefits: 1. ED Exempted 2. ---------- 3. ---------- ii) For availing above benefits, BHEL shall provide following documents. 1. PAC Shall be issued by Customer (NPGC). 2. ---------- iii) In case of import benefit in deemed export projects, bidder to indicate import content (CIF value) in the price bid.
	B.3. Physical export (if indicated) i) Prices are to be quoted considering following benefits 1. ---------- 2. ---------- ii) For availing above benefits BHEL shall provide following documents 1. 2. **C**. The prices are to be quoted on FOR (Destination) basis. The break-up of price shall be as under:- **a) Ex-works Price:** Ex- works price including packing & forwarding charges. **b) Excise duty:** ED as applicable is to be quoted as percentage in both un-price and

price bid.

c) Sales Tax: ST / VAT /CST (against C-form) to be quoted as percentage in un-price and price bid. In case of interstate sale-in-transit supplier have to provide E1/E2 form.

e) Entry tax / Octroi Charges: Any Entry tax / Octroi applicable at destination / destination state shall be paid extra on proof of such payment.

f) Freight & Insurance: Freight and Transit Insurance for door delivery up to destination/store is to be quoted.

g) Type Test charges: If asked in the technical specification, is to be quoted separately for each Test along with taxes and duties applicable on them.

h) Erection / Commissioning supervision charges: If asked in the technical specification, to be quoted separately along with taxes and duties applicable on them.

Note : The purchase order shall be placed on Ex-works basis.

3. TERMS OF PAYMENT :

<RELEVANT OPTION TO BE SELECTED BEFORE ISSUE OF ENQUIRY>

For BOIs (non package items)

100% payment along with taxes, duties, Freight & Insurance within 60 days from the date of receipt of invoice. The invoice must contain following documents in 3 sets (Original + 2 copies).
- Receipted LR
- Excise invoice (where ED re-imbursement is required)
- Delivery Challan / Packing list (casewise)
- Transit insurance certificate from under writers or Copy of Intimation of Transit Insurance duly endorsed by under writers,
- Despatch Clearance given by BHEL,
- Guarantee certificate,
- All Test reports and inspection reports,
- Performance Bank Guarantee copy.

For BOPs : Air-Conditioning & Ventilation, Fire Protection, Illumination, Oil handling system where ETC is in scope of bidder

a. 90% of Ex-works value alongwith 100% taxes, duties, Freight & Insurance within 60 days from the date of receipt of invoice. The invoice must contain following documents in 3 sets (Original + 2 copies)
- Receipted LR / RR
- Excise invoice (where ED re-imbursement is required)
- Delivery Challan / Packing list (casewise)
- Transit insurance certificate from under writers or Copy of Intimation of Transit Insurance duly endorsed by under writers,
- Despatch Clearance given by BHEL,
- Guarantee certificate,
- All Test reports and inspection reports,
- Performance Bank Guarantee copy.

b. 5% of Ex-works value on completion of supplies as per billing breakup.

Sr. No	Terms & Conditions ENQUIRY NO. 333E299 DATED 21.12.13
	c. 5% of Ex-works value on successful completion of Erection, Testing, Commissioning (To be certified by BHEL site) and final documentation (Against proof of submission to Engineering) Note: When ETC is not in scope last 5% as per (c) above shall be paid alongwith (b). <u>Terms of payment for Type test charges:</u> 100% payment with taxes and duties on acceptance of test reports by BHEL on certification by BHEL engineering within 60 days from the date of receipt of clear invoice. <u>Terms of payment for Supervision charges:</u> 100% payment against completion with taxes and duties on certification by BHEL site within 60 days from the date of receipt of clear invoice.
4.	**INTEREST LIABILITY** In case of any delay in payment due to any reason, BHEL shall not pay any interest on delayed payment.
5.	**GUARANTEE :** The equipment / material shall be guaranteed for 18 months from the date of delivery or 12 months from the date of commissioning, which ever is earlier. The defective material / component shall be replaced free of cost at site. **<FOLLOWING TO BE DELETED IN ALL ENQUIRY OTHER THAN ILLUMINATION PACKAGE>** However for Illumination system after commissioning Lamps, Tubes, Ballast, Starters, Capacitors, Fuses will not be covered in Guarantee.
6.	**PERFORMANCE BANK GUARANTEE :** **<PBG CLAUSE TO BE REMOVED BEFORE ISSUE OF ENQUIRY FOR ITEMS FOR WHICH PBG IS NOT REQUIRED>** Bidder shall furnish along with first invoice Performance BG / deposit as per one of following 3 options. <u>Option A</u> Not applicable. <u>Option B</u> BG for 10% of the total Ex-works PO value, valid for 18 months from the date of last delivery and 3 months claim period extra, over and above 18 months. PO value at the time of first invoice for the particular order shall be considered for calculation of BG amount. <u>Option C</u> Retention of 10% of the total Ex-works PO value by BHEL from the first bill in lieu of Performance Bank Guarantee, to be released after expiry of 21 months from the date of last delivery. <u>Note</u> : For Shield wire, Earthing material, Cable gland, Cable Trench material, GI/PVC pipe, Hardwares, Al tube, MS Rod, Lable & phase colour disc, HG Fuse, Ferrule, Lug, Marker, Stationary, Office eqpt. and any petty / sundry purchase no Performance bank guarantee is required. The Bank guarantee shall be from State Bank of India / State bank of Hyderabad / State Bank of Travancore / State Bank of Mysore / Canara Bank / Bank of Baroda / Punjab National Bank / Deutsche Bank / HDFC Bank / Standard Chartered Bank / CITI Bank / ICICI Bank / IDBI Bank / HSBC / any other Nationalised Bank. The original BG should be sent by issuing Bank directly to AGM(Finance), TBG, BHEL.
7.	**FINAL ENGINEERING DOCUMENTATION:** Final documentation as called in the specification is to be submitted within 3 months

Sr. No	Terms & Conditions ENQUIRY NO. 333E299 DATED 21.12.13
	from the date of despatch of material. In case of default, the Performance BG is liable to be en-cashed.
8.	**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 Despatch Clearance from BHEL. Supplier shall send inspection call on prescribed format (web site) only, with an advance notice of 15 days.
9.	**DESPATCH DOCUMENTS :** Following despatch documents are to be immediately sent to purchaser on despatch. - Copy of LR - Copy of delivery challan / packing list - Insurance certificate - Guarantee certificate
10.	**DELIVERY PERIOD:** Bidder to specify delivery period in weeks from the date of LOI / PO. Time for conduction of type test, if required, is to be separately indicated. Note: LR date or Invoice date whichever is later shall be considered as delivery date.
11.	**DELAYED DELIVERY:** In case of delay in execution of order beyond the lot wise contractual delivery, an amount of ½ % of total Ex-Works Value per week or part there-of subject to maximum of 5% of total Ex-Works value of P.O. will be withheld.
12.	**VALIDITY :** The offer shall be valid for 120 days from the due date of opening.
13.	**ACCEPTANCE / REJECTION OF TENDER :** BHEL reserves the right to reject in full or part, any or all tender without assigning any reason thereof. BHEL also reserves right to vary the quantities mentioned in the tender.
14.	**EVALUATION :** Comparative statement shall be prepared based on overall quantity basis unless otherwise indicated in the enquiry. Evaluation of offers shall be done on the basis of delivered cost to BHEL. PO shall be placed separately for each project.
15.	**DEVIATION :** The bids having deviation(s) w.r.to tender are liable for rejection. However, BHEL, at its discretion, may load the prices for evaluation of offer with prior intimation to bidder.
16.	**ARBITRATION :** All cases of disputes emanating from and relating to this contract, the matter shall be referred to the sole arbitration of Unit Head / GM, BHEL or any other person (including an employee of BHEL, even though he had to deal with the matter relating to this contract in any manner) nominated by him to act as sole arbitrator. The arbitration shall be under 'The arbitration and contract act 1996' and the rules there under as amended from time to time. The arbitrator may from time to time with the consent of the parties enlarge the time for making and publishing the award. The venue of arbitration shall be any Indian city as decided by BHEL.
17.	**LEGAL SETTLEMENT :** All suits/claims in respect of this contract shall be in the courts having jurisdiction at New Delhi
18.	**SUBCONTRACTING :** In case further subcontracting of BHEL order or part thereof is envisaged by

Sr. No	Terms & Conditions ENQUIRY NO. 333E299 DATED 21.12.13
	supplier, the same can be done after written permission is obtained from BHEL. However it shall not absolve the supplier of the responsibility of fulfilling BHEL purchase order requirements.
19.	**RISK PURCHASE :** In case the successful bidder fails to supply or fails to comply with the terms & conditions of the purchase order, BHEL reserves the right to source such material/ component / equipment/ system from any other agency at the risk and cost of the successful bidder.
20.	**ADJUSTMENT OF RECOVERY:** Any amount payable by the supplier under any of the condition of this contract shall be liable to be adjusted against any amount payable to the supplier under any other works / contract awarded to him by any BHEL unit. This is without prejudice to any other action as may be deemed fit by BHEL.
21.	**FORCE MAJEURE CONDITION:** If by reason of war, civil commotion, act of god, Government restrictions, strike, lockout which are not in control of supplier the deliveries are delayed, supplier shall not be held responsible.
22.	**MSME:** MSE suppliers can avail the intended benefits only if they submit along with offer, attested copies of either EM II certificate having deemed validity (Two years from the date of issue of acknowledgement in EM-II) or valid NSIC certificate or EM II certificate along with CA certificate (Format enclosed) applicable for the year, certifying quantum of investment in plant and machinery within the permissible limit as per the act for relevant status (Micro or small) were the deemed validity of EM II is over. Date to be reckoned for determining the deemed validity will be the last date of technical bid submission. Non submission of such documents will lead to consideration of their bids at par with other bidders and MSE status of such suppliers shall be shifted to Non MSE supplier till the supplier submits these documents

Signature of Bidder
Seal

PRICE ADJUSTMENT FOR ACSR/AAC CONDUCTOR

The formula for calculating the price adjustment to be applied to the Ex. Works price component of ACSR Moose Conductor shall be as follows:

ACSR Moose Conductors

$$dEC_1 = EC_1 \times \left[0.65 \times \frac{(A_1 - A_0)}{A_0} + 0.15 \times \frac{(B_1 - B_0)}{B_0} + 0.05 \times \frac{(L_1 - L_0)}{L_0}\right]$$

Where,

dEC_1 = Price adjustment amount on Ex. Works price of ACSR Conductor for respective conductors and for each shipment.

EC_1 = Ex. Works price for ACSR Conductor shipment-wise.

A = Price for EC grade Aluminium Ingots (Basic Average price per MT for Ingots), as published by the Cable and Conductor Manufacturer's Association of India, New Delhi (CACMAI).

B = Price for High Tensile Steel Galvanized Wire (HTSG Wire – 3.53 mm, as published by CACMAI.

