

निविदा / Enquiry



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

Project : UPPTCL SHAMLI GIS

Enquiry No	Enquiry Dt	Rev No	Rev Dt	PI No	Enquiry Type	Inspection by	Due Dt	Commercial Comments	Technical Comments	Signing Authority
09Q2000318	26-Nov-19	0		09I2000373	Package		10-Dec-19	BHEL NIT TERMS AND CONDITION ARE APPLICABLE	BHEL TECHNICAL SPECIFICATION IS APPLICABLE	RAJEEV KUMAR ROY

Document Enclosed

SN	Equipment	HSN Code	Phy Unit	Qty	Plan Dt	Comments
1	CLAMPS & CONNECTORS PG CLAMP FOR SHIELD WIRES OF DIA 10.98MM	0	NO	158.0000		
2	CLAMPS & CONNECTORS CLAMP FOR 10.98MM DIA SHIELD WIRE ON LATTICE / PIPE STRUCTURE	0	NO	788.0000		
3	CLAMPS & CONNECTORS PAD CONNECTOR TO SUIT 10.98MM DIA GS WIRE AND 75X12 MM GS FLAT	0	NO	53.0000		
4	CLAMPS & CONNECTORS CLAMPS FOR 75X12MM EARTHING STRIP ON LATTICE/PIPE STRUCTURE	0	NO	788.0000		
5	SUPPLY- CLAMPS & CONNECTORS : 220KV 40KA FOR 3S LA CONNECTOR SUITABLE FOR TWIN MOOSE	0	NO	7.0000		
6	SUPPLY- CLAMPS & CONNECTORS : 220KV 40KA FOR 3S 1000A WT CONNECTOR SUITABLE FOR SINGLE MOOSE	0	NO	5.0000		
7	SUPPLY- CLAMPS & CONNECTORS : 220KV 40KA FOR 3S 2000A BUSHING CONNECTOR SUITABLE FOR TWIN MOOSE	0	NO	13.0000		
8	SUPPLY- CLAMPS & CONNECTORS : 220KV 40KA FOR 3S 1000A CABLE-SEALING-END CONNECTOR SUITABLE FOR SINGLE MOOSE	0	NO	19.0000		
9	SUPPLY- CLAMPS & CONNECTORS : 220KV 40KA FOR 3S 2000A TEE CONNECTOR SUITABLE FOR TWIN MOOSE TO TWIN CONDUCTOR AS PER TS	0	NO	6.0000		

SN	Equipment	HSN Code	Phy Unit	Qty	Plan Dt	Comments
10	SUPPLY- CLAMPS & CONNECTORS : 220KV 40KA FOR 3S RIGID SPACER SUITABLE FOR TWIN MOOSE	0	NO	53.0000		
11	SUPPLY- CLAMPS & CONNECTORS : STRAIN CLAMP FOR SHIELD WIRE 10.98MM DIA	0	NO	53.0000		
12	SUPPLY- CLAMPS & CONNECTORS : 400KV 50KA FOR 3S 1000A PG CLAMP SUITABLE FOR SINGLE MOOSE TO SINGLE CONDUCTOR AS PER TS	0	NO	53.0000		
13	SUPPLY- CLAMPS & CONNECTORS : 400KV, 50KA FOR 3S, 3150A, GIS BUSHING CONNECTOR SUITABLE FOR AL TUBE 4.5 INCH IPS, EXPANSION TYPE	0	NO	8.0000		
14	SUPPLY- CLAMPS & CONNECTORS : 400KV, BPI CONNECTOR SUITABLE FOR AL TUBE 4.5 INCH IPS, RIGID/SLIDING THROUGH TYPE	0	NO	23.0000		
15	SUPPLY- CLAMPS & CONNECTORS : 400KV, 50KA FOR 3S, 3150A, GIS BUSHING CONNECTOR SUITABLE FOR AL TUBE 4.5 INCH IPS, RIGID TYPE	0	NO	12.0000		
16	SUPPLY- CLAMPS & CONNECTORS : 400KV, 50KA FOR 3S, 3150A, BPI CONNECTOR SUITABLE FOR AL TUBE 4.5 INCH IPS, EXPANSION - EXPANSION TYPE	0	NO	34.0000		
17	SUPPLY- CLAMPS & CONNECTORS : 400KV, 50KA FOR 3S, 3150A, CVT CONNECTOR SUITABLE FOR AL TUBE 4.5 INCH IPS, RIGID TYPE	0	NO	13.0000		
18	SUPPLY- CLAMPS & CONNECTORS : 400KV, 50KA FOR 3S, 3150A, LA CONNECTOR SUITABLE FOR AL TUBE 4.5 INCH IPS, RIGID TYPE	0	NO	23.0000		
19	SUPPLY- CLAMPS & CONNECTORS : 400KV, 50KA FOR 3S, 3150A, WT CONNECTOR SUITABLE FOR QUAD MOOSE	0	NO	17.0000		
20	SUPPLY- CLAMPS & CONNECTORS : 400KV, 50KA FOR 3S, 3150A, ISOLATOR (HDB) CONNECTOR SUITABLE FOR QUAD MOOSE	0	NO	13.0000		
21	SUPPLY- CLAMPS & CONNECTORS : 400KV, 50KA FOR 3S, LA CONNECTOR SUITABLE FOR QUAD MOOSE	0	NO	7.0000		
22	SUPPLY- CLAMPS & CONNECTORS : 400KV, 50KA FOR 3S, 3150A, REACTOR BUSHING CONNECTOR SUITABLE FOR QUAD MOOSE	0	NO	10.0000		
23	SUPPLY- CLAMPS & CONNECTORS : 400KV, 50KA FOR 3S, 3150A, BUSHING CONNECTOR SUITABLE FOR QUAD MOOSE	0	NO	7.0000		
24	SUPPLY- CLAMPS & CONNECTORS : 220KV, 40KA FOR 3S, 2000A, GIS BUSHING CONNECTOR SUITABLE FOR AL TUBE 4.5 INCH IPS, EXPANSION TYPE	0	NO	7.0000		
25	SUPPLY- CLAMPS & CONNECTORS : 220KV, 40KA FOR 3S, 2000A, GIS BUSHING CONNECTOR SUITABLE FOR AL TUBE 4.5 INCH IPS, RIGID TYPE	0	NO	7.0000		
26	SUPPLY- CLAMPS & CONNECTORS : 220KV, 40KA FOR 3S, 2000A, BPI CONNECTOR SUITABLE FOR AL TUBE 4.5 INCH IPS, EXPANSION - EXPANSION TYPE	0	NO	26.0000		
27	SUPPLY- CLAMPS & CONNECTORS : 220KV, BPI CONNECTOR SUITABLE FOR AL TUBE 4.5 INCH IPS, RIGID/SLIDING THROUGH TYPE	0	NO	7.0000		
28	SUPPLY- CLAMPS & CONNECTORS : 220KV, 40KA FOR 3S, 2000A, BPI CONNECTOR SUITABLE FOR TWIN MOOSE	0	NO	21.0000		
29	SUPPLY- CLAMPS & CONNECTORS : 220KV, 40KA FOR 3S, 2000A, CVT CONNECTOR SUITABLE FOR AL TUBE 4.5 INCH IPS, RIGID TYPE	0	NO	19.0000		

SN	Equipment	HSN Code	Phy Unit	Qty	Plan Dt	Comments
30	SUPPLY- CLAMPS & CONNECTORS : 220KV, 40KA FOR 3S, 2000A, LA CONNECTOR SUITABLE FOR AL TUBE 4.5 INCH IPS, RIGID TYPE	0	NO	26.0000		
31	SUPPLY- CLAMPS & CONNECTORS : 132KV, 1000A, CABLE-SEALING-END CONNECTOR SUITABLE FOR SINGLE MOOSE	0	NO	29.0000		
32	SUPPLY- CLAMPS & CONNECTORS : 132KV, 1600A, CABLE-SEALING-END CONNECTOR SUITABLE FOR TWIN MOOSE	0	NO	7.0000		
33	SUPPLY- CLAMPS & CONNECTORS : 132KV, 1600A, LA CONNECTOR SUITABLE FOR TWIN MOOSE	0	NO	7.0000		
34	SUPPLY- CLAMPS & CONNECTORS : 132KV, 1600A, LA CONNECTOR SUITABLE FOR SINGLE MOOSE	0	NO	29.0000		
35	SUPPLY- CLAMPS & CONNECTORS : 132KV, 1600A, BUSHING CONNECTOR SUITABLE FOR TWIN MOOSE	0	NO	7.0000		
36	SUPPLY- CLAMPS & CONNECTORS : 72.5KV, 25KA FOR 3S, 1250A, CB CONNECTOR SUITABLE FOR AL TUBE 3 INCH IPS, EXPANSION TYPE	0	NO	13.0000		
37	SUPPLY- CLAMPS & CONNECTORS : 72.5KV, 25KA FOR 3S, 1250A, CB CONNECTOR SUITABLE FOR AL TUBE 3 INCH IPS, RIGID TYPE	0	NO	7.0000		
38	SUPPLY- CLAMPS & CONNECTORS : 72.5KV, 25KA FOR 3S, 1250A, CT CONNECTOR SUITABLE FOR AL TUBE 3 INCH IPS, EXPANSION TYPE	0	NO	7.0000		
39	SUPPLY- CLAMPS & CONNECTORS : 72.5KV, 25KA FOR 3S, 1000A, LA CONNECTOR SUITABLE FOR SINGLE MOOSE	0	NO	13.0000		
40	SUPPLY- CLAMPS & CONNECTORS : 72.5KV, 25KA FOR 3S, 1250A, CABLE-SEALING-END CONNECTOR SUITABLE FOR TWIN MOOSE	0	NO	7.0000		
41	SUPPLY- CLAMPS & CONNECTORS : 72.5KV, 25KA FOR 3S, 1250A, ISOLATOR (HDB) CONNECTOR SUITABLE FOR AL TUBE 3 INCH IPS, RIGID TYPE	0	NO	7.0000		
42	SUPPLY- CLAMPS & CONNECTORS : 72.5KV, 25KA FOR 3S, 1250A, ISOLATOR (HDB) CONNECTOR SUITABLE FOR AL TUBE 3 INCH IPS, EXPANSION TYPE	0	NO	7.0000		
43	SUPPLY- CLAMPS & CONNECTORS : 72.5KV, 25KA FOR 3S, 1250A, ISOLATOR (HDB) CONNECTOR SUITABLE FOR TWIN MOOSE	0	NO	7.0000		
44	SUPPLY- CLAMPS & CONNECTORS : 72.5KV, 25KA FOR 3S, 1250A, BUSHING CONNECTOR SUITABLE FOR TWIN MOOSE	0	NO	4.0000		
45	SUPPLY- CLAMPS & CONNECTORS : 72.5KV, 25KA FOR 3S, 1250A, BPI CONNECTOR SUITABLE FOR AL TUBE 3 INCH IPS, RIGID/SLIDING THROUGH TYPE	0	NO	7.0000		
46	SUPPLY- CLAMPS & CONNECTORS : 72.5KV, 25KA FOR 3S, 1250A, BPI CONNECTOR SUITABLE FOR AL TUBE 3 INCH IPS, EXPANSION - EXPANSION TYPE	0	NO	17.0000		
47	SUPPLY- CLAMPS & CONNECTORS : 400KV, 50KA FOR 3S, 3150A, FLEXIBLE SPACER SUITABLE FOR QUAD MOOSE	0	NO	105.0000		
48	SUPPLY- CLAMPS & CONNECTORS : 220KV, 40KA FOR 3S, 2000A, FLEXIBLE SPACER SUITABLE FOR TWIN MOOSE	0	NO	42.0000		
49	SUPPLY- CLAMPS & CONNECTORS : 400KV, 50KA FOR 3S, 3150A, RIGID SPACER SUITABLE FOR QUAD MOOSE	0	NO	252.0000		
50	SUPPLY- CLAMPS & CONNECTORS : 400KV, CORONA BELL SUITABLE FOR 4.5 INCH IPS AL TUBE	0	NO	53.0000		
51	SUPPLY- CLAMPS & CONNECTORS : 66KV, END CAP SUITABLE FOR 3 INCH IPS AL TUBE	0	NO	27.0000		

