

BHEL Jhansi wishes to enter into TC MoU contract with eligible bidders in line with Tender document for the enquiry no. E06250039 (2026_BHEL_57697_1) – For supply of **CTC conductors on finished basis**

Duration of TC MoU – 19.03.2026 to 18.03.2028

Any vendor who wishes to participate in TC MoU can submit their techno commercial bid on email id tenderbox.jhs@bhel.in

Note:

- 1) Mail should contain heading “TCMOU E06250039 (2026_BHEL_57697_1) – SUPPLY OF CTC CONDUCTORS ON FINISHED BASIS”
- 2) Mail size should not exceed 15MB
- 3) For any clarification, please contact through mail on following id(s):

rrajeev.s@bhel.in

komalk@bhel.in

Interested suppliers can participate at any time and if their bid is found to be techno commercially qualified, then price (bid) will be sought from the supplier for participation in the forthcoming 6 months rate contract.



BHARAT HEAVY ELECTRICALS LTD.
 (A GOVT. OF INDIA UNDERTAKING)
 P.O BHEL Jhansi - 284120, INDIA
 Tel.:0510-277001/2412260
 Website : jhs.bhel.com

JSC140/M2053

PURCHASE ENQUIRY

ENQ NO/DT: E06250039 29/01/26
 REV NO/DT: 0 29/01/26

PAGE 1
6

PLEASE SEND YOUR BEST QUOTATION AS PER TERMS & CONDITIONS AND REMARK MENTIONED UNDERNEATH.

Enq Due on: 12-02-26 THURSDAY
 Close at: 13:15 Open at: 14:00
 Matcat: 061001 CONTINUOUSLY TRANSPO
 Validity: 120 days from Technical bid opening date
 IEM:
 TOP: See Special Remarks
 RA: RA not applicable
 Est. Value: Item wise
 Bid Type: TWO BID
 Tot Item: 6
 Delivery: FOR Jhansi
 E-Proc: Yes

REQUIRED:

ITEM NO : 1 PSL QTY/UM: 3400.00 MT
 MATL CODE : TR173676A204 PO QTY /UM: 3400000.00 KG
 DESTINATION: JS

DESCRIPTION	DELIVERY	QUANTITY (PSL UM)
EPOXY COATED PROOF STRESS GLUED CTC upto 41 STRANDS AND UPTO 30 SQ mm CROSS SECTION AREA AS PER ITEM-1 OF ATTACHED ANNEXURE-1.	JUN-26	850.00
	DEC-26	850.00
	JUN-27	850.00
	DEC-27	850.00

ITEM NO : 2 PSL QTY/UM: 1000.00 MT
 MATL CODE : TR173676A205 PO QTY /UM: 1000000.00 KG
 DESTINATION: JS

DESCRIPTION	DELIVERY	QUANTITY (PSL UM)
EPOXY COATED PROOF STRESS GLUED CTC WITH NORMAL DENSITY TUP upto 41 STRANDS AND UPTO 30 SQ mm CROSS SECTION AREA AS PER ITEM-2 OF ATTACHED ANNEXURE-1.	JUN-26	250.00
	DEC-26	250.00
	JUN-27	250.00
	DEC-27	250.00

ITEM NO : 3 PSL QTY/UM: 600.00 MT
 MATL CODE : TR173676A206 PO QTY /UM: 600000.00 KG
 DESTINATION: JS

DESCRIPTION	DELIVERY	QUANTITY (PSL UM)
EPOXY COATED PROOF STRESS GLUED CTC WITH STRANDS FROM 43 TO 65 AND CROSS SECTION AREA upto 15 SQ mm AS PER ITEM-3 OF ATTACHED ANNEXURE-1.	JUN-26	150.00
	DEC-26	150.00
	JUN-27	150.00
	DEC-27	150.00

ITEM NO : 4 PSL QTY/UM: 600.00 MT
 MATL CODE : TR173676A207 PO QTY /UM: 600000.00 KG



BHARAT HEAVY ELECTRICALS LTD.
 (A GOVT. OF INDIA UNDERTAKING)
 P.O BHEL Jhansi - 284120, INDIA
 Tel.:0510-277001/2412260
 Website : jhs.bhel.com

PURCHASE ENQUIRY

ENQ NO/DT: E06250039 29/01/26
 REV NO/DT: 0 29/01/26

PAGE 2
6

JSC140/M2053

DESTINATION: JS

DESCRIPTION	DELIVERY	QUANTITY (PSL UM)
EPOXY COATED PROOF STRESS GLUED CTC WITH NORMAL DENSITY TUP PAPER WITH STRANDS FROM 43 TO 65 AND CROSS SECTION AREA upto 15 SQ mm AS PER ITEM-4 OF ATTACHED ANNEXURE-1.	JUN-26	150.00
	DEC-26	150.00
	JUN-27	150.00
	DEC-27	150.00

ITEM NO : 5 PSL QTY/UM: 150.00 MT
 MATL CODE : TR873190A207 PO QTY /UM: 150000.00 KG
 DESTINATION: JS

DESCRIPTION	DELIVERY	QUANTITY (PSL UM)
NOMEX COVERED ,0.1% PROOF STRESS CTC, UP TO 13 STRANDS AND CROSS SECTION AREA UP TO 20 SQ MM./STRAND , AS PER ATTACHED ANNEXURE II (TYPICAL SIZE INDICATED IN ANNEXURE II)	JUN-26	37.50
	DEC-26	37.50
	JUN-27	37.50
	DEC-27	37.50

ITEM NO : 6 PSL QTY/UM: 1150.00 MT
 MATL CODE : TR873190A208 PO QTY /UM: 1150000.00 KG
 DESTINATION: JS

DESCRIPTION	DELIVERY	QUANTITY (PSL UM)
NOMEX COVERED 0.1% PROOF STRESS CTC MORE THAN 13 STRANDS AND UP TO 27 STRANDS AND CROSS SECTION AREA UP TO 20 SQ. MM PER STRAND. (TYPICAL SIZE INDICATED IN ANNEXURE II.)	JUN-26	287.50
	DEC-26	287.50
	JUN-27	287.50
	DEC-27	287.50

SPECIAL REMARKS:

- ENQUIRY IS FLOATED IN "TWO BID" SYSTEMS THROUGH E-PROCUREMENT ([HTTPS://EPROCUREBHEL.CO.IN](https://EPROCUREBHEL.CO.IN)) FOR PROCUREMENT OF CTC AS PER TENDER DOCUMENT ANNEXURE-I TO ANNEXURE-V.
- ALL THE TENDER DOCUMENTS SPECIFICATIONS AND GENERAL TERMS AND CONDITIONS OF ENQUIRY IS UPLOADED AT OUR E-PROCUREMENT PORTAL <https://eprocurebhel.co.in> AS WELL AS BHEL PORTAL.
- TECHNO-COMMERCIAL CONDITIONS FROZEN AGAINST THIS MOU SHALL BE VALID FOR ORDERING FOR TWO-YEARS PERIOD FROM DATE OF ENTERING INTO FIRST RATE CONTRACT. THE TECHNO-COMMERCIAL AGREEMENT MAY BE EXTENDED FOR FURTHER 3 MONTHS AFTER 2 YEARS ON MUTUAL AGREEMENT WITH THE SUPPLIER
- INITIALLY, RATES ARE BE CALLED FOR QUANTITY ITEM 1-850 MT, ITEM 2-250 MT, ITEM 3-150 MT, ITEM 4- 150 MT, ITEM 5- 37.5 MT, ITEM 6-287.5 MT FOR ORDERING VALID FOR THE PERIOD OF SIX MONTHS FROM THE DATE OF FIRST-RATE CONTRACT.
- FOR FURTHER REQUIREMENT, SEPARATE PRICES SHALL BE INVITED FROM TECHNO-COMMERCIALY QUALIFIED BIDDERS AS PER BHEL REQUIREMENT FOR ORDERING VALID FOR THE PERIOD OF SIX MONTHS FROM THE DATE OF RATE CONTRACT.
- PLEASE READ ALL THE DOCUMENTS CAREFULLY BEFORE SUBMITTING THE OFFER.



JSC140/M2053

BHARAT HEAVY ELECTRICALS LTD.
(A GOVT. OF INDIA UNDERTAKING)
P.O BHEL Jhansi - 284120, INDIA
Tel.:0510-277001/2412260
Website : jhs.bhel.com

PURCHASE ENQUIRY

ENQ NO/DT: E06250039 29/01/26
REV NO/DT: 0 29/01/26

PAGE 3
6

7. QUANTITY OF EACH ITEM MAY VARY + /- 30% ON OVERALL BASIS AND FURTHER WILL BE APPLICABLE FOR EACH PERIOD OF ORDERING.
8. DULY FILLED, SIGNED AND STAMPED COPY OF TENDER DOCUMENTS, SPECIFICATIONS, GTC OF ENQUIRY AND PQR RELATED SUPPORTING DOCUMENTS SHALL BE UPLOADED AT E-PROCUREMENT PORTAL (<https://eprocurebhel.co.in>) FAILING WHICH OFFER MAY LIABLE FOR REJECTION.
9. FOR ITEMS 1 TO 4 BIDDER HAS TO COMPLY BHEL QAP NO. QC/TCB/QAP/BO/56REV.07. IN ADDITION TO BHEL QAP, BHEL CUSTOMER'S QAP /NTPC & POWERGRID QAP SHALL ALSO BE ADHERED BY SUPPLIER.
10. FOR ITEM 5 AND 6 SUPPLIERS TO BE AS PER CLW APPROVED VENDOR LIST/ BOM.10-TECH.SPEC AND OTHER TERMS AS PER ATTACHED ANNEXURE TO BE COMPLIED BY VENDOR.
11. SUBMISSION OF TENDER DOCUMENT THROUGH OTHER MODE SHALL NOT BE CONSIDERED.
12. LOI SHALL BE ISSUED ON SET WISE/ LOT WISE.
13. DELIVERY MENTIONED ABOVE IS TENTATIVE AND ACTUAL DELIVERY WILL BE GIVEN IN PURCHASE ORDER AFTER ESTABLISHMENT OF TCMOU RATE CONTRACT.
14. INSPECTION AT SUPPLIER'S WORK AS PER APPLICABLE QAP BY BHEL JHANSI/ BHEL NOMINATED AGENCY/CUSTOMER FOR WHICH TWO WEEK ADVANCE INTIMATION SHALL BE GIVEN BY SUPPLIER.
15. PRICE BID OF BIDDER, WHO HAS OVERDUE SUPPLY OF MORE THAN 5% OF TOTAL ORDER QUANTITY PLACED AGAINST THIS 2 YEAR TCMOU OF PREVIOUS FINALISED HALF YEARLY TCMOU RATE ON THE DATE OF CURRENT PRICE BID OPENING, SHALL NOT BE CONSIDERED.
16. IF ANY VENDOR WISHES TO PARTICIPATE IN TCMOU CAN SUBMIT THEIR TECHNO-COMMERCIAL OFFER DURING ENTIRE DURATION OF 2 YEARS. THE LINK OF THE SAME IS "<https://jhs.bhel.com/apps/sip/mou.php>".

In case the bidder has not submitted PAN No, TIN No. and E-mail ID, the bidder has to submit the same along with the copy of PAN No and TIN No. Else his offer will be liable to be rejected.

If you are not in a position to quote due to any reason, you must send regret letter titled enquiry no. etc, failing which you may not be considered for sending future enquiries.

ENCLOSERS:



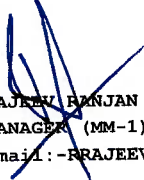
BHARAT HEAVY ELECTRICALS LTD.
(A GOVT. OF INDIA UNDERTAKING)
P.O BHEL Jhansi - 284120, INDIA
Tel.:0510-277001/2412260
Website : jhs.bhel.com

PURCHASE ENQUIRY

ENQ NO/DT: E06250039 29/01/26
REV NO/DT: 0 29/01/26

PAGE 4
6

FOR AND ON BEHALF OF
BHARAT HEAVY ELECTRICALS LTD


RAJEEV BANJAN
MANAGER (MM-1)
Email:-RAJEEV.S@BHEL.IN

***** END OF PURCHASE ENQUIRY *****

NOTE :

- * THE BIDDER IS INFORMED THAT THE GENERAL TERMS & CONDITIONS OF ENQUIRY (JHS 2055A Rev 03) WHICH ARE UPLOADED AT <https://jhs.bhel.com/apps/sip/index.php> AT (TERMS & CONDITION -> FOR ENQUIRY) LINK, ARE TO BE READ BY THE BIDDER BEFORE SUBMITTING QUOTE IN THE ENQUIRY. BHEL SHALL CONSTRUCT THE PARTICIPATION BY THE BIDDER IN ENQUIRY AS ACCEPTANCE TO THE GENERAL TERMS AND CONDITIONS OF ENQUIRY.
- * SUPPLIERS ARE REQUESTED TO INFORM US WITH VALID CERTIFICATE, IF THEY ARE REGISTERED UNDER MSMED ACT'2006. (APPLICABLE FOR INDIAN SUPPLIERS ONLY).
- * FOR SUPPLIERS SUPPLYING FROM OUTSIDE THE LOCAL AREA OF BHEL JHANSI, ENTRY TAX WILL BE APPLICABLE. SUPPLIERS SHOULD NECESSARILY INDICATE RATE OF ENTRY TAX SEPARATELY WHEREVER APPLICABLE. THEY SHOULD ALSO MENTION THE ENTRY TAX CHARGED SEPARATELY IN THE INVOICE.
- * FOR SUPPLIERS SUPPLYING FROM OUTSIDE UP, IN CASE THE OFFER IS SILENT ON ENTRY TAX, IT SHALL BE LOADED SUITABLY WITH THE APPLICABLE RATES
- * IN CASE IF THERE IS ANY DIFFERENCE BETWEEN THE 'SPECIAL REMARKS/ANNEXURES' OF THE ENQUIRY AND THE PREPRINTED TERMS & CONDITIONS (REF JSC140/M2053), THE REQUIREMENT GIVEN IN REMARKS WILL PREVAIL.
- * Reference Sl. No. 2(B) of General Terms and Conditions regarding option for offer submission through Email addressed to tenderbox.jhs@bhel.in , please note that the maximum mail size including attachments should not exceed 15 MB , otherwise the offer shall not be delivered due to size limitation and bidder sending mail attachments more than 15 MB will have no claim whatsoever on the subject tender . Also due to any technical snag , if offer has not reached tenderbox.jhs@bhel.in , it will be bidder's sole responsibility to ensure offer submission through alternate routes before the due date and time .BHEL will not entertain any such claim for non-receipt of offer on time .

Terms & Conditions for supply of CTC conductors on finished basis under TCMOU for 02 years against Enquiry No. E06250039 through E-procurement.

1. **General:** - E-tenders are invited in Two-Part Bid system for procurement of CTC conductors as per various drawings/ Specifications and terms & conditions mentioned in the Annexures -“I to V” on finished basis. The supplies against this TCMOU enquiry shall be subject to our General Terms and conditions of enquiry and PO. In addition, the terms and conditions given under this annexure shall specifically apply to this enquiry. If any difference between the General Terms and conditions of enquiry, purchase order, the conditions included in this annexure shall prevail. The offer of the bidders who are in the banned list and also the offer of the bidders who engage the services of the banned firms shall be rejected. List of banned firms is available on BHEL website: www.bhel.com. Likewise, offers of those bidder(s) will not be considered who have been suspended (under hold / delisting) by BHEL, Jhansi during the given period.

Please upload your best quotation/ offer on <https://eprocurebhel.co.in> for the requirement strictly as per schedule of price format before due date & time as mentioned in “PURCHASE ENQUIRY”.

Your best quotation/offer for the requirement mentioned in “PURCHASE ENQUIRY”, in line with our terms and conditions, should be submitted online via e-procurement system only. It shall be the responsibility of the bidder to ensure that the Tender is submitted on or before the due date. Part-I bids shall be opened through e-procurement Portal. Detailed Tender documents can be downloaded from the following websites: - a) <https://eprocurebhel.co.in/> b) www.bhel.com

2. **Procedure for Bid submission:** - Offer shall be submitted by the bidders in two parts; -

Part – I Technical cum Commercial bid

A- Part-I of the bid shall contain complete detail of the product offered, all techno-commercial terms & conditions and acceptance to the following: -

- (i) Duly signed & sealed copy of **Annexure-I**.
- (ii) Duly filled, signed & sealed copy of **Annexure-II**.
- (iii) Duly filled, signed & sealed copy of Qualifying Requirement (PQR) **Annexure- III** with authenticated copy of all supporting documents.
- (iv) Un-price format- **Annexure-IV**.
- (v) Duly filled, signed & sealed copy of Integrity pact, **Annexure-V**
- (vi) Duly sealed and signed copy General Terms and Conditions (GTC) Rev-3 of Enquiry, purchase specifications and technical documents attached with NIT documents.
- (vii) Duly signed & sealed copy of **Technical Annexure-A & Annexure-B**.

B- In case it becomes necessary to deviate in any of the above, the deviations must be clearly brought out in bid Part-I of the offer. Any deviation to INTEGRITY PACT' is not acceptable. Copy of un-priced bid with status “**quoted (Q) & un - quoted (NQ)**” must accompany bid part-I.

Bidders to mandatorily put sign and seal on all documents before uploading at e-procurement cite <https://eprocurebhel.co.in>

Part - II Price bid

Bidders have to quote their rate in as per attached Price BOQ formats only. Price bid form are to be filled in e-procurement module using Class-III digital signature.

Both Part –I (**Technical cum Commercial bid**) & Part –II (**Price bid as per uploaded Price BOQ formats**) of the offer shall be duly filled, sealed and signed copy to be uploaded by bidders at e-procurement site only.

Note: -



ANNEXURE – I

Terms & Conditions for supply of CTC conductors on finished basis under TCMOU for 02 years against Enquiry No. E06250039 through E-procurement.

- . Documents and Credential as per Technical & Financial PQR, Techno Commercial Bids and Price Bids should be uploaded on the e-procurement portal.
- . Bidders to ensure that Third party/customer issued certificates wherever applicable being submitted as proof of PQR qualification should have verifiable details of document/certificate issuing authority such as name & designation of Issuing Authority and its organisation contact number and email Id etc. In case the same found not available, Purchaser has right to reject such document from evaluation.

3. **Bid Opening**:- The 'Techno-commercial' part of the bid i.e. Bid Part –I of the offers shall be opened. Clarifications, wherever required on this part, shall be obtained from the bidders for their evaluation. The Price bid Part-II of such vendors alone shall be opened whose techno-commercial bids are found acceptable. The date of 'Price bid -Part II' opening shall be intimated later on. Before price bid opening all formalities for registration has to be completed by the bidders as per new supplier link at www.bhel.com.

Note for Bidders:

- **Initially rates to be called for 1st lot of quantity mentioned against each enquiry item with $\pm 30\%$ quantity variation having ordering validity of 6 months from the date of TCMOU.**
- **Separate price bids shall be invited from all techno commercially qualified bidders on half yearly basis for each lot of enquiry. However, price bid of bidder, who has overdue supply of more than 5% of total order quantity placed against this 2-year TCMOU of previous finalized half yearly TCMOU rate on the date of current price bid opening, shall not be considered.**
- **Initially, rates to be called for first lot of enquiry items with $\pm 30\%$ quantity tolerance for ordering and same shall be valid for the period of six months from the date of TCMOU contract. Subsequently, only separate prices will be required to be submitted in annexure-VI (Attached along with tender document) through email id- tenderbox.jhs@bhel.in for price bid evaluation and finalization of contract for next six months.**
- **From 2nd half yearly period onwards qty may change as per BHEL's requirement and same will be communicated to all techno commercially qualified bidders before price bid opening of 2nd, 3rd and 4th half yearly period.**

IF ANY VENDOR WISHES TO PARTICIPATE IN TCMOU CAN SUBMIT THEIR TECHNO - COMMERCIAL OFFER DURING ENTIRE DURATION OF 2 YEARS. THE LINK OF THE SAME WILL BE AVAILBLE ON BHEL SITE (Link - <https://jhs.bhel.com/apps/sip/mou.php>). PRICE OF NEWLY ADDED SUPPLIER WILL BE CONSIDERED FOR OPENING IN UPCOMING HALF YEARLY DUARTION.

4. **Pre Qualification Criteria**: For Pre-qualification criteria, refer Annexure-III.

Offers of those bidders who meet the Pre-qualification criteria mentioned in Annexure-III will be accepted. Any deviation from these shall render offer submitted by bidder as rejected.

*Bidders have to submit duly filled, signed & sealed copy of Annexure-III with all relevant documents as required.

5. **Bid evaluation**: The bid shall be evaluated on total delivered cost to BHEL (landed cost net of input tax credit) taking into account all duties / taxes / Cess as per prevailing structure on date of bid opening date (bid part-I).

Bidders may note that quoted rates shall be loaded for any deviation from the terms & conditions given in this enquiry, to arrive at landed cost and same shall be communicated to techno-commercially suitable bidders before price bid opening.

Terms & Conditions for supply of CTC conductors on finished basis under TCMOU for 02 years against Enquiry No. E06250039 through E-procurement.

Evaluation of tender shall be done on item wise L1 basis for every half-yearly period.

6. **Technical Parameters and Tendered Quantity**:- As per below table:

Item no	Material Description	Qty (In MT)	LOT-1 Qty (In MT)
1	EPOXY COATED PROOF STRESS GLUED CTC upto 41 STRANDS AND UPTO 30 SQ mm CROSS SECTION AREA AS PER ITEM-1 OF ATTACHED TECHNICAL ANNEXURE-A.	3400	850
2	EPOXY COATED PROOF STRESS GLUED CTC WITH NORMAL DENSITY TUP upto 41 STRANDS AND UPTO 30 SQ mm CROSS SECTION AREA AS PER ITEM-2 OF ATTACHED TECHNICAL ANNEXURE-A.	1000	250
3	EPOXY COATED PROOF STRESS GLUED CTC WITH STRANDS FROM 43 TO 65 AND CROSS SECTION AREA upto 15 SQ mm AS PER ITEM-3 OF ATTACHED TECHNICAL ANNEXURE-A.	600	150
4	EPOXY COATED PROOF STRESS GLUED CTC WITH NORMAL DENSITY TUP PAPER WITH STRANDS FROM 43 TO 65 AND CROSS SECTION AREA upto 15 SQ mm AS PER ITEM-4 OF TECHNICAL ANNEXURE-A.	600	150
5	NOMEX COVERED ,0.1% PROOF STRESS CTC, UP TO 13 STRANDS AND CROSS SECTION AREA UP TO 20 SQ MM./STRAND, AS PER ATTACHED ANNEXURE II (TYPICAL SIZE INDICATED IN ANNEXURE-B.)	150	37.5
6	NOMEX COVERED 0.1% PROOF STRESS CTC MORE THAN 13 STRANDS AND UP TO 27 STRANDS AND CROSS SECTION AREA UP TO 20 SQ. MM PER STRAND. (TYPICAL SIZE INDICATED IN TECHNICAL ANNEXURE-B.)	1150	287.5
	TOTAL QUANTITY	6900	1725

Important note:

- Quantity mentioned in above table are insulated weights which include Bare and insulation of Copper conductor.
- **Quantity of each item may vary + /- 30% on overall basis and further will be applicable for each period of ordering.**
- For further technical details refer attached **Technical Annexures- A & B.**
- After finalization of TCMOU, Ordering/Letter of intent (LOI) will be issued as per BHEL requirement and separate technical annexures indicating actual size and other technical parameters will be shared accordingly.

7. **Pricing Terms**: - Material will be supplied on finished basis as per pricing terms given below: -

- A) **LME CSP for Copper & Exchange rate for US \$**: - LME CSP & Exchange rate will be corresponding to 3rd LME working day from the date of letter of intent (LOI) / instruction for copper booking (excluding date of LOI). Exchange rate shall be FBIL USD rate + 0.10. In case

Terms & Conditions for supply of CTC conductors on finished basis under TCMOU for 02 years against Enquiry No. E06250039 through E-procurement.

of FBIL USD rate is not available due to holiday on the 3rd LME working day, then FBIL USD rate of next working day shall be considered.

B) **Premium (USD / MT):-** 190. This will be firm through out the validity of contract.

C) **Multiplication factor (MF) :-** 1.055*

*This is as per notional customs duty, presently it is 1.055

D) **Copper Rate (Rs / Kg):-** (LME CSP + Premium) X Exchange rate X MF/1000.

E) **Fabrication Rate (Rs / KG):-** To be quoted by bidders in E-procurement Price BOQ format.

F) **PO Rate:** - Sum of D + E.

Premium & fabrication rate shall be firm throughout the validity of the contract. The fabrication rate shall be inclusive of all tooling cost, enameling /insulation cost, packing, freight, insurance and forwarding charges etc. and no extra charges shall be payable on whatsoever account.

While quoting the rates, bidders must take into account the following factors in addition to whatever they deem fit:

- No extra charges shall be paid for packing, forwarding, radial insulation, fumigation, weight per drum and Cross section of conductor etc.
- Bidders shall quote their most competitive rates, which shall be valid regardless of the quantity that may be awarded to them.
- Rate quoted on other base prices shall be rejected.

The packing material i.e. drums on which the CTC Copper Conductors shall be supplied can be **re-usable** and will remain property of the supplier. Supplier shall time to time collect the same at their own cost so that work space at BHEL is not limited due to empty drums. Benefit of the saving on this account to be passed on, while quoting the rates. **The empty drum will be collected by the suppliers from BHEL works at their own cost.**

8. **PVC (Price variation Clause) Applicable:** Yes, as per pricing Terms mentioned at clause 7.

9. **Transit Insurance:** - By the bidder.

10. **Number of Suppliers:** - We need 03 suppliers for Item wise execution of this contract and the tentative distribution of quantities among L1, L2 & L3 would be in the ratio of 50:30:20. Number of minimum suppliers required to execute this contract may change depending upon committed capacity and also acceptance to counter offer, if any made by BHEL. Quantity distribution to bidders shall be limited to (n-1) limited to 03 bidders where n is number of techno-commercially qualified bidders and shall be as shown below:

n	L1	L2	Total
1	100	-	100
2	70	30	100
3	50	30	20

- While the above pattern shall also be followed in TCMOU, performance of suppliers shall be monitored periodically, and loading in agreement will also be subject to factors like
 - (a) Customer approval of suppliers in specific projects
 - (b) Suppliers delivery and quality performance during execution of TCMOU
 - (c) pendency of orders on the supplier

In view of above factors, the loading during execution of above TCMOU may vary with respect to allocated quantity. During execution of agreement, if the performance of supplier is not upto the mark in respect of delivery/quality performance/ quoted capacity

Terms & Conditions for supply of CTC conductors on finished basis under TCMOU for 02 years against Enquiry No. E06250039 through E-procurement.

of the bidder for half yearly period, BHEL reserves the right to either reduce further loading or stop loading till the execution of overdue orders. In such cases, action will be taken against defaulting supplier(s) as per guidelines of the company, and the balance allocated full or part quantity of defaulting supplier(s) may be redistributed amongst other performing and willing vendors of TCMOU.

11. **Quantity Tolerance:** - Against **individual P.O. items shall be $\pm 2\%$** . However, requirements such as the specified weight/length/No. of pieces and other dimensions shall be strictly adhered to. Any discrepancy w.r.t. quantity mentioned in the Letter of Intent (LOI) must be brought to notice of BHEL before copper booking date as per LOI. Quantity supplied above the permissible limit of +2% shall not be liable for payment and return to the vendor.
12. **Inspection of material:** - Test Certificates shall be as per annexures provided at the time of issuing of purchase order, purchase specifications, QA plan etc. and must accompany with each lot against supply. Generally, Final inspection for acceptance of quality and quantity shall be done at BHEL's works after receipt of material and results shall be binding on the suppliers. However, as per BHEL's customer quality plan requirement inspections may be done at suppliers work also.
- Bidders shall mark on each drum/package of CTC the following data: BHEL spec no., BHEL Order no., Gross and net Weight, weight of empty bobbin/drum, weight of other packing material, dimension of drum, date of manufacture etc.
- Advisory Note:** Vendors are advised to ensure supply of material as per technical specifications, QAPs and other technical documents. Further, vendors are advised to strictly adhere to tolerance ranges of the specifications. Any deviation from technical parameters may result in rejection of materials.
13. **Replacement of rejected Goods:** - Final inspection for acceptance of quality shall be at BHEL's works after receipt of material and results shall be binding on the suppliers. In case of rejection due to non-compliance to agreed specification and for the reasons attributable to the vendor, the materials shall be replaced by vendor free of charge on "FOR BHEL works basis" including inter-alia cost elements such as total transportation, insurance and other taxes / levies etc as applicable. The rejected goods shall be subsequently returned to the vendor at his cost.
14. **Taxes & Duties:** - All taxes & duties shall be paid extra and as applicable at the time of dispatch within India only will be paid / reimbursed by BHEL and same will be loaded for price comparison on delivered cost to BHEL (i.e. landed cost net of input tax credit).
15. **Payments Terms:** - 100% payment within 90 days of receipt of material (45 days for MSE suppliers as per relevant act in force), subject to acceptance of material at BHEL, on direct presentation of the documents.
Any deviation from the above payment terms, if accepted (by BHEL), shall be loaded @ repo rate (as on date of Part I bid opening) + 4%, for the purpose of bid evaluation.
- For more details refer clause 15 of General terms and conditions of enquiry rev03.**
16. **Terms of delivery:** - On FOR BHEL Jhansi basis.
17. **Validity of Contract:** - The TCMOU contract shall be valid for two year for ordering (i.e. for issue of purchase order/ issue of letter of intent (LOI)) and supply upto 3 months thereafter. The contract may be extended for further 3 months (or part thereof) on mutual consent for ordering & further 3 months for supply. Quoted rate during a particular half yearly period shall be valid for that particular half yearly period only.
18. **Guarantee Clause:** - CTC shall be free from any kind of manufacturing defects and shall be under guarantee for a period of 12 months from the date or until testing of transformers using CTC supplied under this contract, whichever occurs earlier.