L = All India Average Consumer Price Index for Industrial Workers (Base 2001 = 100) as published by Labour Bureau, Shimla – 171 004 (Govt. of India, Ministry of Labour).

Subscript "0" refers to the base indices corresponding to 30 days prior to date of opening of bid.

Subscript "1" refers to indices as on 60 days prior to date of shipment.

NOTE:

1. The price adjustment of Ex. Works price component of ACSR/AAC Conductor shall not be subject to any ceiling.
2. If price adjustment amount works out to be positive, the same will be payable to supplier and if it works out to be negative, the same will be recovered from supplier.
3. The supplier will be asked to submit price adjustment invoice after dispatch of material (positively within one month), whether such adjustment is positive or negative.

Annexure - I

Certificate by Chartered Accountant on letter head

This is to Certify that M/S ....., (hereinafter referred to as 'company') having its registered office at ..... is registered under MSMED Act 2006, (Entrepreneur Memorandum No (Part–II) ..... dtd:....., Category: ..... (Micro/Small)). (Copy enclosed).

Further verified from the Books of Accounts that the investment of the company as on date..... as per MSMED Act 2006 is as follows:

1. **For Manufacturing Enterprises:** Investment in plant and machinery (i.e. original cost excluding land and building and the items specified by the Ministry of Small Scale Industries vide its notification No.S.O.1722(E) dated October 5, 2006 :
   Rs.....Lacs
2. **For Service Enterprises:** Investment in equipment (original cost excluding land and building and furniture, fittings and other items not directly related to the service rendered or as may be notified under the MSMED Act, 2006:
   Rs.....Lacs

The above investment of Rs.....Lacs is within permissible limit of Rs.....Lacs for .....Micro / Small **(Strike off which is not applicable)** Category under MSMED Act 2006.

Date:

(Signature)

Name -

Membership number -

Seal of Chartered Accountant

Sr. No	Loading proposed
1	**TERMS OF PAYMENT :**
	If a bidder asks for payment within specified no. of days from receipt of material at site, loading as following to be done :(Standard payment terms as per P-5 to be put in GTC) 0-29 days – 2% on total ex-works value 30-59 days – 1% on total ex-works value 60 days or more – no loading
2	**GUARANTEE :**
	If the offered Guarantee period is less than the tender guarantee period, the ex-works prices shall be loaded for the difference in the period (higher of the difference with respect to guarantee required from date of delivery and date of commissioning) @ 2.5% per year for number of months (fractional months to be rounded off to next higher). [2.5% is taken same as BHEL's corporate norms for complaint reserve (contractual obligation)]
3	**DELAYED DELIVERY / PENALTY DUE TO DELAYED DELIVERY:**
	Loading for not accepting this clause / accepting only on un delivered portion shall be the maximum amount specified in this clause.

Terms & Conditions of Reverse Auction

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

1. For the proposed reverse auction, technically and commercially acceptable bidders only shall be eligible to participate.

2. Those bidders who have given their acceptance for Reverse Auction (quoted against this tender enquiry) will have to necessarily submit 'online sealed bid' in the Reverse Auction. Non-submission of 'online sealed bid' by the bidder for any of the eligible items for which techno-commercially qualified, will be considered as tampering of the tender process and will invite action by BHEL as per extant guidelines in vogue.

3. BHEL will engage the services of a service provider who will provide all necessary training and assistance before commencement of on line bidding on internet.

4. In case of reverse auction, BHEL will inform the bidders the details of Service Provider to enable them to contact & get trained.

5. Business rules like event date, time, bid decrement, extension etc. also will be communicated through service provider for compliance.

6. Bidders have to fax the Compliance form (annexure IV) before start of Reverse auction. Without this, the bidder will not be eligible to participate in the event.

7. In line with the NIT terms, BHEL will provide the calculation sheet (e.g., EXCEL sheet) which will help to arrive at "Total Cost to BHEL" like Packing & forwarding charges, Taxes and Duties, Freight charges, Insurance, Service Tax for Services and loading factors (for non-compliance to BHEL standard Commercial terms & conditions) for each of the bidder to enable them to fill-in the price and keep it ready for keying in during the Auction.

8. Reverse auction will be conducted on scheduled date & time.

9. At the end of Reverse Auction event, the lowest bidder value will be known on auction portal.

10. The lowest bidder has to fax/e-mail the duly signed and filled-in prescribed format for price breakup including that of line items, if required, (Annexure VII) as provided on case-to-case basis to Service provider within two working days of Auction without fail.

11. In case BHEL decides not to go for Reverse Auction procedure for this tender enquiry, the Price bids and price impacts, if any, already submitted and available with BHEL shall be opened as per BHEL's standard practice.

12. Bidders shall be required to read the "Terms and Conditions" section of the auctions site of Service provider, using the Login IDs and passwords given to them by the service provider before reverse auction event. Bidders should acquaint themselves of the 'Business Rules of Reverse Auction', which will be communicated before the Reverse Auction.

13. If the Bidder or any of his representatives are found to be involved in Price manipulation/ cartel formation of any kind, directly or indirectly by communicating with other bidders, action *as per extant BHEL guidelines*, shall be initiated by BHEL and the results of the RA scrapped/ aborted.

14. The Bidder shall not divulge either his Bids or any other exclusive details of BHEL to any other party.

15. In case BHEL decides to go for reverse auction, the H1 bidder (whose quote is highest in online sealed bid) may not be allowed to participate in further RA process.

SCHEDULE OF COMMERCIAL DEVIATION

The following are the deviations/ variations exception from the General Terms and Conditions:

SL. NO.	CLAUSE NO. OF GENERAL TERMS AND CONDITION	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 General 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 scheduled.

Signature of the authorized representative of

Place: - ……

Bidder's name:……

Date: - ……

Designation……

Company Seal:……

SCHEDULE OF TECHNICAL DEVIATION

The following are the deviations/ variations exception from the Specification:

SECTION	CLAUSE NO. / PAGE NO.	STATEMENT OF DEVIATION/ VARIATIONS/EXCEPTIONS

- 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 General 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 scheduled.

Signature of the authorized representative of

Place: - ……

Bidder's Name :……

Date: - ……

Designation:……

Company Seal:……

ACTIVITY SCHEDULE

(SEPARATE ACTIVITY SCHEDULE TO BE FILLED-UP FOR EACH PROJECT BY THE SUPPLIER)

Sl. NO.	ACTIVITY	ACTIVITY TIME IN WEEKS	CUMULATIVE TIME IN WEEKS FROM LOI / PO DATE	REMARKS IF ANY
1.	Submission of Documents necessary for getting manufacturing clearance like Drawings, Date sheet etc.			
2.	Approval of documents from BHEL / Customer *			
3.	Manufacturing time			
4.	Inspection call			
5.	Customer Inspection & Despatch Clearance			
6.	Arrangement for Dispatch			

Note: 1) * 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.

2) Inspection call should be given in the prescribed format only. Inspection calls not in the prescribed format shall not be entertained.

3) 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 of Supplier
Date

Un-Priced SCHEDULE (For Indian vendors only) (Part II)

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

ENQUIRY NO: 333E299 Dtd: 21.12.13

S.No.	Description of Item	Unit	Quantity	Unit Price Ex-works	Total Ex-Works	Unit F & I	Total F & I	*ED @____ % of Col6*	CST / ST @____% of (Col 6+9)	TOTAL (FOR Destination) PRICE (Rs.)
1	2	3		5	6	7	8	9	10	11
1	OVERHEAD CONDUCTOR ACSR MOOSE as per Technical Specification No. TB-350-316-005 (for Nabhinagar STPP Site 170.7 KM and 1.4 KM for Nabhinagar TPP Site)	KM	172.1							

NOTE: 1.VENDOR TO INDICATE APPLICABLE LOCAL TAX/VAT WITHOUT AS ANY CONCESSIONAL FORMS FOR TRANSACTION WITHIN THE STATE.LOCAL TAX/VAT_____

2. PLEASE NOTE THAT UNPRICED COPY OF PRICE BID (i.e. WITH ALL PRICE BLANKED) SHALL BE FURNISHED ALONGWITH TECHO-COMMERCIAL BID.

3. REQUIRED COPIES OF FORMAT BE MADE & DETAILS MAY BE ANNEXED.

4. THE PRICES MUST BE QUOTED IN THE PRESCRIBED UNIT ONLY.

5.IN CASE OF CST RATE AGAINST 'C' FORM SHALL BE QUOTED.

TENDERER

SCHEDULE OF PRICE (For Foreign vendors only) (Part II)

Unpriced price bid to be kept with Techno-commercial offer. **Price bid should be kept in separate sealed cover.**

ENQUIRY NO:333E299 Dtd: 21.12.2013

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	
	Name of item	Tariff No.	Qty	Unit-CIF {Indian Sea port)}	Total -CIF {Indian Sea port)}.	Break up of CIF(Indian 'Any' Sea port) rates						Breakup of Inland Transportation			
						Unit -FOB (Load port).	Total -FOB (Load port).	Unit-Sea Freight (upto indian Discharge port)	Total-Sea Freight (upto indian Discharge port)	Unit-Insurance(upto indian Discharge port)	Total-Insurance(upto indian Discharge port)	Unit-Freight (from Indian Discharge port to site)	Unit-Insurance (from Indian Discharge port to site)	Total-Freight (from Indian Discharge port to site)	Total-Insurance (from Indian Discharge port to site)
			KM												
1	OVERHEAD CONDUCTOR ACSR MOOSE As per Technical Specification No. TB-350-316-005 (for Nabhinagar STPP Site 170.7 KM and 1.4 KM for Nabhinagar TPP Site)		172.1												
	Total														

NOTE-

Discharge Port:- Indian Sea Port (Any Indian port)

CIF (indian port) should be equal to "FOB(load port) + Sea Freight (upto indian Sea port) +Insurance(upto Indian Sea port)"

Load port to be mentioned by bidder .

No of package with Dimensions and type of cargo(/Break Bulk/LCL/FCL) and no. of container (with type of container) required-Is also to be mentioned by bidder.

Vendor has to mention tarrif no. against each item for custom duty purpose.

Bidder has to mention quoted (in each cell) in unpriced price bid

BHARAT HEAVY ELECTRICALS LIMITED
TRANSMISSION BUSINESS GROUP
ENGINEERING MANAGEMENT

BHEL Document No.	Rev 00		Prepared by	Checked by	Approved by
TB-350-316-005		Name	MM	DKM	RS
Type of Document **TECHNICAL SPECIFICATION**		Sign	Mmot		Rakesh
Title **ACSR Moose Conductor**		Date	18.12.13		18/12/13
		Group	**TBEM**		
Customer	**NABINAGAR POWER GENERATION CO. LTD.**				
Projects	400/132/33 kV s/s at Nabinagar STPP (3x660 MW)				

CONTENTS

Rev No.	Date	Altered	Checked		

Distribution						

SECTION – I

SCOPE, SPECIFIC TECHNICAL REQUIREMENT AND QUANTITIES

1.0 SCOPE

This technical specification covers the requirements of design, manufacture, testing at works, packing and dispatch of ACSR Moose Conductor.