SN	Equipment	HSN Code	Phy Unit	Qty	Plan Dt	Comments
52	SUPPLY- CLAMPS & CONNECTORS : 400KV, 50KA FOR 3S, 3150A, TEE CONNECTOR SUITABLE FOR QUAD MOOSE TO QUAD CONDUCTOR AS PER TS	0	NO	27.0000		
53	SUPPLY- CLAMPS & CONNECTORS : 400KV, 50KA FOR 3S, 3150A, TEE CONNECTOR SUITABLE FOR AL TUBE 4.5 INCH IPS TO QUAD CONDUCTOR AS PER TS	0	NO	37.0000		
54	SUPPLY- CLAMPS & CONNECTORS : 220KV, 40KA FOR 3S, 1000A, TEE CONNECTOR SUITABLE FOR AL TUBE 4.5 INCH IPS TO SINGLE CONDUCTOR AS PER TS	0	NO	21.0000		
55	SUPPLY- CLAMPS & CONNECTORS : 220KV, 40KA FOR 3S, 2000A, TEE CONNECTOR SUITABLE FOR AL TUBE 4.5 INCH IPS TO TWIN CONDUCTOR AS PER TS	0	NO	16.0000		
56	SUPPLY- CLAMPS & CONNECTORS : 220KV, 40KA FOR 3S, 1000A, TEE CONNECTOR SUITABLE FOR SINGLE ZEBRA TO SINGLE CONDUCTOR AS PER TS	0	NO	53.0000		
57	SUPPLY- CLAMPS & CONNECTORS : 72.5KV, 25KA FOR 3S, 1250A, TEE CONNECTOR SUITABLE FOR AL TUBE 3 INCH IPS TO SINGLE CONDUCTOR AS PER TS	0	NO	27.0000		
58	SUPPLY- CLAMPS & CONNECTORS : 72.5KV, 25KA FOR 3S, 1250A, TEE CONNECTOR SUITABLE FOR AL TUBE 3 INCH IPS TO TWIN CONDUCTOR AS PER TS	0	NO	27.0000		
59	SUPPLY- CLAMPS & CONNECTORS : 220KV, 40KA FOR 3S, 1000A, PG CLAMP SUITABLE FOR SINGLE ZEBRA TO SINGLE CONDUCTOR AS PER TS	0	NO	53.0000		
60	SUPPLY- CLAMPS & CONNECTORS : 400KV, 50KA FOR 3S, 3150A, WELDING SLEEVE SUITABLE FOR 4.5 INCH IPS AL TUBE	0	NO	74.0000		
61	SUPPLY- CLAMPS & CONNECTORS : 72.5KV, 25KA FOR 3S, 1250A, WELDING SLEEVE SUITABLE FOR 3 INCH IPS AL TUBE	0	NO	11.0000		
62	SUPPLY- CLAMPS & CONNECTORS : 72.5KV, 25KA FOR 3S, 1250A, CABLE-SEALING-END CONNECTOR SUITABLE FOR AL TUBE 3 INCH IPS, RIGID TYPE	0	NO	13.0000		
63	SUPPLY- CLAMPS & CONNECTORS : 72.5KV, 25KA FOR 3S, 1250A, BPI 90 DEGREE CONNECTOR SUITABLE FOR AL TUBE 3 INCH IPS, EXPANSION - EXPANSION TYPE	0	NO	4.0000		

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

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

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

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

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

(4/5)

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

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

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

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

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

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

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

21/11/19
26-11-19



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

We acknowledge the receipt of tender.

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

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

हस्ताक्षर और निविदाकार की सील / Signature and Seal of Tenderer

Ph: 0120-6748471
Fax: 0120-6748581

Enquiry No : 09Q2000318 Enquiry Dt : 26-Nov-19



SPECIAL TERMS & CONDITIONS

FOR CLAMPS & CONNECTORS FOR UPPTCL SHAMLI PROJECT

Enquiry No:, Dated.....

1. In case any discrepancy between the requirements mentioned under special terms & conditions and general terms & conditions, special terms and conditions shall prevail.
2. For any technical clarification, kindly contact **Mr. MANVENDER SINGH PUNDIR, DY MGR (TBEM) / Mr. SANJEEV SRIVASTAVA, DGM-TBEM**
BHEL, Transmission Business Group
Tower-A, 5th Floor, Advant Navis IT Business Park
Plot-7, Sector-142, Expressway Noida, Noida-201305, UP, India
Phone: +91 (0) 0120- 6748534
Fax: +91 (0) 0120 – 6748580.
E-mail: manvender@bhel.in
3. For any commercial clarification, kindly contact **Rajeev Kumar Roy, Manager (TBMM);**
BHEL, Transmission Business Group
Tower-A, 5th Floor, Advant Navis IT Business Park
Plot-7, Sector-142, Expressway Noida, Noida-201305, UP, India
Phone: +91 (0) 0120- 6748484
Fax: +91 (0) 0120 – 6748580.
Contact No. 0120 6748484; e-mail: rajeevroy@bhel.in.
4. **Bidder to submit offer directly through E-PROCUREMENT MODE ONLY.** Bidder may visit <https://bhel.abcpurchase.com>. No other mode for submission of tender is acceptable. Note: Both bids (Techno-commercial Bid & Price Bid) will be opened immediate after receipt of offer.
5. **Proposed delivery plan: IMMEDIATE.** However, vendor has to examine their best possible delivery plan & mentioned in **ACTIVITY SCHEDULE** to meet the tender delivery requirement. In case, BHEL's delivery requirement is not met by vendor(s), then a chance may be given to all such vendors to review their quoted delivery schedule in line with BHEL's delivery requirement. However, if vendor fails to meet the requisite delivery plan, then BHEL reserves the right not to consider the offer of such vendor(s).
6. **Technical specification No:** BHEL technical specification no: TB-406-316-TS-CC, REV-00 is applicable. No permissible Technical Deviation has been envisaged.
7. **Quantity Variation:** The final quantity may vary at contract stage by +/- 30%, however quantity of individual items may vary up to any extent during detailed engineering stage.
8. **PQR (Pre-qualification requirement):** Bidder must comply with technical specification of tender enquiry otherwise offer is liable for rejection.



SPECIAL TERMS & CONDITIONS

FOR CLAMPS & CONNECTORS FOR UPPTCL SHAMLI PROJECT

Enquiry No:, Dated.....

9. **Clause No. 2.1 of General Terms & Conditions (GTC) for tender Enquiry / Contract should be as follows:**

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

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

10. **PERFORMANCE BG (Refer Clause no-7 of General Terms and condition): Option-B is applicable** in case not opt any option as per NIT condition and cover guarantee period as validity of BG.

11. **DEFECT LIABILITY (GUARANTEE SPECIFIC CLAUSE):** The guarantee period of equipment shall be twelve (12) months from the date of Taking Over plant. **Taking Over plant is 16-01-2021.**

12. **LIQUIDATED DAMAGES FOR DELAYED DELIVERY (Clause No:13 of GTC for tender Enquiry / Contract should be as follows:**

In case of delay in execution of Purchase Order beyond the contractual delivery time, an amount of 0.5% of the total PO ex-works value for supply (excluding taxes and duties, freight & insurance as applicable) per week of delay or part thereof subject to a maximum of 10% of the total Purchase Order ex-works value for supply (excluding taxes and duties, freight & insurance as applicable) shall be deducted as Liquidated Damages (LD) along with applicable GST (if any) on LD

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

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

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

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

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

SPECIAL TERMS & CONDITIONS

FOR CLAMPS & CONNECTORS FOR UPPTCL SHAMLI PROJECT

Enquiry No:, Dated.....

specifically agrees to this condition and undertakes to execute the contract on thus awarded rates.

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

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

In addition to above RA guidelines, bidder note that

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

If L1 bid is not from a 'Local Supplier', the lowest evaluated bidder among the 'Local Suppliers' based on the ranking of the price after RA, will be invited to match the L1 price provided 'Local Supplier's price is within the Margin of Purchase Preference i.e. +20% of L1 price. In case such local supplier agrees to match the price of L-1 Bidder, such local supplier may be considered for further award of work. In case such lowest eligible 'Local Supplier' fails to match the L1 price, the eligible 'Local Supplier' with the next higher bid within the Margin of Purchase Preference (i.e 20% of L-1 Price) as above shall be invited to match the L1 price, and so on, and may be considered for award of work accordingly. In case none of the 'Local Suppliers' within the Margin of Purchase Preference (i.e. 20% of L-1 price) matches the L1 price, then the L1 bidder may be considered for award of work.

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

14. **PRICE BID FORMAT:** Vendor to quote as per specified price format of NIT, otherwise their offer shall be liable to be rejected.

15. **IMPORTANT INSTRUCTION:**

- Final acceptance of technical qualified vendor for placement of order is subject to approval of CUSTOMER (UPPTCL).
- Bidder who are not approved by customer, needs to submit complete credential for approval from CUSTOMER & placement of order is subject to approval of CUSTOMER.
- All boxes / Containers are to be distinctly marked with boldly written "TBG" mark on it.

SPECIAL TERMS & CONDITIONS
FOR CLAMPS & CONNECTORS FOR UPPTCL SHAMLI PROJECT

Enquiry No:, Dated.....

- PO/LOI shall be placed to L1 bidder project wise. However evaluation shall be done based on overall quantity as per NIT.

16. **Promotion of MAKE IN INDIA:** For this procurement, Public Procurement (Preference to Make in India), Order 2017 dated 15.06.2017 & 28.05.2018 and subsequent orders issued by the respective nodal ministry shall be applicable even if issued after issue of this NIT but before finalization of contract/PO/WO against this NIT.

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

http://dipp.nic.in/sites/default/files/publicProcurement_MakeinIndia_15June2017.pdf

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

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

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

Note: Bidder to submit FORMAT duly filled & signed and stamped by their authorized persons. It is mandatory against this NIT. Minimum Local content is 50% (being transmission/sub-station package).

17. Following confirmation to be provided by vendor:

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

NAME & SEAL OF TENDERER

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SCHEDULE OF PRICE BID

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

PROJECT: UPPTCL SHAMLI PROJECT

ENQUIRY NO:

ITEM: CLAMPS & CONNECTORS

SN	DESCRIPTION OF ITEM (As per Tech Spec. TB-406-316-TS-CC)	UNIT	QTY	HSN CODE	UNIT PRICE EX. WORKS (Rs.)	TOTAL EX. WORKS (Rs.)	UNIT FREIGHT & INSURANCE UP TO SITE (Rs.)	TOTAL FREIGHT & INSURANCE UP TO SITE (Rs.)	GST @.....% OF TOTAL EX- WORKS (Rs.)	GST @.....% OF (TOTAL FREIGHT & INSURANCE UP TO SITE)	TOTAL F.O.R. DESTINATION PRICE
1	SUPPLY- CLAMPS & CONNECTORS : 72.5KV, 25KA FOR 3S, 1250A, WELDING SLEEVE SUITABLE FOR 3 INCH IPS AL TUBE	NO	11								
2	SUPPLY- CLAMPS & CONNECTORS : 72.5KV, 25KA FOR 3S, 1250A, TEE CONNECTOR SUITABLE FOR AL TUBE 3 INCH IPS TO TWIN CONDUCTOR AS PER TS	NO	27								
3	SUPPLY- CLAMPS & CONNECTORS : 72.5KV, 25KA FOR 3S, 1250A, TEE CONNECTOR SUITABLE FOR AL TUBE 3 INCH IPS TO SINGLE CONDUCTOR AS PER TS	NO	27								
4	SUPPLY- CLAMPS & CONNECTORS : 72.5KV, 25KA FOR 3S, 1250A, ISOLATOR (HDB) CONNECTOR SUITABLE FOR TWIN MOOSE	NO	7								
5	SUPPLY- CLAMPS & CONNECTORS : 72.5KV, 25KA FOR 3S, 1250A, ISOLATOR (HDB) CONNECTOR SUITABLE FOR AL TUBE 3 INCH IPS, RIGID TYPE	NO	7								
6	SUPPLY- CLAMPS & CONNECTORS : 72.5KV, 25KA FOR 3S, 1250A, ISOLATOR (HDB) CONNECTOR SUITABLE FOR AL TUBE 3 INCH IPS, EXPANSION TYPE	NO	7								
7	SUPPLY- CLAMPS & CONNECTORS : 72.5KV, 25KA FOR 3S, 1250A, CT CONNECTOR SUITABLE FOR AL TUBE 3 INCH IPS, EXPANSION TYPE	NO	7								
8	SUPPLY- CLAMPS & CONNECTORS : 72.5KV, 25KA FOR 3S, 1250A, CB CONNECTOR SUITABLE FOR AL TUBE 3 INCH IPS, RIGID TYPE	NO	7								
9	SUPPLY- CLAMPS & CONNECTORS : 72.5KV, 25KA FOR 3S, 1250A, CB CONNECTOR SUITABLE FOR AL TUBE 3 INCH IPS, EXPANSION TYPE	NO	13								
10	SUPPLY- CLAMPS & CONNECTORS : 72.5KV, 25KA FOR 3S, 1250A, CABLE-SEALING-END CONNECTOR SUITABLE FOR TWIN MOOSE	NO	7								
11	SUPPLY- CLAMPS & CONNECTORS : 72.5KV, 25KA FOR 3S, 1250A, CABLE-SEALING-END CONNECTOR SUITABLE FOR AL TUBE 3 INCH IPS, RIGID TYPE	NO	13								
12	SUPPLY- CLAMPS & CONNECTORS : 72.5KV, 25KA FOR 3S, 1250A, BUSHING CONNECTOR SUITABLE FOR TWIN MOOSE	NO	4								
13	SUPPLY- CLAMPS & CONNECTORS : 72.5KV, 25KA FOR 3S, 1250A, BPI CONNECTOR SUITABLE FOR AL TUBE 3 INCH IPS, RIGID/SLIDING THROUGH TYPE	NO	7								
14	SUPPLY- CLAMPS & CONNECTORS : 72.5KV, 25KA FOR 3S, 1250A, BPI CONNECTOR SUITABLE FOR AL TUBE 3 INCH IPS, EXPANSION - EXPANSION TYPE	NO	17								
15	SUPPLY- CLAMPS & CONNECTORS : 72.5KV, 25KA FOR 3S, 1250A, BPI 90 DEGREE CONNECTOR SUITABLE FOR AL TUBE 3 INCH IPS, EXPANSION - EXPANSION TYPE	NO	4								
16	SUPPLY- CLAMPS & CONNECTORS : 72.5KV, 25KA FOR 3S, 1000A, LA CONNECTOR SUITABLE FOR SINGLE MOOSE	NO	13								
17	SUPPLY- CLAMPS & CONNECTORS : 66KV, END CAP SUITABLE FOR 3 INCH IPS AL TUBE	NO	27								
18	SUPPLY- CLAMPS & CONNECTORS : 400KV, 50KA FOR 3S, 3150A, WT CONNECTOR SUITABLE FOR QUAD MOOSE	NO	17								
19	SUPPLY- CLAMPS & CONNECTORS : 400KV, 50KA FOR 3S, 3150A, WELDING SLEEVE SUITABLE FOR 4.5 INCH IPS AL TUBE	NO	74								
20	SUPPLY- CLAMPS & CONNECTORS : 400KV, 50KA FOR 3S, 3150A, TEE CONNECTOR SUITABLE FOR QUAD MOOSE TO QUAD CONDUCTOR AS PER TS	NO	27								
21	SUPPLY- CLAMPS & CONNECTORS : 400KV, 50KA FOR 3S, 3150A, TEE CONNECTOR SUITABLE FOR AL TUBE 4.5 INCH IPS TO QUAD CONDUCTOR AS PER TS	NO	37								
22	SUPPLY- CLAMPS & CONNECTORS : 400KV, 50KA FOR 3S, 3150A, RIGID SPACER SUITABLE FOR QUAD MOOSE	NO	252								
23	SUPPLY- CLAMPS & CONNECTORS : 400KV, 50KA FOR 3S, 3150A, REACTOR BUSHING CONNECTOR SUITABLE FOR QUAD MOOSE	NO	10								
24	SUPPLY- CLAMPS & CONNECTORS : 400KV, 50KA FOR 3S, 3150A, LA CONNECTOR SUITABLE FOR AL TUBE 4.5 INCH IPS, RIGID TYPE	NO	23								
25	SUPPLY- CLAMPS & CONNECTORS : 400KV, 50KA FOR 3S, 3150A, ISOLATOR (HDB) CONNECTOR SUITABLE FOR QUAD MOOSE	NO	13								
26	SUPPLY- CLAMPS & CONNECTORS : 400KV, 50KA FOR 3S, 3150A, GIS BUSHING CONNECTOR SUITABLE FOR AL TUBE 4.5 INCH IPS, RIGID TYPE	NO	12								
27	SUPPLY- CLAMPS & CONNECTORS : 400KV, 50KA FOR 3S, 3150A, GIS BUSHING CONNECTOR SUITABLE FOR AL TUBE 4.5 INCH IPS, EXPANSION TYPE	NO	8								