Terms & Conditions for supply of CTC conductors on finished basis under TCMOU for 02 years against Enquiry No. E06250039 through E-procurement.

If the item supplied is found non-compliant during the warranty period, leading to rejection, the Seller shall arrange free replacement / repair of goods, within one month from the date of intimation or any mutually agreed period. The rejected goods shall be taken away by the Seller at his cost and replaced on FOR - BHEL Stores/ designated destination basis within such period. In case the defects attributable to Seller are detected during processing of the goods at purchaser's/ his subcontractor's works, the Seller shall be responsible for free replacement/ repair of the goods as required by the purchaser.

19. **Short Closure:** - BHEL reserves the right to short close tender at any point of time during validity of the tender.
20. **Validity of Offer:** - Offer should be valid for a period of 120 days from the date of techno-commercial bid opening date (part-1) for finalization of the contract.
21. **Levy of Penalty for delayed performance:** - LD shall be 0.5% of the undelivered portion per week or part thereof subject to a maximum of 10% of the undelivered portion.
22. Compliance to **Make in India** circular issued by Gov.

"For this procurement the local content to categorize a supplier as a class-I local supplier/ Class-II local supplier / Non-local supplier and purchase preference to Class-I local supplier is, as defined in Public Procurement (Preference to Make in India) order 2017 dated 16.09.2020 issued by DPIIT. In case of subsequent orders issued by the nodal ministry changing the definition of local content for the items of the NIT, the same shall be applicable even if issued after issue of this NIT, but before opening of Part-II bids against this NIT."

23. Tenders shall be submitted strictly in accordance with the requirements of the above tender documents
24. **BREACH OF CONTRACT, REMEDIES AND TERMINATION**
In case of breach of contract, BHEL shall have the right to terminate the Purchase Order either in whole or in part thereof without any compensation to the Supplier.
The following shall amount to breach of contract:
- (i) Non-supply of material by the Supplier within scheduled delivery as per contract or as extended from time to time.
 - (ii) The Supplier delivers material not of the contracted quality.
 - (iii) The Supplier fails to replace the defective material as per guarantee clause.
 - (iv) Assignment, transfer, subletting of Contract by the Supplier without BHEL's written permission resulting in termination of Contract or part thereof by BHEL.
 - (v) Non-compliance to any contractual condition or any other default attributable to Supplier.
 - (vi) Any other reason(s) attributable to supplier towards failure of performance of contract.
 - (vii) Any of the declarations furnished by the supplier at the time of bidding and/ or entering into the contract for supply are found untruthful and such declarations were of a nature that could have resulted in non-award of contract to the contractor or could expose BHEL and/ or Owner to adverse consequences, financial or otherwise.
 - (viii) Supplier/Vendor is convicted of any offence involving corrupt business practices, antinational activities or any such offence that compromises the business ethics of BHEL, in violation of the Integrity Pact entered into with BHEL has the potential to harm the overall business of BHEL/ Owner.
 - (ix) **Note-**Once BHEL considers that a breach of contract has occurred on the part of Supplier, BHEL shall notify the Supplier by way of notice in this regard. Supplier shall be given an opportunity to rectify the reasons causing the breach of contract within a period of 14 days.

Terms & Conditions for supply of CTC conductors on finished basis under TCMOU for 02 years against Enquiry No. E06250039 through E-procurement.

In case the contractor fails to remedy the breach, as mentioned in the notice, to the satisfaction of BHEL, BHEL shall have the right to take recourse to any of the remedial actions available to it under the relevant provisions of contract.

REMEDIES IN CASE OF BREACH OF CONTRACT

- (i) Wherein the period as stipulated in the notice issued under clause 20.ix has expired and Supplier/Vendor has failed to remedy the breach, BHEL will have the right to terminate the contract on the ground of "Breach of Contract" without any further notice to contractor.
- (ii) Upon termination of contract, BHEL shall be entitled to recover an amount equivalent to 10% of the Contract Value for the damages on account of breach of contract committed by the Supplier. This amount shall be recovered by way of encashing the security instruments like performance bank guarantee etc. available with BHEL against the said contract. In case the value of the security instruments available is less than 10% of the contract value, the balance amount shall be recovered from other financial remedies (i.e. available bills of the Supplier, retention amount, from the money due to the Supplier etc. with BHEL) or the other legal remedies shall be pursued.
- (iii) wherever the value of security instruments like performance bank guarantee available with BHEL against the said contract is 10% of the contract value or more, such security instruments to the extent of 10% contract value will be encashed. In case no security instruments are available or the value of the security instruments available is less than 10% of the contract value, the 10% of the contract value or the balance amount, as the case may be, will be recovered in all or any of the following manners:
 - (iv) In case the amount recovered under sub clause (a) above is not sufficient to fulfil the amount recoverable then; a demand notice to deposit the balance amount within 30 days shall be issued to Supplier.
 - (v) If Supplier fails to deposit the balance amount within the period as prescribed in demand notice, following action shall be taken for recovery of the balance amount:
 - a) From dues available in the form of Bills payable to defaulted Supplier against the same contract.
 - b) If it is not possible to recover the dues available from the same contract or dues are insufficient to meet the recoverable amount, balance amount shall be recovered from any money(s) payable to Supplier under any contract with other Units of BHEL including recovery from security deposits or any other deposit available in the form of security instruments of any kind against Security deposit or EMD.
- (vi) In-case recoveries are not possible with any of the above available options, Legal action shall be initiated for recovery against defaulted supplier/Vendor.
- (vii) It is an agreed term of contract that this amount shall be a genuine pre-estimate of damages that BHEL would incur in completion of balance contractual obligation of the contract through any other agency and BHEL will not be required to furnish any other evidence to the Supplier/Vendor for the purpose of estimation of damages.
- (viii) In addition to the above, imposition of liquidated damages, debarment, termination, de-scoping, short-closure, etc., shall be applied as per provisions of the contract

Note: The defaulting Supplier shall not be eligible for participation in any of the future enquiries floated by BHEL to supply the balance or whole material. The defaulting supplier shall mean and include:

- (a) In case defaulted Supplier is the Sole Proprietorship Firm, any Sole Proprietorship Firm owned by same Sole Proprietor.
- (b) In case defaulted Supplier is The Partnership Firm, any firm comprising of same partners/ some of the same partners; or sole proprietorship firm owned by any partner(s) as a sole proprietor

ANNEXURE – I

Terms & Conditions for supply of CTC conductors on finished basis under TCMOU for 02 years against Enquiry No. E06250039 through E-procurement.

25. Standard pre-printed terms & conditions of the tenders may not be considered valid and offer may liable for rejection.
26. All the above tender documents shall automatically become a part of the Order/Contract after its finalization.
27. All corrigenda addenda, amendments, time extensions, clarifications etc. to the tender will be hosted on BHEL websites only (www.bhel.com & <https://eprocurebhel.co.in> under subject tender reference. Bidders are requested to visit our websites from time to time to keep themselves updated. Bidders may go through the Sellers' manual & Help documents provided on E-Procurement Portal website & obtain required Digital Signature Certificate for participating in the subject Tender.
28. Bidders to submit their offers strictly in line with the form available at e-procurement portal.
29. **Integrity Pact (IP) – Independent external monitor (IEM) :-** As per Annexure-V
30. Commercial Conditions quoted by the vendor in any place including as stated in bidder's 'General Terms and Conditions' if any, shall not be binding on the Purchaser and the conditions contained in this annexure, including General terms & Conditions rev 03 of enquiry shall only prevail.

**Raanu Verma
DGM (MM-1)**

**Rajeav Ranjan
Manager (MM-1)**

Annexure – II

Techno – commercial format for supply of CTC conductors on finished basis under TCMOU for 02 years against Enquiry No. E06250039 through E-procurement.

SL. NO.	DESCRIPTION	BIDDERS RESPONSE												
1	Name of the supplier													
2	Name & designation of the contact person													
3	Address of the works at which inspection / delivery is offered.													
4	Complete acceptance to Technical Terms & conditions including Technical/ Purchase Specs as mentioned in Annexure. – I.	<input type="checkbox"/> Accepted												
5	Complete acceptance to all terms & conditions of tender enquiry as mentioned in Annexure.-I	<input type="checkbox"/> Accepted												
6	*Acceptance for the final inspection of material after receipt at BHEL works and results shall be binding on the supplier.	<input type="checkbox"/> Accepted												
7	Intentionally left blank.													
8	Quoted delivery of first lot in number of days for contractual purpose on FOR destination basis from the date of PO/LOI. Desired delivery is within 60 days from PO/LOI.	_____ Days												
9	Monthly committed capacity against exclusively against this tender for BHEL on finished basis. (Quantity quoted against this tender shall not be linked with ongoing contracts/enquires.	<input type="checkbox"/> Accepted												
10	Applicable GST (mention NA if not applicable)													
	A. IGST@ %												
	B. CGST @ %												
	C. SGST @ %												
11	*Acceptance to Pricing Terms as per sl.no: 7 of Annexure – I.	<input type="checkbox"/> Accepted												
12	*Acceptance to bid evaluation criterion at sl.no.5 of Annexure – I	<input type="checkbox"/> Accepted												
13	Initially, rates to be called for first lot of enquiry items with $\pm 30\%$ quantity tolerance for ordering and same shall be valid for the period of six months from the date of TCMOU contract. Subsequently, only separate prices will be required to be submitted in annexure-VI (Attached along with tender document) through email id-tenderbox.jhs@bhel.in for price bid evaluation and finalization of contract for next six months. From 2nd half yearly period onwards qty may change as per BHEL's requirement and same will be communicated to all techno commercially qualified bidders before price bid opening of 2nd, 3rd and 4th half yearly period.	<input type="checkbox"/> Accepted												
14	Price bid of vendors, who has overdue supply of more than 5% of total order quantity placed against this 2-year TCMOU of previous finalized half yearly TCMOU rate on the date of current price bid opening, shall not be considered.	<input type="checkbox"/> Accepted												
15	Also, price bid shall not be considered for further processing (1st time, 2nd time, 3rd time and 4th time) of those vendors who have pending supply of the same/ similar enquiry items/ low spr rating (d rating)/ hold/ banned at the time of opening of price bid (1st time, 2nd time, 3rd time and 4th time).	<input type="checkbox"/> Accepted												
16	Quantity(Previous half yearly) shall not be carry forwarded to next half yearly period.	<input type="checkbox"/> Accepted												
17	Techno commercial conditions frozen against this MOU for this enquiry shall be valid for ordering for two-year period from the date of entering into first rate contract.	<input type="checkbox"/> Accepted												
18	Acceptance to Delivery Terms on F.O.R destination basis as per clause 16 of Annexure-I	<input type="checkbox"/> Accepted												
19	Acceptance of penalty @ $\frac{1}{2}$ % per week or part there of subject to max. of 10% for delay in supply beyond agreed delivery as per sl.no 21 of Annexure – I.	<input type="checkbox"/> Accepted												
20	Acceptance to payment terms as per sl.no 15 of Annexure – I. 100% payment within 90 days of receipt (45 days for MSE registered suppliers as per relevant act n force), subject to acceptance of material at BHEL.	<input type="checkbox"/> Accepted MSE's <input type="checkbox"/> Accepted 90day												
21	Any Bidder falling under MSE category shall furnish the following details & submit documentary evidence/ Govt. Certificate etc. in support of the same along with their techno-commercial offer.													
	<table border="1"> <thead> <tr> <th>Type under MSE</th> <th>SC/ST Owned</th> <th>Women Owned</th> <th>Others (excluding SC/ST & Women Owned)</th> </tr> </thead> <tbody> <tr> <td>Micro</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Small</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Type under MSE	SC/ST Owned	Women Owned	Others (excluding SC/ST & Women Owned)	Micro				Small				
Type under MSE	SC/ST Owned	Women Owned	Others (excluding SC/ST & Women Owned)											
Micro														
Small														
	Note: If the bidder does not furnish the above in the tender, offer shall be processed construing that the bidder is not falling under MSE category.													

22	*Acceptance to rejection replacement clause as per sl.no.13 of Annexure - I.	<input type="checkbox"/> Accepted
23	Validity of offer to be reckoned from the date of bid Part-I opening and it will be 120 days from the date of techno-commercial bid opening date (part-1) for finalization of the contract	<input type="checkbox"/> Accepted
24	*Acceptance to quantity distribution as per sl.no 10 of Annexure – I.	<input type="checkbox"/> Accepted
25	Un-Price bid (Annexure – IV) submitted with 'Q (Quoted)' OR 'NQ (Not Quoted)' status with bid part – I.	<input type="checkbox"/> Yes
26	Acceptance to short closure clause as per sl.no. 19 of Annexure – I.	<input type="checkbox"/> Accepted
27	*Integrity Pact submitted in original duly signed	
28	Acceptance to Warranty, Corresponding Repairs / Replacement of Goods, and Deductions as per clauses of Annexure-I.	<input type="checkbox"/> Accepted
29	The Bidder declares that they will not enter into any illegal or undisclosed agreement or understanding, whether formal or informal with other Bidder(s). This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process. In case, the Bidder is found having indulged in above activities, suitable action shall be taken by BHEL as per extant policies/ guidelines.	<input type="checkbox"/> Accepted
30	In case of any inconsistency between offers of supplier and the accepted terms and conditions in this sheet, the terms and conditions of this sheet shall prevail.	<input type="checkbox"/> Accepted

*In case of non-acceptance to these clauses, your bid may be liable for rejection.

Signature with name of the Authorized Signatory



Pre-Qualifying Requirement for Procurement of 'Continuously Transposed Copper Cable (CTC)' – PI:4406251100/

Sl. No.	REQUIREMENT	Bidder's Response															
1	<p>A. Bidders should be the MANUFACTURER of 'Continuously Transposed Copper Cable (CTC)'</p> <p>B. Bidders to provide Self Undertaking / Declaration on their Letter Head that: <u>We are capable of executing the job under captioned enquiry and have manufacturing facilities, in-house testing facilities in compliance with BHEL purchase specification, national / international standards & BHEL / BHEL's customer Quality plan.</u></p> <p>C. Source of raw material should be ETP grade copper and should be sourced from BHEL's approved sources like Hindalco, Sterlite (Vedanta), HCL, Norrdeutsche Affinerie & Societe Lensoise De Cuivre only. In case where the vendor has in-house facility for production of ETP grade copper rod, The TC and sample to be furnished to BHEL. Acceptance of the same shall be at BHEL discretion based on test result of the sample. <u>Sample TCs clearly stating chemical compositions including Oxygen content and conductivity.</u></p>	<p><input type="checkbox"/> YES</p> <p><input checked="" type="checkbox"/> Submitted</p> <p><input type="checkbox"/> Submitted</p>															
2	<p>Annual average financial turnover For qualifying, the average financial Turnover should be as below: 1. For Item-1- Minimum Rs.43.33 Cr for MSEs and Rs. 61.9 Cr for non-MSEs 2. For Item-2- Minimum Rs.12.78 Cr for MSEs and Rs. 18.25 Cr for non-MSEs 3. For Item-3- Minimum Rs.15.27 Cr for MSEs and Rs. 21.81 Cr for non-MSEs 4. For Item-4- Minimum Rs.15.27 Cr for MSEs and Rs. 21.81 Cr for non-MSEs 5. For Item-5- Minimum Rs.2.16 Cr for MSEs and Rs. 3.09 Cr for non-MSEs 6. For Item-6- Minimum Rs.33.19 Cr for MSEs and Rs. 47.43 Cr for non-MSEs Bidders quoting for more than 1 item, Qualifying requirement of turnover shall be sum of the Turnover required above for items being quoted.</p> <p>Bidders to submit following documents of past three financial years of previous financial year, <u>as evidence for Turnover:</u> (i) A certificate from CA duly vetting the Turnover and balance sheet (may be un-audited). "Or" (ii) Audited Balance Sheet and Profit & Loss Statements.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>FY-></th> <th>2022-23</th> <th>2023-24</th> <th>2024-25</th> <th>Average Turnover</th> </tr> </thead> <tbody> <tr> <td>T/O -></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	FY->	2022-23	2023-24	2024-25	Average Turnover	T/O ->					<p><input type="checkbox"/> Submitted</p>					
FY->	2022-23	2023-24	2024-25	Average Turnover													
T/O ->																	
2	<p>SUPPLY EXPERIENCE:- Bidder should be manufacturing and supplying complete CTC from their own works for respective enquiry items to at least 2 major Power Transformer Manufacturers as below: "As a proof, bidder to submit copies of minimum 2 purchase orders and corresponding invoices for supply of CTC for respective enquiry items to any two Power transformer manufacturers. PO and Invoice date must be from 3 years from the date of Technical Bid opening. All copies of invoices and purchase orders should be self-attested by the authorized signatory of bidder.</p>	<p><input type="checkbox"/> Submitted</p>															
3	<p>Minimum Quantum- For qualifying, bidder should have supplied minimum 10% (for Non-MSEs) or 7% (For MSEs) of tender quantity for which price bid is asked. Vendor to submit details of executed PO.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Customer Name</th> <th>Order No. & Date</th> <th>Qty. supplied in UoM</th> <th>Tax Invoice / Completion Certificate & Date</th> <th>Remark, if any</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	Customer Name	Order No. & Date	Qty. supplied in UoM	Tax Invoice / Completion Certificate & Date	Remark, if any											<p><input type="checkbox"/> Submitted</p>
Customer Name	Order No. & Date	Qty. supplied in UoM	Tax Invoice / Completion Certificate & Date	Remark, if any													
4	<p>It is better / desired that New vendors who are not registered with BHEL, Jhansi should submit duly filled "Supplier Registration Form (SRF)" along with the requested documents. The SRF is available on line on our website www.bhel.com. However the same is not mandatory.</p>	<p><input type="checkbox"/> Submitted</p>															

We agree that our bid is liable to be rejected in case (a) the relevant information is not filled, (b) documentation is incomplete, (c) there are false declarations, and (d) if we do not meet the PQR.

(Signature of the Supplier with Name, Designation & Seal)

[Signature]
 21/11/2026
 AGM(TRP)

[Signature]
 21/11/26
 AGM(CMM/TMM)

[Signature]
 AGM (TRE-NPT)

[Signature]
 AGM(TRE-QC)

Prepared by (Indentor)
[Signature]
 AGM(TRE-NPT)



BHARAT HEAVY ELECTRICALS LIMITED JHANSI - 284120
(A Govt of India undertaking)
Material Management

ANNEXURE-IV
UNPRICE BID

UNPRICE BID FOR INDIGENOUS BIDDER, FOR ENQUIRY NO. E06250039

1	Name & Address of the Supplier						
2	Enquiry Item No.	1	2	3	4	5	6
3	Enquiry Item Description	Refer Purchase enquiry					
4	Items Qty, in MT	3400	1000	600	600	150	1150
5	Rates as per annexure-I						
	Enquiry Item No.	1	2	3	4	5	6
	Confirmation of quotation / offer	Quoted / Not Quoted	Quoted / Not Quoted	Quoted / Not Quoted	Quoted / Not Quoted	Quoted / Not Quoted	Quoted / Not Quoted

(Signature of the Supplier with Name, Designation & Seal)

BHEL-IP

AA:SSP:IP:R04 dtd 12-11-2025

INTEGRITY PACT**Between**

Bharat Heavy Electricals Ltd. (BHEL), a company registered under the Companies Act 1956 and having its registered office at "BHEL House", Siri Fort, New Delhi - 110049 (India) hereinafter referred to as "The Principal", which expression unless repugnant to the context or meaning hereof shall include its successors or assigns of the ONE PART

and

_____, (description of the party along with address), hereinafter referred to as "The Bidder/ Contractor" which expression unless repugnant to the context or meaning hereof shall include its successors or assigns of the OTHER PART

Preamble

The Principal intends to award, under laid-down organizational procedures, contract(s) for PROCUREMENT OF CTC THROUGH TCMOU ENQUIRY E06250039 (hereinafter referred to as "Contract"). The Principal values full compliance with all relevant laws of the land, rules and regulations, and the principles of economic use of resources, and of fairness and transparency in its relations with its Bidder(s)/ Contractor(s).

In order to achieve these goals, the Principal will appoint panel of Independent External Monitor(s) (IEMs), who will monitor the tender process and the execution of the contract for compliance with the principles mentioned above.

Section 1- Commitments of the Principal

- 1.1 The Principal commits itself to take all measures necessary to prevent corruption and to observe the following principles: -
 - 1.1.1 No employee of the Principal, personally or through family members, will in connection with the tender for, or the execution of a contract, demand, take a promise for or accept, for self or third person, any material or immaterial benefit which the person is not legally entitled to.
 - 1.1.2 The Principal will, during the tender process treat all Bidder(s) with equity and reason. The Principal will in particular, before and during the tender process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential/ additional information through which the Bidder(s) could obtain an advantage in relation to the tender process or the contract execution.
 - 1.1.3 The Principal will exclude from the process all known prejudiced persons.
- 1.2 If the Principal obtains information on the conduct of any of its employees which is a penal offence under the Indian Penal Code 1860 and Prevention of Corruption Act 1988 or any other statutory penal enactment, or if there be a substantive suspicion in this regard, the Principal will inform its Vigilance Office and in addition can initiate disciplinary actions.

Section 2 - Commitments of the Bidder(s)/ Contractor(s)

- 2.1 The Bidder(s)/ Contractor(s) commit himself to take all measures necessary to prevent corruption. The Bidder(s)/ Contractor(s) commits himself to observe the following principles during participation in the tender process and during the contract execution.

BHEL-IP

AA:SSP:IP:R04 dtd 12-11-2025

- 2.1.1 The Bidder(s)/ Contractor(s) will not, directly or through any other person or firm, offer, promise or give to the Principal or to any of the Principal's employees involved in the tender process or the execution of the contract or to any third person any material, immaterial or any other benefit which he/ she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the tender process or during the execution of the contract.
- 2.1.2 The Bidder(s)/ Contractor(s) will not enter with other Bidder(s) into any illegal or undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process.
- 2.1.3 The Bidder(s)/ Contractor(s) will not commit any penal offence under the relevant Indian Penal Code (IPC) and Prevention of Corruption Act; further the Bidder(s)/ Contractor(s) will not use improperly, for purposes of competition or personal gain, or pass on to others, any information or document provided by the Principal as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.
- 2.1.4 Foreign Bidder(s)/ Contractor(s) shall disclose the name and address of agents and representatives in India and Indian Bidder(s)/ Contractor(s) to disclose their foreign principals or associates. The Bidder(s)/ Contractor(s) will, when presenting his bid, disclose any and all payments he has made, and is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract.
- 2.2 The Bidder(s)/ Contractor(s) will not instigate third persons to commit offences outlined above or be an accessory to such offences.
- 2.3 The Bidder(s)/ Contractor(s) shall not approach the Courts while representing the matters to IEMs and shall await their decision in the matter.

Section 3 - Disqualification from tender process and exclusion from future contracts

If the Bidder(s)/ Contractor(s), before award or during execution has committed a transgression through a violation of Section 2 above, or acts in any other manner such as to put his reliability or credibility in question, the Principal is entitled to disqualify the Bidder(s)/ Contractor(s) from the tender process, terminate the contract, if already awarded, exclude from future business dealings and/ or take action as per the separate "Guidelines on Banning of Business dealings with Suppliers/ Contractors", framed by the Principal.

Section 4 - Compensation for Damages

- 4.1 If the Principal has disqualified the Bidder (s) from the tender process before award / order acceptance according to Section 3, the Principal is entitled to demand and recover the damages equivalent to Earnest Money Deposit/ Bid Security.
- 4.2 If the Principal is entitled to terminate the Contract according to Section 3, or terminates the Contract in application of Section 3 above , the Bidder(s)/ Contractor (s) transgression through a violation of Section 2 above shall be construed breach of contract and the Principal shall be entitled to demand and recover from the Contractor an amount equal to 5% of the contract value or the amount equivalent to Security Deposit/ Performance Bank Guarantee , whichever is higher, as damages, in addition to and without prejudice to its right to demand and recover compensation for any other loss or damages specified elsewhere in the contract.

BHEL-IP

AA:SSP:IP:R04 dtd 12-11-2025

Section 5 - Previous Transgression

- 5.1 The Bidder declares that no previous transgressions occurred in the last 3 (three) years (to be reckoned from date of bid submission) with any other company in any country conforming to the anti-corruption approach in India that could justify his exclusion from the tender process. The date of such transgression, for the purpose of disclosure by the bidders in this regard, would be the date on which cognizance of the said transgression was taken by the competent authority. The transgression(s), for which cognizance was taken even before the said period of three years, but are pending conclusion, shall also be reported by the bidders.
- 5.2 If the Bidder makes incorrect statement on this subject, he can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason or action can be taken as per the separate "Guidelines on Suspension of Business dealings with Suppliers/ Contractors", framed by the Principal.

Section 6 - Equal treatment of all Bidder (s)/ Contractor (s) / Sub-contractor (s)

- 6.1 The Principal will enter into Integrity Pacts with identical conditions as this Integrity Pact with all Bidders and Contractors.
- 6.2 In case of a joint venture, all the partners of the joint venture should sign the Integrity Pact. In case of Sub-contracting, the Principal Contractor shall be solely responsible for the adherence to the provisions of IP by the sub-contractor(s).
- 6.3 The Principal will disqualify from the tender process all Bidders who do not sign this Integrity Pact or violate its provisions.

Section 7 - Criminal Charges against violating Bidders/ Contractors /Subcontractors

If the Principal obtains knowledge of conduct of a Bidder, Contractor or Subcontractor, or of an employee or a representative or an associate of a Bidder, Contractor or Subcontractor which constitutes corruption, or if the Principal has substantive suspicion in this regard, the Principal will inform the Vigilance Office.

Section 8 -Independent External Monitor(s)

- 8.1 The Principal appoints competent and credible panel of Independent External Monitor (s) (IEMs) for this Integrity Pact. The task of the IEMs is to review independently and objectively, whether and to what extent the parties comply with the obligations under this Integrity Pact on receipt of any complaint by them from the bidder(s).
- 8.2 The IEMs are not subject to instructions by the representatives of the parties and performs his functions neutrally and independently. He reports to the CMD, BHEL.
- 8.3 The IEMs shall be provided access to all documents/ records pertaining to the Contract, for which a complaint or issue is raised before them as and when warranted. However, the documents/records/information having National Security implications and those documents which have been classified as /Top Secret are not to be disclosed.
- 8.4 The Principal will provide to the IEMs sufficient information about all meetings among the parties related to the Contract provided such meetings could have an impact on the contractual relations between the Principal and the Contractor. The parties offer to the IEMs the option to participate in such meetings.