The equipment is required for the following project.

Name of Customer : **Nabinagar Power Generation Co. Pvt. Ltd. (JV between NTPC and Bihar State electricity Board)**

Name of Project : **400/132 kV Switchyard at Nabinagar STPP and extn. at 400 kV Nabinagar TPP (BRBCL)**

1.1 SPECIFIC TECHNICAL REQUIREMENT

Sl. No.	Description	
1.	Code & Standard	IS 398
2.	Overall Diameter	31.77 mm
3.	Weight	2.004 kg/m
4.	Ultimate Tensile Strength	161.2 kN minimum
5.	Strands and wire diameter of -Aluminium - Steel	 54 / 3.53 mm 7 / 3.53 mm

1.2 BILL OF QUANTITY

Sl. No.	Description	Quantity		
		Nabinagar STPP	Nabinagar TPP	Total
1	ACSR Moose Conductor	170700 m	1400 m	172100 m

1.3 TYPE TESTS

Qty Variation 20%

Bidder shall submit valid type test reports of the tests (as per relevant IS/IEC) carried out within last ten years from the date of bid opening i.e. **29.06.2011**. These reports should be for the tests conducted on the equipment similar to those proposed to be supplied under this contract and test (s) should have been either conducted at an independent laboratory or should have been witnessed by a client. The owner reserves the right to waive conducting of any or all the specified type test(s) under this contract. In case type tests are waived, the type test charges shall not be payable to the bidder.

All acceptance and routine tests as per the specification and relevant standards shall be carried out. Charges for these shall be deemed to be included in the equipment price

The type test reports once approved for any projects shall be treated as reference. For subsequent projects of NTPC, an endorsement sheet will be furnished by the manufacturer confirming similarity and "No design Change". Minor changes if any shall be highlighted on the endorsement sheet.

In case type test reports are more than 10 years old (from the date of bid opening i.e. 29.06.2011) OR the reports of type tests are found to be technically unacceptable, the type test shall be conducted without cost and delivery implication to BHEL/NTPC.

SECTION – II

STANDARD TECHNICAL SPECIFICATION

2.1 This section covers the standard technical requirements of the ACSR MOOSE Conductor. In case of any discrepancies between the requirements mentioned in this section and those specified in other sections of this specification, the later shall prevail and shall be treated as binding requirements.

2.2 TECHNICAL REQUIREMENTS

1. Conductor type : ACSR
2. Commercial name item : MOOSE

2.2.1 The details of the conductor are tabulated below:

a)	Stranding and wire Diameter in mm	54/3.53 mm Al+7/3.53 Steel
b)	Number of strands	
	Steel center	1
	1st steel layer	6
	1st Aluminium layer	12
	2nd Aluminium layer	18
	3rd Aluminium layer	24
c)	Sectional area of aluminium	528.5 mm^2
d)	Total sectional area	597.00 mm^2
e)	Overall diameter	31.77 mm
f)	Approximate weight	2004 kg/km
g)	Calculated d.c. resistance at 20°C	0.05552 ohm/km
h)	Minimum UTS	161.2kN
i)	Drum Length	As required, generally 1500 – 1800m

2.2.2 The details of **aluminium strand** are as follows:

i)	Minimum breaking load of strand - before stranding - after stranding	 1.57kN 1.49kN
ii)	Max. D.C. resistance of strand at 20°C	2.921 ohm/km

2.2.3 The details of steel strand are as follows:

i)	Minimum breaking load of strand - before stranding - after stranding	 12.86 kN 12.22 kN
ii)	Minimum number of twist to be withstood in torsion test when tested on a gauge length of 100 times diameter of wire	18-before stranding 16-after stranding

2.3 APPLICABLE STANDARDS

The ACSR MOOSE Conductor shall strictly conform to the following Indian and International standards, as appropriate:

IS 398 (Part-V): 1992 Aluminium conductors galvanized Steel reinforced

IS 2629:1990	Recommended practice for hot dip galvanizing on iron and steel.
IS 4826:1992	Hot dip galvanized coatings on round steel wires
IS 2633:1992	Method for testing uniformity of coating of zinc--coated articles.
IS 6745: 1990	Methods for determination of mass of Zinc coating on zinc coated iron and steel articles
IS 8263:1990	Methods for radio interference test
IS 1778:1980	Reels and drums for bare conductors
IS 1521:1991	Method for tensile testing of steel wire

2.4 TECHNICAL REQUIREMENT AND CONSTRUCTIONAL DETAILS

2.4.1 The finished conductor shall be smooth, compact, uniform and free from all imperfections including spills and splits, die marks, scratches, abrasion, scuff marks, kinks (protrusion of wires), dents, press marks, cut marks, wire cross over, over riding, looseness (wire being dislocated by finger/hand pressure and/or unusual bangle noise on tapping), material inclusions, white rust, power formation or black spots (on account of reaction with trapped rain water etc.), dirt, grit etc.

2.4.2 All the aluminium and steel strands shall be smooth, uniform and free from all imperfections, such as spills and splits, die-marks, scratches, abrasions and kinks after drawing.

2.4.3 The steel strands shall be hot dip galvanized and shall have a minimum Zinc coating of 260 gm/m^2 after stranding of the uncoated wire surface. The zinc coating shall be smooth, continuous and of uniform thickness, free from imperfections and shall withstand minimum three dips after stranding in standard Preece Test. The finished strands and the individual wires shall be of uniform quality and have the same properties and characteristic as prescribed in ASTM designation: B 498-74.

2.4.4 The steel strands shall be preformed and post-formed in order to prevent spreading of strands in the event of cutting of composite core wire. Care shall be taken to avoid damage to galvanization during pre-forming and post-forming operation.

2.5 Joints in wires

2.5.1 Aluminium wires

No joints shall be permitted in the individual wires in the outermost layer of the finished conductor. However, joints in the 12 wire and 18 wire inner layers of the conductor shall be allowed but these joints shall be made by cold pressure butt welding and shall be such that no such joints are within 15 metres of each other in other in the complete stranded conductor.

2.5.2 Steel wires

There shall be no joint of any kind in the finished wire entering into the manufacture of the strand. There shall also be no strand splices in any length of the completed stranded steel core of the conductor.

2.6 Tolerances

The manufacturing tolerances to the extent of the following limits only shall be permitted in the diameter of individual aluminium and steel strands and lay-ratio of the conductor.

a) Diameter of aluminium and steel strands (in millimeters):

	Standard	Maximum	Minimum
Aluminium	3.53	3.55	3.51
Steel	3.53	3.60	3.46

b) Lay ratio of conductor:

		Maximum	Minimum
Steel	6-wire layer	18	16
Aluminium	12-wire layer	14	12
	18-wire layer	13	11
	24-wire layer	12	10

2.7 Materials

2.7.1 Aluminium

The aluminium strands shall be hard drawn from electrolytic aluminium rods having purity not than 99.5% and a copper content not exceeding 0.04%

2.7.2 Steel

The steel wire strands shall be drawn from high carbon steel wire rods and shall conform to the following chemical composition:

Element	-	**% composition**
Carbon	-	0.50 to 0.85
Manganese	-	0.50 to 1.10
Phosphorous -	-	not more than 0.035
Sulphur	-	not more than 0.045
Silicone	-	0.10 to 0.3

2.7.3 Zinc

The zinc used for galvanizing shall be electrolytic high grade zinc of 99.95% purity. It shall conform to and satisfy all the requirements of IS: 209-1979.

2.8 Standard length

The conductor shall be supplied in lengths as required generally in the range of 1500/ 1800 metres.

2.9 Tests:

2.9.1.A The conductor should have type tested as per IEC/IS and shall be subjected to routine and acceptance tests in accordance with applicable IS specifications/ISO/ASTMA

recommendations. Type test reports of the tests conducted earlier (not more than 5 years earlier) on similar material shall be submitted. If the valid type test reports are not available with the bidder than the test shall be conducted by the bidder free of cost.

2.9.1.B If the purchaser insists to carry out the type test(s) afresh, the same shall be conducted on chargeable basis, fo that bidder shall submit the test charges in the price bid.

2.9.1.C TYPE TESTS

In accordance with the stipulation of the specification the following type tests shall be conducted on the conductor:

a)	UTS test	As per clause No. 2.10.1 below (The number of samples shall be mutually agreed)
b)	Corona extinction voltage test (dry)	As per clause No. 2.10.2 below
c)	Radio interference voltage test (dry)	As per clause No. 2.10.3 below
d)	DC resistance test	As per clause No. 2.10.4 below

2.9.2 Acceptance tests: Tests to be conducted

a)	Visual check for joints, scratches, etc. and lengths of conductor	As per clause No. 2.10.7 below
b)	Dimensional check on strands	As per clause No. 2.10.8 below
c)	Check for lay ratio of various layers	As per clause No. 2.10.9 below
d)	Galvanizing test on steel strands	As per clause No. 2.10.10 below
e)	Torsion and elongation test on steel strands	As per clause No. 2.10.11 below
f)	Breaking load test on strands	As per clause No. 2.10.12 below

In addition wrap test on steel and aluminium strands, dc resistance test on aluminium strands and UTS test on welded joint of aluminium strands shall be carried out as per clauses 12.5.2,12.7& 12.8 respectively of IS:398 (part V)1982.

NOTE:
All the above tests except test mentioned at (a) shall be carried out on aluminium and steel strands after stranding only.

2.9.3 Routine tests: Tests to be conducted

a) Check to ensure that the joints are as per specification.
b) Check that there are no cuts, fins etc. on the strands
c) All acceptance test as mentioned in clause 2.9.2 above to be carried out on each coil.

2.9.4 Tests during manufacture

a)	Chemical analysis of zinc used for galvanizing	As per clause No. 2.10.5
b)	Chemical analysis of aluminium used for making aluminium stands	As per clause No. 2.10.6
c)	Chemical analysis of steel used for making steel strands	As per clause No. 2.10.6

2.9.5 Sample batch for type testing

The contractor shall offer material for selection of samples for type testing, only after getting quality assurance plans approved from owner's quality assurance department. The sample shall be manufactured strictly in accordance with the quality assurance plan approved by owner.

2.10 TESTING PROCEDURE FOR ACSR MOOSE CONDUCTOR

2.10.1 UTS Test on Stranded Conductor

Circles perpendicular to the axis of the conductor shall be marked at two places on a sample of conductor of minimum 5 m length suitably compressed with dead end clamps at either end. The load shall be increased at a steady rate up to 80 kN and held for one minute. The circles drawn shall not be distorted due to relative movement of strands. Thereafter the load shall be increased at a steady rate to 161.2 kN and held for one minute. The applied load shall then be increased until the failing load is reached and the value recorded.