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SCHEDULE OF PRICE BID

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

PROJECT: UPPTCL SHAMLI PROJECT

ENQUIRY NO:

ITEM: CLAMPS & CONNECTORS

SN	DESCRIPTION OF ITEM (As per Tech Spec. TB-406-316-TS-CC)	UNIT	QTY	HSN CODE	UNIT PRICE EX. WORKS (Rs.)	TOTAL EX. WORKS (Rs.)	UNIT FREIGHT & INSURANCE UP TO SITE (Rs.)	TOTAL FREIGHT & INSURANCE UP TO SITE (Rs.)	GST @.....% OF TOTAL EX- WORKS (Rs.)	GST @.....% OF (TOTAL FREIGHT & INSURANCE UP TO SITE)	TOTAL F.O.R. DESTINATION PRICE
28	SUPPLY- CLAMPS & CONNECTORS : 400KV, 50KA FOR 3S, 3150A, FLEXIBLE SPACER SUITABLE FOR QUAD MOOSE	NO	105								
29	SUPPLY- CLAMPS & CONNECTORS : 400KV, 50KA FOR 3S, 3150A, CVT CONNECTOR SUITABLE FOR AL TUBE 4.5 INCH IPS, RIGID TYPE	NO	13								
30	SUPPLY- CLAMPS & CONNECTORS : 400KV, 50KA FOR 3S, 3150A, BUSHING CONNECTOR SUITABLE FOR QUAD MOOSE	NO	7								
31	SUPPLY- CLAMPS & CONNECTORS : 400KV, 50KA FOR 3S, 3150A, BPI CONNECTOR SUITABLE FOR AL TUBE 4.5 INCH IPS, EXPANSION - EXPANSION TYPE	NO	34								
32	SUPPLY- CLAMPS & CONNECTORS : 400KV, 50KA FOR 3S, LA CONNECTOR SUITABLE FOR QUAD MOOSE	NO	7								
33	SUPPLY- CLAMPS & CONNECTORS : 400KV, CORONA BELL SUITABLE FOR 4.5 INCH IPS AL TUBE	NO	53								
	SUPPLY- CLAMPS & CONNECTORS : 400KV, BPI CONNECTOR SUITABLE FOR AL TUBE 4.5 INCH IPS, RIGID/SLIDING THROUGH TYPE	NO	23								
35	SUPPLY- CLAMPS & CONNECTORS : 400KV, 50KA FOR 3S, 1000A PG CLAMP SUITABLE FOR SINGLE MOOSE TO SINGLE CONDUCTOR AS PER TS	NO	53								
36	SUPPLY- CLAMPS & CONNECTORS : 220KV, 40KA FOR 3S, 2000A, TEE CONNECTOR SUITABLE FOR AL TUBE 4.5 INCH IPS TO TWIN CONDUCTOR AS PER TS	NO	16								
37	SUPPLY- CLAMPS & CONNECTORS : 220KV, 40KA FOR 3S, 2000A, LA CONNECTOR SUITABLE FOR AL TUBE 4.5 INCH IPS, RIGID TYPE	NO	26								
38	SUPPLY- CLAMPS & CONNECTORS : 220KV, 40KA FOR 3S, 2000A, GIS BUSHING CONNECTOR SUITABLE FOR AL TUBE 4.5 INCH IPS, RIGID TYPE	NO	7								
39	SUPPLY- CLAMPS & CONNECTORS : 220KV, 40KA FOR 3S, 2000A, GIS BUSHING CONNECTOR SUITABLE FOR AL TUBE 4.5 INCH IPS, EXPANSION TYPE	NO	7								
40	SUPPLY- CLAMPS & CONNECTORS : 220KV, 40KA FOR 3S, 2000A, FLEXIBLE SPACER SUITABLE FOR TWIN MOOSE	NO	42								
41	SUPPLY- CLAMPS & CONNECTORS : 220KV, 40KA FOR 3S, 2000A, CVT CONNECTOR SUITABLE FOR AL TUBE 4.5 INCH IPS, RIGID TYPE	NO	19								
42	SUPPLY- CLAMPS & CONNECTORS : 220KV, 40KA FOR 3S, 2000A, BPI CONNECTOR SUITABLE FOR TWIN MOOSE	NO	21								
43	SUPPLY- CLAMPS & CONNECTORS : 220KV, 40KA FOR 3S, 2000A, BPI CONNECTOR SUITABLE FOR AL TUBE 4.5 INCH IPS, EXPANSION - EXPANSION TYPE	NO	26								
44	SUPPLY- CLAMPS & CONNECTORS : 220KV, 40KA FOR 3S, 1000A, TEE CONNECTOR SUITABLE FOR SINGLE ZEBRA TO SINGLE CONDUCTOR AS PER TS	NO	53								
	SUPPLY- CLAMPS & CONNECTORS : 220KV, 40KA FOR 3S, 1000A, TEE CONNECTOR SUITABLE FOR AL TUBE 4.5 INCH IPS TO SINGLE CONDUCTOR AS PER TS	NO	21								
46	SUPPLY- CLAMPS & CONNECTORS : 220KV, 40KA FOR 3S, 1000A, PG CLAMP SUITABLE FOR SINGLE ZEBRA TO SINGLE CONDUCTOR AS PER TS	NO	53								
47	SUPPLY- CLAMPS & CONNECTORS : 220KV, BPI CONNECTOR SUITABLE FOR AL TUBE 4.5 INCH IPS, RIGID/SLIDING THROUGH TYPE	NO	7								
48	SUPPLY- CLAMPS & CONNECTORS : 220KV, 40KA FOR 3S, 2000A, TEE CONNECTOR SUITABLE FOR TWIN MOOSE TO TWIN CONDUCTOR AS PER TS	NO	6								
49	SUPPLY- CLAMPS & CONNECTORS : 220KV, 40KA FOR 3S, 2000A, BUSHING CONNECTOR SUITABLE FOR TWIN MOOSE	NO	13								
50	SUPPLY- CLAMPS & CONNECTORS : 220KV, 40KA FOR 3S, 1000A, WT CONNECTOR SUITABLE FOR SINGLE MOOSE	NO	5								
51	SUPPLY- CLAMPS & CONNECTORS : 220KV, 40KA FOR 3S, 1000A, CABLE-SEALING-END CONNECTOR SUITABLE FOR SINGLE MOOSE	NO	19								
52	SUPPLY- CLAMPS & CONNECTORS : 220KV, 40KA FOR 3S, RIGID SPACER SUITABLE FOR TWIN MOOSE	NO	53								
53	SUPPLY- CLAMPS & CONNECTORS : 220KV, 40KA FOR 3S, LA CONNECTOR SUITABLE FOR TWIN MOOSE	NO	7								
54	SUPPLY- CLAMPS & CONNECTORS : 132KV, 1600A, LA CONNECTOR SUITABLE FOR TWIN MOOSE	NO	7								
55	SUPPLY- CLAMPS & CONNECTORS : 132KV, 1600A, LA CONNECTOR SUITABLE FOR SINGLE MOOSE	NO	29								

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SCHEDULE OF PRICE BID

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

PROJECT: UPPTCL SHAMLI PROJECT

ENQUIRY NO:

ITEM: CLAMPS & CONNECTORS

SN	DESCRIPTION OF ITEM (As per Tech Spec. TB-406-316-TS-CC)	UNIT	QTY	HSN CODE	UNIT PRICE EX. WORKS (Rs.)	TOTAL EX. WORKS (Rs.)	UNIT FREIGHT & INSURANCE UP TO SITE (Rs.)	TOTAL FREIGHT & INSURANCE UP TO SITE (Rs.)	GST @.....% OF TOTAL EX- WORKS (Rs.)	GST @.....% OF (TOTAL FREIGHT & INSURANCE UP TO SITE)	TOTAL F.O.R. DESTINATION PRICE
56	SUPPLY: CLAMPS & CONNECTORS : 132KV, 1600A, CABLE-SEALING- END CONNECTOR SUITABLE FOR TWIN MOOSE	NO	7								
57	SUPPLY: CLAMPS & CONNECTORS : 132KV, 1600A, BUSHING CONNECTOR SUITABLE FOR TWIN MOOSE	NO	7								
58	SUPPLY: CLAMPS & CONNECTORS : 132KV, 1000A, CABLE-SEALING- END CONNECTOR SUITABLE FOR SINGLE MOOSE	NO	29								
59	SUPPLY: CLAMPS & CONNECTORS : STRAIN CLAMP FOR SHIELD WIRE 10.98MM DIA	NO	53								
60	CLAMPS & CONNECTORS PG CLAMP FOR SHIELD WIRES OF DIA 10.98MM	NO	158								
61	CLAMPS & CONNECTORS PAD CONNECTOR TO SUIT 10.98MM DIA GS WIRE AND 75X12 MM GS FLAT	NO	53								
62	CLAMPS & CONNECTORS CLAMPS FOR 75X12MM EARTHING STRIP ON LATTICE/PIPE STRUCTURE	NO	788								
63	CLAMPS & CONNECTORS CLAMP FOR 10.98MM DIA SHIELD WIRE ON LATTICE / PIPE STRUCTURE	NO	788								
A	TOTAL DELIVERED COST TO BHEL=										

NOTE:

1. PLEASE NOTE THAT UNPRICED COPY OF PRICE BID (i.e. WITH ALL PRICES BLANKED) SHALL BE FURNISHED ALONG WITH TECHNO-COMMERCIAL BID.
2. REQUIRED COPIES OF FORMAT BE MADE & DETAILS MAY BE ANNEXED.
3. THE PRICES MUST BE QUOTED IN THE PRESCRIBED UNIT ONLY.
4. BHEL STANDARD SPECIFICATION NO: TB-406-316-TS-CC IS APPLICABLE

SIGNATURE & SEAL OF TENDERER

Item Name :	CLAMPS & CONNECTROS
Enquiry No. :	
Project :	UPPTCL SHAMLI PROJECT
Type of project	Transmission / Thermal (Coal or Gas) / Hydro
Applicable percentage of Local Content	50 % (Minimum)

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

Date: / /2019

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

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

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

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

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

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

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

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

x _____

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

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

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

<Insert Name, Designation and Contact No.>

ACTIVITY SCHEDULE FOR CLAMPS & CONNECTORS

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

SN	ACTIVITY	TIME ALLOTTED [in weeks]	CUMULATIVE TIME FROM RECEIPT OF INPUTS FROM BHEL [in weeks]	SCOPE
1.	Submission of Documents necessary for getting manufacturing clearance like drawings, Data sheet.	2	2	BY SUPPLIER
2.	Review and Approval of documents from BHEL/Customer and issue of manufacturing clearance.	4	6	BHEL SCOPE
3.	Manufacturing Time	10	16	BY SUPPLIER
4.	Inspection call	1	17	BY SUPPLIER
5.	Inspection by BHEL/Customer	1	18	BHEL SCOPE
6.	Issue of Dispatch clearance	2	20	BHEL SCOPE
7.	Dispatch	2	22	BY SUPPLIER

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

Signature & Seal of
Supplier
Date:

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SCHEDULE OF COMMERCIAL DEVIATION

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

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

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

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

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

Place :
Date :

Signature of the authorised representative of

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

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SCHEDULE OF TECHNICAL DEVIATION

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

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

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

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

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

Place :
Date :

Signature of the authorised representative of

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

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

GENERAL TERMS AND CONDITIONS FOR TENDER ENQUIRY / CONTRACT

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

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

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marked as "Techno-commercial Bid (Part-I)" and "Price Bid (Part-II)" respectively. Both the envelopes are to be kept in another common envelope and marked as "BID". Each envelope should be sealed and superscribed with tender enquiry no., item / package name, project name and due date of opening. Bidder's name and address shall also be mentioned on each envelope.