BHEL-IP

AA:SSP:IP:R04 dtd 12-11-2025

- 8.5 The role of IEM is advisory and the advice of IEM is non-binding on the Organization. However, as IEMs are invariably persons with rich experience who have retired as senior functionaries of the government, their advice would help in proper implementation of the IP.
- 8.6 For ensuring the desired transparency and objectivity in dealing with the complaints arising out of the tendering process, the matter should be examined by the full panel of IEMs jointly, who would look into the records, conduct an examination, and submit their joint recommendations to the Management. In case the full panel is not available due to some unavoidable reasons, the available IEM(s) will conduct examination of the complaints. Consent of the IEM(s), who may not be available, shall be taken on record.
- 8.7 The IEMs shall examine all the representations/grievances/ complaints received by them from the bidders or their authorized representative related to any discrimination on account of lack of fair play in modes of procurement and bidding systems, tendering method, eligibility conditions, bid evaluation criteria, commercial terms & conditions, choice of technology/ specifications etc.
- 8.8 The CMD, BHEL shall decide the compensation to be paid to the IEMs and its terms and conditions.
- 8.9 IEMs should examine the process integrity, they are not expected to concern themselves with fixing of responsibility of officers. Complaints alleging mala fide on the part of any officer of the Principal should be looked into by the CVO of the Principal.
- 8.10 If the IEMs have reported to the CMD, BHEL, a substantiated suspicion of an offence under relevant Indian Penal Code / Prevention of Corruption Act, and the CMD, BHEL has not, within reasonable time, taken visible action to proceed against such offence or reported it to the Vigilance Office, the IEMs may also transmit this information directly to the Central Vigilance Commissioner, Government of India.
- 8.11 After award of work, the IEMs shall look into any issue relating to execution of Contract, if specifically raised before them. As an illustrative example, if a Contractor who has been awarded the Contract, during the execution of Contract, raises issue of delayed payment etc. before the IEMs, the same shall be examined by the panel of IEMs.
- 8.12 However, the IEMs may suggest systemic improvements to the management of the Principal, if considered necessary, to bring about transparency, equity and fairness in the system of procurement.
- 8.13 The word 'Monitor' would include both singular and plural.

Section 9 - Pact Duration

- 9.1 This Integrity Pact shall be operative from the date this Integrity Pact is signed by both the parties. Any violation of the same would entail disqualification of the bidders and exclusion from future business dealings.
- 9.2 If any claim is made/ lodged during currency of this Integrity Pact, the same shall be binding and continue to be valid despite the lapse of this Pact as specified above, unless it is discharged/ determined by the CMD, BHEL.


Section 10 - Other Provisions

- 10.1 This Integrity Pact is subject to Indian Laws and exclusive jurisdiction shall be of the competent Courts as indicated in the Tender or Contract, as the case may be.
- 10.2 Changes and supplements as well as termination notices need to be made in writing.


BHEL-IP

AA:SSP:IP:R04 dtd 12-11-2025

- 10.3 If the Bidder(s)/ Contractor(s) is a partnership or a consortium or a joint venture, this Integrity Pact shall be signed by all partners of the partnership or joint venture or all consortium members.
- 10.4 Should one or several provisions of this Integrity Pact turn out to be invalid, the remainder of this Integrity Pact remains valid. In this case, the parties will strive to come to an agreement to their original intentions.
- 10.5 Only those bidders / contractors who have entered into this Integrity Pact with the Principal would be competent to participate in the bidding. In other words, entering into this Integrity Pact would be a preliminary qualification.
- 10.6 In the event of any dispute between the Principal and Bidder(s)/ Contractor(s) relating to the Contract, in case, both the parties are agreeable, they may try to settle dispute through Mediation before the panel of IEMs in a time bound manner. If required, the Principal may adopt any mediation rules for this purpose. However, not more than five meetings shall be held for a particular dispute resolution. The fees/expenses on dispute resolution shall be equally shared by both the parties. In case, the dispute remains unresolved even after mediation by the panel of IEMs, either party may take further action as per the terms & conditions of the Contract.


 (राजीव रंजन)
 (RAJEEV RANJAN)
 For & On behalf of the Principal
 Manager (MM)
 (Office Seal)
 B.H.E.L., JHANSI

 For & On behalf of the Bidder/ Contractor
 (Office Seal)

Place _____
 Date _____
 Witness: 
 (Name & Address) LAANS VERMA

Witness: _____
 (Name & Address) _____

DGM (MM-I) BHEL JHANSI



Clause on IP in the tender**Integrity Pact (IP)**

- (a) IP is a tool to ensure that activities and transactions between the Company and its Bidders/ Contractors are handled in a fair, transparent and corruption free manner. Following Independent External Monitors (IEMs) on the present panel have been appointed by BHEL with the approval of CVC to oversee implementation of IP in BHEL.

SI	IEM	Email
1.	Dr. Sarat Kumar Acharya, Ex-CMD, NLC	iem1@bhel.in
2.	Shri R. Mukundan, IRPS (Retd.)	iem2@bhel.in
3.	Shri Madan Lal Meena, IAS (Retd.)	iem3@bhel.in

- (b) The IP as enclosed with the tender is to be submitted (duly signed by authorized signatory) along with techno-commercial bid (Part-I, in case of two/ three part bid). Only those bidders who have entered into such an IP with BHEL would be competent to participate in the bidding. In other words, entering into this Pact would be a preliminary qualification.
- (c) Please refer Section-8 of IP for Role and Responsibilities of IEMs. In case of any complaint arising out of the tendering process, the matter may be referred to any of the above IEM(s). All correspondence with the IEMs shall be done through email only.

Note:

No routine correspondence shall be addressed to the IEM (phone/ post/ email) regarding the clarifications, time extensions or any other administrative queries, etc on the tender issued. All such clarification/ issues shall be addressed directly to the tender issuing (procurement) department's officials whose contact details are provided below:

Details of contact person(s):

(1)
 Name: RASEEV RANJAN
 Deptt: MM
 Address: BHEL - JHANSI
 Phone: (Landline/ Mobile)
0510-2460124-2732/9487669022
 Email: r.rajeev.s@bhel.in
 Fax: _____

(2)
 Name: RAANU VERMA
 Deptt: MM
 Address: BHEL JHANSI
 Phone: (Landline/ Mobile)
0510-2460124-2249/ 7587571260
 Email: Yaanu.verma@bhel.in
 Fax: _____



BHARAT HEAVY ELECTRICALS LIMITED JHANSI - 284120
(A Govt of India undertaking)
Material Management

ANNEXURE-VI**PRICE BID (2ND time/ 3rd time/ 4th time)****PRICE BID FOR INDIGENOUS BIDDER, FOR TCMOU ENQUIRY NO. E06250039**

1	Name & Address of the Supplier						
2	Enquiry Item No.	1	2	3	4	5	6
3	Enquiry Item Description	EPOXY COATED PROOF STRESS GLUED CTC upto 41 STRANDS AND UPTO 30 SQ mm CROSS SECTION AREA	EPOXY COATED PROOF STRESS GLUED CTC WITH NORMAL DENSITY TUP upto 41 STRANDS AND UPTO 30 SQ mm CROSS SECTION AREA	EPOXY COATED PROOF STRESS GLUED CTC WITH STRANDS FROM 43 TO 65 AND CROSS SECTION AREA upto 15 SQ mm	EPOXY COATED PROOF STRESS GLUED CTC WITH NORMAL DENSITY TUP PAPER WITH STRANDS FROM 43 TO 65 AND CROSS SECTION AREA upto 15 SQ mm	NOMEX COVERED .01% PROOF STRESS CTC, UP TO 13 STRANDS AND CROSS SECTION AREA UP TO 20 SQ MM./STRAND	NOMEX COVERED 0.1% PROOF STRESS CTC MORE THAN 13 STRANDS AND UP TO 27 STRANDS AND CROSS SECTION AREA UP TO 20 SQ. MM PER STRAND
4	Items Qty, in MT	<u>Shall be intimated before price bid opening</u>					
5	Basic fabrication rate in Rs. / KG basis (Without GST): Bidder to quote against line items for which they want offer their rates						
	Enquiry Item No.	1	2	3	4	5	6
	Quoted Rate in Rs/ KG (In figures)						
	Quoted Rate in Rs/ KG (In words)						

NOTE: The price bid submitted in any other fashion or by adding any condition (e.g. minimum order quantity, rates applicable for specified quantity, discount for quantity, rate based on slabs, rate based on terms of payment etc.), offer shall be straight way REJECTED even if, offer has been found technically & commercial acceptable before opening of price bid. Quoted rates are inclusive of packing forwarding, insurance and freight.

(Signature of the Supplier with Name, Designation & Seal)

INSTRUCTIONS FOR SUBMISSION OF TENDER

1. The offers against TCMOU enquiry shall be submitted as detailed below: -
Price Bid (Part-B2/B3/B4): -Filled Price bid
2. The vendor shall prepare Part B2/B3/B4 in above format duly super-scribing Enquiry no of the bid and send to email id- tenderbox.jhs@bhel.in ONLY for further processing.



JHS 2055A R03

GENERAL TERMS AND CONDITIONS OF ENQUIRY

Page 1 of 12

SN	Description
1	General:
A	These general terms & conditions shall apply to all enquiries, notice inviting tenders, request for quotations concerning the supply of goods and / or rendering of services to Bharat Heavy Electricals Ltd., Jhansi (hereinafter referred to as BHEL or the Purchaser) or its Projects / Customers.
B	Special / supplementary enquiry conditions & Mandatory Sheet requirements, if any, covered in the respective enquiry, will override the relevant conditions mentioned in this document.
C	Commercial Conditions quoted by the vendor in any place including as stated in bidder's 'General Terms and Conditions' if any, shall not be binding on the Purchaser. Only the conditions contained in this document, including special conditions, if any, for this enquiry shall prevail.
2	General Instructions - Common for Indigenous & Foreign enquiries
A	Sealed bids are invited for scope of Supply / Services as detailed in the enquiry. The quotation should be neatly typed and free from over writing/ erasures. Any correction or addition must be authenticated.. Relevant enclosures, supporting documents, catalogue, samples, if any, as required as per Notice Inviting Tender (NIT) conditions shall be sent along with technical offer. Rate should be quoted in the units asked for in the enquiry. The rates should be quoted both in figures and words. In case of discrepancy in figures and words, the rates quoted in words shall be considered.
B	<p>Bids shall be submitted in a Sealed cover with Enquiry No., Due date and Bidder's name indicated on the Cover. The Cover should contain both Part-I and Part -II bids, as the case may be.</p> <p><u>Part – I bid</u></p> <p>In case of Two part Bid, Part – I bid i.e. Technical bid containing (i) technical offer, (ii) Mandatory Sheet, (iii) un-priced copy of the Price Bid, (iv) EMD (if called in NIT), and (v) Relevant documents of PQR (if called in NIT), all duly filled-in & signed; should be kept in one envelope. The Part – I bid Cover items should have Enquiry No., Part I Bid, Due date, and Bidder's name indicated on the Cover</p> <p><u>Part –II Bid wherever Reverse Auction is not called for</u></p> <p>Part – II bid i.e. Price Bid containing only the price (as called for in the price format where required), duly filled-in & signed; should be kept in a separate envelope. The Price bid Cover items should have Enquiry No., Part II Bid, and Bidder's name indicated on the Cover</p> <p><u>Part –II Bid wherever Reverse Auction is called for</u></p> <p>Part – II bid i.e. Price Bid containing only the price (as called for in the price format where required), duly filled-in & signed; should be kept in a separate envelope. Wherever, BHEL informs that it proposes to conduct Reverse Auction for many items in the tender and where evaluation of the tender is on individual item basis, separate Part – II bids are to be submitted for each of the item. The Price bid Cover for each of the items should have Enquiry No., Part II Bid, Item no of Enquiry, and Bidder's name indicated on the Cover</p> <p>The envelopes indicating Part –I or Part-II, as the case may be, to be put in a bigger envelope, which should be addressed to In-charge, Tender Room, Bharat Heavy Electricals Ltd., Administration Building, Jhansi 284120. Enquiry No., due date and bidder's name must be mentioned on the bigger envelope. Offer must reach tender room of BHEL Jhansi latest by 13.15 hrs of the enquiry due date.</p> <p>In case, the bids are not submitted in the manner stated above, the offer of the bidder(s) are liable to be rejected.</p> <p>It is preferred that offers are sent in sealed envelope. However, if the bidder chooses to send the offer through E-mail, offers received through E-mail shall be considered only when such offers are complete in all respects.. In cases of offers through E-mail, the offers shall be sent to tenderbox.jhs@bhel.in, wherein the Subject of the Email should mention the Enquiry Number. E mail offers sent to any other E mail ID shall not be entertained. BHEL shall not take any responsibility if the offers are incomplete or if the Enquiry number is not mentioned in the subject of the E-mail.</p>
C	Wherever BHEL proposes to issue tender through e –procurement, the same philosophy as mentioned in 2B above is ensured through suitable system locks.
D	Offer received after 13.15 hrs of the due date will be termed as "Late" and shall not be considered



JHS 2055A R03

GENERAL TERMS AND CONDITIONS OF ENQUIRY

Page 2 of 12

	<p>BHEL reserves the right to go for Reverse Auction (RA) (as per Guidelines available on www.bhel.com) instead of opening the sealed envelope price bid, submitted by the bidder. This will be decided after techno-commercial evaluation. Bidders to give their acceptance with the offer for participation in RA. Non-acceptance to participate in RA may result in non consideration of their bids, in case BHEL decides to go for RA. Those bidders who have given their acceptance to participate in Reverse Auction will have to necessarily submit 'Process compliance form' (to the designated service provider) as well as 'Online sealed bid' in the Reverse Auction. Non-submission of 'Process compliance form' or 'Online sealed bid' by the agreed bidder(s) will be considered as tampering of the tender process and will invite action by BHEL as per extant guidelines for suspension of business dealings with suppliers/ contractors (as available on www.bhel.com).</p>
E	<p>The bidders have to necessarily submit online sealed bid less than or equal to their envelope sealed price bid already submitted to BHEL along with the offer. The envelope sealed price bid of successful L1 bidder in RA, if conducted, shall also be opened after RA and the order will be processed on lower of the two bids (RA closing price & envelope sealed price) thus obtained. The bidder having submitted this offer specifically agrees to this condition and undertakes to execute the contract on thus awarded rates.</p> <p>If it is found that L1 bidder has quoted higher in online sealed bid in comparison to envelope sealed bid for any item(s), the bidder will be issued a warning letter to this effect. However, if the same bidder again defaults on this count in any subsequent tender in the unit, it will be considered as fraud and will invite action by BHEL as per extant guidelines for suspension of business dealings with suppliers/ contractors (as available on www.bhel.com)</p>
F	<p>The goods offered shall conform to BHEL specifications / drawings and / or Indian / International standards as mentioned in the Enquiry and the bidder is required to confirm his unconditional acceptance to the same. Vendors, seeking deviations from the specifications and any other conditions, may indicate the same clearly on a separate sheet, with reasons for such deviations. BHEL reserves the right to reject the offer with deviations or load the deviations suitably for evaluation.</p>
G	<p>Offers shall be submitted directly by vendor or his authorized agent/representative only. Offers from any other sources shall be considered as unsolicited and shall be summarily rejected.</p>
H	<p>Bid in single part or techno-commercial bid in two part system (as the case may be) will be opened on the due date. In case of two part bid, price bids of techno-commercially acceptable bidder(s) only shall be opened on the assigned date, for which separate intimation will be sent to the acceptable bidders.</p>
I	<p>The bidder whose bid is technically not accepted will be informed & EMD wherever submitted shall be returned along with his price bid within <u>30 days</u> of contract finalization date. No interest will be payable on EMD amount. EMD shall however be forfeited in the event of bidder backing out after submission of the bid.</p>
J	<ol style="list-style-type: none">1. Any discount / revised offer submitted by a bidder on its own shall be considered, provided it is received on or before the due date and time of offer submission (Part-I). Conditional discounts shall not be considered for evaluation of tenders.2. Unsolicited discounts / revised offers given after Part-I bid opening shall not be accepted. No change in price will be permitted within the validity period asked for in the enquiry.3. In case of changes in scope and / or technical specification and / or commercial terms & conditions, having price implication, techno-commercially acceptable bidders shall be asked by BHEL to submit the impact of such changes on their price bids. A suitable cut-off date and time shall be given to all the techno-commercially acceptable bidders to submit the impact on their price bids. In case a bidder opts to submit revised price bid instead of impact called for, then their original price (i.e. previous bid) shall be necessarily opened to know the price impact. .
K	<p>The bidders will submit Integrity Pact, duly signed by its authorized signatory, if called for in the enquiry.</p>
L	<p>Wherever the enquiry is issued to unregistered vendor referred by BHEL Customer, the bidder shall submit the Supplier Registration Form (SRF) online at www.bhel.com and submit the signed copy of the duly filled-in SRF along with the bid. Price bids of such vendors, will be opened only on techno-commercial acceptance of bid and if allotted permanent code before the date of price bid opening.</p>
M	<p>BHEL expects that the bidder must respond to the enquiry. Regret letter, with valid reasons for not participating in the tender will be submitted where the bidder is unable to submit offer. Repeated lack of response on the part of vendor may lead to his deletion from BHEL's approved vendor list.</p>
N	<p>Goods shall be properly packed to avoid transit damage. Suitable markings shall be provided to identify the goods with that of the PO No, Item no. and the consignee details.</p>
O	<p>Goods shall be consigned to Manager , Stores (CRX), BHEL, Jhansi - 284120, India, unless otherwise specified in the PO.</p>
P	<p>Offers of the Bidders who are under HOLD or are under Interim Suspension or are on the banned list (as on date of Price bid opening) and / or those bidders who engage services of such suspended / banned firms, shall be rejected. The list of firms banned by BHEL is available on BHEL web site www.bhel.com. The list of firms suspended by BHEL, Jhansi is available on www.bheljhs.co.in. The " Guidelines for suspension of business dealings with Suppliers / Contractors" is uploaded on BHEL website http://www.bhel.com/vender_registration/vender.php</p>



JHS 2055A R03

GENERAL TERMS AND CONDITIONS OF ENQUIRY

Page 3 of 12

Q	In case of press tenders (i.e. those published in newspapers) all corrigenda, addenda, amendments, time extensions, clarifications etc. to the tender will be hosted on BHEL website. (www.bhel.com & www.bhejhs.co.in) only. Bidders responding to press tender should regularly visit website(s) to keep themselves updated.
R	In case the bidder decides to sub-contract part of his activity / work to some of his vendors, details of such intended subcontracting shall be mentioned in the bid. This will however not absolve the bidder from his contractual obligations and responsibilities.
S	In the course of evaluation, if more than one bidder happen to occupy L-1 status and the order is to be placed on a single vendor, effective L-1 will be decided by soliciting discounts from the respective L1 bidders.. In case more than one bidder happen to occupy the L1 status even after soliciting discounts, the L1 bidder shall be decided by, a toss / draw of lots, in the presence of the respective L1 bidder(s). BHEL's decision in such situations shall be final and binding.
T	Wherever the minimum reserved capacity is called for in the tender, the offers of such bidders, who do not quote for the minimum reserved capacity, are liable to be rejected.
U	<p>Due to large qty. requirement, we may finalize the tendered quantities among more than one bidder (after acceptance of L1 price by the other bidders), but limited to the capacity quoted by the bidder. Indicate your committed capacity for the item(s) tendered and confirm that capacity offered by you against our tender shall be available for us during the entire period of the Purchase Order / Contract.</p> <p>Where the number of qualified responses (N) are three or more, the distribution shall be limited to (N-1) responses. The manner and proportion of distribution shall be mentioned in the specific enquiry. Normally, the quantity distribution shall be generally as per quantities allocated to the bidder, but limited to the capacity quoted by the bidder.</p> <p>While the manner of distribution is mentioned in the enquiry, the absolute values of the unit of measurement shall be rounded off. For eg : If an allocation of 40% quantity results in 23.5 units, the quantity allocated shall be 24 units. If an allocation of 40% quantity results in 23.3 units, the quantity allocated shall be 23 units</p> <p>The distribution shall be based on the acceptance given by bidders to the L1 price counter offered to them. In case any or all of the bidders do not accept the counter offer, and a situation arises wherein bidder(s) who have agreed to the counter offer may have to be allotted more quantity than what has been proposed earlier, then the same shall be done, but limited to the capacity quoted by the bidder (s).</p> <p>Wherever, the number of techno commercially qualified responses (N) is two, BHEL reserves the right on whether or not to distribute the quantity on more than one bidder</p> <p>While the above pattern shall also be followed in long term framework agreements (FA), performance of the suppliers shall be monitored periodically, and the loading in FA will also be subject to factors like (a) Customer approval of suppliers in specific projects, (b) quality surveillance at Supplier works, (c) Suppliers delivery and quality performance during execution of FA, (c) Pendency of orders on the supplier and (d) responsiveness in addressing post order completion issues at BHEL. In view of these factors, the loading during execution of FA may vary with respect to allocated quantity. During execution of FA, if the performance of supplier is not upto the mark in respect of delivery / quality performance / quoted capacity of the bidder, BHEL reserves the right to either reduce further loading or stop loading till the execution of overdue orders. In such cases, action shall be taken against the defaulting supplier(s) as per guidelines of the Company, and the balance allocated full or part quantity of the defaulting supplier(s) may be re-distributed amongst other performing and willing vendors of the FA..</p>
V	The bidder shall submit price bid strictly in the price format, wherever provided for, in the enquiry. Any attempt on the part of the bidder to alter the contents of the price bid format in any manner, which in the opinion of BHEL can vitiate the tendering process, will lead to rejection of the bid, <u>besides BHEL taking appropriate punitive action as deemed fit.</u>
3	Vendor's particulars & logistics information
	Bidder to provide contact details and all logistical information as called for in the Mandatory Sheet enclosed to this enquiry
4	Delivery Schedule & Completion date
A	<ul style="list-style-type: none">• Instead of writing specific date against delivery offered, Bidder shall commit delivery period in number of days / weeks/ months to suit the delivery period indicated in the enquiry.• Commencement of delivery period shall be reckoned from the date of PO / LOI or any other agreed milestone.• Seller shall deliver the goods in the manner and schedule agreed under the Purchase order.• Goods shall be delivered within contractual period or any extension thereof, if any, granted by the Purchaser.



JHS 2055A R03

GENERAL TERMS AND CONDITIONS OF ENQUIRY

Page 4 of 12

B.	In case of foreign supplies, bidders are to quote for CIF/CFR delivery terms .For CIF / CFR delivery terms, the date of bill of lading (BL) shall be taken as actual date of delivery.
C.	In case of Indigenous bidders, the date of delivery at named destination in India shall be taken as contractual delivery completion date where delivery terms are FOR destination. In case of 'Ex-works' delivery terms, the date of LR / RR shall be the contractual delivery completion date.
D	In case of unreasonable delivery quoted by the bidders, BHEL reserves the right to reject such offers.
5	Transit Insurance
	Except where delivery terms are agreed on CIF basis for Imports & FOR destination basis for indigenous purchases, transit insurance will be covered by BHEL under its open Marine Insurance Policy. Seller shall inform dispatch particulars with value of consignment to the Purchaser within 07 days of dispatch for BHEL to arrange insurance coverage in its policy. Failure on the part of seller to inform dispatch particulars will make him liable to pay for any transit damages / losses suffered by the Purchaser.
6	Delivery Terms
A	Indigenous Purchase
	Goods shall be delivered on 'FOR Destination' basis (with freight and insurance in bidder scope) to the named destination unless otherwise called for in the enquiry. In case the bidder quotes on Ex-Works, the offer of such bidder(s) is/are liable to be rejected. Wherever the PO terms mentions delivery terms as FOR Destination basis, and In the event of supplier having supplied the material by BHEL Truck / Vehicles as per BHEL transportation rate contract, thus causing BHEL to bear the freight charges, the corresponding amount ,incurred / estimated, shall be deducted from the bills of the Supplier.
B	Foreign Purchase – Imports
	<ol style="list-style-type: none">1. Goods shall be dispatched by sea on CIF/CFR basis, unless stated otherwise in the enquiry or purchase order. The destination shall at Navsheva, Mumbai for LCL/Breakbulk Cargo and ICD, Mandideep, Madhya Pradesh for FCL Cargo2. If air freight is called for in the enquiry, the goods shall be delivered on FCA basis to the named Airport3. Please visit BHEL Jhansi web site www.bheljhs.co.infor details of named Airports. . Name of the airport so chosen by the Seller shall be indicated by the Bidder in his offer.4. Goods shall be handled for air freight by BHEL's freight forwarder only, under FCA contracts and HAWB issued by BHEL appointed forwarder or his authorized agent(s) shall only be accepted for negotiation.
C	<ul style="list-style-type: none">• In the event of bidder offering CFR or CIF delivery terms for delivery in FCL(Full Container Load), the Bidder shall provide 14 days' time free of detention from the date of delivery at delivery port. Wherever the detention free period offered is less than 14 days, the bids shall be loaded for the period short of 14 days period.• <u>Port congestion charges or any additional charges claimed by shipping line till delivery at destination port shall be to the Seller's account.</u>•
7	Force Majeure
	Notwithstanding anything contained in the contract, neither the Seller nor the Purchaser shall be held responsible for total or partial non-execution of any of the contractual obligations, should the obligation become unreasonably onerous or impossible due to occurrence of a 'Force Majeure' which directly affects the obligations to be performed by the Purchaser or the Seller; Such events include war, military operations of any nature, blockages, revolutions, insurrections, riots, civil commotions, insurgency, sabotage, acts of public enemy, fires, explosion, epidemics, quarantine restrictions, floods, earthquake, or acts of God, restrictions by Govt. authorities; over which the Seller or the Purchaser has no control. The party claiming to be affected by force majeure shall notify the other party in writing without delay, within two weeks on the intervention and on the cessation of such circumstance. Extension of time sought by the Seller along with supporting evidence and so granted by the Purchaser for the supply/ work affected, if any, shall not be construed as waiver in respect of remaining deliveries. Rescheduling of deliveries on account of force majeure conditions, if so agreed by the Purchaser, will not entail the Seller to claim any increase in the price on whatsoever account.