2.10.2 Corona Extinction Voltage Test

Two samples of conductor of 5m length shall be strung with a spacing of 450 mm between them at a height not exceeding 8.0 m above ground. This assembly shall be tested as per Section 3, corona extinction voltage shall not be less than 320kV (RMS) Line to ground for 400 kV system.

2.10.3 Radio Interference Voltage Test

The sample assembly similar to that specified above shall be tested as per Section 3. Maximum RIV level (across 300 ohm resistor at 1 MHz) at 305 kV (RMS) line to ground voltage shall be 1000 μV.

2.10.4 D.C Resistance Test on Stranded Conductor

On a conductor sample of minimum 5 m length two contact clamps shall be fixed with a pre-determined bolt torque. The resistance shall be measured by a Kelvin double bridge by placing the clamps initially zero meter and subsequently one meter apart. The test shall be repeated at least five times and the average value recorded. The value obtained shall be corrected to the value at 20^0C as per clause no. 12.8 of IS:398 (Part V)-1982.The resistance corrected at 20^0C shall conform to the requirements of this specification.

2.10.5 Chemical Analysis of Zinc

Samples taken from the zinc ingots shall be chemically/spectrographically analysed. The same shall be in conformity to the requirements stated in this specification.

2.10.6 Chemical Analysis of Aluminium and Steel

Samples taken from the Aluminium ingots/ coils/ strands shall be chemically/ spectrographically analyzed. The same shall be in conformity to the requirements in this specification.

2.10.7 Visual Check for Joints, Scratches etc.

Conductor drums shall be rewound in the presence of the inspector. The inspector shall visually check for scratches, joints, etc. and that the conductor generally

conforms to the requirements of this specification. The length of conductor wound on the drum shall be measured with the help of counter meter during rewinding.

2.10.8 Dimensional Check for steel and Aluminium Strands.

The individual strands shall be dimensionally checked to ensure that they conform to the requirements of this specification.

2.10.9 Check for Lay –ratios of various Layers.

The lay-ratios of various layers shall be checked to ensure that they conform to the requirements of this specification and clause no. 9.4 and 9.5 of IS-398 (Part-V) 1982.

2.10.10Galvanising Test

The test procedure shall be as specified in IS: 4826-1968. The material shall conform to the requirements of this specification.

2.10.11Torsion and Elongation Tests on Steel Strands

The test procedures shall be as per relevant clauses of IS 398 (Part V): 1982. In torsion test, the number of complete twists before fracture shall not be less than 18 on a length equal to 100 times the standard diameter of the strand before stranding & 16 after stranding. In case test sample length of less or more than 100 times the standard diameter of the strand, the minimum number of twist will be proportionate to the length and if number comes in the fraction then it will be rounded off to next higher whole number. In elongation test, the elongation of the strand shall not be less than 4% for a gauge length of 200 mm.

2.10.12Breaking load test on welded Aluminium stand:

Two Aluminium wires shall be welded as per the approved quality plan and shall be subjected to tensile load. The welded point of the wire shall be able to with stand the minimum breaking load of the individual strand guaranteed by the bidder.

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SECTION- 3

PROJECT DETAILS & 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, equipment and services covered under other sections of tender documents 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 prevail.

3.1 PROJECT INFORMATION:

	Particular	Details	
a)	Customer	**Nabinagar Power Generating Company Ltd. (NPGC)** (A joint venture of NTPC Ltd. and Bihar State Electricity Board)	
b)	Project Title	400/132 kV Switchyard including 400 kV & 33 kV Transmission Lines for Nabinagar Super Thermal Power Project (3X660 MW) at Nabinagar Bihar and extension of two line bays at 4X250MW Nabinagar TPP.	
c)	Location	**Nabinagar STPP** (i.) Place : Nabinagar (ii) District :Aurangabad (iii.) State :Bihar	**Nabinagar TPP (BRBCL)** (i.) Place : Nabinagar (ii) District :Aurangabad (iii.) State :Bihar
d)	Nearest Road Head	National Highway-2 (Approximately 25 kms from National highway)	
e)	Nearest Rail Head	Dehri-On-Sone (Approximately 30 kms from Railway Station)	
SITE CONDITIONS			
a)	Max. ambient air temp.	50°C	
b)	Min. ambient air temp.	0°C	
c)	Max. design ambient temp.	50°C	
d)	Design reference RH	100 %	
e)	Altitude	<500 MSL	
f)	Pollution Severity	High Pollution level (25mm/kV)	
g)	Seismic Zone	Zone-III	
WIND DATA			
a)	Basic Wind speed	47m/sec	
b)	The risk co-efficient (K1)	1.07	
c)	Category of terrain	Category-2	

d)	Maximum wind pressure on steel members	1500 N/m2

3.1.1 SYSTEM PARAMETERS:

Sl.No.	Parameters	**400 kV**	**132 kV**	**33 kV**
1	Highest system voltage	420 kV rms	145 kVrms	36 kVrms
2	Lightning Impulse voltage	±1425kVp	± 650kVp	± 170kVp
3	Switching impulse voltage	±1050kVp	--	--
4	Power frequency withstand for 1 min (rms)	630 kV(rms)	275 kV(rms)	70 kV(rms)
5	Max. fault level (1 sec.)	50 kA	31.5kA	25 kA
6	Minimum creepage distance	10500 mm	3625mm	900 mm

3.1.2 AUXILIARY POWER:

Sl.No.	Nominal Connection Voltage	Variations in Voltage	Frequency	Phase	Neutral
1	415V	±10%	50±5%	3	Solidly Earthed
2	240V	±10%	50±5%	4	Solidly Earthed

Combined variation of voltage and frequency shall be + 10%. Fault level of 415V system shall not be less than 20kA.

The minimum height of equipment supports shall be 2550mm. The various minimum heights of the switchyard shall be as given below from plinth level :

Voltage	Equipment /1st Level	2nd Level	3rd Level
132kV	4600mm	8500mm	12500mm
400kV (1½ breaker	8000mm	16000mm	--

3.2 INSTRUCTION TO BIDDERS:

The bidders shall submit the technical requirements, data and information as per the technical data sheets, provided in Section-4.

The bidders shall furnish catalogues, engineering data, technical information, design documents, drawings etc fully in conformity with the technical specification.

It is recognized that the bidders may have standardized on the use of certain components, materials, processes or procedures different than those specified herein. Alternate proposals offering similar equipment based on the manufacturer's standard practice will also be considered provided such proposals meet the specified designs, standard and

performance requirements and are acceptable to the Purchaser. Unless brought out clearly, the Bidder shall be deemed to conform to this specification scrupulously. All deviations from the specification shall be clearly brought out in the respective schedule of deviations. Any discrepancy between the specification and the catalogues or the bid, if not clearly brought out in the schedule, will not be considered as valid deviation.

Except for lighting fixtures, wherever a material or article is specified or defined by the name of a particular brand, Manufacturer or Vendor, the specific name mentioned shall be understood as establishing type, function and quality and not as limiting competition. For lighting fixtures, makes shall be as defined in Section-Lighting System.

Equipment furnished shall be complete in every respect with all mountings, fittings, fixtures and standard accessories normally provided with such equipment and/ or needed for erection, completion and safe operation of the equipment as required by applicable codes, though they may not have been specifically detailed in the Technical Specifications unless included in the list of exclusions. Materials and components not specifically stated in the specification but which are necessary for commissioning and satisfactory operation of the switchyard unless specifically excluded shall be deemed to be included in the scope of the specification and shall be supplied without any extra cost. All similar standard components/parts of similar standard equipment under supply shall be inter-changeable with one another.

The bidder shall supply type tested (including special tests as per tech. specification) equipment and materials. The test reports shall be furnished by the bidder along with equipment/ material drawings. In the event of any discrepancy in the test reports, (i.e., if any test report is not acceptable due to any design/ manufacturing changes or due to non-compliance with the Technical Specification and/ or applicable standard), the tests shall be carried out without any additional cost implication to the BHEL. BHEL reserves the right to get any or all type/tests conducted/repeated.

3.3 STANDARDS

3.3.1 The Contractor is required to follow local statutory regulations stipulated in the latest amended Electricity Supply Act 1948 and Indian Electricity Rules 1956, and other local rules and regulations.

3.3.2 The equipment to be furnished under this specification shall conform to latest issue with all amendments of standards and/or codes specified under respective section heads. The standards mentioned in the specification are not mutually exclusive or complete in themselves, but intended to compliment each other. The Contractor shall also note that list of standards presented in this specified is not complete. Whenever necessary the list of standards shall be considered in conjunction with specific IS/IEC. When the specified requirements stipulated in the specifications exceed or differ than those required by the applicable standards, the stipulation of the specification shall take precedence.

3.3.3 Other internationally accepted standards which ensure equivalent or better performance that that specified in the standards referred under section shall also be acceptable.

3.3.4 In case governing standards for the equipment is different from IS or IEC,the salient points of difference shall be clearly brought out in additional information schedule alongwith English language version of standard of relevant extract of the same. The

equipment conforming to standards other than IS/IEC shall be subject to Employer's approval.

3.3.5 The full names of the codes and standards mentioned in abbreviations under various equipment heads are as follows:

BS British Standards
IEC/CISPR International Electro-technical Commission
IS Bureau of Indian Standards
ISO International Organisation for Standards
NEMA National Electric Manufacturers Association

3.4 ENGINEERING DATA

3.4.1 Drawings

All drawings submitted by the supplier including those submitted at the time of bid shall be in sufficient detail to indicate the type, size, arrangement, material description, Bill of Materials, weight of each component, break-up for packing and shipment, the external connections, fixing arrangement required. The dimensions required for installation and interconnections with other equipment and materials, clearances and spaces required for installation and interconnections between various portions of equipment and any other information specifically requested in the specifications.

Each drawing submitted by the Contractor shall be clearly marked with the name of the Purchaser, the unit designation, the specifications title, the specification number and the name of the Project. If standard catalogue pages are submitted, the applicable items shall be indicated therein. All titles, noting, markings and writings on the drawing shall be in English. All the dimensions should be in metric units.

Further work by the Contractor shall be in strict accordance with these drawings and no deviation shall be permitted without the written approval of the Purchaser, if so required.

The review of these data by the purchaser will cover only general conformance of the data to the specification and documents, interfaces with the equipment provided under specification, external connections and of the dimensions which might affect substation layout.. This review by the purchaser may not indicate a thorough review of the dimensions, quantities and details of the equipment, material, any devices or items indicated or the accuracy of the information submitted. This review and/or approval by the purchaser shall not be considered by the contractor, as limiting any of his responsibilities and liabilities for mistakes and deviations from the requirements, specified under these specifications and documents.