- 1.7 For any technical clarification, please contact official mentioned in the tender enquiry / NIT.
- 1.8 For any commercial clarification please contact official issuing tender enquiry / NIT.
- 1.9 Price bid (Part-II) should not contain any additional information / description other than given in "Un-Priced Bid" submitted with "Techno-commercial Bid (Part-I)" except prices, otherwise bid is liable for rejection.
- 1.10 Price Bid submitted along with the bid shall remain valid up to validity of offer. Any discount / revised offer submitted by the bidder on its own shall be accepted provided it is received before the due date and time of offer submission (i.e. Part-I Bid). The discount shall be applied on pro-rata basis to all items including optional items, if any, unless specified otherwise by the bidder. Discount offered shall be valid for full duration of validity of the offer including extension of validity, if any. Unsolicited Supplementary / Revised Price Bid submitted after the due date and time of offer submission (i.e. Part-I Bid), during validity period of offer, unless asked by BHEL, shall not be considered. Withdrawal of quotation by the bidder, at any stage after its opening, may entail suitable action against such bidder by BHEL.
- 1.11 The consultants / firm (and any of its affiliates) shall not be eligible to participate against tender enquiry for the related goods or works or services for the same project, if they were engaged by BHEL-TBG for the consultancy services.
- 1.12 In case any Foreign OEM / Foreign Principal insists on engaging the services of an agent, such agent shall not be allowed to represent more than one manufacturer / supplier in the same tender. Moreover, either the agent could bid on behalf of the manufacturer / supplier or the manufacturer / supplier could bid directly but not both. In case bids are received from the manufacturer / supplier and the agent, bid received from the agent shall be ignored.
- 1.13 Non-conformities / errors / discrepancies in quoted prices in price bids shall be dealt as follows :-
 - a) If, in the price structure quoted for the required goods / services / works, there is discrepancy between the unit price and the total price (which is obtained by multiplying the unit price by the quantity), the unit price shall prevail and the total price corrected accordingly, unless in the opinion of BHEL there is an obvious misplacement of the decimal point in the unit price, in which case the total price as quoted shall govern and the unit price corrected accordingly.
 - b) If there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail and the total shall be corrected.

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

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No.**

- b) Freight: Freight for door delivery up to destination / site / store are to be quoted separately.
- c) Insurance: Insurance for door delivery up to destination / site / store are to be quoted separately.
- d) Type Test Charges: If asked in the technical specification, it is to be quoted separately for each test.
- e) Charges for Supervision of Erection, Testing & Commissioning (ETC) at Site: To be quoted separately if specified in NIT/Price Schedule.
- f) Charges for Testing & Commissioning at Site: To be quoted separately if specified in NIT/Price Schedule.
- g) Charges for Erection, Testing & Commissioning at Site: To be quoted separately if specified in NIT/Price Schedule.
- h) Training Charges: To be quoted separately if specified in NIT/Price Schedule.

2.4 GST rates along with HSN/SAC code as applicable on Sr No (a) to (h) above is to be mentioned separately in percentage in both un-priced bid and price bid.

Note :

- i) Unless otherwise specified in the NIT, the purchase order shall be placed on Ex-works basis for Indian bidders.
- ii) Prices quoted by Indian bidders shall be in Indian Rupees only.
- iii) In case Supervision of Erection, Testing & Commissioning (ETC) at Site or Testing & Commissioning at Site or Erection, Testing & Commissioning at Site is also in scope of the bidder along with supply, bidder has to ensure that prices quoted for such services also are in line with special terms & conditions of the NIT, if any.
- iv) Unless otherwise specified in the NIT, Unloading at Site / Destination shall not be in the scope of the supplier.
- v) Prices in respect of Sr No (a) to Sr No (h) of Clause 2.3 above are to be quoted inclusive of all taxes & Duties, charges, Levies , royalty etc if any, excluding GST.

3. TERMS OF PAYMENT :

3.1 For Supply only in scope of the supplier

100% of payment within 60 days from the date of receipt of complete invoice along with documents in 3 sets (original + 2 copies) as follows :

- LR / GR duly endorsed by BHEL Site Official.
- Material Receipt Certificate issued by BHEL Site Official.
- GST Compliant Tax Invoice
- Packing List (Case-wise)
- Copy of Transit Insurance Certificate from underwriters.
- Material Inspection Clearance Certificate (MICC) issued by BHEL Quality Management
- Guarantee Certificate
- Copy of Performance Bank Guarantee (PBG)
- Certificate of acceptance of Type Test Reports issued by BHEL Engineering Management wherever specifically mentioned in the Purchase Order.

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

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

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

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	Note : i) In case of Illumination System, items viz. Lamps, Tubes, Ballast, Starters, Capacitors & Fuses will not be under Guarantee after commissioning. ii) In addition to the above guarantee period, Extended Guarantee / Warranty, if any, shall be as per NIT / Technical Specifications. iii) In case offer of agent of Foreign OEM / Foreign Principal is considered, as per Clause No. 1.12 above, Guarantee as mentioned above has to be provided by the Foreign OEM / Foreign Principal also.
6.	LATENT DEFECT : Liability for latent defects shall be for defects inherently lying within material or arising out of design deficiency which does not manifest itself during guarantee period but later and shall be limited to five years from the expiry of the guarantee period.
7.	PERFORMANCE BANK GUARANTEE (PBG) : Supplier shall arrange to submit Performance BG / deposit on a non-judicial stamp paper of appropriate value along with first invoice or within 60 days from placement of Purchase Order (PO) whichever is earlier, in line with one of the applicable options as follows :- <u>Option "A"</u> A single rolling PBG for Rs. 50 Lakhs initially valid for 18 months with claim period of 3 months extra over and above 18 months for all the Purchase Orders being executed for Transmission Business Group, BHEL. However, validity of the PBG shall be extended till 18 months from the date of last delivery with 3 months claim period extra over and above 18 months. Single Rolling PBG option shall not be applicable in case Ex-works value of the PO at the time of placement of PO exceeds Rs. One Crore. <u>Option "B"</u> PBG for 10% of the total Ex-works PO value, valid for 18 months from the date of last delivery with claim period of 3 months extra over and above 18 months. Ex-works PO value at the time of placement of PO shall be considered for calculation of the PBG amount. <u>Option "C"</u> In case the total Ex-works PO value at the time of placement of PO does not exceed Rs. Ten Lakhs, interest free Deposit of 10% of the total Ex-works PO value at the time of placement of PO in form of Demand Draft favouring "Bharat Heavy Electricals Limited" and payable at New Delhi / Delhi / Noida shall also be acceptable to BHEL in lieu of PBG, which shall be released after expiry of 21 months from the date of last delivery after deduction, if any, within 60 days from receipt of invoice in 3 sets (original + 2 copies) to be submitted by the supplier. Note : i) The Bank Guarantee shall be from any bank as per Annexure for List of Banks (32 Nos.). The original PBG should be sent by issuing Bank directly to AGM (Finance), TBG, BHEL, Noida. ii) Extension of validity of the PBG in original, as per above clause, should be sent by issuing Bank directly to AGM (Finance), TBG, BHEL, Noida at least 45 days

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

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

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

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

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25.	MANUFACTURING QUALITY PLAN (MQP) : Supplier to submit approved MQP in line with requirement of BHEL/customer.
26.	SUPPLIER PERFORMANCE MONITORING AND RATING SYSTEM : BHEL reserve the right for evaluation of Supplier Performance Rating as per Supplier Performance Monitoring and Rating System of BHEL for necessary action. Details are available at BHEL Website www.bhel.com for reference.
27.	DEALING WITH BANNED SUPPLIERS / CONTRACTORS IN BHEL : Offers of the bidders, who are on the banned list, as also the offers of the bidders who engage the services of the banned firms, shall be rejected. The list of banned firms is available on BHEL website www.bhel.com for reference.
28.	ORDER OF PRECEDENCE : The order of precedence shall be as follows :- a) Special Terms & Conditions (STC) for Tender Enquiry / Contract, if any b) General Terms & Conditions (GTC) for Tender Enquiry / Contract & Additional General Terms & Conditions (GTC) for Tender Enquiry / Contract for Erection Testing & Commissioning (ETC) at Site, if applicable Provisions in (a) above shall prevail over (b). In case of conflict, between Technical Specifications and STC / GTC, bidder to seek necessary clarifications from BHEL concerned official as specified in NIT.
29.	PACKING : Packing shall be in conformity with specifications and shall be such as to ensure prevention of damages, corrosion, deterioration, shortages, pilferage and loss in transit or storage. In case of shipment by sea or air, the packing shall be sea-worthy or air-worthy respectively and of international standards. Different types of spares i.e. start-up / commissioning spares and initial spares (mandatory spares and recommended O&M spares) are to be packed separately. Packing List shall be submitted as per standard format along with advance set of documents for claiming payment which shall also indicate :- a) Case / Packing size (as applicable). b) Gross weight and net weight of each package. c) Detailed contents of the package with quantity of each item separately. Project, Item / Package Description, BHEL's PO No. with date & Case / Packing Mark should also be clearly mentioned on the Case / Packing and Packing List for identification. Also, Packing List must be duly signed & should include respective Invoice No. & LR No.
	Note : Foreign suppliers to furnish details to arrange inland transportation by BHEL, if applicable, as follows :-

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

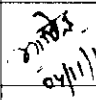
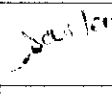
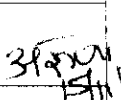
Sr. No.	considered as tampering of the tender process and will invite action by BHEL as per extant guidelines in vogue. General Terms and Conditions of RA are available at Annexure. Business Rules for RA shall be sent to the bidders before conducting RA. Abridged Version of "Common Guidelines for Conducting Reverse Auction" may also be seen at BHEL website (www.bhel.com) on "Supplier Registration" Page & "Tender Notifications" Page.
34.	INTEGRITY PACT : NOT APPLICABLE Bidders shall have to enter into Integrity Pact with BHEL, duly signed with seal in original, if specified in NIT / RFQ failing which bidder's offer shall be liable for rejection.
35.	TERMINATION OF CONTRACT : BHEL shall have the right to cancel the Purchase Order / Contract without any financial implication to BHEL if vendor approval by end user / customer is withdrawn or in case of Suspension of Business Dealings with the Suppliers / Contractors by BHEL. BHEL shall have the right to cancel Purchase Order / Contract, wholly or in part, in case they are obliged to do so on account of any decline, diminution, curtailment or stoppage of their business and in that event, the Supplier's / Contractor's compensation claim shall be settled mutually. In case of cancellation of Purchase Order / Contract for main supply, all other associated Purchase Orders / Contracts like those for Mandatory Spares / Recommended Spares / Erection, Testing & Commissioning (ETC) / Supervision of ETC, if any, would also get cancelled.
36.	SHELF LIFE : NOT APPLICABLE Supplier has to inform the list of the items / sub-items which have limited shelf life like consumables or those required for the first fill and shall indicate the corresponding shelf life period in the offer. Such items / sub-items shall be manufactured / despatched only after getting formal clearance from BHEL.
37.	LIMITATION OF LIABILITY : Notwithstanding any other provisions, except in cases of wilful misconduct and / or criminal negligence / acts, a) Neither the Supplier / Contractor nor BHEL shall be liable to the other, whether in Purchase Order / Contract, tort, or otherwise, for any consequential loss or damage, loss of use, loss of production or loss of profits or interest costs, provided however that this exclusion shall not apply to any obligation of the Supplier / Contractor to pay Liquidated Damages to the BHEL and b) Notwithstanding any other provisions incorporated elsewhere in the contract, the aggregate liability of the Contractor in respect of this contract, whether under the Contract, in tort or otherwise, shall not exceed total Contract Price, provided however that this limitation shall not apply to any obligation of the Vendor to indemnify BHEL with respect to Patent Infringement or Intellectual Property Rights.
38.	SHORTAGES / DAMAGES : a) Against Supply only or Supply where Supervision of Erection, Testing & Commissioning (ETC) at Site or Supply where Testing & Commissioning at Site is in scope of the supplier : Any shortages and / or damages in supplies shall be supplied / replenished free of cost by the supplier as early as possible but not later than 30 days from the date of intimation by BHEL to the supplier.