JHS 2055A R03

GENERAL TERMS AND CONDITIONS OF ENQUIRY

Page 5 of 12

	Notwithstanding above provisions, Purchaser shall reserve the right to cancel the order/ Contract, wholly or partly, in order to meet the overall project schedule and make alternative arrangements. If deemed necessary, Purchaser may takeover partly processed material at a mutually agreed price.
8	LD / Penalty for delayed performance.
A	<p>I. Subject to force majeure conditions, LD shall be 0.5% of the total order value per week of delay or part thereof, subject a maximum of 10% of the total order value.</p> <p>II. In case of staggered delivery schedule, LD shall be 0.5% of the undelivered portion per week or part thereof subject to a maximum of 10% of the undelivered portion .</p> <p>III. However in case of Capital Machine / BOP where staggered deliveries may be applicable, the LD cap will be levied on total order value inclusive of E&C charges. (15%)</p> <p>IV. Wherever Erection & Commissioning (E& C) is called for, the vendor is provided a stipulated period from date of site readiness. LD shall be applicable for any delay beyond the stipulated period mentioned in the PO.</p> <p>V. In case of any amendment / revision, the LD shall be linked to the amended / revised PO value.</p> <p>VI. Any loading on LD clause shall be to the extent to which it is not agreed to by the bidder (at offered value)</p> <p>For the sake of clarity – Total order value means purchase order value (exclusive of taxes), Undelivered portion means , the delayed portion for the given lot.</p> <p>In case a supply is rejected and the same is replaced at a later date, the date of replacement of accepted supply shall be reckoned for calculation of LD</p>
B	In case the contractually agreed delivery date falls on a holiday in BHEL Jhansi, the next working day shall be taken as contractual delivery date for compliance and applicability of LD / penalty.
C	<p>In case of Ex works Delivery terms for Indigenous supplies, the date LR shall be reckoned for LD deduction.</p> <p>In case of FOR Delivery terms, the date of entry in BHEL Jhansi (CISF date) shall be reckoned for LD deduction.</p> <p>In case of FCA Delivery terms / Ex Works Delivery terms of Foreign supplies , the date Invoice / Packing List / Test Certificate, whichever date is later, shall be reckoned for LD deduction.</p> <p>In case of FOB / CIF / CFR / CIP Delivery terms, the date of Bill of Lading , shall be reckoned for LD deduction.</p>
	Risk Purchase.
C	<p>If the material is not supplied within the agreed delivery period, BHEL reserves the right to cancel the order and purchase the material(of the undelivered portion) from alternate source(s) at the Risk and Cost of the Seller. In such an event, it shall be obligatory on the part of seller to make good any loss suffered by the purchaser. In such cases, BHEL shall withhold bills, bank guarantees, etc of the Supplier, which are pending either at BHEL, Jhansi or any other Unit of BHEL . Wherever Risk purchase is invoked attracting action as per guidelines of the Company, action shall be initiated to suspend business dealings with the Supplier. To know the implications of suspension, the bidder may see the “ Guidelines for suspension of business dealings with Suppliers / Contractors” which is uploaded on BHEL website http://www.bhel.com/vender registration/vender.php</p>
9	Indian Agents and Agency commission
A	BHEL prefers to deal directly with Foreign vendor, wherever required, for procurement of Goods. However if the Foreign Principal desires to avail services of an Indian Agent, then the Principal should ensure compliance to “regulatory guidelines” which will require submission of an agency agreement. The agency agreement should specify the precise relationship between the foreign OEM / foreign Principal and their Indian Agent. Any payment which the Indian agent receives in India or abroad from the OEM, whether as commission or as a general retainer fee, should be brought on record in the agency agreement.
B	The CIF price quoted will be deemed to be inclusive of Indian Agency commission. Agency commission as disclosed by the bidder in his quoted CIF price will be paid in Indian Rupees on receipt & acceptance of Materials or it's installation at destination, as the case may be. The lower of the TT selling rate prevailing on the date of (a_ technical bid opening, or (b) price bid opening, or (c) date of invoice, shall be considered for computation of Agency commission.
C	Be it a case of a Foreign / Indigenous Principal or OEM, in a tender either the Indian Agent on behalf of Principal / OEM or the Principal / OEM itself can bid, but both cannot bid simultaneously for same item / product in the same Tender. In case both submit a bid in the tender, then the bid of OEM only shall be opened



JHS 2055A R03

GENERAL TERMS AND CONDITIONS OF ENQUIRY

Page 6 of 12

D	Be it a case of a Foreign / Indigenous Principal or OEM, If an agent submits Bid on behalf of the Principal / OEM, the same agent shall not submit bid on behalf of another Principal / OEM in the Tender, for the same Item / Product.									
10	Documentation:									
A	Indigenous Purchase									
	<p>Immediately on despatch of Goods, the following documents shall be necessarily sent by the Seller to the respective address(es) mentioned below</p> <table border="1" data-bbox="297 449 1479 968"> <tr> <td data-bbox="297 449 358 632">(a).</td> <td data-bbox="358 449 740 632"> Addressed to: Addl General Manager (Stores) Main Store Building BHEL Jhansi PIN-284120 Telephone . 0510-2412230 </td> <td data-bbox="740 449 1479 632"> Documents to be sent: (i) GST compliance Invoice – Duplicate for Transporter (ii) Challan/Despatch Advice note / Packing List etc. + 1 Photo copy (iii) Test Certificate, Guarantee / Warrantee Certificate (iv) LR/RR Duplicate for Transporter copy (v) O&M Manuals, wherever applicable </td> </tr> <tr> <td data-bbox="297 632 358 842">(b)</td> <td data-bbox="358 632 740 842"> Addressed to: Dy. General Manager (Finance) Administrative Building BHEL Jhansi PIN-284120 </td> <td data-bbox="740 632 1479 842"> Documents to be sent: (i) GST compliance Invoice – Original for Buyer (ii) Copy of LR/RR (iii) Copy of Test Certificate (iv) PVC Calculation sheet, if any, with supporting documents. (v) MOM with BHEL Customer (if called for in the PO) in case of installation & commissioning at Customer Site (vi) Capitalization Certificate, if called for in the PO </td> </tr> <tr> <td data-bbox="297 842 358 968">(c)</td> <td data-bbox="358 842 740 968"> Addressed to: Dy. General Manager (MM) Administrative Building BHEL Jhansi PIN-284120 </td> <td data-bbox="740 842 1479 968"> Documents to be sent: (i) GST compliance Invoice – Extra copy / Photo copy (ii) Challan/Despatch Advice note (iii) Test Certificate, Guarantee / Warrantee Certificate (iv) Copy of LR/RR </td> </tr> </table> <p>In case any other documents are required, the distribution of such documents will be specified in the Purchase order.</p> <p>Further, if specified in the Purchase order, all the details and copies of documents have to be uploaded by Supplier on BHEL portal before despatch of Goods</p>	(a).	Addressed to: Addl General Manager (Stores) Main Store Building BHEL Jhansi PIN-284120 Telephone . 0510-2412230	Documents to be sent: (i) GST compliance Invoice – Duplicate for Transporter (ii) Challan/Despatch Advice note / Packing List etc. + 1 Photo copy (iii) Test Certificate, Guarantee / Warrantee Certificate (iv) LR/RR Duplicate for Transporter copy (v) O&M Manuals, wherever applicable	(b)	Addressed to: Dy. General Manager (Finance) Administrative Building BHEL Jhansi PIN-284120	Documents to be sent: (i) GST compliance Invoice – Original for Buyer (ii) Copy of LR/RR (iii) Copy of Test Certificate (iv) PVC Calculation sheet, if any, with supporting documents. (v) MOM with BHEL Customer (if called for in the PO) in case of installation & commissioning at Customer Site (vi) Capitalization Certificate, if called for in the PO	(c)	Addressed to: Dy. General Manager (MM) Administrative Building BHEL Jhansi PIN-284120	Documents to be sent: (i) GST compliance Invoice – Extra copy / Photo copy (ii) Challan/Despatch Advice note (iii) Test Certificate, Guarantee / Warrantee Certificate (iv) Copy of LR/RR
(a).	Addressed to: Addl General Manager (Stores) Main Store Building BHEL Jhansi PIN-284120 Telephone . 0510-2412230	Documents to be sent: (i) GST compliance Invoice – Duplicate for Transporter (ii) Challan/Despatch Advice note / Packing List etc. + 1 Photo copy (iii) Test Certificate, Guarantee / Warrantee Certificate (iv) LR/RR Duplicate for Transporter copy (v) O&M Manuals, wherever applicable								
(b)	Addressed to: Dy. General Manager (Finance) Administrative Building BHEL Jhansi PIN-284120	Documents to be sent: (i) GST compliance Invoice – Original for Buyer (ii) Copy of LR/RR (iii) Copy of Test Certificate (iv) PVC Calculation sheet, if any, with supporting documents. (v) MOM with BHEL Customer (if called for in the PO) in case of installation & commissioning at Customer Site (vi) Capitalization Certificate, if called for in the PO								
(c)	Addressed to: Dy. General Manager (MM) Administrative Building BHEL Jhansi PIN-284120	Documents to be sent: (i) GST compliance Invoice – Extra copy / Photo copy (ii) Challan/Despatch Advice note (iii) Test Certificate, Guarantee / Warrantee Certificate (iv) Copy of LR/RR								
B	Foreign Purchase – Imports									
	<p>Seller shall send 1 set of following documents, in English, within 7 days of BL date by courier to the Purchaser</p> <ol style="list-style-type: none"> 1. Original Clean on board Bill of lading. 2. One set of Commercial Invoice, Packing list indicating container-wise Gross weight, net weight, CBM (cubic metre) volume, No. of packages with Dimensions of each package. 3. Original certificate of Country of Origin issued by Chamber of Commerce 4. One set of Original test certificates and O&M manual where called for. 5. Fumigation certificate wherever cargo is packed in wooden packing or packing of Plant origin material is used. <p>In case the Seller decides to negotiate all 3 originals of BL through negotiating Bank, non-negotiable documents (NND) consisting of copy of BL / HAWB & all originals at sl.no. 10-B2 to B5 will be couriered to Purchaser. Soft Copy of documents at sl. 10-B1 to B5 will also be sent by e-mail to the Purchaser at the e-mail address given in the PO. Other documents, as required, will be separately indicated in the Purchase Order. Additional expenditure, if any, incurred by the Purchaser by way of detention / demurrage, resulting out of delay attributable to the Seller in providing negotiable documents, will be recovered from the Seller.</p>									
C	In case of incomplete documentation, the communication shall be provided to supplier. The delays in submission of documentation by the supplier shall be reckoned while releasing payments to the Supplier									
11	Pricing Terms									
	Prices once quoted shall remain firm within the validity or any extension thereof for placement of order, till complete execution of the order, without any escalation/increase for any reason, whatsoever, unless specifically provided for in the Enquiry & PO. In case of foreign vendors, the quoted price shall be taken as inclusive of Third Party Inspection and testing charges as called for in the NIT.									



JHS 2055A R03

GENERAL TERMS AND CONDITIONS OF ENQUIRY

Page 7 of 12

12	Price Validity :
	<p>Unless stated otherwise in the enquiry, offer shall be valid for a period of 120 days from the date of Techno- commercial (Part-I) bid opening date.</p> <p>The prices quoted for spare parts of the main equipment shall be kept valid for a period of 180 days from the date of placement of PO for the main equipment.</p>
13	Taxes & Duties - Indigenous Purchase
A	<p>The Taxes and duties as applicable shall be payable extra which may include GST against Gate pass- The Seller shall clearly indicate extent of taxes as applicable in his techno commercial bid. In the event of vendor failing to furnish valid GST invoices with appropriate HSN Code , amount corresponding to GST will be disallowed by BHEL while making payments.</p> <p>Bidders to ensure applicability of IGST / CGST/SGST based on the Inter / Intrastate movement of goods.</p> <p>GST Registration Number (GSTIN) should be clearly mentioned on the vendor's quotation.</p> <p>Please quote our IGST registration number 09AAACB4146P2ZC in all invoices raised for supply of goods and services under GST regime and also ensure filing of timely return and payment of tax and compliance of other applicable provisions on supplier under GST regime.</p> <p>In the event of any disallowance of input credit or applicability of interest or any other financial liability arises on BHEL- Jhansi due to any default of supplier under GST such implication shall be to supplier's account.</p> <p>GST shall be levied on LD and the relevant tax invoice shall be provided to vendors for availing credit.</p> <p>In case of directly despatchable items to Customer's Site, Supplier to bill to BHEL Jhansi at its GST Account number 09AAACB4146P2ZC and ship to the respective Customer</p> <p>Since, input credit of GST will be available to BHEL-Jhansi only after correct filing of return and payment of applicable GST by supplier, reimbursement of GST shall be made by BHEL-Jhansi on matching of vendor inputs at GST portal and after ensuring availability of input credit to BHEL-Jhansi. Payment of tax shall be done only after availing matching ITC, in all cases where bills are submitted directly to BHEL-Jhansi or through bank or under LC or through any other mode.</p> <p>Other statutory declaration forms are also to be submitted in time, as mentioned in the relevant Laws. BHEL reserves the right to withhold the payment due to the vendor equivalent to BHEL's tax and related liability thereon.</p> <p>In case of any changes in statutory laws w.r.t. taxes and duties, the same shall be applicable at the given point of time.</p>
B	<p><i>Wherever GST is not applicable, the tax and duty structure , as applicable, is to be complied by the seller.</i></p>
14	Taxes & Duties - Foreign Purchase – Imports
A	<p>The offered prices shall be inclusive of all the Taxes and duties as applicable in the country of bidder / country of dispatch for the quoted FCA / CFR/CIF price.</p>
15	Payment Terms-
A	<p>Indigenous: 100 % payment within 90 days (45 days for MSE / NSIC registered suppliers as per relevant act in force) from the date of receipt of material and submission of clear and admissible bill, subject to acceptance of material at BHEL , on direct presentation of the documents..</p> <p>Payments to vendors who are seeking benefits under MSME act shall not be entertained if the Udyog Aadhar Memorandum (UAM) submitted by them is not valid on the date of Purchase Order and date of supply (SRV Date of BHEL) . It is hence in the interest of the vendor that they validate the status of UAM regularly with BHEL.</p> <p>In case of despatch of material to site directly, site certification for receipt of materials is required unless otherwise provided for in the PO. Any deviation from the above payment terms, if accepted (by BHEL), shall be loaded @ SBI base rate(as on date of Part I bid opening) + 6%, for the purpose of bid evaluation.</p>



JHS 2055A R03

GENERAL TERMS AND CONDITIONS OF ENQUIRY

Page 8 of 12

	All documents as called for in the PO have to be submitted by the Supplier at the time of receipt of material and this should include the Invoice of the Supplier - Original copy of the Buyer and Duplicate for Transporter. On receipt of Invoice, the same shall be acknowledged by BHEL. Any clarifications on the bill submitted by the supplier shall be sought generally within 30 days (15 days for MSE / NSIC registered suppliers as per relevant act in force) of receipt of bill at BHEL. While it would be in the interest of the Supplier to provide the reply immediately to the clarifications sought , the Supplier is to respond at least within 7 days from the date of clarifications sought by BHEL. Wherever clarifications are sought by BHEL, the date of receipt of clarifications from the supplier shall be considered as date of submission of clear and admissible bill.						
B	Foreign: 100% against irrevocable, unconfirmed LC, payable within 120 days of the bill of lading (BL) date. In case BHEL considers any deviation in payment terms i.e. early payment based on vendor's request, then bids shall be evaluated with loading of State bank of India Base rate (as on date of Part I bid opening) plus 6%, for the credit period short of 120 days. The LC shall be established 2 month prior to shipment date, valid for period of 120 days, unless agreed otherwise. Payment terms of CAD payable on 120 th day of BL / HAWB date shall be preferred.						
C	While there could be exceptional situations wherein the payment may be delayed beyond the stipulated time mentioned above, it is clarified that BHEL shall not pay any interest on such delays						
D	In case of any disagreement between BHEL and the Supplier on any part of the bill, such part shall be severed from the rest and payment against agreed and admissible part shall be processed as per laid down procedure, while the disputed part shall be dealt as per contract provisions viz. conciliation, dispute resolution, arbitration, etc						
16	Inspection of Goods						
A	The Seller shall give adequate notice, of 1 week or as mutually agreed period, in writing to the Purchaser about the date and place at which the goods will be ready for inspection/ testing, as provided for in the contract.						
B	Purchaser or his authorized representative shall be entitled to carry out inspection of material and workmanship at Seller's premises or at his sub-contractor's premises at all reasonable times during execution of contract; Such inspection, examination and testing, if made, shall not absolve the Seller from his obligations under the contract.						
C	All costs related to inspections and re-inspections shall be borne by the Seller. In case of foreign vendors, the cost of third party inspection, where called for, shall be deemed to be included in the quoted price. Seller shall be responsible to provide assistance such as labour, materials, electricity, fuels, stores, apparatus, instruments at his cost, as may be required and as may be reasonably demanded to carry out such tests effectively.						
D	Undertaking to be provided by Suppliers before despatch : The suppliers , before despatching the jobs, shall provide an undertaking on their letterhead, that the jobs have been made as per BHEL Specification / Drawings, that the test results meet the specified parameters of the drawing / specification, that the supplies have been inspected as per Quality Plan (if called for in the Purchase Order), that on receipt of supplies at BHEL, Jhansi; BHEL reserves the right to reject any supplies which are non compliant, that in case the material is accepted with deviationst wherever rectifications / rework is observed, that the Supplier shall be given seven days notice to attend to the work and if the Supplier does not attend the rectifications in the said period, BHEL shall reserve the right for suitable deductions. Despatch clearance shall be given when the Supplier provides the above undertaking (as per Annexure I) to BHEL						
E	Uploading despatch information on BHEL SIP The supplier has to upload despatch information details by logging in at ' Supplier Information Portal ' of BHEL Jhansi website using their User name (Vendor Code) and Password. Subsequently, the supplier has to click at the link' Update Consignment details ' provided therein.Submitting ' Despatch Intimation ' is mandatory . All supplies arriving (reaching BHEL Jhansi) will be allowed inside CISF Material gate of BHEL Jhansi only if the supplier has submitted online Despatch Intimation. The following documents are necessary before entry of material at our Material Gate:						
	<table border="1"> <tr> <td>1</td> <td>GST Invoice OR Delivery Challan (as per rule 55) OR Bill of entry for imports OR Excise Duty Invoice for Petroleum supplies</td> </tr> <tr> <td>2</td> <td>Lorry Receipt (LR) OR Railway Receipt (RR) OR Door Delivery (Courier Docket..).</td> </tr> <tr> <td>3</td> <td>'Despatch Intimation' (Printout required).</td> </tr> </table>	1	GST Invoice OR Delivery Challan (as per rule 55) OR Bill of entry for imports OR Excise Duty Invoice for Petroleum supplies	2	Lorry Receipt (LR) OR Railway Receipt (RR) OR Door Delivery (Courier Docket..).	3	'Despatch Intimation' (Printout required).
1	GST Invoice OR Delivery Challan (as per rule 55) OR Bill of entry for imports OR Excise Duty Invoice for Petroleum supplies						
2	Lorry Receipt (LR) OR Railway Receipt (RR) OR Door Delivery (Courier Docket..).						
3	'Despatch Intimation' (Printout required).						



The following documents are additionally required for **SRV clearance** if they are called for in the Purchase Order (PO):

4	Complete Test certificates/Inspection reports
5	Guarantee certificates
6	Any other document as called for

Following may be required for **SRV preparation** depending on the nature of material being supplied:

7	Packing lists, wherever applicable.
8	Weighment slip.

A cost of one percent of the transaction value (not more than Rs 5000 per transaction but not less than Rs 500 per transaction) shall be deducted from supplier bills in case supplier has failed to upload the despatch information on Supplier Information Portal

E Material despatched one month prior to the date of despatch shall not be permitted inside BHEL, unless there are instructions otherwise from BHEL. In all such cases, material will be allowed inside only if approved by Head MM

Material despatched 10 weeks after date of despatch shall not be permitted inside BHEL, unless there are instructions otherwise from BHEL. In all such cases, material will be allowed inside only if approved by Head MM

17 Warranty , Corresponding Repairs / Replacement of Goods, and Deductions

Goods shall comply with the specifications for material, workmanship and performance.

The warranty shall be for a period of 24 months from the date of receipt at BHEL, Jhansi

However, **wherever erection & commissioning also is in the scope of the bidder**, the warranty shall be for a period of 24 months from the date of supply or 18 months from the date of commissioning, whichever is later.

In case any other terms are to be specified for warranty, the same shall be specified in the specific enquiry

A Normally deviation shall not be accepted for the criteria of warranty period. The offers of bidders, who offer deviation to the warranty terms mentioned in the NIT, are liable to be rejected.

If the item supplied is found non-compliant during the warranty period, leading to rejection, the Seller shall arrange free replacement / repair of goods, within one month from the date of intimation or any mutually agreed period. The rejected goods shall be taken away by the Seller at his cost and replaced on Delivered Duty Paid (DDP) (FOR - BHEL Stores/ designated destination basis) within such period. In the event of the Seller's failure to comply, Purchaser may take action as appropriate, including Repair / Replenish rejected goods & disposal of rejections, at the risk & cost of the Seller.

In case the defects attributable to Seller are detected during processing of the goods at purchaser's/ his subcontractor's works, the Seller shall be responsible for free replacement/ repair of the goods as required by the purchaser.

18 Evaluation and Loading Criteria:

Evaluation of the tender shall be on the basis of delivered cost, i.e. 'total cost to BHEL' w.r.t the finalized technical scope and commercial conditions (after considering, inter alia, Customs Duty and CENVAT/ VAT/ CST/Service Tax/Entry Tax or any other tax as applicable). Exchange rate (TT selling rate of State Bank of India) applicable on the date of Part-I bid opening shall be considered for evaluation of foreign bids. If the relevant day happens to be a bank holiday in India, then the FOREX rate as on the previous bank working day shall be taken for evaluation.

Foreign suppliers shall ensure that the benefits as applicable under Free Trade Agreement (FTA) with Government of India are disclosed in the bid & relevant documents such as Certificate of Country of Origin, issued by the appropriate authority in the country of Export, is provided by the vendor along with dispatch documents. Bids shall be evaluated with such applicable benefits. In the event of Seller failing to provide appropriate documents for Purchaser to avail disclosed



JHS 2055A R03

GENERAL TERMS AND CONDITIONS OF ENQUIRY

Page 10 of 12

	<p>concessional duty benefits in India, the cost incurred owing to consequent delays, detention and demurrage thereof, will be to the Seller's account.</p> <p>To arrive at the Delivered Cost, the quoted price shall be suitably loaded, the details of which are mentioned in this annexure / special remarks of the enquiry. In case of any additional techno commercial deviations, for which the loading criterion is required to be framed after opening of techno commercial bid, such criteria shall be communicated to all qualified bidders before price bid opening.</p>
19	Non-Disclosure Agreement
	<p>All Drawing and technical documents relating to the product or its manufacture submitted by one party to the other, prior or subsequent to the formation of contract, shall remain property of the submitting party. Drawing, technical documents or other technical information received by one party, shall not without the consent of the other party, be used for any other purpose than that, for which they were provided. Such technical information shall not without the consent of the submitting party, otherwise be used or copied, reproduced, transmitted or communicated to a third party. Patterns supplied by BHEL will remain BHEL's property which shall be returned by the bidder on demand to BHEL. Bidder shall in no way share or use such intellectual property of BHEL to promote his own business with others. <u><i>BHEL reserves the right to claim damages from the bidder, or take appropriate penal action as deemed fit against the bidder, for any infringement of the provisions contained herein.</i></u></p>
20	RIGHT OF REJECTION /NON- PLACEMENT OF PO/ SHORTCLOSURE OF PO: BHEL reserves the right to accept the offers in part or in full, or cancel the Tender enquiry without assigning any reason whatsoever / non placement of PO or contract / short closure of PO or contract.
21	Performance Bank Guarantee (PBG)/ Security Deposit (SD):
A	Bank Guarantee wherever called for, shall be in the BHEL prescribed format. In case the order is to be placed in foreign currency, the BG must normally be in Indian Currency from the Consortium Banks of BHEL / as specified in the specific Enquiry
B	Wherever the contract is for supply of Goods processed on labour basis from BHEL supplied materials, the materials shall be issued against a suitable security, preferably Bank guarantee.
22	Benefits earmarked for Purchase from Micro & Small Enterprises (MSEs) – Indigenous Purchase
A	MSE suppliers who are registered by bodies like MSMED, NSIC & DIC specified by Ministry of Micro, Small and Medium Enterprises (MoMSME) can avail the intended benefits only if they submit along with the offer, relevant documents including valid certificate as mentioned in " Format for Supplier MSME Status' on Supplier Information Portal of BHEL, Jhansi. In case the valid MSE registration of the bidder is already updated in SDC records of BHEL, Jhansi, it may not submit the details again. It is hence in the interest of the supplier that they validate the status of UAM regularly with BHEL, if they would like to avail intended benefits under MSME Act.
B	Tenders to MSE suppliers shall be issued free of cost & no EMD wherever called for will be insisted upon. Such MSE bidders shall submit along with bid, relevant documents including valid certificate. Date to be reckoned for determining the deemed validity will be the date of bid opening (Part I in case of two part bid). Non- submission of such document will lead to consideration of their bid, at par with other bidders. No benefit shall be applicable for this enquiry if any deficiency in the above required documents are not submitted before price bid opening. If the tender is to be submitted through e-procurement portal, then the above required documents are to be uploaded on the portal. Documents should be notarized or attested by a Gazetted Officer.
C	In tender, participating MSEs quoting price within price band of L1 (on total cost to BHEL) +15% shall also be allowed to supply a portion of requirement by bringing down their price to L1 price in a situation where L1 price is from someone other than a MSE and such MSE shall be allowed to supply up to 20% of total tendered quantity. In case of more than one such MSE within price band of L1 (on total cost to BHEL) +15%, the supply shall be shared proportionately (to tendered quantity, as per their tender ranking of the bidders and also their SC/ST status). However if there are more than one MSE vendor at the same price level, then the quantity shall be distributed equally. A quantum of 4% out of 20% quantity, so earmarked, will be reserved for MSE's owned by SC / ST entrepreneurs who submit their bid with relevant documents. However, such distribution shall be subject to the tender requirement in terms of Customer approval of vendors, divisibility of quantity, etc. While all efforts shall be made to ensure compliance to the stated distribution, the decision of BHEL in distribution stated in this clause shall be binding on all bidders.

	The above distribution is not applicable (a) where L1 vendor is MSE vendor and minimum 20% share is assured to the L1 bidder in the tender, or (b) where the MSE bidders qualified for distribution as per 'manner of splitting' clause in NIT already cater to 20% share in the tendered load.
D	In case it comes to notice that the bidder is found responsible for misconducts like, having submitted fake/false/forged documents/ certificates, has misrepresented the facts, has wilfully suppressed the facts, has resorted to unethical/illegal means, etc., action shall be initiated against such bidders as per the extant guidelines of the Company for suspension of business dealings.
23	Benefits earmarked to suppliers for Purchase under 'MAKE IN INDIA'
	As part of minimizing import content, Government of India, vide order no P-45021/2/2017-B.E.-II dated 15.06.2017, under the subject – Public Procurement (Preference to Make in India) -- has set the initiatives to encourage and promote indigenously manufactured goods within India and services provided by sources within India. . In line with this, bidders who manufacture the goods and provide services within India (otherwise referred as local suppliers) are given purchase preference and are entitled to benefits in the tender
A	Definitions
(i)	Local content means the amount of value added in India which shall, unless otherwise prescribed by the Nodal Ministry, be the total value of item procured (excluding net domestic indirect taxes) minus the value of imported content in the item (including all customs duties) as a proportion of the total value , in percent . Presently, the minimum local content required is 50%. The nodal ministry may prescribe a higher or lower percentage in respect of any particular item and may also prescribe the manner of calculation of local content.
(ii)	Local supplier means a supplier or service provider whose product or service offered for procurement meets the minimum local content as prescribed
(iii)	Margin of Purchase Preference means the maximum extent to which the price quoted by a local supplier may be above the L1 for the purpose of purchase preference. Presently the margin of Purchase preference is 20%.
B	Conditions under which preference is given
(i)	In procurement of goods in respect of which the Nodal ministry has communicated that there is sufficient local capacity and local competition, and where the estimated value of procurement is Rs 50 lakhs or less, only local suppliers shall be eligible. If the estimated value of procurement of such goods is more than Rs 50 lakhs, provisions of 23(B) (ii) and 23(B)(iii) shall apply.
(ii)	If the procurement of goods are not covered by 23(B)(i) and are divisible in nature, the following procedure shall be followed :
a	If L1 is a local supplier, the order for full quantity shall be awarded to local supplier
b	If L1 bid is not from a local supplier, 50% of the order quantity shall be awarded to L1. Thereafter, the lowest bidder among the local suppliers, shall be invited to match the L1 price for the remaining 50% quantity , subject to the local supplier's quoted price falling within the margin of purchase preference, and the order for that quantity shall be awarded to such local supplier subject to matching the L1 price. In case such lowest eligible local supplier fails to match the L1 price or accepts less than offered quantity, the next higher local supplier within the margin of purchase preference shall be invited to match the L1 price for remaining quantity and so on, and the order shall be awarded accordingly. In case some quantity is still left uncovered on local suppliers, then such balance quantity may also be ordered on the L1 bidder.
iii	If the procurement of goods are not covered by 23(B)(ii) and are not divisible in nature, and in procurement of services where the bid is evaluated on the price alone, the following procedure shall be followed :
a	If L1 is a local supplier, the order shall be awarded to local supplier
b	If L1 bid is not from a local supplier, then the lowest bidder among the local suppliers, will be invited to match the L1 price, subject to the local supplier's quoted price falling within the margin of purchase preference, and the order shall be awarded to such local supplier subject to matching the L1 price. In case such lowest eligible local supplier fails to match the L1 price, the local supplier with the next higher bid within the margin of purchase preference shall be invited to match the L1 price and so on, and the order shall be awarded accordingly. In case none of the local suppliers within the margin of preference match the L1 price, then the order may be awarded to the L1 bidder.
C	Exemption of small purchases
	Notwithstanding anything contained at clause 23B above, procurements where the estimated value of procurement is less than Rs 5 lakhs are exempt and purchase preference shall not be accorded in such cases.