All manufacturing and fabrication work in connection with the equipment prior to the approval of the drawings shall be at the Contractor's risk. The Contractor may make any changes in the design which are necessary to make the equipment conform to the provisions and intent of the Contract and such changes will again be subject to approval by the Purchaser. Approval of Contractor's drawing or work by the Purchaser shall not relieve the contractor of any of his responsibilities and liabilities under the Contract.

All engineering data submitted by the contractor after final process including review and approval by the purchaser shall form part of the contract document and the entire work

performed under these specifications shall be performed in strict conformity, unless otherwise expressly requested by the purchaser in writing.

3.4.2 Approval Procedure

The following procedure for submission and review/approval of the drawings, data,reports, information, etc. shall be followed by Contractor:

a. All data/information furnished by Vendor in the form of drawings, documents, catalogues or in any other form for NTPC's information/interface and/or review and approval are referred by the general term "drawings".

b. The 'Master drawings list' shall be submitted for review and approval of Employer before award of contract. The Contractor shall have to prepare and submit any other drawings and reference documents in addition to the drawings contained in the list, if so required during engineering stage as felt necessary by the Employer. Number of copies of the list for the distribution shall be as mutually agreed between Contractor and Employer.

c. All drawings (including those of subvendors') shall bear at the right hand bottom corner the 'title block' with all relevant information duly filled in. The format of title block shall approved by Engineer within thirty (30) days after the letter of award. The Contractor shall give this format to his subvendor along with his purchase order for subvendor's compliance. The size of title block basic format and its contents shall not be changed. All drawings shall be in English language. All dimensions shall be in metric units.

d. Contractor shall submit all the drawings in five (5) copies for review of Employer. Employer shall forward their comments within four (4) weeks of receipt of drawings.

e. Upon review of each drawings, depending on the correctness and completeness of the drawings, the same will be categorised and approval accorded in one of the following categories:

CATEGORY I	Approved
CATEGORY II	Approved subject to incorporation of comments/modification as noted. Resubmit revised drawing incorporating the comments
CATEGORY III	Not approved. Resubmit revised drawings for Approval after incorporating comments/modifications as noted
CATEGORY IV	For information and records

f. Contractor shall resubmit the drawings approved under Category II and III within three (3) weeks of receipt of comments on the drawings, incorporating all comments. Every revision of the drawing shall bear a revision index wherein such revisions shall be highlighted in the form of description or marked up in the drawing identifying the same with relevant revision number enclosed in a triangle (e.g 1.2.3. etc.)

g. In case Contractor does not agree with any specific comment, he shall furnish the explanation for the same to Employer consideration. In all such cases Contractor shall necessarily enclose explanations along with the revised drawing (taking care of balance comments) to avoid any delay and/or duplication in review work.

h. It is the responsibility of the Contractor to get all the drawings approved in the Category I or IV (as the case may be) and complete engineering activities within the agreed schedule. Any delay arising out of submission and modification of drawings shall not alter the contract completion schedule.

i. Contractor shall not make any changes in the portion of the drawing other than those commented. If changes are required to be made in the portions already approved, the Contractor shall resubmit the drawings identifying the changes (alongwith reasons for changes) for Employer's review and approval.

j. Approval of drawings will not in any way relieve the Contractor of his obligations of furnishing the equipment in accordance with the specification and shall not prevent subsequent rejection if such equipment is later found to be defective.

k. The drawing approval progress report shall be submitted in at least three (3) copies within one (1) week from the last date of the every month.

3.4.3 Final Submission of drawings and documents:

The Contractor shall furnish the following after approval of all drawings /documents and test reports:

a. List of drawings bearing the Employer's and Contractor's drawing number.
b. Ten (10) bound sets alongwith 4 CD-ROMs of all drawing.
c. All documents/designs in five (5) copies as noted above.
d. Contractor shall also furnish nine (9) bound sets of all as-built drawings including the list of all as-built drawings bearing drawing numbers. The Contractor shall also furnish four (4) sets of film reproducibles or CD-ROMs of all as-built drawings as decided by the Employer.
e. The Contractor shall also furnish eleven (11) copies of instruction manuals (after approval) for all the equipments.

3.4.4 TEST REPORTS

Five (5) copies of all test reports shall be supplied for approval before shipment of equipment. The report shall indicate clearly the standard value specified for each test to facilitate checking of the reports. After final approval seven bound copies of all type and routine test reports shall be submitted to Employer.

3.5 MATERIAL /WORKMANSHIP

Where the specification does not contain references to workmanship, equipment, materials and components of the covered equipment, it is essential that the same must be new, of highest grade of the best quality of their kind, conforming to best engineering practice and suitable for the purpose for which they are intended and shall ensure satisfactory performance throughout the service life.

In case where the equipment, materials or components are indicated in the specification as "similar" to any special standard the purchaser shall decide upon the question of similarity. When required by the specification or when required by the purchaser the contractor shall

submit, for approval, all the information concerning the materials or components to be used in manufacture. Machinery, equipment, materials and components supplied, installed or used without such approval shall run the risk of subsequent rejection, it being understood that the cost as well as the time delay associated with the rejection shall be borne by the Contractor.

The design of the Works shall be such that installation, future expansions, replacements and general maintenance may be undertaken with a minimum of time and expenses. Each component shall be designed to be consistent with its duty and suitable factors of safety subject to mutual agreements. All joints and fastenings shall be devised, constructed and documented so that the component parts shall be accurately positioned and restrained to fulfill their required function. In general, screw threads shall be standard metric threads. The use of other thread forms will only be permitted when prior approval has been obtained from the Purchaser.

Whenever possible, all similar part of the works shall be made to gauge and shall also be made interchangeable with similar parts. All spare parts shall also be interchangeable and shall be made of the same materials and workmanship as the corresponding parts of the equipment supplied under the specification. Where feasible, common component units shall be employed in different pieces of equipment in order to minimize spare parts stocking requirements. All equipment of the same type and rating shall be physically and electrically interchangeable.
The equipment offered in the bid only shall be accepted for supply, with the minimum modifications as agreed/accepted.

3.6 LIMIT OF CONTRACT

All the equipment, materials and services furnished by the manufacturer shall be complete in every respect with all mountings, fitting, fixtures and standard accessories normally provided with such equipment, and needed for erection, completion and safe operation of the equipment as required by applicable codes though they may not have been specifically detailed in technical specification and unless included in the list of exclusions. The manufacturer shall supply at no extra cost to Employer any additional material/service not covered specifically but which are found to be required for fulfillment of the scope of work under specification.

3.7 GALVANISING :

3.7.1 The galvanised surface shall consist of a continuous film adhering to the steel. The finished surface shall be clean and smooth, and shall be free from defects like dissolved patches, base, spot, unevenness of coating, spelter which is loosely attached to the steel globules, spiky deposits, blistered surfaces, flaking or peeling off, etc. The presence of any of these defects shall render the material liable to rejection.

3.7.2 All exposed ferrous parts shall be hot dip galvanised as per IS:2629 & IS:2633, Galvanising shall be uniform, smooth continuous and free from acid spots. Should the galvanising of the sample be found defective, the entire batch of steel shall have to be re-galvanised at Contractor's cost. The amount of zinc deposit shall be not less than 610 gms. per sq.m. of surface area and in addition, the thickness of zinc at any spot shall not be less than 85 microns. The Employer reserves the right to measure the thickness of zinc deposit by Elkometer or any other instrument acceptable to Employer and reject any

component which shows thickness of zinc at any location less than 85 microns. The testing on the galvanised materials shall be carried out as per IS:2633.

3.7.3 The amount of zinc deposit over threaded portion of the bolts, nuts and screws shall not be less than 300 gms. per sq. meter of surface area. The amount of zinc deposit on washers shall not be less than 340 gms. per sq. meter of surface area. The threads having extra deposit of zinc shall be removed by die cutting after the completion of galvanising. The removal of extra zinc shall be carefully done so that threads shall have minimum deposits of zinc on them as specified.

3.8 QUALITY ASSURANCE PROGRAMME

3.8.1 The Contractor shall adopt suitable 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 subcontractor's premises or at the Employer's site or at any other place of work are in accordance with the specifications. Such programmes shall be outlined by the Contractor and shall be finally accepted by the Employer/authorised representative after discussions before the award of the contract. The QA programme shall be generally in line with ISO-9001/IS- 14001.

A quality assurance programme of the contractor shall generally cover the following:

i. His organisation structure for the management and implementation of the proposed quality assurance programme
ii. Quality System Manual
iii. Design Control System
iv. Documentation Data Control System
v. Qualification data for Bidder's key Personnel.
vi. The procedure for purchase of materials, parts, components and selection of sub-contractor's services including vendor analysis, source inspection, incoming raw-material inspection, verification of materials purchased etc.
vii. System for shop manufacturing and site erection controls including process, fabrication and assembly.
viii. Control of non-conforming items and system for corrective actions and resolution of deviations.
ix. Inspection and test procedure both for manufacture and field activities.
x. Control of calibration and testing of measuring testing equipments.
xi. System for Quality Audits.
xii. System for identification and appraisal of inspection status.
xiii. System for authorising release of manufactured product to the Employer.
xiv. System for handling storage and delivery.
xv. System for maintenance of records, and
xvi. Furnishing 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 equipment/component.

3.8.2 GENERAL REQUIREMENTS - QUALITY ASSURANCE

3.8.2.1 All materials, components and equipment covered under this specification shall be procured, manufactured, erected, commissioned and tested at all the stages, as per a

comprehensive Quality Assurance Programme. An indicative programme of inspection/tests to be carried out by the contractor for some of the major items is given in the respective technical specification.
This is, however, not intended to form a comprehensive programme as it is the contractor's responsibility to draw up and implement such programme duly approved by the Employer. The detailed Quality Plans for manufacturing and field activities should be drawn up by the Bidder and will be submitted to Employer for approval. Schedule of finalisation of such quality plans will be finalised before award.

3.8.2.2 Manufacturing Quality Plan will detail out for all the components and equipment, various tests/inspection, to be carried out as per the requirements of this specification and standards mentioned therein and quality practices and procedures followed by Contractor's/ Sub-contractor"s/ sub-supplier's Quality Control Organisation, the relevant reference documents and standards, acceptance norms, inspection documents raised etc., during all stages of materials procurement, manufacture, assembly and final testing/performance testing. The Quality Plan shall be submitted on electronic media e.g. floppy or E-mail in addition to hard copy, for review. Once the same is finalised, hard copies shall be submitted for approval. After approval the same shall be submitted in compiled form on CD ROM.

3.8.2.3 Field Quality Plans will detail out for all the equipment, the quality practices and procedures etc. to be followed by the Contractor's site Quality Control Organisation, during various stages of site activities starting from receipt of materials/equipment at site.