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

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43.	INDEMNIFICATION : The Supplier / Contractor shall indemnify and keep indemnified and hold harmless BHEL and its employees and officers from and against any and all claims, suits, actions or administrative proceedings, demands, losses, damages, costs and expenses and any other claim of whatsoever nature in respect of the death or injury of any person or loss of or damage to any property arising during the course and out of the execution of the Purchase Order / Contract.
44.	TITLE OF GOODS : a) Ownership of the equipment / material procured in India, shall be transferred to BHEL upon loading on to the mode of transport to be used for transportation of the said equipment / material from the works to the site / destination and upon endorsement of the dispatch documents in favour of BHEL. b) Ownership of the equipment / material to be imported into the country where the site is located, if not procured in India, shall be transferred to BHEL upon loading on the mode of transport to be used for transportation of the equipment / material from the country of origin to that country / destination and upon endorsement of despatch document in favour of BHEL. c) Notwithstanding the transfer of ownership of the equipment / material, the responsibility for care and safe custody thereof together with the risk of loss or damage thereto for whatsoever reason shall remain with the Supplier.
45.	COMPLIANCE OF STATUTORY REQUIREMENTS : The vendor shall comply with all State and Central Laws / Acts, Statutory Rules, Regulations etc., as may be enacted by the Government during the tenure of the Purchase Order / Contract and having in force and applicable to the Purchase Order / Contract and nothing shall be done by the Supplier / Contractor in contravention of any Law / Act and / or Rules / Regulations, thereunder or any amendment thereof. The Supplier / Contractor shall pay all taxes, fees, licence charges / deposits, duties, tolls, royalty, commissions or other charges which may be levied on account of any of his operations connected with the Purchase Order / Contract. In case BHEL is constrained to make any of such payments, BHEL shall recover the same from the Supplier / Contractor either from moneys due to him or otherwise as deemed fit.
46.	ACCEPTANCE OF ORDER : Supplier should acknowledge and accept the Letter of Award / Purchase Order issued by BHEL within 7 days of the issue of Letter of Award / Purchase Order. In case of any discrepancy / typographical error in issue of Purchase Order / Contract, the agreed terms & conditions, scope of work, rates / prices for placement of PO / award of contract shall be applicable and BHEL reserves the right to issue amendment(s) to PO / Contract for correction of discrepancies / typographical errors in the PO / Contract at a later date.
47.	FRAUD PREVENTION POLICY : The Bidder along with its associate / collaborators / sub-contractors / sub-vendors / consultants / service providers shall strictly adhere to BHEL Fraud Prevention Policy displayed on BHEL website http://www.bhel.com and shall immediately bring to the notice of BHEL Management about any fraud or suspected fraud as soon as it comes to their notice.

Signature of Bidder (Authorized Signatory) with Date & Seal

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		BHARAT HEAVY ELECTRICALS LIMITED TRANSMISSION BUSINESS HVDC ENGINEERING & SYSTEMS								
COPYRIGHT AND CONFIDENTIALITY The information on this document is the property of BHARAT HEAVY ELECTRICALS LTD. It must not be used directly or indirectly in anyway detrimental to the interest of the company	DOCUMENT No.	TB-406-316-TS-CC			Rev. No.	00	Prepared	Checked	Approved	
	TYPE OF DOC.	TECHNICAL SPECIFICATION				SIGN				
	TITLE Clamps & Connectors					NAME	MSP	SKS	AG	
						DATE	04-11-19	04-11-19	04-11-19	
						GROUP	TBEM	W.O. No	88009	
	Customer	UTTAR PRADESH TRANSMISSION CORPORATION LTD (UPPTCL)								
	PROJECT	400/220/132 kV GIS SUBSTATION AT SHAMLI, U.P.								
	LOA NO.	1311/ESD-8/126/III/400 kV SHAMLI dtd 14.11.2018								
	CONTENTS									
	Section	Description							No of Sheets	
1	Section-1: Scope, Bill of Quantity, Specific Technical Requirement & Annexure-1							17		
2	Section-2: Equipment General Specification							12		
3	Section-3: General Technical Requirements							54		
4	Section-4: Guaranteed Technical Particulars							1		
5	Section-5: Check List							3		
Rev No.		Date	Altered	Checked	Approved	REVISION DETAILS				
Distribution					To	TBEM	TBMM	TBQM	Vendor	
					Copies	1	1	1	4	

	Project:	400/220/132 kV GIS Substation at Shamli, U.P.
	Customer:	Uttar Pradesh Transmission Corporation Ltd (UPPTCL)
	Contractor:	Bharat Heavy Electricals Limited
	Document No.	TB-406-316-TS-CC, Rev.00
	Technical Specification:	Clamps & Connectors

1.1 CUSTOMER / PROJECT DETAIL

Name of customer: Uttar Pradesh Transmission Corporation Ltd (UPPTCL)

Name of Projects: 400/220/132 kV GIS Substation at Shamli, U.P.

Refer Section - 3 for Project Details and General Specifications.

1.2 BILL OF QUANTITIES:

Bidder shall supply the items along with all accessories as per the BOQ below:

S.No.	Clamp No.	Description	Clamp Type	TOTAL (No.)
1	401	SUPPLY- CLAMPS & CONNECTORS : 400KV 50KA FOR 3S 3150A GIS BUSHING CONNECTOR SUITABLE FOR AL TUBE 4.5 INCH IPS, EXPANSION TYPE	T E H	8
2	402	SUPPLY- CLAMPS & CONNECTORS : 400KV 50KA FOR 3S 3150A GIS BUSHING CONNECTOR SUITABLE FOR AL TUBE 4.5 INCH IPS, RIGID TYPE	T R H	12
3	403	CLAMPS & CONNECTORS 400KV 50KA FOR 3S 3150A BPI CONNECTOR SUITABLE FOR AL TUBE 4.5 INCH IPS, EXPANSION - EXPANSION TYPE	T E H	34
4	404	CLAMPS & CONNECTORS 400KV 50KA FOR 3S 3150A BPI CONNECTOR SUITABLE FOR AL TUBE 4.5 INCH IPS, RIGID/SLIDING THROUGH TYPE	TRH	23
5	405	SUPPLY- CLAMPS & CONNECTORS : 400KV 50KA FOR 3S 3150A, CVT CONNECTOR SUITABLE FOR AL TUBE 4.5 INCH IPS, RIGID TYPE	TRH	13
6	406	SUPPLY- CLAMPS & CONNECTORS : 400KV 50KA FOR 3S 3150A LA CONNECTOR SUITABLE FOR AL TUBE 4.5 INCH IPS, RIGID TYPE	TRH	23
7	407	SUPPLY- CLAMPS & CONNECTORS : 400KV 50KA FOR 3S 3150A WT CONNECTOR SUITABLE FOR QUAD MOOSE	4SH	17
8	408	SUPPLY- CLAMPS & CONNECTORS : 400KV, 50KA FOR 3S, 3150A, ISOLATOR (HDB) CONNECTOR SUITABLE FOR QUAD MOOSE	4SH	13
9	409	SUPPLY- CLAMPS & CONNECTORS : 400KV, 50KA FOR 3S, LA CONNECTOR SUITABLE FOR QUAD MOOSE	4SH	7

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	Project:	400/220/132 kV GIS Substation at Shamli, U.P.
	Customer:	Uttar Pradesh Transmission Corporation Ltd (UPPTCL)
	Contractor:	Bharat Heavy Electricals Limited
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	Technical Specification:	Clamps & Connectors

23	103	SUPPLY- CLAMPS & CONNECTORS : 132KV 31.5KA FOR 3S 1000A CABLE-SEALING-END CONNECTOR SUITABLE FOR SINGLE MOOSE	1SH	29
24	103A	SUPPLY- CLAMPS & CONNECTORS : 132KV 31.5KA FOR 3S 1600A CABLE-SEALING-END CONNECTOR SUITABLE FOR TWIN MOOSE	2SH	7
25	109	SUPPLY- CLAMPS & CONNECTORS : 132KV 31.5KA FOR 3S 1000A LA CONNECTOR SUITABLE FOR SINGLE MOOSE	1SH	29
26	109A	SUPPLY- CLAMPS & CONNECTORS : 132KV 31.5KA FOR 3S 1600A LA CONNECTOR SUITABLE FOR TWIN MOOSE	2SH	7
27	111	SUPPLY- CLAMPS & CONNECTORS : 132KV, 31.5KA FOR 3S, 1600A, ICT BUSHING CONNECTOR SUITABLE FOR Twin Moose	2SH	7
28	71	SUPPLY- CLAMPS & CONNECTORS : 72.5KV 25KA FOR 3S 1250A CB CONNECTOR SUITABLE FOR AL TUBE 3 INCH IPS, EXPANSION TYPE	T E H	13
29	72	SUPPLY- CLAMPS & CONNECTORS : 72.5KV 25KA FOR 3S 1250A CT CONNECTOR SUITABLE FOR AL TUBE 3 INCH IPS, RIGID TYPE	TRH	7
30	73	SUPPLY- CLAMPS & CONNECTORS : 72.5KV 25KA FOR 3S 1250A CT CONNECTOR SUITABLE FOR AL TUBE 3 INCH IPS, EXPANSION TYPE	T E H	7
31	74	SUPPLY- CLAMPS & CONNECTORS : 72.5KV 25KA FOR 3S 1000A LA CONNECTOR SUITABLE FOR SINGLE MOOSE	1SH	13
32	76	SUPPLY- CLAMPS & CONNECTORS : 72.5KV 25KA FOR 3S 1250A Termination Kit SUITABLE FOR SUITABLE FOR AL TUBE 3 INCH IPS, RIGID TYPE	TRH	13
33	77	SUPPLY- CLAMPS & CONNECTORS : 72.5KV 25KA FOR 3S 1250A Termination Kit SUITABLE FOR SUITABLE FOR TWIN MOOSE	2SH	7
34	78	SUPPLY- CLAMPS & CONNECTORS : 72.5KV 25KA FOR 3S 1250A ISO (HDB) CONNECTOR SUITABLE FOR AL TUBE 3 INCH IPS, RIGID TYPE	TRH	7
35	79	SUPPLY- CLAMPS & CONNECTORS : 72.5KV 25KA FOR 3S 1250A ISO (HDB) CONNECTOR SUITABLE FOR AL TUBE 3 INCH IPS, EXPANSION TYPE	T E H	7

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49	6003	SUPPLY- CLAMPS & CONNECTORS : 220KV 40KA FOR 3S 2000A TEE CONNECTOR SUITABLE FOR TWIN MOOSE TO TWIN CONDUCTOR AS PER TS	TwinACSRMoose - Through TwinACSRMoose - TEE	6
50	6005	SUPPLY- CLAMPS & CONNECTORS : 220KV 40KA FOR 3S 2000A TEE CONNECTOR SUITABLE FOR AL TUBE 4.5 INCH IPS TO TWIN CONDUCTOR AS PER TS	4.5" Inch Tube - Through TwinACSRMoose - TEE	16
51	6006	SUPPLY- CLAMPS & CONNECTORS : 220KV 40KA FOR 3S 1000A TEE CONNECTOR SUITABLE FOR AL TUBE 4.5 INCH IPS TO SINGLE CONDUCTOR AS PER TS	4.5" Inch Tube - Through SingleACSRMoose - TEE	21
52	6007	SUPPLY- CLAMPS & CONNECTORS : 220KV 40KA FOR 3S 1000A TEE CONNECTOR SUITABLE FOR SINGLE ZEBRA TO SINGLE CONDUCTOR AS PER TS	SingleACSRZebra - Through SingleACSRMoose - TEE	53
53	6008	SUPPLY- CLAMPS & CONNECTORS : 72.5KV, 25KA FOR 3S, 1250A, TEE CONNECTOR SUITABLE FOR AL TUBE 3 INCH IPS TO SINGLE CONDUCTOR AS PER TS	3" Inch Tube - Through SingleACSRMoose - TEE	27
54	6009	SUPPLY- CLAMPS & CONNECTORS : 72.5KV, 25KA FOR 3S, 1250A, TEE CONNECTOR SUITABLE FOR AL TUBE 3 INCH IPS TO TWIN CONDUCTOR AS PER TS	3" Inch Tube - Through Twin ACSR Moose - TEE	27
55	6101	SUPPLY- CLAMPS & CONNECTORS : 220KV 40KA FOR 3S 1000A PG CLAMP SUITABLE FOR SINGLE ZEBRA TO SINGLE CONDUCTOR AS PER TS	SingleACSRZebra - To SingleACSRMoose	53
56	6102	SUPPLY- CLAMPS & CONNECTORS : 400KV 50KA FOR 3S 1000A PG CLAMP SUITABLE FOR SINGLE MOOSE TO SINGLE CONDUCTOR AS PER TS	Single ACSR Moose - To Single ACSR Moose	53
57	7001	CLAMPS & CONNECTORS PG CLAMP FOR SHIELD WIRES OF DIA 10.98MM		158
58	7002	CLAMPS & CONNECTORS CLAMP FOR 10.98MM DIA SHIELD WIRE ON LATTICE / PIPE STRUCTURE		788