D	Verification of local content
(i)	The local supplier, at the time of tender, bidding or solicitation, shall be required to provide self certification that the item offered meets the minimum local content and shall give details of the location(s) at which the local value addition is made.
(ii)	In cases of procurement for a value in excess of Rs 10 crores, the local supplier shall be required to provide a certificate from the statutory auditor or cost auditor of the company (in case of companies) or from a practicing cost accountant or practicing chartered accountant (in respect of suppliers other than companies) giving the percentage of local content.
(iii)	False declarations shall be in breach of code of integrity and shall invite action as per guidelines for Suspension of Business dealings with Suppliers
E	In case of any disputes / clarifications, the extant guidelines of Government of India shall prevail.
24	Fraud Prevention
	The Bidder along with its associate/ collaborators/ sub-contractors/ sub-vendors/ consultants/ service providers shall strictly adhere to BHEL Fraud Prevention Policy displayed on BHEL website http://www.bhel.com and shall immediately bring to the notice of BHEL Management about any fraud or suspected fraud as soon as it comes to their notice
25	Settlement of Disputes & Arbitration
A	All questions/interpretations regarding subject matter of the Contract shall be decided by the Purchaser on the request of the Seller and the decision of the Purchaser shall be final.
B	In case of dispute, steps shall be taken by the parties to the contract to settle the same through negotiations.
C	In case, dispute is not settled in negotiations, it shall be referred to Conciliator appointed by the competent authority of the Purchaser.
D	In case dispute is not settled in conciliation proceedings, the same shall be referred to Arbitration as per Corporate Guidelines of the Purchaser and the arbitration proceeding shall be conducted as per provisions of the Arbitration and Conciliation Act, 1996 read with Corporate guideline as amended from time to time.
E	The Seller shall continue to perform the contract, pending settlement of dispute(s).
26	Applicable Laws and Jurisdiction of Courts
	Indian laws both substantive and procedural, for the time being in force, including modifications thereto, shall govern the Contract including Arbitration proceedings. The competent Courts at Jhansi in the State of Uttar Pradesh, India shall have sole jurisdiction.
27	Conciliation
	BHEL and bidder agree that if at any time (whether before, during or after the arbitral or judicial proceedings), any Disputes (which term shall mean and include any dispute, difference, question or disagreement arising in connection with construction, meaning, operation, effect, interpretation or breach of the terms and conditions of order, which the Parties are unable to settle mutually), arise inter-se the Parties, the same may, be referred by either party to Conciliation to be conducted through Independent Experts Committee to be appointed by competent authority of BHEL from the BHEL Panel of Conciliators.
	Notes: 1. No serving or a retired employee of BHEL/Administrative Ministry of BHEL shall be included in the BHEL Panel of Conciliators. 2. Any other person(s) can be appointed as Conciliator(s) who is/are mutually agreeable to both the parties from outside the BHEL Panel of Conciliators.
	The proceedings of Conciliation shall broadly be governed by Part-III of the Arbitration and Conciliation Act 1996 or any statutory modification thereof. The details of Conciliations shall be governed by the BHEL Conciliation scheme 2018.
28	General
	The Bidder shall keep a track of any changes by visiting the Supplier Information Portal of BHEL, Jhansi at https://www.bheljhs.co.in/apps/sip/index.php

Treatment of cases regarding conflict of interest:

The bidder notes that a conflict of interest would said to have occurred in the tender process and execution of the resultant contract, in case of any of the following situations:

- i. If its personnel have a close personal, financial, or business relationship with any personnel of BHEL who are directly or indirectly related to the procurement or execution process of the contract, which can affect the decision of BHEL directly or indirectly;
- ii. The bidder (or his allied firm) provided services for the need assessment/ procurement planning of the Tender process in which it is participating;
- iii. Procurement of goods directly from the manufacturers/ suppliers shall be preferred. However, if the OEM/ Principal insists on engaging the services of an agent, such agent shall not be allowed to represent more than one manufacturer/ supplier in the same tender. Moreover, either the agent could bid on behalf of the manufacturer/ supplier or the manufacturer/ supplier could bid directly but not both. In case bids are received from both the manufacturer/ supplier and the agent, bid received from the agent shall be ignored. However, this shall not debar more than one Authorised distributor (with/ or without the OEM) from quoting equipment manufactured by an Original Equipment Manufacturer (OEM) in procurements under a Proprietary Article Certificate.
- iv. A bidder participates in more than one bid in this tender process. Participation in any capacity by a Bidder (including the participation of a Bidder as a partner/ JV member or sub-contractor in another bid or vice-versa) in more than one bid shall result in the disqualification of all bids in which he is a party. However, this does not limit the participation of an entity as a sub-contractor in more than one bid if he is not bidding independently in his own name or as a member of a JV.

The Bidder declares that they have read and understood the above aspects, and the bidder confirms that such conflict of interest does not exist and undertakes that they will not enter into any illegal or undisclosed agreement or understanding, whether formal or informal with other Bidder(s), in this regard. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process. In case, the Bidder is found having indulged in above activities, the same will be considered as a violation of the tender conditions, and suitable action shall be taken by BHEL as per extant policies/ guidelines.

TENDER QUANTITY AND TECHNICAL TERMS / CONDITIONS FOR PURCHASE OF EPOXY (BONDING LAYER) PROOF STRESS CTC UNDER RATE CONTRACT ON FINISHED BASIS.**1. Tender Quantity**

The total tendered quantity of Epoxy Proof stressed Glued CTC is 5600 MT (+/-30%) for which the quantity break up into various categories and corresponding specification is mentioned below:

Item No.	Description	Specification	Quantity (in MT)
1	Epoxy coated 0.2% proof stress Glued CTC with Standard Kraft Paper, up to 41 strands and cross section area up to 30 sq mm./strand	AA28129 Rev-05 and TRE-036 Rev-09	3400.00
2	Epoxy coated 0.2% proof stress Glued CTC with Normal Density Thermally Upgraded Paper, up to 41 strands and cross section area up to 30 sq mm./strand	AA28129 Rev-05 and TRE-036 Rev-09 and TRE-218 Rev-01	1000.00
3	Epoxy coated 0.2% proof stress Glued CTC with Standard Kraft Paper with strands from 43 to 65 and cross section area up to 15 sq mm./strand	AA28129 Rev-05 and TRE-036 Rev-09	600.00
4	Epoxy coated 0.2% proof stress Glued CTC with Normal Density Thermally Upgraded Paper with strands from 43 to 65 and cross section area up to 15 sq mm./strand	AA28129 Rev-05 and TRE-036 Rev-09 and TRE-218 Rev-01	600.00

Tentative quantity breakup and specification of *Thermal Upgraded Paper for Item#2 and Item#4 is mentioned below:

Type of PCCW	Specification	ITEM NO #2 (IN MT)	ITEM NO #4 (IN MT)
Normal Density Thermally Upgraded paper (For use as covering)	TRE 218 rev 01	50.0	30.0

Important note:

- The above CTC quantity & type are based on firm & anticipated orders.it may vary depending upon received & year of manufacturing as per project requirement.
- The above estimated requirement may vary within $\pm 30\%$ for each group.
- At the time of supply, test certificates as per annexure of the POs must accompany each lot. Final inspection shall be at BHEL works at Jhansi.

(Signature)
(अवधेश प्रताप)
(AWADHESH PRATAAP)
बतौर प्रबन्धक (सी.आर.डी.)
Sr. Manager (T.R.E.)
सी.आर.डी. इलाहाबाद

2. **Technical Parameters:** CTC to be supplied under this enquiry shall strictly conform to the following purchase / technical specifications.

SI	Type of CTC	Specification
i	Epoxy coated 0.2% proof stress Glued CTC	AA28129 Rev-05 and TRE-036 Rev-09

Continuously Cast Copper bar / rods i.e Raw material for manufacturing bare copper strips:

SI	Copper	Specification no.
i.	Electrolytic Tough Pitch Copper Wire Bars / Ingots / continuously cast wire rods / Extruded Sections.	AA12024 Rev. 07 (<i>complying to latest standards referred in AA12024</i>)

Insulating Paper for use as conductor covering.

SI.	Type of paper	Specification no. / Specific requirement over and above specification
i.	Kraft-insulating paper (for use as covering)	AA21111 Rev. 06. / <i>The kraft paper shall completely comply to all parameters as per grade 5B2-2H1 of IEC 554-3-5 for all thickness size of paper.</i> <i>Alternatively, Kraft paper grade 5A2-1M3 completely complying to IEC-554-3-5 can also be used.</i>
ii.	Normal Density Thermally upgraded paper (for use as covering)	TRE218 Rev. 01

- The Copper CTC should be free from instability / twisting / entanglement / tilting when unwound from the drum / payoff.
- The bidder has to comply BHEL Quality Assurance Plan (QAP) no. QC/TCB/QAP/BO/55 Rev. 01. In addition to BHEL Quality Assurance Plan, BHEL's customer Quality Assurance Plan (QAP) shall also to be adhered by the suppliers. Copy of NTPC and POWERGRID approved QAP attached herewith for reference only.
- The bidder shall guarantee that curing properties and shelf life of Epoxy Coated Copper CTC shall not be affected by transportation in GP container in the ambient temperature up to 50°C.
- Inspection of material:** BHEL reserves the right to get the material at source inspected through it's own Engineers / Customer / Third party (TP) inspection agency (e.g. Lloyds, Bureau Veritas, SGS etc.). supplier shall submit the test certificates covering test results for each size of CTC as required in our purchase / technical specification. Test certificates for Copper, insulating paper, etc. and CTC shall be submitted along with each supply, complete in all respect and complying to Technical specification, BHEL Quality Assurance Plan (QAP) and BHEL's customer Quality Assurance Plan.
- Bidders shall mark on each drum/package of CTC the following data:

BHEL Specification no. , BHEL order no. Gross and net weight, Weight of empty, bobbin/drum, Weight of other packing material, Dimension of drum, date of manufacture etc.

Upadef
(AWADHESH PRATAP)
Sr. Manager (T/E)
BHEL

(Rev 00)

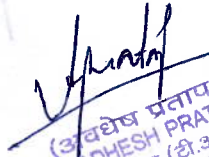
ANNEXURE -B
(PI-4406251100)**TENDER QUANTITY AND TECHNICAL TERMS / CONDITIONS FOR PURCHASE OF NOMEX COVERED CTC UNDER RATE CONTRACT ON FINISHED BASIS.****1. Tender Quantity**

The total tendered quantity of Nomex covered CTC is 1300 MT (+/-30%) for which the quantity break up into various categories and corresponding specification is mentioned below:

Item No.	Description	Specification	Quantity (in MT)
5	Nomex covered ,0.1% proof stress CTC , up to 13 strands and cross section area up to 20 sq mm./strand	FOR CTC-AA28129 Rev-05, FOR ENAMEL: CPS-AA28144/Rev03 FOR NOMEX: CPS-AA22901/REV-05	150.00
6	Nomex covered ,0.1% proof stress CTC , more than 13 and upto 27 strands and cross section area up to 20 sq mm./strand	FOR CTC-AA28129 Rev-05, FOR ENAMEL: CPS-AA28144/Rev03 FOR NOMEX: CPS-AA22901/REV-05	1150.00

Important note:

- The above CTC quantity & type are based on firm & anticipated orders.it may vary depending upon received & year of manufacturing as per project requirement.
- The above estimated requirement may vary within $\pm 30\%$ for each group.
- At the time of supply, test certificates as per annexure of the POs must accompany each lot. Final inspection shall be at BHEL works at Jhansi.


(अवधेश प्रताप)
(AWADHESH PRATAP)
बिड़ो प्रबन्धक (टी.आर.ई.)
Sr. Manager (TR)
टी.आर.ई. विभाग, जहानाबाद

2. **Technical Parameters:** CTC to be supplied under this enquiry shall strictly conform to the following purchase / technical specifications.

SI	Type of CTC	Specification
i	Nomex covered ,0.1% proof stress CTC , up to 13 strands and cross section area up to 20 sq mm./strand	AA28129 Rev-05 with enamel covering CPS-AA28144/Rev03 and IEC-60317-29 (as applicable)
ii	Nomex covered ,0.1% proof stress CTC , more than 13 and upto 27 strands and cross section area up to 20 sq mm./strand	

Continuously Cast Copper bar / rods i.e Raw material for manufacturing bare copper strips:

SI	Copper	Specification no.
i.	Electrolytic Tough Pitch Copper Wire Bars / Ingots / continuously cast wire rods / Extruded Sections.	AA12024 Rev. 07 (<i>complying to latest standards referred in AA12024</i>)

Insulating Paper for use as conductor covering.

SI.	Type of paper	Specification no. / Specific requirement over and above specification
i.	NOMEX PAPER	CPS-AA22901/REV-05

3. The Copper CTC should be free from instability / twisting / entanglement / tilting when unwound from the drum / payoff.
4. **Inspection of material:** BHEL reserves the right to get the material at source inspected through it's own Engineers / Customer / Third party (TP) inspection agency (e.g. Lloyds, Bureau Veritas, SGS etc.). supplier shall submit the test certificates covering test results for each size of CTC as required in our purchase / technical specification. Test certificates for Copper, insulating paper, etc. and CTC shall be submitted along with each supply, complete in all respect and complying to Technical specification, BHEL Quality Assurance Plan (QAP) and BHEL's customer Quality Assurance Plan.
5. Bidders shall mark on each drum/package of CTC the following data:

BHEL Specification no. , BHEL order no. Gross and net weight, Weight of empty, bobbin/drum, Weight of other packing material, Dimension of drum, date of manufacture etc.


 (अवधेश प्रताप)
 (AWADHESH PRATAP)
 वरिष्ठ प्रबंधक (टी.आर.ई.)
 Sr. Manager (TRE)
 वी० एच० ई० एल०, जोरहा
 न.प.स.प. बल्लारपुर

	CORPORATE PURCHASING SPECIFICATION	AA28129
		Rev No. 05
		PAGE 1 of 8

**PAPER COVERED CONTINUOUSLY TRANSPOSED COPPER CABLE
(0.2% PROOF STRENGTH)**

1 GENERAL

This specification governs the quality requirements of paper covered continuously transposed copper conductor (CTC) incorporating a number of individual work hardened copper strips insulated with a polyvinyl – acetal (PVA) based enamel of Grade 1 and covered over all with at least three layers of paper and suitable for use in hot insulating oil. Paper shall conform to BHEL corporate purchase specification AA21111 or as specified in the order. The material in insulating oil shall have temperature index of 120.

2 APPLICATION

Used for windings of transformers.

3 COMPLIANCE WITH INTERNATIONAL STANDARDS

Assistance has been derived from the following standards:

IEC 60317-0-2 Edition 4.0: 2020-06	Specifications for particular types of winding wires – General requirements – Enamelled rectangular copper wire
IEC 60317-18 Edition 4.0: 2020-06	Specifications for particular types of winding wires – Polyvinyl acetal enamelled rectangular copper wire, class 120
IEC 60317-27-3 Edition 1.1: 2024-06	Specifications for particular types of winding wires – Paper tape covered rectangular copper wire.

4 DIMENSIONS

1) CTC of any size as per given below shall be ordered. Maximum and minimum dimensions of cable shall be as per the individual orders. Conductor size, No. of parallels and radial paper covering shall be stated on the order.

No. of strands	5 to 65
Width of individual strands	3 to 11.5 mm
Thickness of individual strands	1 to 3 mm

2) Radial insulation shall be from 0.2 to 3 mm, both inclusive.

3) Bunched CTC consisting of 2 or more individual stacks can also be ordered whenever required.

5 TEST SAMPLES

5.1 Paper

The supplier shall send the test certificate for papers for all the tests as per BHEL Corporate Purchase Specification AA21111 for our approval. The test report shall be sent for each lot of paper and of different thicknesses received from the paper mill which are to be used in the manufacture of BHEL paper covered continuously transposed copper cable.

In the absence of proper test certificate 20 sheets of size 300 x 300 mm of paper from each lot and of different thicknesses with machine direction and cross machine direction marked on each sheet, shall be supplied for our testing and inspection,

Revisions: In line with latest IEC 60317-18			APPROVED: INTERPLANT MATERIAL RATIONALISATION COMMITTEE – MRC(E&IM)		
Rev No.05	Amd No.	Reaffirmed	Prepared HEP, Bhopal	Issued Corp.R&D	Dt. of 1 st Issue August 1987
Dt:22-08-2025	Dt:	Year:			

COPYRIGHT AND CONFIDENTIAL
The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED. It must not be used directly or indirectly in any way detrimental to the interest of the company.

AA28129	CORPORATE PURCHASING SPECIFICATION	
Rev No. 05		
PAGE 2 of 8		

5.2 Finished CTC cable

3 meter long sample of CTC cable shall be supplied for testing and inspection.

6 LENGTH & WEIGHT OF CTC CABLE

- 1) The total weight of cable, the length of cable per drum and total number of drums shall also be stated on the order. The length per drum is very important. It shall neither be less nor more than the specified.
- 2) Weights indicated in an order are nominal and can vary within $\pm 2\%$ considering all allowed tolerances on dimensions and on corner radius.
- 3) Excess weights more than 2 percent shall not be admissible in any circumstances.

7 TEST METHODS

Unless otherwise specified, the tests shall be conducted in accordance with relevant methods of IEC 60851 (Including latest edition / amendments)

8 TYPE OF ENAMEL COVERING

Polyvinyl – Acetal (PVA) based enamel of Grade 1 of IEC 60317-0-2. Increase in dimensions due to PVA enamel insulation shall be 0.085 ± 0.025 mm.

9 CONDUCTOR

9.1 Grade of Material

The conductor shall be manufactured from ETP grade copper conforming to BHEL Corporate Purchase Specification AA12024. Except that it shall be work hardened and meet the requirements of 0.2% proof strength as per clause 9.2 & 9.3 and electrical resistance as per clause 9.3.

NOTE: Manufacture of copper conductors from continuous cast copper bars is preferable provided all other acceptance parameters and conditions remains same.

9.2 0.2% Proof Strength

The nominal value of proof strength shall be selected from the following and shall be as stated in the order.

Nominal value of 0.2% proof strength: 120, 150 and 180 MPa

However, any other value of proof strength can also be ordered. The tolerance on proof strength shall be -0 to +20%.

In special case, paper covered continuously transposed copper conductor (CTC) with proof stress ($R_p 0.1$) 0.1% can also be ordered with tolerance on proof stress as specified in the order.

9.3 Electrical Resistivity

The resistance of the wire shall be expressed as the DC resistance at 20°C. The method used shall provide an accuracy of 0.5%.

The maximum value of resistance shall be not greater than the value calculated for the minimum tolerated cross-sectional area of the conductor resulting from the minimum dimensions in thickness and width and the maximum for the corner radius, and with a resistivity given in Table below.

Proof Strength		Maximum resistivity ($\Omega \cdot \text{mm}^2 \cdot \text{m}^{-1}$)
Nominal value ($\text{N} \cdot \text{mm}^{-2}$)	Tolerance	
120	-0 / +20 %	1/58
150	-0 / +20 %	1/58
180	-0 / +20 %	1/57.5

	CORPORATE PURCHASING SPECIFICATION	AA28129
		Rev No. 05
		PAGE 3 of 8

For other value of proof strength below 180 MPa, the resistivity shall be $1/58 \Omega \cdot \text{mm}^2 \cdot \text{m}^{-1}$ above 180 MPa resistivity shall be $1/57.5 \Omega \cdot \text{mm}^2 \cdot \text{m}^{-1}$

9.4 Tolerance on dimensions

Nominal width or thickness of the conductor mm		Tolerance \pm mm
Over	Up to and including	
--	3.15	0.030
3.15	6.30	0.050
6.30	12.50	0.070

9.5 Rounding of corners

The arc shall merge smoothly into the flat surfaces of the conductor and the strip shall be free from sharp, rough and projecting edges. The conductor shall have radiused corners complying with Table below:

Nominal thickness of conductor (mm)		Corner radius mm	Tolerance on radius %
Over	Up to and including		
--	1.00	0.5 x Nominal Thickness	± 25
1.00	1.60	0.50	
1.60	2.24	0.65	
2.24	3.55	0.80	

9.6 Joints

9.6.1 Joints in Bare Conductor

Joints shall not be made in the conductor after it is drawn. Any joint made during the drawing process shall be resistance welded.

9.6.2 Joint in Enamelled conductor

If a joint in the enamelled conductor becomes unavoidable due to breakage accidental stoppage of machine or when the specified length is in excess of the capacity of transposing machine bobbins, it shall be made by resistance welding, care being taken to ensure that the joint is made sound. All surplus weld shall be removed by filing and the joint finished with emery cloth / paper to give a smooth clean surface after which it shall be patch enamelled. Any joint shall be insulated from the adjacent strips by a single piece of 100 micron thick paper half overlapped. Joints in the individual strips shall be staggered so that the distance between individual joints along the cable shall not be less than 150 mm. A red tag shall be tied at the joint portion of cable for identification and inspection. Any such joint shall be made only after prior approval of BHEL.

10 PAPER

10.1 Grade of paper

Kraft paper shall conform to BHEL specification AA21111 or as specified in the order.

10.2 Thickness

The thickness of paper shall be within limits of 50 and 140 microns both inclusive

10.3 Width of paper

The width of paper shall be within the limits of 15 and 40 mm, both inclusive.

AA28129	CORPORATE PURCHASING SPECIFICATION	
Rev No. 05		
PAGE 4 of 8		

11 CONSTRUCTION OF TRANSPOSED CABLE

11.1 Cleanliness of Enamelled Conductor

The enamelled conductor shall be free from copper dust and other extraneous matter prior to transposing and covering with paper.

11.2 Transposition of Enamelled Conductor

The cable shall be manufactured from any odd number of enamelled conductors from a minimum of 5 to a maximum of 65, according to the size of the individual conductor and the overall size of the cable as specified in the order.

The cable shall be formed by placing the strips into two stacks, the stacks, being edge to edge and the whole group of strips being continuously transposed along the length of the cable.

The pitch of successive transpositions shall be approximately 7 to 15 times the width of bare strip. Lay i.e. the distance over which a strip resumes its original position in the conductor shall be equal to pitch multiplied by the number of strips. For a given one turn on the smallest winding diameter, all the strips change their position at least once.

For cables of radial depth 10 mm and above it shall have an intercolumn paper (paper spacer) inserted between the vertical stacks of strip. This paper shall comply with clause 10 and thickness shall be 100 microns. Width of the paper spacers shall not be less than the value calculated from the following formula.

$$\text{Width} = \frac{(\text{Number of strips} - 3)}{2} \times \text{thickness of enamelled strip}$$

11.3 Application of Paper Covering

11.3.1 General

Each layer of paper shall be continuous, firmly applied and substantially free from creases. No bonding or adhesive material shall be used except to anchor the ends of paper. Any such bonding or adhesive material shall have no adverse effect on transformer oil, insulating paper, or electric strength of the covering.

When papers of different thickness are used, the outermost paper shall be the thickest. The thickness of the paper shall be progressively increased from the innermost to the outermost layer. However, innermost layer may be an exception and can be thicker than the next layer.

11.3.2 Arrangement of layers

All the layers shall be applied in the same direction, all except the two outermost layers shall be butt wound and the two outermost layers shall be applied together with a staggering of 50% so that they are interlocked giving 50% overlap effect. Within each group the positions of the butt joints of any layer relative to the layer below shall be progressively displaced by approximately 30 percent of the paper width.

11.3.3 Paper Thickness for Butt and Overlap Interlocked Wound Layers

Thickness of paper for butt wound layers shall be between 50 µm and 100 µm (both inclusive) Two outermost overlap interlocked layers shall be wound with paper of thickness between 75 and 125 microns (both inclusive). However, when radial insulation is 2.2 mm or more, 140 microns paper for two outermost layers is allowed to avoid two paper covering operations due to availability of a maximum of 24 paper heads in the lapping machine of same manufactures. Special extensible high density and high mechanical strength paper meeting the requirements of clause 10 can be used in the two outermost interlocked layers.

	CORPORATE PURCHASING SPECIFICATION	AA28129
		Rev No. 05
		PAGE 5 of 8

11.3.4 The increase in dimensions due to paper covering shall have tolerance as stated below:

Increase due to the paper covering, mm		Tolerance (%)
Over	Up to and including	
--	0.50	+ 0, -10
0.50	1.25	+ 0, -7.5
1.25	--	+ 0, -5

12 COVERED DIMENSIONS OF TRANSPOSED CABLES

12.1 Method of Calculating covered dimensions

1.	Transposing Factor (Tp)	$T_p = \pi \times ID / (n \times b)$
2.	Nominal Covered Axial Width (AW)	$AW = 2 \times (b + e) + P + l_{cp}$
3.	Tolerance on AW	+0.15 / -0.10
4.	Nominal Covered Radial Depth (RD)	$RD = (n+1)/2 \times (t + e) + P$
5.	Tolerance on RD	
	n	If $T_p \geq 7$ & $t < 2.0$ & $R_p 0.2 \leq 180$ MPa
		For all other cases
	≤ 21	+ 0.30 / -0.20
	23 to 35	+ 0.40 / -0.25
	37 to 55	+ 0.80 / -0.40
	> 55	+ 1.10 / -0.60
6.	Overall covered dimension AW & RD shall be measured under pressure of 100 N/cm ² .	
7.	Abbreviation: ID = Inner diameter of winding n = No. of single strands in transposed cable b = Nominal width of bare single strand t = Nominal thickness of bare single strand e = Nominal increase due to enamel P = Nominal thickness of paper (both side) l _{cp} = Inter column paper, if applicable (100 micron) R _p = 0.2% proof stress value (All dimensions are in mm, if not specified)	

12.2 The measurement of conductor strand / enamel coated strand / bare cable (i.e. without paper covering) shall be made with a suitable ratchet micrometre. The spindle and anvil of the micrometre shall have a diameter of 5 to 8 mm.

12.3 Measuring Method for covered cable

The covered dimension shall be measured at three positions not less than 100 mm apart with suitable gauges under pressure of 1 N/mm². The measurements shall be made on completely straight parts of the transposed cable. The measurement shall include at least one overlap. The average of the three results shall be reported as the covered dimension. The covering shall be removed by any method which does not damage the conductor for three positions used for the measurement of "Covered Dimensions" and "Bare Dimensions" measured at these positions. The difference between "Covered Dimension" and the "Bare Dimension" shall be reported as the increase in dimension due to covering.

12.4 Counter check

The increase in dimensions due to covering shall also be counter checked by adding up the thickness of paper used in each layer. The thickness of paper shall be measured by suitable gauge by stacking the tapes of paper one above the other. Paper tape shall not be folded to form two or more tapes. Length of paper tapes shall not be less than 150 mm. Five measurements shall be made distributed over the stack. The paper thickness shall be computed by dividing by five the mean of the five readings. Measuring pressure shall be 1 N/mm².

AA28129	CORPORATE PURCHASING SPECIFICATION	
Rev No. 05		
PAGE 6 of 8		

Radial insulation so computed in clause 12.4 shall not be less than the minimum allowed (considering the appropriate tolerance) as per clause 11.3.4.

13 TESTS ON FINISHED CABLES

13.1 Insulation test between Strips

The insulation test at 250 V, AC for 1 minute shall be conducted on all drums between each and every other strip in CTC stack. Alternatively, Insulation test can also be done at 500 V DC. There shall be no fault in the insulation. In case of bunched (twin) CTC, this test shall also be conducted between two stacks.

13.2 Breakdown voltage

When tested at room temperature, at least four of the five specimens tested shall not break down at a voltage less than or equal to that given in below, and the fifth shall not break down at less than 50 % of the values specified. When specified in order / QAP, the wire shall be tested at elevated temperature also.

Grade	Minimum breakdown voltage (RMS), V	
	Room temperature	Elevated temperature
1	1000	750

14 TEST CERTIFICATE

Unless otherwise specified, three copies of test certificates shall be supplied along with each consignment. In addition, the supplier shall ensure to enclose one copy of the test certificate along with their despatch documents to facilitate quick clearance of the material.

The test certificate shall bear the following information:


- 1) AA28129, Rev 05: Paper covered continuously Transposed Copper Cable. (0.2% Proof strength). Covered & Bare Dimension of cable, No. and size of individual conductor, increase in dimensions due to paper covering, number of paper layers and thickness of paper in each layer, grade of enamel and length of cable shall be indicated in the test certificate.
- 2) BHEL Order No.
- 3) Manufacturer's / Supplier's Name
- 4) Trade mark, if any
- 5) Batch No. / Lot No.
- 6) No. of drums / Length / Net weight
- 7) Test values obtained for test on conductor, and enamelled and covered transposed cable, as per clauses 5, 6 and 8 to 13
- 8) Test certificate for copper conductor, grade of enamel and paper to be furnished.

15 PACKING AND MARKING

The transposed cable shall be tightly and evenly wound, without twist, on drums in such a direction that when unrolled the exposed edge of the overlap of the outer layer of paper is towards the drum. Drum flanges shall have an arrow mark showing the position of finishing end of cable.

Before winding the cable, a layer of polythene sheet or similar waterproof material shall be wrapped on empty drum. The supplier must ensure that the cable is not wound up to the rim of the drum. A minimum clearance of 30 mm shall be maintained between the outermost cable layer and the drum flange periphery.

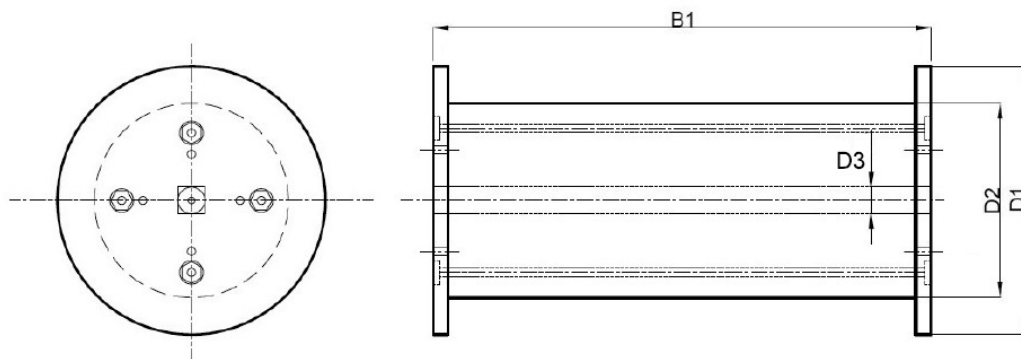
After winding the cable, the sheet edges shall be folded over the cable and then a polythene strip shall be wound on outside.