3.8.2.4 The Bidder shall also furnish copies of the reference documents/plant standards/acceptance norms/tests and inspection procedure etc., as referred in Quality Plans alongwith Quality Plans. These Quality Plans and reference documents/standards etc. will be subject to Employer's approval without which manufacturer shall not proceed.
These approved documents shall form a part of the contract. In these approved Quality Plans, Employer shall identify customer hold points (CHP), i.e. test/checks which shall be carried out in presence of the Employer's Project Manager or his authorised representative and beyond which the work will not proceed without consent of Employer/Authorised representative in writing. All deviations to this specification, approved quality plans and applicable standards must be documented and referred to Employer alongwith technical justification for approval and dispositioning.

3.8.2.5 No material shall be despatched from the manufacturer's works before the same is accepted subsequent to predespatch final inspection including verification of records of all previous tests/inspections by Employer's Project Manager/Authorised representative and duly authorised for despatch by issuance of MDCC.

3.8.2.6 All material used for equipment manufacture including casting and forging etc. shall be of tested quality as per relevant codes/standards. Details of results of the tests conducted to determine the mechanical properties, chemical analysis and details of heat treatment procedure recommended and actually followed shall be

recorded on certificates and time temperature chart. Tests shall be carried out as per applicable material standards and/or agreed details.

3.8.2.7 All welding and brazing shall be carried out as per procedure drawn and qualified in accordance with requirements of ASME Section IX/BS-4870 or other International equivalent standard acceptable to the Employer. All welding/brazing procedures shall be submitted to the Employer or its authorised representative for approval prior to carrying out the welding/brazing.

3.8.2.8 All brazers, welders and welding operators employed on any part of the contract either in Contractor's/his sub-contractor's works or at site or elsewhere shall be qualified as per ASME Section-IX or BS-4871 or other equivalent International Standards acceptable to the Employer.

3.8.2.9 Test results or qualification tests and specimen testing shall be furnished to the Employer for approval. However, where required by the Employer, tests shall be conducted in presence of Employer/authorised representative.

3.8.2.10 For all pressure parts and high pressure piping welding, the latest applicable requirements of the IBR (Indian Boiler Regulations) shall also be essentially complied with. Similarly, any other statutory requirements for the equipments/systems shall also be complied with.

3.8.2.11 All the heat treatment results shall be recorded on time temperature charts and verified with recommended regimes.

3.8.2.12 No welding shall be carried out on cast iron components for repair.

3.8.2.13 Unless otherwise proven and specifically agreed with the Employer, welding of dissimilar materials and high alloy materials shall be carried out at shop only.

3.8.2.14 All non-destructive examination shall be performed in accordance with written procedures as per International Standards, The NDT operator shall be qualified as per SNT-TC-IA (of the American Society of non-destructive examination). NDT shall be recorded in a report which includes details of methods and equipment used, result/evaluation, job data and identification of personnel employed and details of co-relation of the test report with the job.

3.8.2.15 For components/equipment procured by the contractors for the purpose of the contract, after obtaining the written approval of the Employer, the contractor's purchase specifications and inquiries shall call for quality plans to be submitted by the suppliers. The quality plans called for from the subcontractor shall set out, during the various stages of manufacture and installation, the quality practices and procedures followed by the vendor's quality control organisation, the relevant reference documents/standards used, acceptance level, inspection of documentation raised, etc..

Such quality plans of the successful vendors shall be finalised with the Employer and such approved Quality Plans shall form a part of the purchase order/contract between the Contractor and sub-contractor. Within three weeks of the release of

the purchase orders/contracts for such bought out items/components, a copy of the same without price details but together with the detailed purchase specifications, quality plans and delivery conditions shall be furnished to the Employer on the monthly basis by the Contractor.

3.8.2.16 Employer reserves the right to carry out quality audit and quality surveillance of the systems and procedures of the Contractor's or their subvendor's quality management and control activities. The contractor shall provide all necessary assistance to enable the Employer carry out such audit and surveillance.

3.8.2.17 The contractor shall carry out an inspection and testing programme during manufacture in his work and that of his sub-contractor's and at site to ensure the mechanical accuracy of components, compliance with drawings, conformance to functional and performance requirements, identity and acceptability of all materials parts and equipment. Contractor shall carry out all tests/inspection required to establish that the items/equipments conform to requirements of the specification and the relevant codes/standards specified in the specification, in addition to carrying out tests as per the approved quality plan.

3.8.2.18 Quality audit/surveillance/approval of the results of the tests and inspection will not, however, prejudice the right of the Employer to reject the equipment if it does not comply with the specification when erected or does not give complete satisfaction in service and the above shall in no way limit the liabilities and responsibilities of the Contractor in ensuring complete conformance of the materials/equipment supplied to relevant specification, standard, data sheets, drawings, etc.

3.8.2.19 For all spares and replacement items, the quality requirements as agreed for the main equipment supply shall be applicable.

3.8.2.20 Repair/rectification procedures to be adopted to make the job acceptable shall be subject to the approval of the Employer/ authorised representative.

3.8.3 QUALITY ASSURANCE DOCUMENTS

3.8.3.1 The Contractor shall be required to submit two hard copies and two sets on CDROM of the following Quality Assurance Documents as identifed in respective quality plan with tick (_) mark within three weeks after despatch of the equipment.
Typical contents of Quality Assurance Document is as below:-

i) Quality Plan,
ii) Material mill test reports on components as specified by the specification and approved Quality Plans.
iii) Factory test reports/results for testing required as per applicable codes and standard referred in the specification and approved Quality Plans.
iv) Type test report(wherever applicable).
v) Non-destructive examination results /reports including radiography interpretation reports.
Sketches/drawings used for indicating the method of traceability of the radiographs to the location on the equipment.

vi) Heat Treatment Certificate/Record (Time- temperature Chart)
vii) All the accepted Non-conformance Reports (Major/Minor) / deviation, including complete technical details / repair procedure)Verification sketches, if used and methods used to verify that the inspection and testing points in the Quality Plan were performed satisfactorily
viii) CHP / Inspection reports duly signed by the Inspector of the Employer and Contractor for the agreed Customer Hold Points.
ix) Certificate of Conformance (COC) whever applicable.
x) MDCC

3.8.3.2 Similarly, the contractor shall be required to submit two hard copies and two sets on CD ROM of Quality Assurance Documents (in line with above) pertaining to field activities as per Approved Field Quality Plans and otheragreed manuals/ procedures, prior to commissioning of individual system.

3.8.3.3 Due to the large variety of equipment items, it is always possible to adapt the content of the quality document to better match the particularities of any equipment. This shall be done in agreement with the Supplier and the Inspector.
The Quality Document file shall be progressively completed by the Supplier's sub-supplier to allow regular reviews by all parties during the manufacturing.Each quality document shall have a project specific Cover Sheet bearing name & identification number of equipment and including an index of its contents with page control on each document.

3.8.3.4 Before shipping any equipment, the Supplier shall make sure that the corresponding quality document or in the case of protracted phased deliveries, the applicable section of the quality document file is completed. The supplier will then notify the Inspector regarding the readiness of the quality document (or applicable section) for review.

i) If the result of the review carried out by the Inspector of the Quality document (or applicable section) is satisfactory.The Inspector shall stamp,the quality document (or applicable section) for release.
ii) If the quality document is unsatisfactory, the Supplier shall endeavor to correct the incompleteness, thus allowing to finalize the quality document (or applicable section) by time compatible with the requirements as per contract documents. When it is done, the quality document (or applicable section) is stamped by the Inspector.
iii) If a decision is made to ship equipment, whereas all outstanding actions cannot be readily cleared for the release of the quality document by the time as per contract documents (or finalization of the applicable section of the quality document within one month as per corresponding shipment date).The supplier shall immediately, upon shipment of the equipment, send a copy of the quality document Review Status (signed by the Supplier Representative) to the Inspector and notify of the committed date for the completion of all outstanding actions & submission.The Inspector shall stamp the quality document for applicable section when it is effectively completed.
The final quality document will be compiled and issued at the final assembly place of equipment before shipment.

3.8.4 TRANSMISSION OF QUALITY DOCUMENTS

As a general rule, two hard copies of the quality document and Two CD ROMs shall be issued to the Employer not later than 1 month after the delivery date for the

corresponding equipment . One set of quality document shall be forwarded to Corporate Quality Assurance Department and other set to respective Site .
For the particular case of phased deliveries, the complete quality document to the Employer shall be issued not later than 1 month after the date of the last delivery similarly as stated above

3.9 TYPE TESTING , INSPECTION, TESTING & INSPECTION CERTIFICATE

3.9.1 The word 'Inspector' shall mean the Project Manager and/or his authorised representative and/or an outside inspection agency acting on behalf of the Employer to inspect and examine the materials and workmanship of the works during its manufacture or erection.

3.9.2 The Project Manager or his duly authorised representative and/or an outside inspection agency acting on behalf of the Employer 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 Project Manager and for his duly authorised representative permission to inspect as if the works were manufactured or assembled on the Contractor's own premises or works.

3.9.3 The Contractor shall give the Project Manager/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 Project Manager/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 test/inspection failing which the contractor may proceed with test which shall be deemed to have been made in the inspector's presence and he shall forthwith forward to the inspector duly certified copies of test reports in two (2) copies.

3.9.4 The Project Manager 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 inform in writing to the Project Manager/Inspector giving reasons therein, that no modifications are necessary to comply with the contract.

3.9.5 When the factory tests have been completed at the Contractor's or subcontractor's works, the Project Manager /Inspector shall issue a certificate to this effect fifteen (15) days after completion of tests but if the tests are not witnessed by the Project Manager /Inspectors, the certificate shall be issued within fifteen (15) days of the receipt of the Contractor's test certificate by the Project Manager /Inspector. Project Manager /Inspector to issue such a certificate shall not prevent the Contractor from proceeding with the works.The completion of these tests, or the issue of the certificates shall not bind the Employer to accept the equipment should it, on further tests after erection be found not to comply with the contract.

3.9.6 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 charge such items as labour, material, electricity, fuel, water, stores, apparatus and instruments as may be reasonably demanded by the Project Manager /Inspector or his authorised representatives to carry out effectively such tests on the equipment in accordance with the Contractor and shall give facilities to the Project Manager/Inspector or to his authorised representative to accomplish testing.

3.9.7 The inspection by Project Manager / Inspector and issue of Inspection Certificate thereon 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.

3.9.8 To facilitate advance planning of inspection in addition to giving inspection notice as per Clause 3.03.00, 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.

3.9.9 All inspection, measuring and test equipments 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 NTPC. Wherever asked specifically, thecontractor shall re-calibrate the measuring/test equipments in the presence of Project Manager / Inspector.