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19	207	WT	1SH/2SH
20	209	LA	1SH/2SH
21	211	ICT	1SH/2SH
22	212	CSE	1SH
23	103	CSE	1SH
24	103A	CSE	2SH
25	109	LA	1SH/2SH
26	111	ICT	1SH/2SH
27	71	72.5kV CB	T E H
28	72	72.5kV CT	TRH
29	73	72.5kV CT	T E H
30	74	30kV LA	1SH
31	75	BPI With Termination Kit	T E H
32	76	Termination Kit With Tube	TRH
33	77	Termination Kit With Conductor	1SH
34	78	72.5kV ISO	TRH
35	79	72.5kV ISO	T E H
36	80	72.5kV ISO	2SH
37	81	Aux Bushing	2SH
38	82	72.5kV BPI	TRH/Sliding
39	83	72.5kV BPI 90 Deg	T E H
40	84	72.5kV BPI	T E H
41	4001	Spacers (Flexible)	S4
42	2001	Spacers (Flexible)	S2
43	4101	Spacers (Rigid)	S4
44	2101	Spacers (Rigid)	S2
45	5001	Corona Bell	4.5" Inch Tube
46	5101	End Cap	3 Inch Tube
47	6001	TEE Connector	QuadACSRMoose - Through QuadACSRMoose - TEE
48	6002	TEE Connector	4.5" Inch Tube - Through QuadACSRMoose - TEE
49	6003	TEE Connector	TwinACSRMoose - Through TwinACSRMoose - TEE
50	6005	TEE Connector	4.5" Inch Tube - Through TwinACSRMoose - TEE
51	6006	TEE Connector	4.5" Inch Tube - Through SingleACSRMoose - TEE

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7	Dry and wet one minute power frequency withstand voltage	kVrms	680	460	275	140	75
8	Minimum Visual Corona Extinction Voltage	kVrms	320	156	105	--	--
9	Maximum RIV Voltage(at 266 kV at frequency range 0.5 to 2 MHz[rms])	μV	1000	1000	500	--	--
10	Material						
a	For connecting ACSR Conductors	Aluminum alloy casting, conforming to designation A6 of IS:617 and shall be tested for all tests as per IS:617					
b	For connecting equipment terminals made of copper with ACSR Conductor	Bimetallic connectors made from aluminum alloy casting, conforming to designation A6 of IS 617 with 2mm thick Bimetallic liner and shall be tested as per IS:617.					
c	For connecting G.I. shield wire	Galvanized mild steel					
d	Bolts, nuts and plain washers	Electro galvanized for size below M12, for other hot dip galvanized					
e	Spring washers for items 'a' to 'c'	Electro - galvanized mild steel suitable for at least service conditions-3 as per IS:1573					

1.3.3 Type Tests

- a) Clamps and Connectors and spacers to be supplied shall be of type tested design. During detail engineering, the Bidder shall submit for Owner's approval the reports of all the type tests as listed in this specification and carried out not earlier than five years prior to the date of techno-commercial bid opening i.e., 07-Sept-2018. These reports should be for the test conducted on the equipment similar to those proposed to be supplied under this contract and the test(s) should have been either conducted at an independent laboratory or should have been witnessed by a Client.
- b) However if Bidder is not able to submit report of the type test(s) conducted not earlier than ten years prior to the date of techno-commercial bid opening, or in the case of type test report(s) are not found to be meeting the specification requirements, the Bidder shall conduct all such tests under this contract at no additional cost to the owner either at third party lab or in presence of client/ owners representative and submit the reports for approval.
- c) All acceptance and routine tests as per the specification and relevant standards shall be carried out. Charges for these shall be deemed to be included in the equipment price.

The clamps and connectors shall be subject to type tests as per IS-5561-1970. Type tests shall be carried out on three clamps and connectors of each type and design. All

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- vi. Log decrement test (applicable only for spacer dampers)
- vii. Compression test.
- viii. Galvanising test.
- ix. Movement test
- x. Clamp bolt torque test
- xi. Assembly torque test
- xii. Tensile load test
- xiii. Compression and pull off test.
- xiv. Vibration test
- xv. Magnetic power loss test

1.3.4 Quality Plan

Bidder to follow valid UPPTCL approved quality plan at contract stage. In case the bidder does not have UPPTCL approved QP, it will be the bidder's responsibility to get its QP approved directly from UPPTCL.

1.3.5 Special Tools & Tackles

The bidder shall include in his proposal the deployment of all special tools and tackles required for erection, testing, commissioning and maintenance of the equipment. The Special tools and tackles shall only cover items which are specifically required for the equipment offered and are proprietary in nature. A list of all such devices shall be furnished.

1.4 DEVIATIONS

The bidder shall list all the deviation from the specification separately. Offers without specific deviation will be deemed to be totally in compliance with the specification and NO DEVIATION on any account will be entertained at a later date.

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1.5.8 Any material found short inside the packing cases shall be supplied by the Bidder without any extra cost.

1.5.9 Notwithstanding anything stated in this clause the Bidder shall be entirely responsible for any loss, damage or depreciation to the stores.

1.6 OTHER TECHNICAL REQUIREMENT

(A). FACTORY LICENSE & CERTIFICATE

The manufacturer must have all necessary & valid documents pertaining to Factory License & Certificate.

Photo copy of Factory License & certificate shall be submitted.

(B). TESTING FACILITIES

The manufacturer must have all necessary facilities at their works for carrying out such routine and acceptance tests as prescribed in the relevant IS/IEC and any other routine and acceptance test as specified in the specification.

Documentary evidence of existence of such facilities will be submitted.

(D). TYPE TESTS

The offered equipment must have been fully type tested as per relevant ISS and/or any other specified international standards, during the last 5 years period to be reckoned from the date of opening of tender (07.09.2018) i.e test reports should not be older than 07.09.2013.

Photo copy of such type test reports/ certificates must be submitted.

(E) IF VENDOR APPROVAL BY PGCIL

The manufacture shall provide valid MQP/ approved PGCIL compendium etc, if available.

and lowered to determine their precise values. The test voltage shall be raised to 110% of specified corona extinction voltage and maintained there for five minutes. In case corona inception does not take place at 110%, test shall be stopped, otherwise test shall be continued and the voltage will then be decreased slowly until all visible corona disappears. The procedure shall be repeated at least 4 times with corona inception and extinction voltage recorded each time. The corona extinction voltage for purposes of determining compliance with the specification shall be the lowest of the four values at which visible corona (negative or positive polarity) disappears. Photographs with laboratory in complete darkness shall be taken under test conditions, at all voltage steps i.e. 85%, 100%, and 110%. Additional photographs shall be taken at corona inception and extinction voltages. At least two views shall be photographed in each case using Panchromatic film with an ASA daylight rating of 400 with an exposure of two minutes at a lens aperture of f/5.6 or equivalent. The photographic process shall be such that prints are available for inspection and comparison with conditions as determined from direct observation. Photographs shall be taken from above and below the level of connector so as to show corona on bushing, insulators and all parts of energised connectors. The photographs shall be framed such that test object essentially, fills the frame with no cut-off.

For recording purpose, modern devices utilizing UV recording methods such as image intensifier may also be used.

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

5.0 Test Records

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

- a) Background noise before and after test.
- b) Detailed procedure of application of test voltage.
- c) Measurements of RIV levels expressed in micro volts at each level.

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	Contractor:	Bharat Heavy Electricals Limited
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	Technical Specification:	Clamps & Connectors

SECTION-2

Equipment Specification

2.1 GENERAL

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

2.1.1 Technical Particulars for spacers and Clamp & Connectors

Sl. No.	Technical Particulars	Unit	System Ratings				
			400kV	220kV	132kV	66 kV	33 kV
1	Nominal system voltage	kV	400	220	132	66	33
2	Highest system voltage	kV	420	245	145	72.5	36
3	Current Rating	A	3150/ 2000	2000	1600	1250	1250
4	Short circuit current (for 3 sec)	kA	50	40	31.5	25	25
5	Frequency		50 Hz $\pm$ 5%				
6	Dry lightning impulse withstand voltage (for 1.2/50 μ sec.)	kVp	1550	1050	650	325	250
7	Dry and wet one minute power frequency withstand voltage	kVrms	680	460	275	140	75
8	Minimum Visual Corona Extinction Voltage	kVrms	320	156	105	--	--
9	Maximum RIV Voltage(at 266 kV at frequency range 0.5 to 2 MHz[rms])	μ V	1000	1000	500	--	--

System Earthing : Effectively earthed

Spacing between sub-conductors of the bus : 450mm

Maximum working tension:

- a) Twin Conductor (Kg): 6000
- b) Quad Conductor (Kg): 6000

Visual Corona withstand V: 320 kV

- a) The material of clamps and connectors shall be Aluminium alloy casting conforming to designation A6 of IS: 617 for connecting to equipment terminals

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IS 1367 (Part 2):2002	Technical Supply Conditions for threaded fasteners.
IS 1367 (Part 3):2002	Technical Supply Conditions for threaded fasteners.
IS 1367 (Part 13):1983	Technical Supply Conditions for threaded fasteners.
IS 2121:1981 (Part -1 & 2)	Specification for conductors and earth wire accessories for overhead power lines
IS 2121:1992 (Part -3)	Specification for conductors and earthwire accessories for overhead power lines.
IS 2121:1991 (Part -4)	Specification for conductors and earth wire accessories for overhead power lines
IS 5561:1970	Electric power connectors.
IS 2633:1986	Methods for testing uniformity of coating of zinc coated articles.
IS 1573:1986	Electroplated coating of Zinc on Iron and Steel
IS 3138:1966	Hexagonal Bolts & Nuts (M42 to M150)
IS 4218 (Parts 1,2 & 4) 2001	Metric Screw Threads
IS 4218:(Part 3):1999	Metric Screw Threads
IS 4218:(Part 6):1978	Metric Screw Threads
IS 10162:1982	Spacers & spacer dampers for twin horizontal bundle conductors
ISO 272	Fasteners: Hexagonal Products -Width across Flats.
ISO 898	Fasteners, Screws & Studs
NEMA CC1	Electric power connectors for sub-station
NEMA CC3	Connectors for use between Aluminium or Aluminium-Copper Overhead Conductors.

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Zinc	2 to 3%
Lead	2 to 2.5%
Tin	0.6 to 1.5%
Iron	0.5 to 1.0%
Copper	92% to 94%

The impurities if present shall not exceed the limits as indicated, below:

Nickel	0.03%
Antimony	0.03%
Manganese	0.04%
Silicon	0.04%
Phosphorous	0.04%

- g) All casting shall be free from below holes surface blisters and shall be rounded off.
- h) All sharp edges and corners shall be blurred and rounded off.
- i) Thickness of the clamps and connectors shall not be less than 10mm.
- j) Bolts and nuts shall have hexagonal heads and threads as per Indian standard.
Rated torque of the nuts shall be indicated on drawing.
- k) For bimetallic clamps or connectors copper alloy liner of minimum thickness 2mm shall be cast integral with the aluminium alloy body. Equivalent bimetallic sleeve/ strips can also be provided.
- k) For flexible connectors, braids or laminated straps shall be made from tinned copper strips or aluminium laminates depending upon the clamp. All Aluminium conductors of adequate current, mechanical stability & flexibility can also be provided.
- l) Each clamp/ connector shall be identified with respective BOM & Drawing

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B. Acceptance Test

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

- i) Resistance test (Cl.No. 11)
- ii) Tensile test (Cl.No. 10)
- iii) Dimensional Check (Cl.No. 14)
- iv) Galvanization Test (Where applicable) (Cl.15)

C. Routine Test

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

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

2.4 SPACERS

2.4.1 General :

Spacer shall conform to IS : 10162. The spacers are to be located at a suitable spacing to limit the short circuit forces and also to avoid snapping of sub conductors during short circuit conditions. Necessary spacer span calculation shall be provided by the contractor during engineering for the approval

2.4.2 Constructional Features

- a) Spacers shall be of non-magnetic material except nuts and bolts, which shall be of hot dip galvanised mild steel.
- b) Spacers shall generally meet the requirements of clamps and connectors specified above. Spacer design shall be made to take care of fixing and removing during installation and maintenance
- c) The design of the spacers shall be such that the conductor does not come in contact With any sharp edge.