	CORPORATE PURCHASING SPECIFICATION	AA28129
		Rev No. 05
		PAGE 7 of 8
<p>As a final protection, a layer of waterproof material covering shall be wrapped over the polythene sheet, ensuring that no part of the cable is exposed.</p> <p>Drums used for packing shall be made from seasoned wood. Circular disc separator may be made from plywood. Steel drums may also be used where supported by the supplier's proven practices.</p> <p>The packaging shall be designed to be moisture ingress-proof, and the drums must be securely placed within a container or crate to ensure protection against moisture ingress throughout transit.</p> <p>The dimensions of the drum, based on weight capacity, shall be approximately as specified in ANNEXURE – 1. However, the supplier may use drums of similar size. If the supplier intends to use drums with dimensions that differ significantly from those specified in the annexure, prior approval must be obtained.</p> <p>Metal or non-metal straps used to secure the drum shall be stamped or sealed with the manufacturer's identification marks. Likewise, the conductor's end shall also be stamped or sealed for identification.</p> <p>Each drum shall be labelled clearly stating the following information. Preferably, the label shall be fixed within a recess on the side of the drum flange.</p> <ol style="list-style-type: none"> 1) AA28129 - PAPER COVERED CONTINUOUSLY TRANSPOSED COPPER CABLE (0.2% PROOF STRENGTH) 2) BHEL Order No. 3) Manufacturer's Name / Suppliers Name 4) Maximum covered and bare dimension of cable, No. and size of individual conductor, 5) increase in dimensions due to paper covering, No. of paper layers and thickness of paper. 6) in each layer, grade of enamel and length of cable. 7) Batch No./Lot No. 8) Net weight / Gross weight. <p>16 REFERRED STANDARDS (Latest publications including amendments):</p> <ol style="list-style-type: none"> 1) IEC 60851 2) AA12024 3) AA21111 		

ANNEXURE – 1

Dimensions of Drum

Sl. No.	Flange diameter (D1) (mm)	Barrel diameter (D2) (mm)	Overall width (B1) (mm)	Approx. capacity (kg)
1.	800	600	440	300
2.	900	600	440	480
3.	1000	700	660	890
4.	1200	800	380	700
5.	1200	800	650	1000
6.	1400	900	440	1230
7.	1400	900	580	1730
8.	1400	900	710	2200
9.	1400	900	910	2900
10.	1500	900	750	2200
11.	1600	1000	850	3000
12.	1800	1100	1000	5000



Note: Partition to hold multiple length in a drum shall be at least 12.5 mm thick. Any fixing bolt used in drum must not protrude beyond the flange surface. Bore Diameter (D3) shall be 82 mm.



CORPORATE PURCHASING SPECIFICATION

AA 120 24

Rev. No. 07

PAGE 1 OF 5

ELECTROLYTIC TOUGH PITCH COPPER WIRE BARS / INGOTS / CONTINUOUSLY CAST WIRE RODS / EXTRUDED SECTIONS

1.0 GENERAL:

This specification governs the quality requirements of electrolytic tough pitch copper wire bars, ingots, continuously cast wire rods (cleaned), and extruded sections for electrical purposes, with oxygen content of 400 ppm. max (Controlled oxygen).

2.0 APPLICATION:

2.1 Wire bars/rods / extruded sections are used for rolling / drawing into flats, strips, wires and bars etc for electrical application.

2.2 **Ingots are used for Castings.**

3.0 CONDITION OF DELIVERY:

3.1 **Wire Bars / Ingots : As cast.**

3.2 **Wire Rods – Cleaned : Continuously cast, rolled annealed.**

Total thickness of the copper oxide film shall not exceed 400 Å^o (Angstrom)

3.3 **Extruded Sections : As stated in BHEL order.**

Total thickness of the copper oxide film shall not exceed 400 Å^o (Angstrom).

4.0 COMPLIANCE WITH STANDARDS:

The material shall comply with the requirements of the following national standard and also meet the requirements of this specification.

4.1 Wire Bars / Ingots :

ASTM B5 - 2011	}	Standard Specification for
Gr : ETP-C11000	}	Electrolytic tough Pitch Copper
Oxygen - 400 ppm, max	}	Refinery Shapes

4.2 Wire Rod-Continuously Cast:

ASTM B49 - 2010	}	Copper Redrawn Rod for Electrical
Gr: ETP – C11040	}	Purposes
Oxygen - 400 ppm, max.	}	

Revisions :

Cl: 24.1 of MOM of MRC-NFCW+HE

APPROVED :

**INTERPLANT MATERIAL RATIONALISATION
COMMITTEE-MRC (NFCW+HE)**

Rev. No. 07

Amd.No.

Reaffirmed

Prepared

Issued

Dt. of 1st Issue

Dt:06.06.2012


Dt :


Year :

BHOPAL

Corp. R&D

June, 1977

AA 120 24	CORPORATE PURCHASING SPECIFICATION										
Rev. No. 07											
PAGE 2 OF 5											
<p>4.2 Extruded Sections:</p> <p>Assistance has been drawn from the following:</p> <table style="margin-left: 40px;"> <tr> <td>ASTM B49 - 2010</td> <td>}</td> <td>Copper Redrawn Rod for Electrical</td> </tr> <tr> <td>Gr: ETP – C11040</td> <td>}</td> <td>Purposes</td> </tr> <tr> <td>Oxygen - 400 ppm, max.</td> <td>}</td> <td></td> </tr> </table> <p>5.0 DIMENSIONS AND TOLERANCES :</p> <p>5.1 Sizes:</p> <p>5.1.1 Wire Bars / Ingots:</p> <p>The standard size and shape of wire bars/ingots shall be as per clause 7 of ASTM B5 and shall be as per Fig. 1 or 2 of the standard.</p> <p>Any combination of the six standard sizes / shapes of wire bars/ingots as per Fig.1 or 2 of ASTM B5 is acceptable.</p> <p>5.1.2 Wire Rods:</p> <p>Wire rods shall be supplied in continuous length. The diameter of the bar to be supplied shall be as agreed to between BHEL and the manufacturer.</p> <p>5.1.3 Extruded Sections:</p> <p>Size of the extruded sections shall be as specified in BHEL order.</p> <p>5.2 Tolerances:</p> <p>5.2.1 Wire Bars/Ingots:</p> <p>The permissible variation in dimensions and weights shall be as per ASTM B5.</p> <p>5.2.2 Wire Rods:</p> <p>The permissible tolerance on diameter shall be as per ASTM B49.</p> <p>5.2.3 Extruded Sections:</p> <p>As specified in BHEL order.</p> <p>6.0 MANUFACTURE:</p> <p>6.1 Wire Bars/Ingots :</p> <p>Wire bars/Ingots shall be cast from ETP grade copper having oxygen content of 400 ppm, max.</p>			ASTM B49 - 2010	}	Copper Redrawn Rod for Electrical	Gr: ETP – C11040	}	Purposes	Oxygen - 400 ppm, max.	}	
ASTM B49 - 2010	}	Copper Redrawn Rod for Electrical									
Gr: ETP – C11040	}	Purposes									
Oxygen - 400 ppm, max.	}										

	CORPORATE PURCHASING SPECIFICATION	AA 120 24
		Rev. No. 07
		PAGE 3 OF 5

6.2 Wire Rods:

Wire rods shall be manufactured from continuously cast rods and annealed, from ETP grade copper having oxygen content of 400 ppm, max.

6.3 Extruded Sections:

Extruded sections shall be manufactured from ETP grade copper having oxygen content of 400 ppm, max

7.0 FREEDOM FROM DEFECTS:

7.1 Wire Bars/Ingots:

Wire bars/Ingots shall be substantially free of shrinks, holes, cold sets, pits, sloppy edges, concave tops, etc.

7.2 Wire Rods (Cleaned) & Extruded Sections:

The wire rods/Extruded sections shall have a smooth untarnished surface.

Surface shall be clean, smooth and free from pipes, laps, scale, flakes, cracks, kinks, twists, seams, damaged ends, excessive oil & grease and other injurious defects.

Total thickness of the copper oxide film shall not exceed 400 Å (Angstrom), when tested in accordance with ASTM B 49.

8.0 TEST SAMPLES:

One sample per melt shall be taken for chemical, mechanical and physical properties.

9.0 CHEMICAL COMPOSITION:

The chemical composition of copper shall be as follows:

Copper including silver – 99.90, minimum.


Oxygen content – 400 ppm, maximum.


10.0 PHYSICAL PROPERTIES:

Electrical resistivity when tested in accordance with ASTM E 1004 – Eddy Current probe Method, shall meet the following values.

10.1 Wire Bars/Rods/Extruded Sections:

The maximum mass resistivity for wire rods/bars shall be 0.15328 Ohm g/m² (conductivity 100% minimum IACS) at 20°C, annealed.

AA 120 24	CORPORATE PURCHASING SPECIFICATION	
Rev. No. 07		
PAGE 4 OF 5		
<p>10.2 Ingots</p> <p>The maximum mass resistivity for ingots and ingot bars shall be 0.15694 Ohm g/m² (Conductivity 97.66% minimum IACS) at 20^oC annealed.</p> <p>*Note: Refer IS 613 for temperature correction factor.</p> <p>11.0 MECHANICAL PROPERTIES</p> <p>11.1 Elongation (Wire Rods-Continuously Cast & Extruded Sections).</p> <p>When tested in accordance with IS: 1608 / ASTM B49, the elongation on 250 mm gauge length shall not be less than 30 percent.</p> <p>11.2 Spiral Elongation Number (SEN) (Wire Rods – Continuously Cast):</p> <p>The spiral elongation number (SEN) as per ASTM B49 shall be reported for information in the test certificate.</p> <p>12.0 TEST CERTIFICATES:</p> <p>Unless otherwise specified in the order five copies of test certificates shall be supplied along with each consignment, giving the following information.</p> <p>In addition, the supplier shall ensure to enclose one copy of the test certificate along with the dispatch documents to facilitate quick clearance of the material.</p> <p>The test certificate shall bear the following information:</p> <p>AA 12024, Rev. No.06: Electrolytic Tough Pitch Copper Wire Bars/ Ingots/Continuously Cast Wire</p> <p>BHEL Order No. Supplier's Reference and Name Heat No. /Charge No.</p> <p>Results of Chemical composition, Physical & Mechanical properties and Dimensional measurements.</p> <p>The spiral elongation number (SEN) as per ASTM B 49 shall be reported for information. Consignment/Identification, No.</p>		

	CORPORATE PURCHASING SPECIFICATION	AA 120 24
		Rev. No. 07
		PAGE 5 OF 5

13.0 PACKING AND MARKING:

13.1 Packing:

13.1 Wire Bars / Ingots:

The wire bars/ingots shall be supplied in bundles.

13.1.2 Wire Rods (Continuously Cast) / Extruded Sections:

Wire rods / Extruded sections shall be supplied with wax coating, packed on strong wooden pellets with polyethylene and strapped with steel strips.

13.2 Marking :

Each bundle/package shall be marked with the following information :

AA 12024 : Electrolytic Tough Pitch Copper Wire Bars/ Ingots/Continuously Cast Wire Rods/Extruded Sections..

BHEL Order No

Consignment Identification No.

Size & Weight

Cast No.

Supplier's Name.

14.0 REFERRED STANDARDS (LATEST PUBLICATION INCLUDING AMENDMENTS):

1) ASTM: B5 2) ASTM: B49 3) ASTM: E 1004 4) IS: 613

5) IS: 1608



CORPORATE PURCHASING SPECIFICATION

AA 211 11

Rev. No. 06

PAGE 1 OF 4

KRAFT INSULATING PAPER - HIGH AIR PERMEABILITY**1.0 GENERAL:**

This specification governs the quality requirements of kraft Insulating Paper for electrical purposes made entirely from soft-wood pulp manufactured by the sulphate process. The paper shall be manufactured in natural colour (undyed) and shall be free from metallic particles. The material in insulating oil shall have a temperature index of at least 105.

2.0 APPLICATION:

Used in the manufacturing of the following materials:

AA 21113: Medium phenolic coated soft kraft paper

AA 21114: Thick phenolic coated soft kraft paper

AA 28125: Paper covered rectangular copper conductor

AA 28128: Paper covered rectangular copper conductor-0.1% proof stress.

AA 28501: Paper covered stranded copper conductor

AA 28161: Paper covered round copper conductor

3.0 COMPLIANCE WITH NATIONAL STANDARDS:

The material shall comply, in general, with the requirements of the following National standards and also meet the requirements of this specification.

IS: 9335 (Part 3/Sec.5)-1985 | Cellulosic paper for electrical purposes. Part3: Spec.
Gr.: 5B2-2H1 | for individual materials. Sec.5: Special papers.

IEC 60554-3-5 - 1984 | Cellulosic paper for electrical purposes. Part3: Spec.
Gr.: 5B2-2H1 | for individual materials. Sec.5: Special papers.

4.0 DIMENSIONS AND TOLERANCES:**4.1 Sizes:**

Thickness and width shall be as stated on BHEL order.

4.2 Thickness And Tolerances:

Nominal Thickness and Tolerances shall be in accordance with IEC 60554-3-5 as shown below:

Revisions :

Cl: e-mail dt: 19.01.2004 from BP

APPROVED :

**INTERPLANT MATERIAL
RATIONALISATION COMMITTEE-MRC (E)**

Rev. No. 06

Amd.No.

Reaffirmed

Prepared

Issued

Dt. of 1st Issue

Dt:15.01.2004

Dt :

Year :

BHOPAL

Corp. R&D

JUNE, 1982

AA 211 11	CORPORATE PURCHASING SPECIFICATION	
Rev. No. 06		
PAGE 2 OF 4		

<u>Nominal Thickness, micron</u>		<u>Tolerance, ±%</u>
<u>Over</u>	<u>Upto & Includ.</u>	
-	75	10
75	105	7
105	125	6
125	-	4

4.3 Width:

250, 450, 500, 610, 1015, 1145, 1320, 1400, 1780, 2030, 2285 and 2540mm with a tolerance of ± 5 mm. However any other width can also be ordered.

5.0 FINISH:

The paper shall have smooth but unglazed surface.

6.0 TEST METHODS:

Unless other wise specified, the tests shall be conducted in accordance with the relevant methods of IEC 60554-2/IS:9335 Part 2.

7.0 SAMPLE FOR TEST:

20 sheets of size 300 X 300 mm of ordered thickness suitably packed shall be supplied for testing and approval purposes. Machine direction shall be marked clearly on all the sheets.

8.0 PHYSICAL PROPERTIES:

8.1 Substance (grammage):

<u>Nominal Thickness , μm</u>	<u>Substance ,g/m²</u>	<u>Tolerance, ± %</u>
25	20	10
45	36	10
50	40	10
55	44	10
63	50	5
65	52	5
75	60	5
100	80	5
125	100	5
140	112	5

Note: Substance for intermediate thickness shall be 0.8 times of the thickness, in micron.

8.2 Apparent Density : 0.80 ± 0.05 g/cm³

8.3 Moisture Content : 8%, max.



CORPORATE PURCHASING SPECIFICATION

AA 211 11

Rev. No. 06

PAGE 3 OF 4

8.4 Water absorption (Machine Direction Cross Machine Direction):

Upto and including 40 micron thick	- 4 mm, min.
Above 40 micron to 55 micron thick	- 6 mm, min.
Above 55 micron to 75 micron thick	- 8 mm, min
Above 75 micron thick	- 10 mm, min

8.5 Air permeability : 0.5 to 1.0 $\mu\text{m}/\text{Pa.S}$ **9.0 MECHANICAL PROPERTIES:****9.1 Tensile Strength (Expressed as tensile index):**

Machine Direction (MD)	:	93 Nm/g, min.
Cross Direction (XD)	:	34 Nm/g, min.

9.2 Heat Stability (Type Test):

Paper shall be heated in air at $120^{\circ}\text{C} \pm 2^{\circ}\text{C}$ for 168 hours and following requirements shall be met.

- Increase in Conductivity of aqueous extract shall not be more than 23 ms/m.

9.3 Tear Index:


The material when tested shall show a minimum Internal Tearing Resistance as shown below, expressed as Tear Index.

<u>Weight, g/m^2</u>		<u>Machine Direction, $\text{m N m}^2 / \text{g}, \text{min}$</u>	<u>Cross Direction, $\text{m N m}^2, \text{min}$</u>
Above	Upto & Includ.		
30	80	5.0	6.0
80	120	6.0	7.0
120	-	8.0	9.0

10.0 ELECTRICAL PROPERTIES:**Electric strength in air:**

<u>Thickness, micron</u>		<u>BDV, (kV/mm), min.</u>
Above	Upto & Includ.	
-	90	7
90	120	6.5
120	-	6

Electric Strength shall be determined at room temperature after drying the paper for 1 to 2 hours at $105^{\circ}\text{C} \pm 2^{\circ}\text{C}$ and then tested within 2 minutes of removal from the oven.

AA 211 11	CORPORATE PURCHASING SPECIFICATION	
Rev. No. 06		
PAGE 4 OF 4		

11.0 CHEMICAL PROPERTIES:

Ash Content : 1%, max.

Conductivity of 5% aqueous extract : 10 mS/m, max.

pH of 5% aqueous extract : 6 to 8

12.0 TEST CERTIFICATES:

Unless otherwise specified, three copies of test certificates shall be supplied along with each consignment .

In addition, the supplier shall ensure to enclose one copy of the test certificate along with their despatch documents to facilitate quick clearance of the material.

The test certificate shall bear the following information:

AA 21111 (Rev.No 06): Kraft Insulating Paper - High Air Permeability.
 BHEL order No.
 Manufacturer's/Supplier's Name.
 Batch/Lot No.
 Thickness and Width.
 Net weight/No. of rolls.
 Test values obtained and certificate for Physical, Mechanical, Electrical and Chemical Properties called for in this specification.

13.0 PACKING AND MARKING:

The paper shall be supplied in rolls tightly wound on suitable single piece hollow formers of 70, 75 or 90 mm inside diameter. The rolls shall be adequately wrapped to prevent damage during transport, handling and storage. The ends of the rolls shall be protected during packing to avoid any radial or telescopic deformation.

Each roll shall be clearly and indelibly marked with the following information:

AA 21111: Kraft insulating Paper-High Air permeability.
 BHEL order No.
 Manufacturer's / Supplier's Name
 Batch/Lot No.
 Thickness, Width and outside diameter.
 Net weight.

14.0 REFERRED STANDARDS (Latest Publications Including Amendments) :

1) IS:9335, Part 2 & 3	2) IEC 60554-3-5 and IEC 60554-2	3) AA 21113
4) AA 21114	5) AA 28125	6) AA 28128
8) AA 28161		7) AA 28501

BHARAT HEAVY ELECTRICALS LTD. BHOPAL

Specification TRE 036
Page 1 of 2

EPOXY COATED PAPER COVERED CONTINUOUSLY TRANSPOSED COPPER CABLE (0.1% PROOF STRESS)

1. This specification governs the quality of a continuously transposed Copper cable exactly similar to specification AA 28129 except for the following modification/additional requirements. The cable shall not be manufactured earlier than 30 days from date of despatch since it has a limited shelf life.
2. An extra coating of semi cured ('B' stage) epoxy enamel shall be given over PVA enamel on all the conductors. The coating shall be tack-free at room temperature and it shall be able to fully cure when heated at 130°C for 6 hrs. The increase in dimension due to epoxy coating shall be 0.06 mm ± 0.02 mm and due to enamel coating increase in dimensions shall be 0.085 ± 0.025 mm.
3. Nominal value of 0.1% proof stress of conductor shall be specified on order.
4. Tolerance on overall width and thickness (bar strip + PVA enamel + epoxy) of individual conductor shall be as per clause 11 of specification AA 28129.
5. Paper used for outer covering shall comply to AA 21111 or AA 21116.
6. Insulation test between strips as per Cl.12.1 of AA 28129.

REV.04 : Radial bending test incorporated in Cl. 7.
 09-12-07 *[Signature]*

Rev.01 Clause 4 modified 13/12/91	Issued by: Transformer Engg. Divn. BHEL, Bhopal Date of first issue22-1-91.....
Rev.02 Clause 7 modified 02/06/98	
Rev.03 Clause 6 brought in line with spec. AA 28129. 02-08-98 <i>[Signature]</i>	

Specification TRE 036

Page 2 of 2

7. In order to check the bonding strength of epoxy powder coating , samples after curing should be subjected to "Radial bending test" as per enclosed Annexure-I .
8. Test certificate shall be issued indicating observed and specified values of dimension and tests as per Cl. 13 of AA 28129 and Cl.6 & 7 of TRE 036. Packing and marking will be as per Cl.14 of AA 28129. Packing shall be seaworthy and drums should be kept in a container/crate to avoid ingress of moisture in transit.

REV.04 : Radial bending test incorporated in Cl. 7.

Ent Blank

Rev.01	Clause 4 modified 13/12/91	Issued by:
Rev 02	Clause 2 modified 02/06/98	Transformer Engg. Divn. BHEL, Bhopal
Rev.03	Clause 6 brought in line with spec. AA 28129. 02-08-98 <i>REU</i>	Date of first issue 22-1-91

xrp/tre036.nvp

RADIAL BENDING STRENGTH TEST FOR EPOXY BONDED CTC CABLE

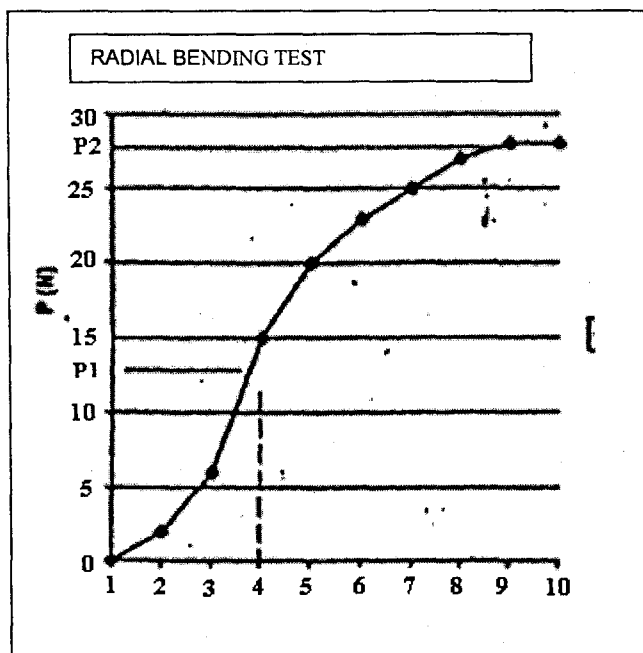
1.0 DETERMINATION OF BONDING STRENGTH/ RADIAL BENDING STRENGTH TEST:

The bonding property is the property of proper bonding of various strands of CTC after curing.

In order to establish the proper bonding the test method as per CI 4.0 shall be followed. From the tests a curve of "P". as function of "f" is obtained, where

P is the force on the cable [N]

f - deflection or flexion [mm]



$$P1 = P2/2$$

$$K = P1/f1$$

f1 f (mm)

The curve gives:

- the value of the maximum load P2
- the ratio K corresponding to the ratio between the half of the maximum load and the corresponding deflection:

$$K = P1 / f1$$

2.0 LIMITATIONS & ASSUMPTIONS:

- The ratio between radial dimension B of the bare CTC and axial dimension H of the bare CTC is:

<5.0 for CTC made with not bondable strands

<4.5 for CTC made with bondable strands

$$B/H = \frac{((n+1)/2)(b+i_E)}{2(h+i_E)}$$

where,

i_E : double-sided thickness of enamel and epoxy if any

- The radial strand dimension $b \leq 3.2$ mm
- The axial strand dimension $h \leq 12.5$ mm

3.0 CALCULATION & TABLES :

The value of P2 is

$$P2 = \epsilon \times h \times n^2 \times b^2 \times 9.81/d \quad (N)$$

Where:

ϵ = coefficient taking into account the number of strands of the CTC as per Table-I

d = distance between the supports

= 150 mm for CTC up to 31 strands

= 300 mm for CTC with more than 31 strands.

Number of strands	<u>Rp 0.2% > 230 MPa</u>	<u>Rp0.2% > 180MPa</u> <u>Rp 0.2% < 230 MPa</u>	<u>Rp 0.2%: ≤ 180 MPa</u>
Up to 23	7.0	5.4	4.4
25	6.6	5.1	4.2
27	6.2	4.8	4.0
29	5.8	4.3	3.7
31	5.0	3.9	3.2
from 33 upto 41	4.6	3.5	3.0
from 43 upto 51	4.0	3.1	2.8
from 53 upto 61	3.6	2.9	2.4
from 63 upto 71	3.2	2.6	2.0
over 73	2.9	2.2	1.8

TABLE I (FOR ϵ)

3.1 CALCULATION FOR K:

The average value of K shall be greater or equal to the value calculated by the following formula:

$$K = \eta \times E \times h \times b^3 \left(\frac{(n-2)^3 + 2}{d^3} \right) \quad (N/mm)$$

Where,

E is the Young modulus of the copper strand & its value is :

- for Rp0.2% ≤ 180 Mpa is considered equal to 80000 N/mm²
- for Rp0.2% > 180 MPa and Rp0.2% ≤ 230 MPa is considered equal to 100 000 N/mm²
- for Rp0.2% > 230 MPa is considered equal to 110 000 N/mm²

η is coefficient depending on the number of strands as per table 2 below :

<u>number of strands</u>	<u>b < 2mm</u>	<u>b ≥ 2mm</u>
upto'15	0.90	0.90
from 17 up to 23	0.90	0.70
25	0.75	0.50
27	0.60	0.45
29	0.55	0.40
31	0.35	0.25
from 33 up to 41	0.40	0.24
from. 43 up to 51	0.24	0.22
from 53 upto 61	0.19	0.17
from 63 up to 71	0.17	0.14
over 73	0.14	0.12

TABLE 2 (For η)

4.0 TEST METHOD

4.1 General

Three CTC specimens with length 450:600 mm shall be prepared as per clause 4.2. Tests to be done as per clause 4.3.

4.2 Specimens

3 specimens for each- supply.

Length of each specimen:

450 mm for CTC with $n < 33$

600 mm for CTC with $n \geq 33$

Sampling

Each specimen shall be cut from the original drum without bending the cable. Strands shall be locked in a suitable way.

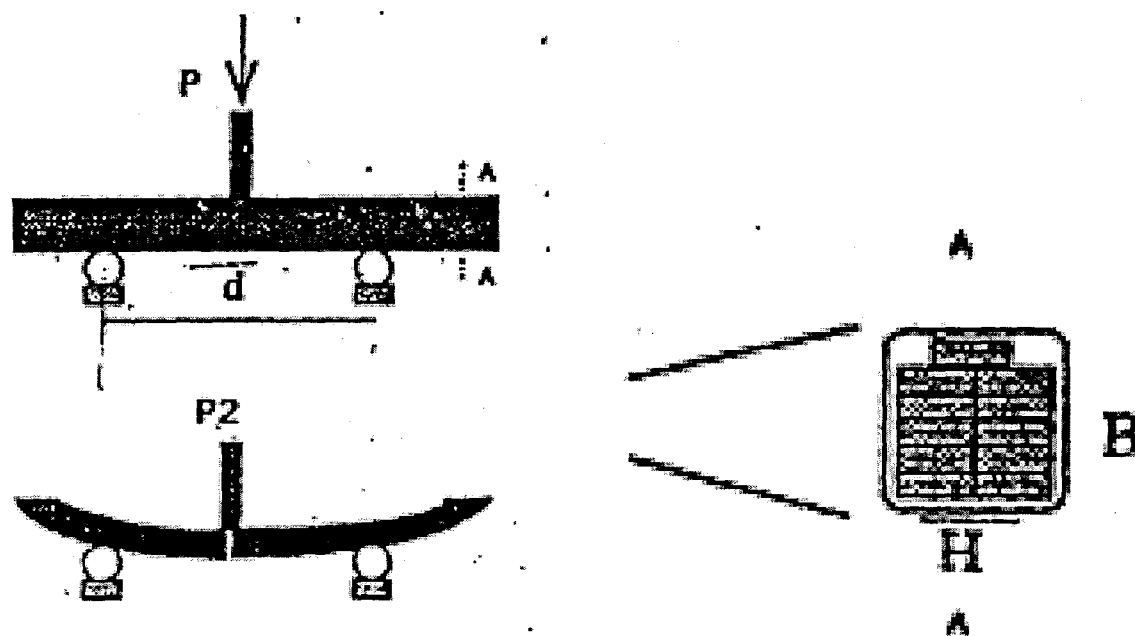
Thermal treatment

The specimens shall by means of a device be shaped to a diameter of 1000 mm and axially loaded with side jaws. Treatment in an oven with air circulation at a temperature of $120 \pm 5^\circ\text{C}$ for 24 hours or at $110 \pm 5^\circ\text{C}$ for 48 hours. Cooling at room temperature for at least 6 hours.