3.14 PACKAGING & PROTECTION

3.14.1 Packing, Marking and shipping

The packing and shipping shall be carried out in accordance with the standard practice of Contractor and with the following additional requirements:

a. The equipment shall be prepared in such a manner as to protect the equipment from damage or deterioration during shipping or storage. The shipments can be exposed to heavy rains, hot sun, high humidity and sudden extreme changes of temperature. The equipment shall be packed and shipped so as to protect it from all such conditions and any other abnormal conditions, generally expected during shipping & storage.

b. The metallic containers, if any, shall be considered as the property of the Contractor and he will be allowed to remove them from site once the contents are unpacked, inspected, documented and placed in temporary storage or in final position.

c. The equipment shall be shipped in such a manner as to facilitate unloading, handling and storage enroute and at the site. The Contractor shall provide lifting lugs and special lifting devices for proper handling and erection.

d. The Contractor shall be liable for any damage or loss resulting due to careless, improper, poor or insufficient packing and handling.

e. Spare parts and spare equipment shall be packed separately in containers adequate for long term storage, plainly marked "Spare Parts Only". They shall be crated individually or in kits to be used in one single renewal or overhaul operation. Other spare part kits shall not be disturbed when using one set or kit.

f. The Contractor shall at all times protect and preserve from damage, loss, corrosion and all other forms of damage, all parts of the works.

3.14.2 Transportation

a. The Contractor shall make a careful examination of access rail/roadways to the site in order to confirm the practical maximum transport weight and dimensions as well as a careful examination of the ports of disembarkation particularly with respect to the capacity of the cranes installed and access roads.

b. All instruments and computer/microprocessor based equipment imported

into India from overseas for the purpose of this contract shall be air freighted to the nearest possible point and further by rail/road taking due precautions as per manufacturer's recommendations. Employer shall have the right to decide the items that should be air freighted and Employer's decision shall be binding on Contractor

3.14.3 Insurance

a. The Contractor shall insure all shipments and works at his own expense for not less than the full replacement cost plus any additional cost for accelerated manufacturing of the replacement parts.

b. Loss or the damage to equipment during shipping or transportation to the site(s) or otherwise shall not constitute groups for claims for extension in time or for extra payment.

3.14.4 Storage of Equipment

a. The Contractor shall provide and construct adequate storage sheds for proper storage of equipment. Sensitive equipments shall be stored indoors. All equipment during storage shall be protected against damage due to act of nature or accidents. The storage instructions of the equipment manufacturers shall be strictly adhered to.

b. The necessary transport packing shall be removed as soon as possible after receipt of equipment at the work site(s).

3.15 CORONA AND RIV TESTS AND SEISMIC WITHSTAND TEST:

The corona (for 400kV only) and RIV tests shall confirm to the requirements as per **Annexure A** to this chapter. The seismic withstand test for 400kV shall conform to requirements as per **Annexure B** to this chapter.

3.16 Enclosures:

1. Annexure- A - CORONA AND RADIO INTERFERENCE VOLTAGE (RIV) TEST

Annexure – A

CORONA AND RADIO INTERFERENCE VOLTAGE (RIV) TEST

1.0 **General**

Unless otherwise stipulated, all equipment 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 measurement of radio interference voltage (RIV).

2.0 **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.

3.0 **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 – I. 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 result 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 measurement 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% for the specified RIV test voltage for all equipment unless otherwise specified. The specified RIV test voltage for 420 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 recommendations 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 the voltage read by the noise meter.
4.0	**Test Methods for visible Corona** The purpose of this test is to determine the corona extinction voltage of the 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 %, the voltage level shall be raised till inception of corona or rated voltage whichever is lower. The voltage will then be decreased slowly until all visible corona disappears. The test 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 the 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 procedure 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 connectors so as to show corona on bushing, insulators and all parts of energized connectors. The photographs shall be framed such that test object essentially fills the frame with no cut off.
4.1	For recording purposes, modern devices using UV recording methods such as image intensifier may also be used.
4.2	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.
4.3	In addition to photographs of the test object preferably four photographs shall be taken of the complete test assembly showing relative positions of the test equipment and test object. Thes e 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.
4.4	The test to determine the visible corona extinction voltage need not be carried out simultaneously with test to determine RIV levels.
4.5	However both tests shall be carried out with the same test set up and as little time duration between tests as possible. No modification or treatment of the sample between tests will be allowed. Simultaneous RIV and visible corona extinction voltage testing may be permitted at the discretion of the owner's engineer, if in his opinion it will not prejudice other test.
5.0	**Test Records:**
	In addition to the information previously mentioned and requirements specified as per CISPR or NEMA 107-1964 the following data shall be included in the test report-
a)	Background noise before and after the test
b)	Detailed procedure of application of test voltage
c)	Measurement of RIV levels expressed in microvolts 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 micro volt in each direction.
f)	Onset and extinction of visible corona for each of the four tests required shall be recorded.

Attributes / Characteristics Items/Components Sub Systems	Make, model, Type & Rating, Test Certificate	Routine & Acceptance Test as per IS / IEC	Functional requirements as per NTPC Specification
Circuit Breaker (IEC:56)	Y	Y	Y
Interrupter & hollow insulator (IEC:233/ IS:5284)	Y	Y	Y
Isolator (IEC:129 / IEC:694)	Y	Y	Y
Current Transformer (IEC:185)	Y	Y	Y
Capacitor Voltage Transformer (IEC:186 / 358)	Y	Y	Y
Bus Post Insualtor (IEC:168 / 273 / IS:2544)	Y	Y	Y
Disc,Pin & String Insualtor (IEC:383 / IS:731)	Y	Y	Y
Long Rod Insualtor (IEC:433)	Y	Y	Y
Surge Arrestor (IEC:99-4)	Y	Y	Y
Hardware fittings for Insulator (IS:2486 / BS:3288)	Y	Y	Y
Spacer Clamps & Connector (IS:10162 / 5561)	Y	Y	Y
Aluminium Tube (IS:5082 / 2673 / 2678)	Y	Y	Y
Wave Trap (IEC:353 / IS:8792 / 8793)	Y	Y	Y
Conductor (IS:398-P-II)(V)	Y	Y	Y
Galvanised Steel Structures (IS:2062/2629/4759/6745)	Y	Y	Y
Vibration Damper (IS:9708)	Y	Y	Y
Sag Compensating Spring DIN:2089/2096 IS:3195 / 7906	Y	Y	Y
Control & Relay Panel	Y	Y	Y
SF6 Gas filling & evacuating plant	Y	Y	Y
SF6 Gas Leak Detector	Y	Y	Y
Leakage Current Analyser	Y	Y	Y
Nitrogen Gas Filling Device	Y	Y	Y
Protection Relays	Y	Y	Y
Event Logger	Y	Y	Y
Operation Analyser	Y	Y	Y
Disturbance Recorder	Y	Y	Y
Tariff Metering System	Y	Y	Y
Synchronising Trolly	Y	Y	Y

Attributes / Characteristics Items/Components Sub Systems	Make, Type Rating,and Model, Test Certificates	Routine & Acceptance Test as per relevant IS/IEC	Functional requirements as per NTPC Specification
Relay Test Kit	Y	Y	Y
LT Switchgear /LT Panels (IEC:947 / IS:13947)	Y	Y	Y
Battery IS:1652	Y	Y	Y
Lighting Panels	Y	Y	Y
Surge Monitor	Y	Y	Y

Notes : 1) This is an indicative list of test/checks. The manufacture is to furnish a detailed Quality Plan indicating the practice and procedure along with relevant supporting documents during QP finalisation for all items.

2) All major Bought Out Items will be subject to NTPC approval.

SECTION IV

GUARANTEED AND TECHNICAL PARTICULARS OF ACSR MOOSE

1.	Manufacturer's Name & address	
2.	Particulars of raw material	
2.1	Aluminium	
a)	Min. purity of aluminium	%
b)	Max. Copper content	%
2.2	Steel wires/ Rods	
a)	Carbon	%
b)	Manganese	%
c)	Phosphorus	%
d)	Sulphur	%
e)	Silicon	%
2.3	Zinc- Minimum Purity	%
3.	Aluminium Strands after stranding	
3.1	Diameter	
	a) Nominal	mm
	b) Maximum	mm
	c) Minimum	mm
3.2	Min. breaking load of strand after stranding	kN
3.3	Max. resistance of 1m length of strand at 20° C	
4.	STEEL STRANDS AFTER STRANDING	
4.1	Diameter	
	a)Nominal	mm
	b)Maximum	mm
	c)Minimum	mm
4.2	Min. breaking load of strand	Kn
4.3	Galvanizing	
a)	Min. weight of zinc coating per sq.m of uncoated wire surface	gm.
b)	Min. no. of dips that the galvanized strand can withstand in the standard preece test	
c)	Min. number of twist to be withstood in torsion test when tested on a gauge length of100 times diameter of wire	Nos.

5. ACSR CONDUCTOR

5.1	Minimum UTS	kN
5.2	Lay Ratio of conductor	
a)	Outer Steel layer	
b)	Aluminium - 12 wire layer	
c)	Aluminium 18 wire layer	
d)	Aluminium 24 wire layer	
5.3	DC resistance of ACSR at 20°C	Ω
5.4	Min. corona extinction voltage (dry)	kV
5.5	RIV at 1 MHz across 300-ohm resistor at 305 kV under dry conditions	
5.6	Standard length of conductor in one drum	m
5.7	Direction of lay for outside layer	-
5.8	Linear mass of conductor	mm
a)	Standard	kg/km
b)	Minimum	kg/km
c)	Maximum	kg/km

6. No. of cold pressure but welding equipment available at works

--xx--

SECTION V

QUALITY PLAN

Bidder shall follow NTPC Approved QAP.

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SUB-SUPPLIER QUESTIONNAIRE
(To be filled in by the Sub Supplier)

APPENDIX-Q1

Approval Desired for Process/item (Rating/Size/Type) :

1. Name of Company (Sub-Supplier):
2. Address of Regd. Office:

_____ Tel_____

_____ Mobile_____

_____ e-mail_____

_____ Fax_____

3. Address of Factory/Works

_____ Tel_____

_____ Mobile_____

_____ e-mail_____

_____ Fax_____

Weekly off day

4. Branch/Liaison Office in Delhi:

_____ Tel_____

_____ Mobile_____

_____ e-mail_____

_____ Fax_____

Weekly off day

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SUB-SUPPLIER QUESTIONNAIRE
(To be filled in by the Sub Supplier)

5. Person(s) to be contacted

Place	Name(s)	Official Capacity	Telephone No(s)
Regd. Off.			
Factory			
Branch/ Liaison Off.			