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- xi. Assembly torque test
- xii. Tensile load test
- xiii. Compression and pull off test.
- xiv. Vibration test
- xv. Magnetic power loss test

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

- a) Visual examination
- b) Dimensional verification
- c) Movement test
- d) Clamp slip test
- e) Clamp bolt torque test (if applicable)
- f) Assembly torque test
- g) Compression test
- h) Tension test
- i) Galvanising test
- j) Hardness test for neoprene (if applicable)

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

- k) Ultimate Tensile Strength Test (where applicable)

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

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ANNEXURE - A

GALVANIZING PROCEDURE

If the steel surfaces are contaminated with marking paint, or welding slag, these must first be removed by mechanical means such as abrasive blasting or grinding.

Moulding sand on the surfaces of cast goods is removed by means of sand/shot blasting.

Grease and oil is usually removed in an alkaline degreasing solution. After washing in water, rust and mill scale are removed from the steel surfaces by pickling in diluted hydrochloric/sulphuric acid.

When dipping into the molten zinc, a fluxing agent must be used. The purpose of the fluxing agent is to dissolve oxides on both the steel and zinc to make pure metallic contact with each other.

In dry galvanizing the steel components are first pickled and then washed with water. They are then dipped in a flux solution of zinc-ammonium chloride in water and then dried at a temperature not greater than 120 deg. C. A thin layer of flux salts remains on the surfaces of the components. Dipping in molten zinc can therefore take place without further addition of fluxing agent.

Before the components are dipped into and withdrawn from the bath, the surface of the molten zinc is skimmed to remove oxides and flux residue. After withdrawal from the zinc bath, the components are cooled in water or air. They are then ready for touching-up, inspection and dispatch.

HOT-DIP GALVANIZING OF SMALL COMPONENTS-CENTRIFUGING

Small components such as nails, nuts, bolts, washers and fittings are cleaned as described above and placed in perforated baskets, which are then dipped into the molten zinc. Upon withdrawal from the zinc bath, the basket is placed in a centrifuge. Rotation has the effect of throwing some of the zinc off the coated surfaces, leaving the components free from drop concentration and uneven deposits of zinc. As a result, the zinc layer is somewhat thinner, with a more matt-like surface, compared with individual dipping (which would in any case be far too expensive for small objects). Individual dipping also makes it difficult to avoid obtaining uneven deposits of zinc on certain sensitive areas, such as threads.

WIRE AND TUBE GALVANIZING

Wire, strip material and tubing are hot-dip galvanized according to the dry or wet methods-or a combination of both-in continuously operating production lines. Immediately after withdrawal from the zinc bath excess zinc is wiped from wire (or blown off tubes) to give a smooth and uniform coating. The thickness of the zinc coating can be varied to some extent during the wiping or air blowing procedures.

SECTION-3

GENERAL TECHNICAL REQUIREMENTS OF SPECIFICATIONS (GTR)

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ANNEXURE – B	SEISMIC WITHSTAND TEST PROCEDURE
ANNEXURE – C	LIST OF SPECIFICATIONS STANDARDS AND CODES

The reports for all type tests and additional type tests as per technical specification furnished by the Bidder shall be of the tests conducted within last 05(five) years prior to the date of bid opening. The type tests conducted should have either been conducted in accredited laboratory (accredited based on ISO/ IEC Guide 25/ 17025 or EN 45001 by the national accreditation body of the country where laboratory is located) or witnessed by UPPTCL or representative authorized by UPPTCL or Utility or representative of accredited test lab or reputed consultant.

3.0 STANDARDS

3.1 Except as modified by this Bid specification, all material and equipment shall conform to the requirement of the latest editions of relevant ISS/ IEC and other applicable standards. The equipments/ works shall be designed, engineered, manufactured, built, tested and commissioned shall be carried out in accordance with the Acts, Rules, Laws and Regulations in force in India.

3.2 In addition to meeting the specific requirements called for in the respective sections of the Technical Specification, the equipment shall also conform to the general requirement of the relevant standards which shall form an integral part of the specification. When the specific requirements stipulated in the specifications exceed or differ than those required by the applicable standards, the stipulation of the specification shall take precedence.

3.3 In the event of the Bidder offering equipment conforming to standards other than ISS/IES standards, which ensure equivalent or better performance than that specified in the standards, the salient point of comparison between the standards adopted and relevant ISS/ IEC standards shall be indicated clearly in the proposal, along with English language version of such standard or relevant extract of the same. The equipment conforming to standards other than IS/IEC shall be subject to Purchaser's approval.

3.4 The standards mentioned in the respective equipment specifications are not mutually exclusive or complete in themselves. The equipment &/or work shall also conform to any other applicable standard, even if not specifically mentioned in these specifications.

3.5 Should the Bidder wish to depart from the provisions of the specifications, either on accounts of manufacturing practices or for any other reason, he shall clearly mention the departure and submit complete justification supported by information, drawings etc. as will enable to assess the suitability of equipment(s) offered. In the event of the Bidder's specifications, drawings, forms and tables etc. being found to disagree with the requirement of the Bid specifications at any stage, Bid specifications shall be binding, unless the departures have been duly approved in writing by the Purchaser.

3.6 REFERENCE OF STANDARDS

Reference	Abbreviation	Name and Address
IEC/ CISPR	International Electro technical Commission	Bureau Central de la Commission, Electro Technique International, 1 Rue de verembe Geneva, Switzerland
IS	Indian Standards,	Bureau of Indian Standard, Manak Bhavan, 9, Bahadur Shah Zafar Marg, New Delhi-110 002, INDIA

The above supply voltage is subject to variation as follows:

All devices must be suitable for a continuous operation over the entire range of voltage variations :

- (i) AC
 - Voltage may vary by $\pm 10\%$.
 - Frequency by $\pm 5\%$
 - Combined Voltage & frequency by $\pm 10\%$.
- (ii) DC
 - a) 220 V may vary between 187 & 242 V
 - b) 110 V may vary between 93 & 121 V
 - c) 48 V may vary between 41 & 53 V

6.0 SYSTEM PARAMETERS

The following system parameters shall prevail:

Sl. No.	Description of Parameters	400 kV System	220 kV System	132 kV System	33 kV System
1.	Nominal system voltage	4000kV	220kV	132kV	33kV
2.	Maximum operating voltage of the system(rms)	420kV	245kV	145kV	36kV
3.	Rated frequency	50Hz	50Hz	50Hz	50Hz
4.	No. of phase	3	3	3	3
5.	Rated short time current	50 kA for 3 Sec.	40 kA for 3 sec	31.5 kA for 3 sec	25 kA for 3 sec
6.	Dry and wet one minute power frequency withstand voltage	680 kV	460 kV	275 kV	95 kV
7.	Dry and wet impulse withstand voltage positive and negative	1550 kVp	1050 kVp	650 kVp	250 kVp
8.	Corona extinction voltage	320 kV	156 kV	105 kV	-
9.	Max. Radio interference voltage for frequency between 0.5 MHz and 2 MHz at 508 kV rms for 765kV, 320kV rms for 400kV system and 156kV rms for 220kV system & 92kV rms for 132kV system	1000 microvolt	1000 microvolt	500 microvolt	-
10.	Minimum total creepage	25mm/ kV (10500 mm)	25mm/ kV (6125 mm)	25mm /kV (3625 mm)	25mm/kV (1300 mm)
11.	Min. clearances				
	i. Phase to phase	4000mm (for Conductor-conductor) 4200mm (for rod - Conductor)	2100 mm	1300 mm	320 mm
	ii. Phase to earth	3500 mm	2100 mm	1300 mm	320 mm

- 8.3** Low voltage connectors, grounding connectors and accessories for grounding all equipment are also included in the scope of work.
- 8.4** No current carrying part of any clamp shall be less than 10 mm thick. All ferrous parts shall be hot dip galvanized. Copper alloy liner of minimum 2 mm thickness shall be used with aluminum body for Bimetallic clamps.
- 8.5** All casting shall be free from blow holes, surface blisters cracks and cavities. Sharp edges and corners shall be blurred and rounded off.
- 8.6** Flexible connectors, braids or laminated straps made for the terminal clamps for bus posts shall be suitable for both expansion or through (fixed/sliding) type connection of 4" IPS AL. tube as required. In both the cases the clamp height (top of the mounting pad to centre line of the tube) should be same.
- 8.7** The clamps/ connectors shall be designed to carry the same current as the conductor and the temperature rise shall be equal or less than that of the conductor at the specified ambient temperature. The rated current for which the clamp/ connector is designed with respect to specified reference ambient temperature, shall also be indelibly marked on each component of the clamp/connector, except on hardware.
- 8.8** All current carrying parts shall be designed and manufactured to have minimum contact resistant.
- 8.9** Clamps and connectors shall be designed to be corona controlled. Corona extinction voltage for 420kV, 220kV and 132kV class clamps shall not be less than 320, 156 and 105kV (rms) respectively and R.I.V. level shall not be more than specified 1000, 1000 and 500 micro volts for 420kV, 220kV and 132kV system at the test voltage specified.

9.0 SUPPORT STRUCTURES

- 9.1** The base design of all the equipments, to be installed on auxiliary structures, shall conform to the standard auxiliary structure designs presently being used in UPPTCL at 400/220/132/33kV Substations.
- 9.2** All equipment support structures shall be supplied alongwith brackets, angles, stools etc. for attaching the operating mechanism, control cabinets and marshalling box (wherever applicable) etc.
- 9.3** The support structures should be hot dip galvanised with minimum 610 gram/sq.m net of zinc.

10.0 COLOUR SCHEME AND CODES FOR PIPE SERVICE

The Bidder shall propose a colour scheme for the those equipments/ items for which the colour scheme has not been specified in the specification. For the approval of purchaser. The decision of Purchaser shall be final. The scheme shall include.

Finishing colour of Indoor equipment.

Finishing colour of Outdoor equipment.

necessary for the installation of the equipment. Lubricants used for installation purposes shall be drained out and the system flushed through where necessary for applying the lubricant required for operation. The Bidder shall apply all operational lubricants to the equipment installed by him.

All oil, grease and other consumables used in the Works/ Equipment shall be purchased in India unless the Bidder has any special requirement for the specific application of a type of oil or grease not available in India. In such is the case he shall declare in the proposal, where such oil or grease is available. He shall help Purchaser in establishing equivalent Indian make and Indian Contractor. The same shall be applicable to other consumables too.

A cast iron or welded steel base plate shall be provided for all rotating equipment which are to be installed on a concrete base unless otherwise agreed to by the Purchaser. Each base plate shall support the unit and its drive assembly, shall be of design with pads for anchoring the units and shall have a raised up all around and shall have threaded in air connections, of so required.

11.2 PROVISIONS FOR EXPOSURE TO HOT AND HUMID CLIMATE

Outdoor equipment supplied under the specification shall be suitable for service and storage under tropical conditions of high temperature, high humidity, heavy rainfall and environment favourable to the growth of fungi and mildew. The indoor equipments located in non-air conditioned areas shall also be of same type.

12.0 SPACE HEATERS

The heaters shall be suitable for continuous operation at 240V AC supply. On-off switch and fuse shall be provided for the heater.

One or more adequately rated thermostatically connected heaters shall be supplied to prevent condensation in any compartment. The heaters shall be installed in the lower portion of the compartment and electrical connections shall be made sufficiently away from below the heaters to minimize deterioration of supply wire insulation. The heaters shall be suitable to maintain the compartment temperature to prevent condensation.

The heaters shall be suitably designed to prevent any contact between the heater wire and the air and shall consist of coiled resistance wire centered in a metal sheath and completely encased in a highly compacted powder of magnesium oxide or other material having equal heat conduction and electrical insulation properties, or they shall consist of resistance wire wound on a ceramic and completely covered with a ceramic material to prevent any contact between the wire and the air. Alternatively, they shall consist of a resistance wire mounted into a tubular ceramic body built into an envelope of stainless steel or the resistance wire is wound on a tubular ceramic body and embedded in glaze. The surface temperature of the heaters shall be restricted to a value which will not shorten the life of the heater sheaths or that of insulator wire or other component in the compartments.

13.0 FUNGI STATIC VARNISH

Besides the space heaters, special moisture and fungus resistant varnish shall be applied on parts which may be subjected or predisposed to the formation of fungi due to the presence or deposit of nutrient substances. The varnish shall not be applied to any surface of part where

the exclusions in these specifications and documents.

18.0 PACKAGING AND PROTECTION

All the equipments shall be suitably protected, coated, covered or boxed and crated to prevent damage or deterioration during transit, handling and storage at site till the time of erection. The Bidder shall also submit packing details/associated drawing for any equipment/material, to facilitate the Purchaser to repack any equipment/material at a later date. The Bidder shall be responsible for any loss or damage during transportation, handling and storage due to improper packing. Any demurrage, wharfage and other such charges claimed by the transporters, railways etc. shall be to the account of the Bidder.