4.3 TEST METHOD

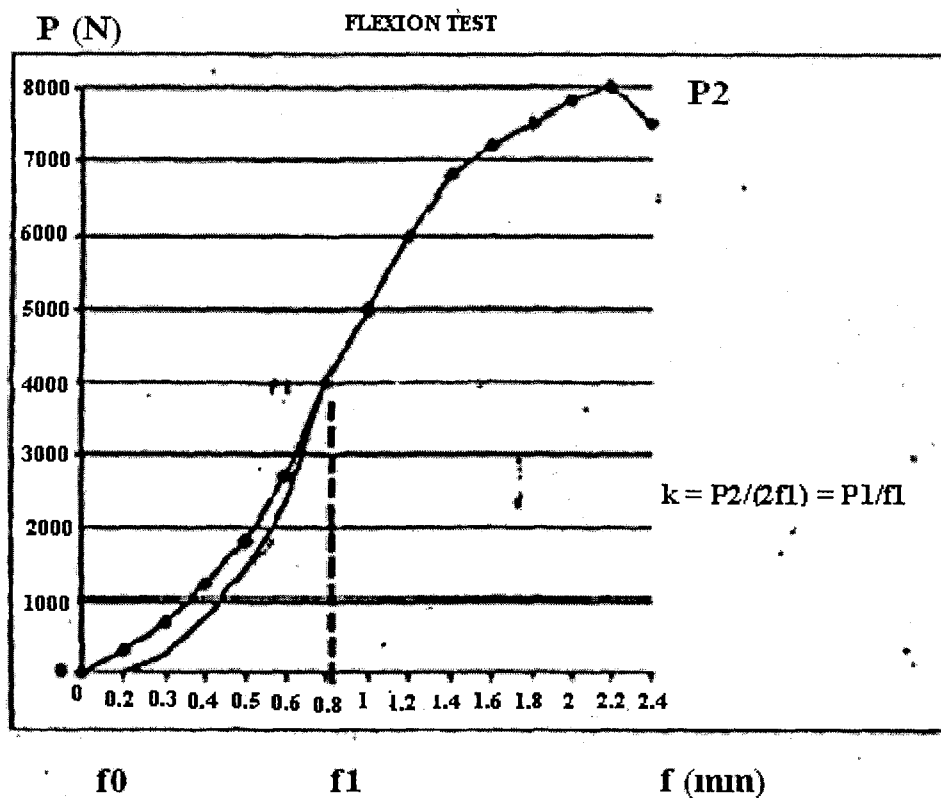
Each sample shall be placed over the cylindrical supports of the flexion machine-with the concave part towards the top and the convex part towards the bottom of the flexion machine.

In case of CTC with ratio $B/H > 3$, it is convenient to take the specimen in the correct position using suitable side-roll supports, without applying any stress.



5.0 RESULTS :

The parameters P2 & K are calculated and average value shall be greater than the values required in Cl. 3.0



$$\text{Example } K = P1/(f1-f0) = 2000/(0.4-0.1) = 6667 \text{ N/mm}$$

6.0 DETAIL OF TEST SET UP :

Flexion machine is composed by a dynamometer, a support device and a plotter. Support device consists of two cylindrical supports at distance of 150 or 300 mm depending on the number of strands of the CTC.

- 150 mm for CTC with $n < 33$
- 300 mm for CTC with ≥ 33

The dynamometer is used in compression with a jaw connected to a cylinder in order to apply the flexional load in the middle of the specimen.

The plotter is used in order to plot the curve of load and flexion.

The support device is placed at the bottom of the dynamometer and the arrow is measured with a strain gauge connected to a touch sensor to the bottom of the specimen.

The touch sensor shall touch an area coincident with the width of the strand, when the spring of the touch sensor is put in tension.

On the plotter the zeroing of the paper is done

The load is gradually applied to the specimen, plotting the diagram of load and arrows.

In order to keep the measurement independent of settling of paper and transpositions, the following test procedure is prescribed:

- Make a dummy test with one of the specimens. This test gives a maximum P2 value where the bonding breaks. $P1 = P2/2$ is calculated.
- On each of the other specimens the load shall be raised up to the theoretical value P1 and then decreased down to zero.. Gives a remaining small flexion f_0 , which is the new, zero point for the flexion.

A load is then applied up to the break of the bonding properties of the specimen. This point is the P2 value for that specimen and is recognized in the diagram when the plotting mark is going towards the bottom showing a significant loss of bonding adhesion. $P1 = P2/2$ is calculated.

- From the load/flexion curve, corresponding P1 and f_1 values can be read.

Calculate the ratio

$$K = P1/(f_1 - f_0)$$

**PRODUCT PURCHASING SPECIFICATION
TRANSFORMER ENGINEERING DEPARTMENT
BHEL BHOPAL**

Specification No. **TRE 218**
Page 1 of 1 Page
Rev. 01 Dt. : 08.09.2018

THERMALLY UPGRADED INSULATING KRAFT PAPER

1. **General** - This specification governs the quality of high density thermally upgraded insulating kraft paper for electrical purposes made entirely from soft-wood pulp manufactured by the sulphate process and upgradation to meet thermal stress. The kraft paper shall be dyed in green colour & shall be free from metallic particles. The material in insulating mineral oil shall have temperature index of at least 120.
2. **Usage** - This paper finds use in power transformer windings.
3. **Compliance with standards** – IEC:60554-3-5 grade 5A4-1M1 + Thermal upgradation.
4. **Sample for test** – 20 sheets of 300 x 300 mm shall be required for testing. Testing shall be as per IEC:60554-2.
5. **Properties** – Shall be as per Table 1 at page 2.
6. **Test certificates** - Unless otherwise stated, test certificates shall be supplied along with each consignment.

In addition, the supplier shall ensure to send one copy of test certificates along with their dispatch documents to facilitate quick clearance of the material.

The test certificates shall bear the information generally as per Table 1 along with nitrogen content.

7. **Packing & marking** - Packing shall be marked legibly at least with the BHEL spec. no., Order No., Quantity, Thickness & width, net/ gross weight & Date of manufacture.

REV	DATE	ALT CHD	REV-01	DATE	ALT CHD	REV 00	NAME	SIGN	DATE
				8.9.18	✓ CHD.	PREP.	S.Sachdeva	-sd-	17.08.18
			COMPLETE SPECIFICATION REVISED.			CHD.	M.Kulkarni	-sd-	17.08.18
DWI/TCB/TRE/010									
25									

**PRODUCT PURCHASING SPECIFICATION
TRANSFORMER ENGINEERING DEPARTMENT
BHEL BHOPAL**

Specification No. **TRE 218**
Page 2 of 2 Pages
Rev. 01 Dt. : 08.09.18

Table 1 – Properties of thermally upgraded insulating kraft paper

Property	Unit	Min.	Nominal	Max.
Nominal thickness	micron	45	50	55
		57	63	69
		68	75	82
		90	100	110
Grammage	g/m ²			
50 micron		47.5	50	52.5
63 micron		62.0	63	68.0
75 micron		71.5	75	78.5
100 micron	95.0	100	105.0	
Apparent bulk density	kg/m ³	950	1000	-
Air permeability	µm/Pa*s	0.05	-	0.10
Moisture content	%	-	-	8.0
Tensile index MD	Nm/g	93.0	-	-
Tensile index CD	Nm/g	35.0	-	-
Elongation MD	%	2.0	-	-
Elongation CD	%	4.0	-	-
Tear index MD	mN*m ² /g			
Up to 75 micron		5.0		
Above 75 micron	mN*m ² /g	6.0		
Tear index CMD	mN*m ² /g			
Up to 75 micron		6.0		
Above 75 micron	mN*m ² /g	7.0		
Electrical strength in Air	kV/mm	8.0	-	-
Ash content	%	-	-	0.5
Conductivity in aqueous extract	mS/m	-	-	4.0
pH in extract	-	6.0	-	8.0
Nitrogen content	%	1.0	-	-

**POLYAMIDE (ARAMID) CALENDER PAPER****1.0 GENERAL:**

This specification governs with the quality requirements calender polyamide (Aramid) paper made from specially formulated polyamide fibres with a high degree of thermal stability. The material is used upto a maximum operating temperature of 220°C.

2.0 APPLICATION:

Used as inter-turn insulation, slot liner of electrical machines.

3.0 COMPLIANCE WITH NATIONAL STANDARDS:

There is no national standard covering this type of material.

4.0 DIMENSIONS AND TOLERANCES:**4.1 Sizes:**

Thickness, width and length of the sheet / tape shall be as specified in BHEL order.

4.1.1 Preferred thickness and Tolerances:

0.05, 0.08, 0.13, 0.18, 0.2, 0.25, 0.3, 0.4, 0.5 and 0.8 mm with tolerances as per Annexure I.

4.1.2 Preferred Width and Tolerances:

Sheet: 600mm and 900mm with tolerance of ± 15 mm.

Tape: 20, 25 and 30 mm with tolerance of ± 0.5 mm.

5.0 FINISH:

The material shall be free from surface or edge defects, inclusions, voids, pin-holes and cracks which may affect its suitability for use. Visual properties shall be consistent from lot to lot.

6.0 TEST SAMPLES:

A roll of at least 50 metres length for tape or 2 m² sample from inner portion of sheet roll of ordered thickness from the same batch shall be supplied for testing and approval.

7.0 PROPERTIES:

When tested in accordance with the relevant clauses of the test methods mentioned against each, the test samples shall show the following values.

Revisions : As per 38th MOM of MRC-E

APPROVED :
INTERPLANT MATERIAL
RATIONALISATION COMMITTEE-MRC (E)

Rev. No. 05

Amd.No.

Reaffirmed

Prepared

Issued

Dt. of 1st Issue

Dt.:20.04.2012

Dt :

Year :

BHOPAL

Corp. R&D

AUGUST, 1983

**7.1 Physical properties:****7.1.1 Moisture absorption:** 8%, maximum

A sample of 75 ± 1 mm x 75 ± 1mm is kept at 90% RH and room temperature (27⁰ ± 2⁰C) for 72 hours.

8.0 TYPE TESTS:**8.1 Mechanical properties**

:

Breaking strength : As per Annexure I

Elongation at break : As per Annexure I

8.2 Electrical Properties:

Electrical strength (BDV) in air at 27 ± 2⁰ C : As per Annexure I

Volume Resistivity (ASTM D –257) : 1 x 10¹⁶ ohm-cm, minimum.

9.0 ACCEPTANCE CRITERIA:

Material shall be accepted on the basis of the following:

- a) Compliance certificate furnished by the supplier
- b) Test certificate furnished by the supplier and / or testing carried out at BHEL end.

10.0 TEST CERTIFICATES:

Unless otherwise stated, three copies of test certificates shall be supplied along with each consignment giving following information:

In addition, the supplier shall ensure to send one copy of test certificate along with the dispatch documents to facilitate quick clearance of the materials.

AA 229 01, Rev 05: Polyamide (Aramid) calender paper.

BHEL order No.

Manufacturers/suppliers Name:

Trade name/mark, if any:

Batch/Lot No.

Quantity supplied

Test results of clauses 4.0, 7.0 and 8.0

11.0 PACKING AND MARKING:

Rolls shall be suitably packed to prevent damage during transit and storage.

Each consignment shall be legibly marked or labeled with the following information:

AA 229 01: Polyamide (Aramid) calender paper

BHEL order No.

Manufacturers/suppliers Name:

Batch/Lot No.

Trade mark, if any

Sizes and Quantity supplied

12.0 REFERRED STANDARDS (Latest Publications Including Amendments):

- 1) ASTM D 257



CORPORATE PURCHASING SPECIFICATION

AA 229 01


Rev. No. 05

PAGE 3 OF 3

ANNEXURE I - CLAUSE 8.0

Nominal Thickness, mm	Tolerance ± mm	Substance g/m ² Tolerance of ±10%	Breaking strength , N/cm width, minimum		Elongation, percent, minimum		Tear strength, N, minimum		Dissipation factor, maximum	Electric strength (BDV) in air at 27±2°C kV/mm, min.
			Machine direction (MD)	Cross machine direction (XD)	Machine direction (MD)	Cross machine direction (XD)	Machine direction (MD)	Cross machine direction (XD)		
0.05	0.01	40	44	19	11	8	0.7	1.6	0.004	19
0.08	0.01	63	70	35	11	9	1.2	2.3	0.005	24
0.13	0.02	120	140	68	16	13	2.4	5.1	0.006	27
0.18 0.2	0.02	170	230	120	19	15	3.6	7.1	0.006	35
0.25	0.03	250	320	160	20	16	5.2	9.8	0.006	33
0.3	0.03	310	390	210	23	19	6.5	12	0.007	34
0.4	0.05	410	490	260	21	17	8.1	15	0.007	33
0.5	0.06	540	670	390	22	17	12	19	0.007	33
0.8	0.10	850	910	610	20	16	--	--	0.007	28

COPYRIGHT AND CONFIDENTIAL
 The information on this document is the property of Bharat Heavy Electricals Limited .
 It must not be used directly or indirectly in any way detrimental to be interest of the company

	CORPORATE PURCHASING SPECIFICATION	AA 28144
		REV NO. 03
		PAGE 1 OF 6

POLYESTERIMIDE ENAMELLED RECTANGULAR COPPER CONDUCTORS
(TEMPERATURE INDEX 155)

- 1. GENERAL:**

This specification governs the quality requirements of rectangular copper conductors, insulated with flexible enamel based on polyesterimide base fine and medium covering with a temperature index of at least 155.
- 2. APPLICATION:**

Used in the windings of Rotating Electrical Machines. ↑
- 3. COMPLIANCE WITH NATIONAL STANDARDS:**

This specification conforms to the following Standards and shall also meet the alternate / additional requirements of this specification. ↑

IS:13730 Pt 16 1996 : Specification for particular types of winding wire- Polyester enameled rectangular copper wires clause 155. ↑

IEC : 60317- 0-2 : Specification for particular types of winding wire Pt. 0 - General Requirements - Section 2 Enamelled Rectangular Copper Wire. ↑
- 4. SIZES :**

The conductor shall be supplied to the sizes specified in our order.
 The sizes shall be preferably selected from Cl. 4 of IS : 13730 Pt . 16 ↑
- 5. JOINTS :**

No joint shall be made in the copper conductor after it is drawn.
 Any joint made during the drawing process shall be resistance welded only.

Revision : Cl.34.1.19 of MOM of MRC- E	APPROVED : INTER PLANT MATERIAL RATIONALISATION COMMITTEE- MRC (E)				
Rev.No. 03 Dt: 23.05.2007	Amd.No. Dt:	Reaffirmed Year:	Prepared BHOPAL	Issued Corp. R&D	Dt.of Ist Issue Dec.1977



CORPORATE PURCHASING SPECIFICATION

AA 28144

REV NO. 03

PAGE 2 OF 6

6. CONDUCTOR :

6.1 Conductor Material :

The conductor shall be manufactured from ETP grade copper , conforming to IS : 191 Part 5 , and shall be of high conductivity, annealed copper .

6.2 TOLERANCES ON NOMINAL DIMENSIONS :

Width of Conductor mm			Tolerance on thickness ± mm			
Over	Up to & incl.	Tol.(±)	Up to 1	Over 1 & Incl. 3	Over 3 & Upto 6	Over 6 & up to 10
-	3	0.03	0.02	0.03	-	-
3	6	0.04	0.02	0.03	0.04	-
6	10	0.07	0.02	0.03	0.04	0.07
10	18	0.10	0.02	0.03	0.04	0.07
18	25	0.10	0.03	0.04	0.06	0.08

6.3 Radius on Corners :

The conductor shall have radius corners, the radius of curvature together with the Tolerances being as given below. The arc shall merge smoothly in to the flat and the conductor shall be free from sharp, rough and projected edges.

Thickness of strip, mm		Nominal Radius on edges in mm	Tolerances (± mm)
Over	up to & incl.		
-	1.2	0.4	0.06
1.2	1.7	0.5	0.08
1.7	2.5	0.6	0.09
2.5	4.0	0.8	0.12
4.0	10.0	1.0	0.15

6.4 Tensile Strength & Elongation :

A sample of conductor 250 mm long between the grips shall be steadily elongated at a rate of 60 to 300 mm/minute until the conductor fractures. The tensile strength and elongation at fracture shall comply with the following requirements :

Nom. Conductor Thickness in mm		Tensile Strength Max.	Elongation at 200 mm G.L.
Over	Up to & incl.	N / m ²	% Min.
0.8	2.5	265	30
2.5	10.0	255	35

**6.5 Hardness :**

Hardness on finished conductor shall not exceed 60 HV.

6.6 Resistance :

The resistance at 20 ° C of a conductor of one meter length and of uniform cross sectional area of 1 mm² shall be taken as 0.01737 ohm max.

7.0 Increase In Dimensions Due To Covering :

The increase in dimensions due to the enamel covering, shall conform to the values given below :

Grade	Increase in Dimension, mm	
	Minimum	Maximum
Fine	0.06	0.11
Medium	0.11	0.16

8.0 ENAMEL COVERING:**8.1 General :**

The conductor shall be completely and uniformly covered with a durable, flexible synthetic enamel polyesterimide base . The enameled conductor shall have a smooth surface, free from embedded particles of dust and other deleterious materials.

8.2 Flexibility And Adherence:

Separate samples of conductors above 2 mm thickness shall be bent, one on edge and one on flat, through 180° round a mandrel of diameter 4 times the bare width of the conductor when bent on edge or four times the bare thickness when bent on flat.

Conductors of upto and including 2 mm thickness shall be pre-elongated by 10 percent and bent through 180° round a mandrel of diameter 9 times the thickness as per the standard procedure.

After bending the samples shall show no cracks and peeling off when examined under a magnification of approximately 10-15 times .

**8.3 Prolonged Heat Shock Test :**

Samples of conductor above 2 mm thickness shall be bent, on flat, through 180° round a mandrel of diameter 4 times the bare thickness of the conductor.

Conductors upto and including 2 mm thickness shall be pre-elongated by 10% and bent through 180° round a mandrel of diameter 9 times the thickness in accordance with the standard procedure.

The samples prepared as above shall be placed in an electrically heated forced air circulation oven at a temperature of $180 \pm 2^\circ \text{C}$ for 48 hours. After removal from the oven, the samples shall be allowed to cool to room temperature and shall show no cracks when examined under a magnification of approximately 10-15 times.

8.4 Thermal Endurance Test :

The manufacturer shall certify that the enameled wire has been made using materials and process that have been shown to give a product which will meet the following requirement.

When tested by the method given in IS : 13778 Pt. 6 / IEC -851 Pt. 6 , temperature $\hat{1}$ corresponding to an extrapolated life 20,000 hours shall be not less than 155°C .

8.5 Hardness of Enamel :

When tested under a thrust of 500 gf the hardness of the pencil which just fails to scrape off the enamel to the bare conductor shall be 5 H minimum.

8.6 Resistance of Enamel to Varnish Solvent :

Six samples of enameled conductors immersed in the solvents xylene butanol (approx. 9 : 1) solvent naphtha, toluene, White spirit, methylated spirit (when specially demanded) butanol, butyl acetal for 24 hours at 10° to 40°C and allowed to dry for 30 minutes after removal. The hardness of enameled conductor so obtained shall not be reduced when compared to that specified in clause 8.5.

8.7 Resistance of Enamel to Insulating Oil :

The enameled conductor bent on flat as described in clause 8.2 & then immersed in oil conforming to IS:335 for 6 hours at $110 \pm 2^\circ \text{C}$ and allowed to cool to room temperature. The hardness of enameled conductor so obtained shall not be reduced when compared to that specified in clause 8.5.

**8.8 Cure Test :**

A sample of the enameled wire shall be conditioned by baking at $130 \pm 2^\circ\text{C}$. for 10 minutes and allowed to cool to room temperature. Not less than 100 mm of the sample shall then be immersed, without bending for 5 minutes in a boiling mixture 30% commercial grade toluene and 70% denatured ethyl alcohol by volume. On removal from the liquid the enamel film shall show no visible swelling or blistering except on the last 10 mm of the immersed end.

8.9 Electric Strength :

When tested at $155 \pm 2^\circ\text{C}$ by the method specified in IS:13730 Pt. 16 the enameled conductor shall not breakdown at a voltage less than specified below :

Grade of covering	Breakdown Voltage Min
Fine	750
Medium	1500

9.0 TEST CERTIFICATES:

Unless otherwise stated, three copies of test certificates shall be supplied along with each consignment . In addition, the supplier shall ensure to enclose one copy of test certificate along with their dispatch documents to facilitate quick clearance of the material.

The test certificate shall bear the following

AA 28144 : Polyesterimide Enamelled Rectangular Copper Conductors
(Rev.No 03) : Conductors. (Temp. Index 155)

BHEL Order No.

Manufacturer's/Supplier's Name.

Batch / Lot No.

Sizes and Quantity Supplied.

Test results / certificate of compliance with clause 6 to 8

Note: On first consignment for establishment of material, the supplier shall indicate the type and make of enamel used for the conductors, with their life time characteristics, for BHEL's approval. The approved enamel as identified by IR spectroscopy or any other suitable instrumental method shall only be used. On subsequent orders, supplier shall furnish a certificate that only the approved enamel have been used.



10. PACKING AND MARKING:

The covered conductor shall be wound on Drum No. 4520 (Dia. Of flange to IS:2069 = 450 MM and approximate capacity = 55 Kgs.) . In all the cases, the covered strip shall be protected against possible damages from the inner faces of the flanges of the drums by lining each flange with stout paper or card.

Each drum shall be marked with the following :
AA 28144 : Polyesterimide Enamelled rectangular Copper conductors
(Temp. Index 155).

BHEL Order No.
Suppliers Name
Size of the Conductor
Quantity

11. Referred Standards (Latest Publications Ind. Amdts)

↑

- | | | | | | |
|----|------------------|----|---------------|----|----------|
| 1. | IS : 13730 Pt.16 | 2. | IEC 60317-0-2 | 3. | IS : 191 |
| 4. | IS : 13778 Pt. 6 | 5. | IEC 851 Pt. 6 | 6. | IS:335 |
| 7. | IS : 2069 | | | | |



BHARAT HEAVY ELECTRICALS LIMITED, BHOPAL
QUALITY PLAN FOR CTC (Continuously Transposed Conductor)

QA PLAN NO: QC/TCB/QAP/BO 55 REV 01

DATE: 27/08/2010 PAGE 1 OF 3

SL	COMPONENT / OPERATION	CHARACTERISTICS	TYPE OF CHECK	REFERENCE DOCUMENT	QUANTUM OF CHECK	INSPECTION AGENCY	REMARKS
Raw material Inspection							
1	Kraft Insulating Paper	<ul style="list-style-type: none"> Thickness Routine tests Type Test (test to be conducted for each manufacturer once in 5 Yrs.) 	M/T	BHEL spec. AA 21111 AA 21116	1 Sample per lot for each thickness	CTC Vendor, BHEL/TPIA	<ul style="list-style-type: none"> - CHP For Record Review - CTC manufacturer shall send one set of samples (20 sheets of size 300mm x 300mm) and paper Manufacturer's test certificates for approval from BHEL Bhopal before use. Complete consignment details e.g. No. of reel, weight, invoice and linking paper shall be sent. - Paper from BHEL Bhopal approved source shall only be used. - CHP For Record Review - Any discrepancy observed in CC rod at any stage of processing should be reported to BHEL with full details stating coil no. nature of defect with photographs. - CC Rod from BHEL Bhopal approved source shall only be used.
2	CC Rod	<ul style="list-style-type: none"> Surface finish. Chemical composition: <ul style="list-style-type: none"> i) Copper including silver ii) Oxygen content. Mass Resistivity. Elongation 	V/T	BHEL spec. AA 12024	1 sample per lot.	CTC Vendor, BHEL/TPIA	<ul style="list-style-type: none"> - CHP For Record Review - Any discrepancy observed in CC rod at any stage of processing should be reported to BHEL with full details stating coil no. nature of defect with photographs. - CC Rod from BHEL Bhopal approved source shall only be used.
3	a) PVA based adhesive used for Kraft paper Bonding b) Enamel and Epoxy coat	<ul style="list-style-type: none"> Type grade & make. Non volatile matter content, consistency, bond strength, pH Value, Compatibility with Transformer oil (Type test) Colour, appearance, Solid contents, Viscosity, Flash point, storage and shelf life of enamel, Compatibility with Transformer Oil 	T	IS 2257 CTC Vendor's spec.	1 sample per lot.	CTC Vendor CTC Vendor	Record review by CTC vendor

Handwritten signature and date: 27/08/2010

Handwritten signature and stamp:
 (CAUTION: For Parts)
 (KAUSAL KUMAR SINGH)
 Sr. Manager (Design) In-charge, Engg.
 B.H.E.L., BHANSI

QA PLAN NO: QC/TCB QAP BO 55 REV 01		DATE: 27-08-2010		PAGE 2 OF 3			
SL	COMPONENT / OPERATION	CHARACTERISTICS	TYPE OF CHECK	REFERENCE DOCUMENT	QUANTUM OF CHECK	INSPECTION AGENCY	REMARKS
In process inspection							
4	Manufacturing and storage area	Proper cleaning of copper dust and normal dust in plant and machinery	V	BHEL Spec AA28125/ AA28128	100%	Vendor	- Surveillance Check By BHEL, TPIA/CC
5	(a) Drawing / Flattening and annealing	- Surface finish - Corner radius - Dimension - Elongation / Proof stress	V/M/T	AA 28127 AA 28129	100% mother reels	CTC Vendor	1-Surface defects like burrs, sharp edges, blisters, flakes, cracks, grease, foreign particles, and embedded impurities are not acceptable. 2-The conductor shall have smooth, bright and polished surface. 3-The enamel coating shall be smooth and continuous, free from streaks, blisters and foreign material.
	(b) Enameling and Epoxy coating	- Surface finish of bare strip - Appearance of enameled strip - Bare and covered Dimensions - Shelf life - Tests: Resistance, Elongation, Proof stress (if applicable), springiness, flexibility and adherence, heat shock, resistance to solvents, BDV	V/M	AA 28127 AA 28129 IEC 317-18 TRE 036	100%	CTC Vendor	Complete records to be maintained by vendor for ensuring traceability from CC rod to Finish stage
	(c) Transposition and Paper Covering	- Visual Inspection - Dimensions of CTC stack - Pitch of Transposition - No. of layers, width and arrangement of paper lapping	V/M/T	AA 28127 AA 28129	100%	CTC Vendor, BHEL/TPIA	CTP for witness of covering for 2 reels of each size. The CTC stack shall be compact in both the directions; there shall be no damage to enamel.
Final inspection							
6	(a) Visual, Dimensions and Insulation covering	- Covered dimension of cable - Increase in dimension due to paper insulation. - Paper covering: Thickness, width, staggering and overlap - Inter column paper - Bare dimensions of cable - Pitch of transposition - Appearance of enameled conductor	V/M	AA 28127 AA 28129 IEC 317-18 TRE 036	3 samples per lot for each size	BHEL/TPIA	CTP for witness

(Handwritten Signature)
 (CAJAY K. SINGH)
 (KAJUSAL ENDRAPALAM)
 Sr. Manager (Design) Int. Engrg.
 BHEL, JHANSI

(Handwritten Signature)
 27/08/2010

QA PLAN NO. QC TCB QAP BO 55 REV 01

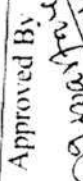
Sl	COMPONENT / OPERATION	CHARACTERISTICS	TYPE OF CHECK	REFERENCE DOCUMENT	QUANTUM OF CHECK	INSPECTION AGENCY	REMARKS
		<ul style="list-style-type: none"> - Increase in thickness due to enameling and epoxy coating. - Corner radius perpendicular ness of edges and merging - Bare thickness and width 					
	(b) Tests	<ul style="list-style-type: none"> - Resistivity - Elongation - Proof stress test (if applicable) - Flexibility and adherence - Springiness - Heat shock - resistance to solvent - BDV 	T	AA 28127 AA 28129 IEC 317-18 TRE 036	1 sample per lot per size	BHEL/TPIA	CHP for witness
7	Packing and Dispatch	<ul style="list-style-type: none"> - Insulation test (between each and every other strip) at 250V - Epoxy curing check - Provision of inter-layer paper. - Sufficient gap from drum brim to packed conductor top - Marking of winding direction. - Use of proper drum size - Proper identification - use of refrigerated container as per PO requirement 	V	AA 28127 AA 28129 TRE 036 TR 10133	100%	CTC Vendor	Surveillance check by BHEL/TPIA

LEGENDS: V - VISUAL, M - MEASUREMENT, T - TEST, TPIA THIRD PARTY INSPECTION AGENCY, CQ- BHEL CORPORATE QUALITY, CHP - CUSTOMER HOLD POINT (VENDOR CAN NOT PROCEED WITHOUT GETTING CLEARANCE FROM BHEL CQ TPIA)

Changes in the revision:
 - Remarks for clause 2 updated.
 - Clause 4 added and renumbering done.