6. Nature of Company : Proprietary/Partnership/Pvt. Ltd./Public Ltd.

Works Details:

7. Year of Factory Establishment :

8. Year of Commencement of Manufacture :

9. Total Area/Covered Area

10. Electric Power-Connected Load :
Electric Power-Standby Load & System

11. Finance-Total Capital :
- Annual Turnover & profit For past three years
- Limit of Credit Facility :
Available from the Banks

12. Do you have in-house Department for :

a) Design Yes/No
b) Research & Development Yes/No
c) Manufacturing/Production Yes/No
d) Quality control/Inspection Yes/No
e) Clearance from pollution deptt. Yes/No

13. Shift works per day One/Two/Three

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SUB-SUPPLIER QUESTIONNAIRE
(To be filled in by the Sub Supplier)

14. Details regarding employees :

Division / Status	Graduate		Diploma	Skilled	Un-Skilled	Remarks
	Technical	Non-Technical				
Production						
Quality Control						
Admn & other Supporting Activities						

15. Please enclose a copy of company's organisation chart (for the unit).

16. Trade Name of Product (if any) :

17. Manufacturing capacity details :

S. N.	Product	Licensed Capacity	Installed Capacity

18. Brief details of items manufactured :

Sl. No.	Item & Material	Description (Type/Size/Rating)	Annual Production for last Three years		
			I	II	III

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SUB-SUPPLIER QUESTIONNAIRE
(To be filled in by the Sub Supplier)

19.Details of foreign collaboration, if any :

Sl. No.	Product	Name & Address of Collaborator	Collaboration		
			Scope	Year	Valid upto

20. Have your product been type tested by any external agency? If so, give details

Sl. No.	Product	Test (Size, Type & Class)	Test Report No. & Date	Next Due Date

21. Indicate Approval/Certification by National/International standards/agencies applicable for the subject product.

Sl. No.	Product	Code/Standard	License No. & Date

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SUB-SUPPLIER QUESTIONNAIRE
(To be filled in by the Sub Supplier)

22. Have you been approved by any third party/statutory agency? If so, indicate details and enclose copies of approval letters.

Sl. No.	Item/ Material	Description (Size, Type & Class)	Agency	Date of Approval	Next Due Date

23. Reference list (Experience in the particular type of equipment) :

Sl. No.	Item/ Material	Type & Capacity	Customer (End User) with Address	Date of supply	Under Operation Since Year/ Month

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SUB-SUPPLIER QUESTIONNAIRE
(To be filled in by the Sub Supplier)

24(a) Specific to process & product facilities :

Sl. No.	Description of machine	Capacity & Nos.	Location Shop	Make	Year of Manufg.

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SUB-SUPPLIER QUESTIONNAIRE
(To be filled in by the Sub Supplier)

24(b) Other/General facilities .

Sl. No.	Description of machine	Capacity & Nos.	Location Shop	Make	Year of Mfg.
1)	Material Handling Mobile Crane Fork Lift Over Head Cranes				
2)	Metal Cutting & Bending				
3)	Casting				
4)	Forging				
5)	Fabrication				
6)	Welding				
7)	Machining				
8)	Heat Treatment				
9)	Sheet Metal				
10)	Fettling & Cleaning Sand Blasting Shot Blasting Pickling				
11)	Painting				
12)	Metal Coating				
13)	Protection before packing				
14)	Packing				
15	Other				

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SUB-SUPPLIER QUESTIONNAIRE
(To be filled in by the Sub Supplier)

25 (a) Facilities for Testing & Inspection :

Sl. No.	Description	Capacity & Nos.	Make & year of Mfg.	Calibration Status	Approval Qualification	

25 (b) If In-house testing facilities are not available, indicate source of testing with relevant details:

Sl. No.	**Source of Testing**	**Description**	**Capacity & Nos.**	Make & year of Mfg.	Calibration Status	**Approval/ Qualification**	

26 (a) Details of any Govt. laboratory facilities available in area :

26 (b) Product related testing facilities (Type/Performance/Routine/Acceptance Tests) :

26 (c) Storage of finish goods (covered / open)

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SUB-SUPPLIER QUESTIONNAIRE
(To be filled in by the Sub Supplier)

27 Source of Raw Materials (including imported raw materials) :

a) Type Source

b) Raw material storage & identification :

28. **No. of PCs available with internet Connectivity at works:**

29. Quality management

29.1 General

29.1.1. Organisation Chart of Quality Management: Attached: (Y/N)

29.1.2. Head of QC Department reports to :

29.1.3. Do you have a written Quality Control Instruction Manual? If yes, please furnish a copy of the same.

29.1.4. Have written Quality Control Instruction sheets been prepared and properly used ?

29.1.5. Are records generated during inspection maintained & available for review?

29.1.6. Are final inspection areas clean, adequately lighted & of suitable size?

29.1.7. Are written procedure defining stage wise operations and functions on shop floor established and followed?

29.1.8. Are quality control checks adequate to maintain desired quality right from incoming stage to final operation?

29.1.9. Whether 100% or adequate sampling inspection used?

29.1.10. Are statistical quality control techniques used?

29.2. Corrective Action

29.2.1. Does the system provide for proper detection of inferior quality and correction of its assignable causes?

29.2.2. Is adequate action taken to correct the causes of defects in products?

29.2.3. Are analysis made to identify trends towards product deficiencies?

29.2.4. Does corrective action extend to products?

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SUB-SUPPLIER QUESTIONNAIRE
(To be filled in by the Sub Supplier)

29.3 **Documentation Control**

29.3.1. Does a system for clear and precise stipulation of responsibilities for documentation issue & change control exists?

29.3.2. Are changes made in writing?

29.4. Control of Inspection, measuring & Testing equipments

29.4.1. Are necessary gauges, testing and measuring equipment's, available and used?

29.4.2. Are testing and measuring equipment properly maintained?

29.4.3. Is recorded control on calibration of equipment available?

29.5. Control of procured supplies & Services

29.5.1. Do the vendor/sub-Supplier's purchasing documents refer to specific design manufacturing and testing requirements?

29.5.2. Do purchasing documents also contain special requirements?

29.5.3. Are requirements for necessary tests and inspection of raw material specified in purchasing documents?

30. CONSISTENCY IN SUPPLY

30.1. Has the vendor/sub-Supplier produced items of similar nature in past?

30.2. Has the vendor/sub-Supplier maintained delivery commitments in past?

30.3. Has there been frequent labour trouble in past?

30.4. Has there been major upset due to faulty material management?

30.5 Whether the system of planning and scheduling resilient enough to overcome temporary setbacks and make up lost time?

30.6. Can the vendor/sub-Supplier quickly off load the work to other reliable subvendors:

If Yes, the name of sub-vendors :

31. Order booking position as on date in terms of:

a) Value :

b) Time :

32. Any special information

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SUB-SUPPLIER QUESTIONNAIRE
(To be filled in by the Sub Supplier)

33. I CERTIFY THAT THE INFORMATION SUPPLIED HEREIN (INCLUDING ALL PAGES ATTACHED) IS CORRECT TO THE BEST OF MY KNOWLEDGE.

SEAL

SIGNATURE_____
NAME_____
DESIGNATION_____
M/S._____
PLACE_____
DATE_____

LIST OF ENCLOSURE

1.
2.
3.

Certification by Main Supplier: Above information have been verified and found in order / minor changes which have been marked and initialed on this form itself / observed the following discrepancies.

Name : Designation : Signature : Date :

Certification by visiting team : Above information except as under have been verified and found in order.

Name : Designation : Signature : Date :

1.
2

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MAIN SUPPLIES'S EVALUATION REPORT

(For Proposed Sub-Supplier)

APPENDIX-Q2

MAIN SUPPLIER M/S.....

PACKAGE & PROJECT :

EQUIPMENT / ITEM :

GENERAL INFORMATION

1. PROPOSED SUB-SUPPLIER'S NAME & WORKS ADDRESS :

2. CONTACT PERSON :
   TELEPHONE (LAND LINE/MOB.) :
   FAX :
   E-MAIL :

3. BRIEF SPEC. OF EQUIPMENT ITEM/MODEL/TYPE /RANGE / CAPACITY:

4. REFERENCE LIST (EXTENSIVE EXPERIENCE IN THE PARTICULAR TYPE OF EQUIPMENT / ITEM)

CUSTOMER/ LOCATION WITH ADDRESS AND CONTACT PERSON	TYPE , RATING & CAPACITY	DATE OF COMMISS-IONING.	NO. OF YRS. IN OPERA-TION	PERFORMANCE FEEDBACK

5. RECOMMENDATIONS :

NAME _____ DESIGN _____ SIGN.: _____

List of Encl.

Date : _____

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APPENDIX-Q3

MFGR.'s LOGO	MANUFACTURER'S NAME AND ADDRESS	MANUFACTURING QUALITY PLAN		PROJECT : PACKAGE : CONTRACT NO. : MAIN-SUPPLIER:
		ITEM : SUB-SYSTEM:	QP NO.: REV.NO.: DATE: PAGE: .... OF....	

SL. NO	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		AGENCY			REMARKS
					M	C / N					M	C	N	
1.	2.	3.	4.	5.	6.		7.	8.	9.	D*	** 10.			11.

MANUFACTURER/ SUB-SUPPLIER	MAIN SUPPLIER
SIGNATURE	

LEGEND: * RECORDS, INDENTIFIED WITH "TICK" (√) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION.
** M: MANUFACTURER/SUB-SUPPLIER C: MAIN SUPPLIER, N: NTPC
P: PERFORM W: WITNESS AND V: VERIFICATION, AS APPROPRIATE.
CHP: NTPC SHALL IDENTIFY IN COLUM "N" AS "W"

FOR NTPC USE

DOC. NO.:		REV..... CAT.....
REVIEWED BY	APPROVED BY	APPROVAL SEAL

FORMAT NO.: QS-01-QAI-P-09/F1-R1 1/1 ENGG. DIV./QA&I

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APPENDIX-Q5

SUPPLIER'S LOGO	SUPPLIER'S NAME AND ADDRESS	FIELD QUALITY PLAN		PROJECT : PACKAGE : CONTRACT NO. : MAIN-SUPPLIER:
		ITEM : SUB-SYSTEM:	QP NO.: REV. NO.: DATE: PAGE: .... OF....	

SL. NO	ACTIVITY AND OPERATION	CHARACTERISTICS / INSTRUMENTS	CLASS OF CHECK #	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		REMARKS
1.	2.	3.	4.	5.	6.	7.	8.	9.	D*	10.

MANUFACTURER/ SUB-SUPPLIER	MAIN-SUPPLIER
SIGNATURE	

LEGEND: * RECORDS INDENTIFIED WITH "TICK" (√) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION.
LEGEND TO BE USED: CLASS # ; A = CRITICAL, B=MAJOR, C=MINOR;
'A' SHALL BE WITNESSED BY NTPC FQA, 'B' SHALL BE WITNESSED BY NTPC ERECTION / CONSTRUCTION DEPTT. AND 'C' SHALL BE WITNESSED BY MAIN SUPPLIER (A & B CHECK SHALL BE NTPC CHP STAGE)

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DOC. NO.:		REV.....
REVIEWED BY	APPROVED BY	APPROVAL SEAL

FORMAT NO.: QS-01-QA1-P-09/F2-R1 | 1/1 | ENGG. DIV./QA&I

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