Prepared By

 (S.K. Bhargava)

Approved By

 (J.B. Basfore)
 जे. बी. बासफोर / J.B. BASFORE


एच.बी.एसफोर (जुल-टी.बी.)
 एच.बी.एसफोर (जुल-टी.बी.)
 Addl. General Manager (Quality-T.C.B.)
 बी.एच.ई.एल. भोपाल / B.H.E.L., BHOPAL


 Sr. Manager (Design) (Quality)
 B.H.E.L., JHANSI


MANUFACTURER'S NAME & ADDRESS :		REFERENCE QUALITY PLAN						TO BE FILLED IN BY NTPC			
BHARAT HEAVY ELECTRICALS LIMITED, BHOPAL (Transformer -Division, Piplani, BHOPAL - 462 022)		ITEM :		SIGN OF MFR.		QP NO. : 0000-999-QVE-P-168		REVIEWED BY			
		POWER TRANSFORMER Up to 765 kV CLASS		 Santosh Meena		RAHUL KUDJIGRAMA RAKESH PANGTEY S N TRIPATHI S S MISHRA		APPROVED BY			
SL NO	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY	REMARKS
1	2	3	4	5	M	C/N	7	8	9	M C N	11
1.12	Insulating Oil	e) Flexibility & adherence of enamel covering f) Break down Voltage g) Copper Purity h) Oxygen content a) Kinematic viscosity at 40°C & (-)30°C b) Flash point c) Pour Point d) Appearance e) Density at 20°C f) Interfacial tension at 25°C g) Neutralisation value h) Corrosive sulphur i) Water content j) Anti oxidants additives k) Oxidation Stability l) Sludge % by mass m) Breakdown voltage n) As delivered, kV o) After treatment p) Dissipation factor at 90°C & 40 Hz to 60 Hz q) PCA content r) Impulse withstand level	Major	Test	As per IS/IEC	As per IS/IEC	IEC 60296/NTPC Specification	NTPC Specification	Insp,Record	W	At refinery works, Insulating oil is to be directly dispatched to site Hence, CHP shall be reviewed after final dispatch CHP of Transformer Tank.
1.13	Oil Impregnated Paper (OIP) Condenser Bushing (Applicable for Bushing other than BHEL make)	a) Routine tests b) Nitrogen Pressure test c) Dimensional Check d) Visual inspection	Major	Test	100%	100%	IEC-137 / IS:2099 / IS 2099 : 1986 / Appvd OGA Drawing.	IEC-137 / IS:2099 / IS 2099 : 1986 / Appvd OGA Drawing.	TC or TR	P	For BHEL make Bushings, please refer RQP no. 0000-999-QVE-P-198 BHEL-TRE (Engg.) to review the test results Creepage, lead & CT Length, total height etc

Notes: * RECORDS, IDENTIFIED WITH "TICK" (✓) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION.
 **M: MANUFACTURER, C: MAIN SUPPLIER, N: NTPC, P: Perform, W: Witness and V: Verification as appropriate, CHP: NTPC shall identify in column "N" as W


 Sr. Manager (Design) Terr. Engg.
 B.H.E.L., JHANSI

MANUFACTURER'S NAME & ADDRESS :		REFERENCE QUALITY PLAN						TO BE FILLED IN BY NTPC	
BHARAT HEAVY ELECTRICALS LIMITED, BHOPAL (Transformer-Division, Piplani, BHOPAL - 462 022)		ITEM :		SIGN OF MFR.		APPROVED BY		REMARKS	
		POWER TRANSFORMER Up to 765 kV CLASS		MFR. 		RAHUL KUDIGRAMA RAKESH PANGTEY S N TRIPATHI S S MISHRA		11	
SL NO	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY
1	2	3	4	5	M C/N	7	8	9	M C N
1.14	Resin Impregnated Paper (RIP) Bushing (as applicable)	a) Visual, Type, Model, Rating b) Routine tests c) Leakage (Tightness) Test d) Dimensional Check	Major	Test	100%			TC or TR	P V V
1.15	Marshalling Box & RTCC Panel	a) Dimensional / Visual checks for wiring b) Check for make of components c) 2 kV insulation test on wiring d) Paint shade, thickness and adhesion test e) Degree of protection class	Major	Measure	100%	IEC-60137 / IS:2099 / NTPC Approved Drawing / IS:13947:1993 Pt. 3		TC or TR	P V V
1.16	Bushing C.T.	a) Dimensions b) Routine tests	Major	Measure	100%	IS:2705-92 Approved Drawing / Datasheet		TC or TR	P V V
1.17	Porcelain Bushing (Stock Item)	a) Dimensional & brazing checks b) Visual Checks c) Routine tests	Major	Measure	100%	BHEL Drawing & IS:3347- P5 / IS:2099		TC or TR	P V V
1.18	Buchholz Relay (Stock Item)	a) Type, Size & Make b) Routine tests	Major	Visual	100%	IS:3637 / TR20053B		TC or TR	P V V
1.19	OTI & WTI (local & Remote) (Stock Item)	a) Type, Size & Make b) HV Test c) Calibration	Major	Visual	1sample / lot	TR 10157/TR 10123		TC or TR	P V V
1.20	Gate/Globe Valves - Gunmetal / CI (Stock Item)	a) Dimensional check b) Type, Size & Make c) Leakage Test (Hydraulic test for Body and Seat)	Major	Measure	100%	TR 20036V/TR 20037V		TC or TR	P V V
1.21	Butterfly Valves (Stock Item)	a) Dimensional check b) Type, Size & Make c) Leakage Test (Hydraulic test for Body and Seat)	Major	Measure	100%	TR20034V/TR 20020V		TC or TR	P V V
1.22	Pressure Relief Valve (Stock Item)	a) Dimensions, Type & Make b) Pressure operation test c) Leakage test at 75% rated press. d) HV Test	Major	Measure	1sample / lot	TR 20001V		TC or TR	P V V

LEGEND: * RECORDS, IDENTIFIED WITH "TICK" (✓) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION.
 **M: MANUFACTURER, G: MAIN SUPPLIER, N: NTPC, P: Perform, W: Witness and V: Verification as appropriate, CHP: NTPC shall identify in column "N" as W
 Notes: # NTPC Inspection Engineer to check, approval date/revision no. of reference documents at the time of inspection


 (KAUSHALENDRA SINGH)
 Sr. Manager (Design) Trn. Engrg.
 B.H.E.L., JHANSI

MANUFACTURER'S NAME & ADDRESS :		REFERENCE QUALITY PLAN						TO BE FILLED IN BY NTPC		
BHARAT HEAVY ELECTRICALS LIMITED, BHOPAL (Transformer -Division, Piplani, BHOPAL - 462 022)		ITEM :		QUANTUM OF CHECK		TYPE OF CHECK	CLASS	FORMAT OF RECORD	AGENCY	REMARKS
		POWER TRANSFORMER Up to 765 kV CLASS	REFERENCE DOCUMENT	M	C/N					
1	2	3	4	5	6	7	8	9	10**	11
CHARACTERISTICS e) Pressure test of diverter switch compartment with oil f) Mechanical test of tap selector with motor drive 500 satisfactory operations (in all) from one extrem position to the other in air g) Operation test of complete (functional check) tapchanger - satisfactory operation for one complete cycle h) Auxiliary circuits HV Test at 2KV for 1 min. i) Condition of Silver plating on contacts on the job after 4000 switching operation j) Adhesion & thickness check on silver plated contact		Major -do- -do- -do- -do- -do-	100% -do- -do- -do- -do-	Test -do- -do- -do- -do- -do-	100% -do- -do- -do- -do-	IEC-60214 & BHEL Specification IEC-60214 & BHEL Specification BHEL Specification BHEL Specification	Withstand 0.7 Kg/cm2 for 1Hr. Good condition BHEL Specification	-do- -do- -do- -do- -do- TC or TR	W W W V W V	NA for off Ckt tap switch for outsourced OLTC, BHEL will perform this test & NTPC will verify the same. NA for off Ckt tap switch
1.31	Terminal Connector (Stock Item)	a) Dimensional check b) Surface Finish c) Acceptance tests	Major -do- -do-	Measure Visual Test	As per IS -do- -do-	IS 5561 & NTPC Approved Drawings	TC or TR -do-	P V V	-	-
1.32	Pressure Gauge (Stock Item)	a) Dimensions b) Accuracy check (calibration)	Major -do-	Measure Test	100% -do-	TR 20007P	TC -do-	P V	-	-
1.33	Roller Assembly (Stock Item)	a) Dimensions b) Mechanical properties c) Chemical Properties	Major -do- -do-	Measure Test Test	1Sample/lot -do- -do-	BHEL Drawings & AA1050 I/AA19331	TC or TR -do- -do-	P V V	-	-
1.34	Power / Control Cables (Stock Item)	a) Review of Supplier's TC for physical & electrical tests	Major	Verify	Sample Random	BP 28575/IS 1554	TC	V V	V	V
1.35	Silicagel Breather (Stock Item)	a) Visual check, dimensions b) Pressure Test	Major -do-	Measure Test	100% -do-	TR 20040B	TC -do-	P V	-	-

LEGEND: * RECORDS, IDENTIFIED WITH "TICK" (✓) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION.
 **M: MANUFACTURER, C: MAIN SUPPLIER, N: NTPC, P: Perform, W: Witness and V: Verification as appropriate, CHP: NTPC shall identify in column "N" as W
 Notes: # NTPC Inspection Engineer to check, approval date/revision no. of reference documents at the time of inspection

(K.AUSHALENDRA SINGH)
 Sr. Manager (Design) Trn. Engrg.
 B.H.E.L., JHANSI

MANUFACTURER'S NAME & ADDRESS :		REFERENCE QUALITY PLAN						TO BE FILLED IN BY NTPC		
BHARAT HEAVY ELECTRICALS LIMITED, BHOPAL (Transformer -Division, Piplani, BHOPAL - 462 022)		ITEM :		SIGN OF MFR.		Q.P. NO. :		REVIEWED BY		
		POWER TRANSFORMER Up to 765 kv CLASS		QP/TCB3/161 REV. : 06 DATE : 17.09.2024		RAHUL KUDIGRAMA RAKESH PANGTEY S N TRIPATHI SK LAL		APPROVED BY S S MISHRA		
SL NO	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY	REMARKS
1	2	3	4	5	M C/N	7	8	9	M C N	11
2.00	IN PROCESS CHECKS:									
2.01	Fabrication of Tank, Cover, Conservator - Welding requirement & Painting	a) WPS approval b) PQR & welder qualification c) Welding electrode type d) Check for fit up for butt welds on tank walls, base & cover e) DP test on all load bearing welds as per drawing f) Visual check on weldment for undercuts, contour & uniformity g) Dimensional check after final welding including foundation dimn. h) Rim flatness, fitment of Transformer Tank i) Air Leakage test for: i) Transformer Tank with turret ii) Conservator & Pipes j) Mounting, matching & orientation of Fabricated component k) Surface cleaning by shot blasting l) Primer Application m) Paint film thickness inside & outside, paint shed n) Paint film adhesion test o) Visual checks for any foreign material in the entire tank with conservator, pipes, etc and blanking of ends with bolted plates. p) Pressure test q) Vacuum test r) Review of all previous stage of fabrication of Tank and accessories and final CHP	Major	Verify	Once 100%	Once 100%	BHEL WPS as per ASME Sec IX	QW 482	V	1) BHEL approved WPS, PQR & Welders' qualification Record shall be reviewed by NTPC. 2) Fabrication may be off-loaded to NTPC approved vendor & their names to be incorporated in the endorsement sheet specifying any change of scope of inspection from RQP. 3) i) Wherever bends are coming in the piping, the pipes shall preferably be bent to avoid any butt joints in the pipes. ii) All weld joints should ground flush from inside. iii) In case of doubt, particular weld shall be checked visually from inside. 4) 100% witness by BHEL-QC (No Third Party Inspection Agency is allowed). 5) For End Frame separate QAP QA/TCB/BO/39 shall be applicable 6) UT / RT shall be witnessed by BHEL, NTPC at the Tank manufacturer's works for all butt welds, if any.
			-do-	-do-	100%			TC or TR	V	
			-do-	Visual	-do-		BHEL Drawings	-do-	V	
			-do-	Test	100%		BHEL Drawings / AA0850129	-do-	W	
			Critical	Visual	-do-		BHEL Drawings / AA0622101	-do-	W	
			Major	Measure	One tank of each type		BHEL Drawings	-do-	W	
			Major	-do-	-do-		TR 10015T/ BHEL Drawings	-do-	W	
			-do-	Measure	100%		TR10084T	-do-	W	
			-do-	Measure	100%		BHEL Drawings	-do-	W	
			Critical	Visual & Measure	100%			TC or TR	W	
			-do-	-do-	-do-		TR10005P-Sr No 22 & BHEL Drgs	-do-	W	
			Major	Test	Random spot check			-do-	W	Paint proven for VPD process to be only used. Painting to be done at vendor works. (TR 165/166/167/168)
			-do-	-do-	100%			-do-	W	
			-do-	Visual	100%		BHEL Drawings	-do-	P	The visual inspection shall be done after final painting of pipes.
			-do-	Test	100%		NTPC Specification/IS 2026/IEC-60076	TC / TR	P	Review of all stages and CHP of Fabrication stage and issuance of Final CHP.
			-do-	Test	100%			TC / TR	W	


LEGEND: * RECORDS, IDENTIFIED WITH "TICK" (✓) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION.
 **M: MANUFACTURER, C: MAIN SUPPLIER, N: NTPC, P: Perform, W: Witness and V: Verification as appropriate, CHP: NTPC shall identify in column "N" as W

Notes: # NTPC Inspection Engineer to check, approval date/revision no. of reference documents at the time of inspection

Signature and Stamp of S. S. Mishra, NTPC

MANUFACTURER'S NAME & ADDRESS:		REFERENCE QUALITY PLAN										TO BE FILLED IN BY NTPC	
BHARAT HEAVY ELECTRICALS LIMITED, BHOPAL (Transformer -Division, Piplani, BHOPAL - 462 022)		ITEM :		QF NO.:		SIGN OF MFR.		REVIEWED BY		APPROVED BY		REMARKS	
		POWER TRANSFORMER Up to 765 kV CLASS		QA/TCB/31/161 REV. : 06 DATE : 17.09.2024		Santosh Meena		RAHUL KUDIGRAMA RAKESH PANGTEY S N TRIPATHI S K LAL		SS MISHRA			
SL NO	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY			
1	2	3	4	5	M	C/N	7	8	9	M	C	N	11
2.02	Radiator	a) Surface cleaning of header support & bracing details by sand/shot blasting b) Air leakage test on elements & radiator assembly by water dipping method c) Hot Dip Galvanization d) Paint film thickness & paint shade e) Paint film adhesion test f) Visual checks for any foreign material in the header	Major	Visual	100%	-	BHEL Drawing/TR10005P-Sr No 22	BHEL Drawing/TR10005P-Sr No 22	TC or TR	P	-	-	
			-do-	Test	-do-	-	BHEL Drawing/TR10005P-Sr No 22	No leakage at 2kg/cm2 for 30 secs.	-do-	P	-	-	
			-do-	Test	100%	100%	ISO 12944-5:2018, Table D.1, System no. G5.05. & approved GA drawing and Datasheet		TC or TR	P*	V	V	Galvanising at NTPC approved/accepted sources
			-do-	Measure	Random spot check	100%			-do-	P*	V	V	* BHEL witness in case of Radiator outsourcing.
			-do-	Test	100%	-	BHEL Drawing/ TR10005P-Sr No 22		-do-	P	-	-	
			-do-	Visual	100%	-			-do-	P	-	-	
2.03	Core	a) Lamination thickness & size b) Dia over resiglass tape c) Stack Height d) Yoke bolt tightness	Major	Measure	100%	-	BHEL Drawing		TR	P	-	-	
			-do-	-do-	-do-	-			-do-	P	-	-	
			-do-	Measure	-do-	-			-do-	P	-	-	
			Major	Test	100%	Surveillance check	BHEL Drawing/Plant standard		TR	P	W*	W*	
			-do-	-do-	-do-	Check	TR10041C/BHEL Drawing		-do-	P	W*	W*	
			-do-	Visual	-do-	-do-			-do-	P	W*	W*	
			Major	Test	100%	100%	BHEL Drawing/Plant Std/NTPC Specification.		TR	P	V	V	
			-do-	-do-	-do-	-do-			-do-	P	V	V	
			-do-	-do-	-do-	-do-			-do-	P	V	V	
			-do-	-do-	1 core/design/project	1 core/design/project	TR10260T		-do-	P	V	V	For core having top yoke
2.05	Winding of Coil	a) Brazing procedure & Brazer qualification b) Brazed joints- visual check b) PIGC width & thickness c) Coil ID / OD, radial depth, no. of turns/discs, disc anchoring, spacer block alignment, cross-over & interleaving	Major	Verify	100%	100%	BP0631199 / ASME Sec IX		TR	P	V	V	NTPC to review record of BHEL approved BPS, BQR & Brazer's qualification. BHEL to maintain proper record of brazer deployed for each transformer.
			-do-	Visual	100%	-	BP0631199		TR	P	-	-	
			-do-	Measure	-do-	-			-do-	P	-	-	
			-do-	-do-	-do-	-	BHEL drawing		-do-	P	-	-	

Notes: # NTPC Inspection Engineer to check, approval date/revision no. of reference documents at the time of inspection


 (K.A. LEADERSHIP)
 KAUSHALENDRA SINGH
 Sr. Manager (Design) Trns. Engrg.
 B.H.E.L., JHANSI

MANUFACTURER'S NAME & ADDRESS :		REFERENCE QUALITY PLAN					TO BE FILLED IN BY NTPC			
BHARAT HEAVY ELECTRICALS LIMITED, BIHOPAL (Transformer - Division, Piplani, BIHOPAL - 462 022)		ITEM :		SIGN OF MFR.		QP NO. : 0000-999-QVE-P-168		REVIEWED BY		
		POWER TRANSFORMER Up to 765 kV CLASS		Santosh Meena		RAHUL KUDIGRAMA		APPROVED BY		
QP NO.: QATCB31/161 REV.: 06 DATE: 17.09.2024		REFERENCE DOCUMENT		ACCEPTANCE NORMS		FORMAT OF RECORD		Date: 17.09.2024 Page: 11 of 14		
QP NO.: QATCB31/161 REV.: 06 DATE: 17.09.2024		7		8		9		11		
SL NO	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY	REMARKS
2.08	Tanking	a) Cleanliness of tank b) Electrical Clearances c) Tanking	Major	Visual Measure	-do-	BHEL Drawing / QC-CL	QC-CL	QC-CL	P	BHEL-FRE. to review the test results
2.09	Treatment Process	a) Vacuum Drying-1st Process b) Servicing (visual inspection of active part, tightening of all joints, clamping, coil clamping pressure, etc) c) Vacuum Drying- 2nd Process	Major	Visual	-do-	TR 10266P	TR 10266P	TR	P	- Joint Inspection with BHEL-FRE during services. VPD process record to be furnished for review
2.10	Stage Inspections	a) Review of all previous stage of inspection as per QP prior to final testing.	Major	Physical	100%	Reports / NTPC Specification.	TR 10266P	TC / TR	P	Cleaning of Tap Changer Contacts is to be done CHP
3.00	TYPE TESTS, SPECIAL TESTS & THEIR STAGE INSPECTIONS:									
3.01	Type & Special Tests	a) Review of Test Reports	Critical	Review	100%	NTPC Technical specification/ Applicable Standards	NTPC	Type Test Report	P	NTPC RIO to verify type test clearance from NTPC Engg for complete transformer including bushing, marshalling box, transformer tank (eg: Pressure & Vacuum tests), terminal connector, etc, as per specification / LDA.
4.00	ROUTINE TESTS:									
4.01	Transformer	a) Particle Counting for Oil b) Electric strength (BDV), water content, resistivity, tan delta & interfacial tension for insulating oil c) Measurement of winding resistance of LV & HV at all taps d) Measurement of voltage ratio at all taps, polarity & vector group verification. e) Measurement of no load losses & megnetising current at 90%, 100% & 110% of rated voltage f) Magnetic balance test with low voltage single phase supply of LV side for 3 phase transformer before & after final inspection	Major	Test	100%	TR 10270P	IS 1866	TC / TR	P	
			Major	Test	1 Sample / transformer	IS 2026/IEC-60076/NTPC Specification & NTPC Approved DataSheet			P	
			Critical	Measure	100%				P	
			-do-	-do-	-do-				P	
			-do-	-do-	-do-				P	
			-do-	-do-	-do-				P	

Notes: # NTPC Inspection Engineer to check, approval date/revision no, of reference documents at the time of Inspection


 (Kausik Lal Bhowra Singh)
 Sr. Manager (Design) Trns. Engng.
 B.H.E.L., JHANSI

MANUFACTURER'S NAME & ADDRESS :		REFERENCE QUALITY PLAN						TO BE FILLED IN BY NTPC					
BHARAT HEAVY ELECTRICALS LIMITED, BHOPAL (Transformer -Division, Piplani, BHOPAL - 462 022)		ITEM :	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	SIGN OF MFR.	QP NO. : 0000-999-QVE-P-168	REVIEWED BY	APPROVED BY	
SL NO	COMPONENT & OPERATIONS	CHARACTERISTICS	4	5	M	C/N	7	8	9	10**	M	C	N
1		3	Critical	Measure	100%	100%	IS 2026/IEC-60076/NTPC Specification & NTPC Approved Data Sheet	Santosh Meena	9	10**			
		aa) Isolation test / measurement of insulation resistance between (at 10 KV): i) Core to core clamp ii) Core to tank iii) Core clamp to tank ab) Verification of core earthing ac) Check orientation of components	4	Measure	100%	100%	IS 2026/IEC-60076/NTPC Specification & approved DataSheet		9	10**			
4.02	Marshalling Box	a) 2 kV Test for Aux. wiring b) Degree of protection class check by thin paper insertion method c) Adhesion Test d) Paint, shade, thickness e) Continuity checking of WTLOTL, buchholz relay etc	-do- -do- -do- -do- -do-	Test Test Test -do- -do-	100% 100% Spot check on random basis 100%	100% 100% -do- 100%	BHEL Standard. ASTM D3359 NTPC Specification		TR -do- -do- -do-	W W W W W			
4.03	Composite Monitoring System (CMS)	a) Make & BOM of CMS b) All functional tests including logic checks	-do- -do-	Test Test	100% 100%	100% 100%	NTPC approved Drawing/DataSheet		TR TR	W W			11
5.00	PRE-SHIPMENT CHECKS:												
5.01	Transformer	a) Internal inspection of transformer b) Dew point measurement of N2 / Dry Air at the time of filling & after 24 hours in transformer tank c) Nitrogen gas / Dry Air tightness / pressure d) Installation of impact recorder & functional check on the same in X, Y & Z direction e) Check for proper loading of transformer on road trailer / railway wagon -proper bracing & anchoring	Major Critical -do- -do- Major	Verify Measure Measure/ Verify -do- -do-	100% -do- -do- -do- -do-	Surveillance Check -do- -do- -	BHEL QC-Check List NTPC Specification TR 10165 S Pressure to be maintained at 0.17±0.02 kg/cm2 for 24 hrs or at 0.35±0.02 kg/sq cm for 12 Hrs BHEL Drawings/ NTPC specification. BHEL Standard		QC-CL QC-CL TR TR QC-CL	W* W* V V -			At the time of filling, dew point should be better than -50°C. After 24 hrs dew point should be better than (-)30°C
LEGEND: * RECORDS, IDENTIFIED WITH "TICK" (✓) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION. **M: MANUFACTURER, C: MAIN SUPPLIER, N: NTPC, P: Perform, W: Witness and V: Verification as appropriate, CHP: NTPC shall identify in column "N" as W													


 (KALIKA ALEKHYA SINGH)
 Sr. Manager (Design) Trn. Engrg.
 B.H.E.L., JHANSI

MANUFACTURER'S NAME & ADDRESS :		REFERENCE QUALITY PLAN						TO BE FILLED IN BY NTPC				
BIHARAT HEAVY ELECTRICALS LIMITED, BHOPAL (Transformer -Division, Piplani, BHOPAL - 462 022)		ITEM :		SIGN OF MFR.		REVIEWED BY		APPROVED BY				
		POWER TRANSFORMER Up to 765 kV CLASS		QP NO.: QATCB/31/161 REV.: 06 DATE: 17.09.2024		 Santosh Meena		RAHUL KUDIGRAMA RAKESH PANGTEY S N TRIPATHI S K LAL.		S S MISHRA		
SL NO	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE, NORMS	FORMAT OF RECORD	AGENCY	REMARKS	
1	2	3	4	5	M	C/N	6	7	8	9	10**	11
5.02	Accessories & fittings	a) Proper packing of accessories & fittings b) Cleaning of pipes & blanking of pipe ends with bolted plates	Major	Physical	100%	-	100%	7	8	TR	P V V	11
Abbreviation:												
W* : Customer Hold Point (CHP) - Not to proceed without NTPC clearance TR : Test record issued by BHEL TC : Test certificate / Inspection report / Observation report issued by BHEL Supplier / Vendor W* (Surveillance Check): Specific call will be given before four hours from start of the activity. In case of non-availability of Inspector, BHEL will complete the activity within stipulated time and will proceed to next stage.												
Notes:												
1 In case of difference between BHEL Specification / drawing, the later shall be binding considering comments / deviation mutually agreed between BHEL & NTPC for each contract.												
2 TC correlation for stocked items (having no serial no for identification) will not be possible. For items having unique serial numbers, correlation with TC shall be made.												
3 Revisions of QP-referred purchase specification & plant standards will be submitted to NTPC for review and reference in case revision takes place during contract execution. In addition to Specs / Standard mentioned in RQP; the Specs / stds. as mentioned in contract drgs. of BHEL shall be applicable. Similarly, Revision number of documents / standards will be as per BHEL Design recommendation / drawing / technical specification.												
4 A tentative manufacturing Schedule will be submitted to NTPC (RIO) Bhopal by BHEL to facilitate check the activities in general as and when desired by RIO.												
5 Relevant records should be available with concerned agency (as mentioned in agency column). NTPC may verify them at their discretion at any time.												
6 Quality & inspection of spare will also be guided as per this QP.												
Spare fitting, accessories, components & instruments ordered by NTPC but not covered in this QP shall be accepted as under :-												
a) Items of control cabinet e.g. contactor, overload relay, indicating lamp, push button, rotary switches, etc. shall be VDE / CE / UL / CSA Marking Certification preferably from Third Party Agency or BIS Approval Letter shall be submitted for NTPC's Verification / Information. Despatch clearance will be given based on visual inspection report including type designation and a certificate of conformance issued by BHEL-QC. Other items shall be cleared for despatch on the basis of COC.												
b) CHP clearance will be given after verification of supplier's test certificate or QC (TCB) inspection report for miscellaneous items procured as per BHEL's Spec / drg / called in purchase order.												
8 All pipes / flange openings shall be blanked by bolted plates on flanges to prevent ingress of foreign material.												
9 Serial no. of testing instrument used, its range and calibration status shall form part of final test reports.												
10 All TCs/ Records must be reviewed by BHEL prior to submitting it for NTPC Verification. In case of non availability of original TC with BHEL, the BHEL authenticated xerox copy of the same shall be put up for NTPC review.												
11 The TC/ TR identified as "10" -under Column 9 D* are required to be a part of QA documentation after final completion of the contract.												
12 Relevant IS/IEC along with current specifications covered in RQP shall also be applicable as reference Document. However, NTPC specification shall prevail.												
13 BOI make list is to be furnished alongwith RQP for endorsement for the respective project and package.												
LEGEND: * RECORDS, IDENTIFIED IN COLUMN D WITH "TICK" (✓) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION.												
**M: MANUFACTURER, C: MAIN SUPPLIER, N: NTPC, P: Perform, W: Witness and V: Verification as appropriate, CHP: NTPC shall identify in column "N" as W												
Notes: # NTPC Inspection Engineer to check, approval date/revision no. of reference documents at the time of inspection												

(KAUSHALENDRA SINGH)
 Sr. Manager (Design) (Hrs. Engrg.)
 B.H.E.L., JHANSI