All coated surfaces shall be protected against abrasion, impact, discolouration and any other damages. All exposed threaded portions shall be suitably protected with either a metallic or a non-metallic protection device. All ends of all valves and pipings and conduit equipment connections shall be properly sealed with suitable devices to protect them from damage. The parts which are likely to get rusted, due to exposure to weather should also be properly treated and protected in a suitable manner.

19.0 SURFACE FINISH

All interiors and exteriors of tanks, control cubicles and other metal parts shall be thoroughly cleaned to remove all rust, scales, corrosion, greases or other adhering foreign matter. All steel surfaces in contact with insulating oil as far as accessible shall be painted with not less than two coats of heat resistant, oil insoluble, insulating paints.

All metal surfaces exposed to atmosphere shall be given two primer coats of zinc chromate and two coats of epoxy paint with epoxy base thinner. All metal parts not accessible for painting shall be made of corrosion resisting material. All machine finished or bright surfaces shall be coated with a suitable preventive compound and suitably wrapped or otherwise protected. All paints shall be carefully selected to withstand tropical heat and extremes of weather within the limit specified. The paint shall not scale off or wrinkle or be removed by abrasion due to normal handling.

All external painting shall be as per shade No. 631 of IS: 5.

20.0 HOT DIP GALVANISING

All ferrous parts including all sizes of nuts, bolts, plain and spring washers, support channels, structures, shall be hot dip galvanized conforming to latest version of IS: 2629 or any other equivalent authoritative standard. However, hardware less than M12 size shall be electro-galvanized. Minimum weight of zinc coating shall be 610 gm/ sq.mm and minimum thickness of coating shall be 85 microns for all items thicker than 6 mm. For items lower than 6mm thickness, requirement of coating shall be as per relevant ASTM. For surface which shall be embedded in concrete, the zinc coating shall be 610 gm/sq. m minimum.

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

and to make a tight seal. Ventilating Louvers, if provided, shall have screen and filters, the screen shall be fine wire mesh made of brass.

- 23.6** All boxes/ cabinets shall be designed for the entry of cables from bottom by means of weather proof and dust-proof connections. Boxes and cabinets shall be designed with generous clearances to avoid interference between the wiring entering from below and any terminal blocks or accessories mounted within the box or cabinet. Suitable cable gland plate projecting at least 150 mm above the base of the marshalling kiosk/box shall be provided for this purpose along with the proper blanking plates. Necessary number of cable glands shall be supplied and fitted on this gland plate. Gland plate shall have provision for some future glands to be provided later, if required.
- 23.7** A 240V, single phase, 50 Hz, 15 amp AC plug and socket shall be provided in the cabinet with ON-OFF switch for connection of hand lamps. Plug and socket shall be of industrial grade.
- 23.8** For illumination, a 20 Watts fluorescent tube or 15 watts CFL/LED bulb shall be provided. The switching of the fittings shall be controlled by the door switch.
- For junction boxes of smaller sizes such as lighting junction box, manual operated earth switch mechanism box etc., plug socket, heater and illumination is not required to be provided.
- 23.9** All control switches shall be of rotary type. Toggle piano switches shall not be accepted.
- 23.10** Positive earthing of the cabinet shall be ensured by providing two separate earthing pads. The earth wire/ strip shall be terminated on to the earthing pad and secured by the use of self etching washer. Earthing of hinged door shall be done by using a separate earth wire.
- 23.11** The bay marshalling kiosks shall be provided with danger plate and a diagram showing the numbering/connection/feruling by pasting the same on the inside of the door.
- 23.12** a) The following routine tests alongwith the routine tests as per IS: 5039 shall also be conducted.
- Check for wiring
Visual and dimension check
- b) The enclosure of bay marshalling kiosk, junction box, terminal box shall be type tested for IP-55 as per IS: 13947. After IP-55 test, 2.5 kVrms for 1 (one) minute, insulation resistance and functional test should be conducted.
- 23.13 Auxiliary Switches**
- All the auxiliary switches shall be fully type tested as per relevant IS.
- The following type test reports on auxiliary switches shall be submitted:
- (a) Electrical endurance test - A minimum of 2000 operation for 2A D. C. with a time constant greater than or equal to 20 millisecond with a subsequent examination of mV drop/visual defects/temperature rise test.

24.11 At least 20% spare terminals shall be provided on each panel/cubicle/box and these spare terminals shall be uniformly distributed on all terminal rows.

24.12 There shall be minimum clearance of 250 mm between the first bottom row of terminal block and the associated cable gland plate. Also the clearance between two rows of terminal blocks shall be a minimum of 150 mm.

24.13 The Bidder shall furnish all wire, conduits and terminals for the necessary interphase electrical connections (where applicable) as well as between phases and common terminal boxes or control cabinets.

24.14 All input and output terminals of each control cubicle shall be tested for surge withstand capability in accordance with the relevant IEC Publications, in both longitudinal and transverse modes. The Bidder shall also provide necessary filtering, surge protection, interface relays and any other measures necessary to achieve an impulse withstand level at the cable interfaces of the equipment.

25.0 LAMPS AND SOCKETS

25.1 Lamps

All incandescent lamps shall use a socket base as per IS-1258, except in the case of signal lamps.

25.2 Sockets

All sockets (convenience outlets) shall be suitable to accept both 5 Amp & 15 Amp pin round Standard Indian plugs. They shall be switched sockets with shutters.

25.3 Hand Lamp

A 240 Volts, single Phase, 50 Hz AC plug point shall be provided in the interior of each cubicle with ON- OFF Switch for connection of hand lamps.

25.4 Switches and Fuses

Each panel shall be provided with necessary arrangements for receiving, distributing, isolating and fusing of DC and AC supplies for various control, signalling, lighting and space heater circuits. The incoming and sub-circuits shall be separately provided with miniature circuit breaker/ switchfuse units. Selection of the main and Sub-circuit fuse ratings shall be such as to ensure selective clearance of sub-circuit faults. Potential circuits for relaying and metering shall be protected by HRC fuses.

All fuses shall be of HRC cartridge type conforming to IS-9228 mounted on plug-in type fuse bases. Miniature circuit breakers with thermal protection and alarm contacts will also be accepted. All accessible live connection to fuse bases shall be adequately shrouded. Fuses shall have operation indicators for indicating blown fuse condition. Fuse carrier base shall have imprints to the fuse rating and voltage. All control switches shall be of rotary type. Toggle piano switches shall not be accepted.

- a) Motors to be installed outdoor without enclosure shall have hose proof enclosure equivalent to IP-55 as per IS: 4691. For motors to be installed indoor i.e. inside a box, the motor enclosure, shall be dust proof equivalent to IP-44 as per IS: 4691.
- b) Two independent earthing points shall be provided on opposite sides of the motor for bolted connection of earthing conductor.
- c) Motors shall have drain plugs so located that they will drain water resulting from condensation or other causes from all pockets in the motor casing.
- d) Motors weighing more than 25 Kg. shall be provided with eyebolts, lugs or other means to facilitate lifting.

27.2 Operational Features

- a) Continuous motor rating (name plate rating) shall be at least ten (10) percent above the maximum load demand of the driven equipment at design duty point and the motor shall not be over loaded at any operating point of driven equipment that will rise in service.
- b) Motor shall be capable at giving rated output without reduction in the expected life span when operated continuously in the system.

27.3 Starting Requirements

- a) All induction motors shall be suitable for full voltage direct-on-line starting. These shall be capable of starting and accelerating to the rated speed alongwith the driven equipment without exceeding the acceptable winding temperature even when the supply voltage drops down to 80% of the rated voltage.
- b) Motors shall be capable of withstanding the electrodynamic stresses and heating imposed if it is started at a voltage of 110% of the rated value.
- c) The locked rotor current shall not exceed six (6) times the rated full load current for all motors, subject to tolerance as given in IS:325.
- d) Motors when started with the driven equipment imposing full starting torque under the supply voltage conditions specified, shall be capable of withstanding atleast two successive starts from cold condition at room temperature and one start from hot condition without injurious heating of winding. The motors shall also be suitable for three equally spread starts per hour under the above referred supply condition.
- e) The locked rotor withstand time under hot condition at 110% of rated voltage shall be more than starting time with the driven equipment of minimum permissible voltage by at least two seconds or 15% of the accelerating time whichever is greater. In case it is not possible to meet the above requirement, the Bidder shall offer centrifugal type speed switch mounted on the motor shaft which shall remain closed for speed lower than 20% and open for speeds above 20% of the rated speed. The speed switch shall be capable of withstanding 120% of the rated speed in either direction of rotation.

27.4 Running Requirements

- a) The maximum permissible temperature rise over the ambient temperature of 50 degree C shall be within the limits specified in IS:325 (for 3 - phase induction motors) after adjustment due to increased ambient temperature specified.
- b) The double amplitude of motor vibration shall be within the limits specified in IS: 4729.

parent company or collaborator for the respective equipment(s) can also be considered provided the parent company (Principal) or collaborator meets qualifying requirements stipulated under clause no 28.2.(i) given above.

And

- 28.2.(ii)(b) Furnishes (jointly with parent company or collaborator) a legally enforceable undertaking to guarantee quality, timely supply, performance and warranty obligations as specified for the equipment(s)

And

- 28.2.(ii)(c) Furnishes a confirmation letter from the parent company or collaborator along with the bid stating that parent company or collaborator shall furnish performance guarantee for an amount of 10% of the cost of such equipment(s). This performance guarantee shall be in addition to contract performance guarantee to be submitted by the Bidder

28.3 Instrument Transformers (Applicable for 400kV, 220kV & 132kV)

- 28.3.(i) The manufacturer whose instrument transformers are offered, should have designed, manufactured & tested as per IS/IEC or equivalent standard and supplied the same for the specified system voltage for CT & VT and 40kA/ 50kA fault level or above class. These equipment should be in satisfactory operation for at least 2 (two) years as on the date of bid opening

Or

- 28.3.(ii)(a) The manufacturer(s) whose Instrument Transformer are offered who have recently established production line in India for the specified system voltage or above class, based on technological support of a parent company or collaborator for the respective equipment(s) can also be considered provided the parent company (Principal) or collaborator meets qualifying requirements stipulated under clause no 28.3.(i) given above.

And

- 28.3.(ii)(b) Furnishes (jointly with parent company or collaborator) a legally enforceable undertaking to guarantee quality, timely supply, performance and warranty obligations as specified for the equipment(s)

And

- 28.3.(ii)(c) Furnishes a confirmation letter from the parent company or collaborator alongwith the bid stating that parent company or collaborator shall furnish performance guarantee for an amount of 10% of the cost of such equipment(s). This performance guarantee shall be in addition to contract performance guarantee to be submitted by the Bidder

28.4 Surge Arresters (Applicable for 400kV, 220kV & 132kV)

- (a) The manufacturer whose Surge Arresters are offered should have designed, manufactured and tested as per IEC/IS or equivalent standard and supplied the Surge Arrester for the specified energy capability with rated system voltage and which are in satisfactory operation for at least 2 (two) years as on the date of bid opening.

Or

- (b) The manufacturer(s) whose Surge Arrestors are offered who have recently established production line in India for the specified system voltage or above class, based on technological support of a parent company or collaborator for the respective equipment(s) can also be considered provided the parent company (Principal) or collaborator meets qualifying requirements stipulated under clause no (a) given above.

And

Furnishes (jointly with parent company or collaborator) a legally enforceable undertaking to

tested and supplied in a single contract atleast 25 kms of 1.1 kV or higher grade XLPE insulated power cables as on the date of bid opening. Further the manufacturer should also have designed, manufactured, tested and supplied at least 1 km of 1C x 630 Sq. mm or higher size as on the date of bid opening.

28.9 LT Switchgear

28.9.1 The Manufacturer whose LT Switchgear are offered, should be a manufacturer of LT Switchboards of the type and rating being offered. He should have designed, manufactured, tested and supplied at least 50 nos. draw out circuit breaker panels, out of which at least 5 nos. should have been with relay and protection schemes with current transformer. He should have also manufactured at least 50 nos. MCC panels comprising of MCCBs (ie Moulded Case Circuit Breakers) modules of the type offered which should be in successful operation as on date of bid opening.

28.9.2 The Switchgear items (such as circuit breakers, fuse switch units, contactors etc.), may be of his own make or shall be procured from reputed manufacturers and of proven design. At least one hundred circuit breakers of the make and type being offered shall be operating satisfactory as on date of bid opening.

28.10 Battery and Battery Charger

28.10.1 Requirements for Battery Manufacturers

The manufacturer whose Batteries are offered should have designed, manufactured and supplied DC Batteries of the type specified and being offered, having a capacity of at least 600 AH and these shall be operating satisfactorily for two years in power sector and/or industrial installations as on date of bid opening.

28.10.2 Requirements for Battery Charger Manufacturers

The manufacturer, whose Battery Chargers are offered, should have designed, manufactured and supplied Battery Chargers generally of the type offered, with static automatic voltage regulators and having a continuous output of at least ten (10) kW and these should be in successful as on the date of bid opening.

28.11 LT Transformers

The manufacturer, whose transformers are offered should have designed, manufactured, type tested including short circuit test as per IEC/IS or equivalent standards and supplied transformers of at least 33 kV class of 800 kVA or higher. The transformer should have been in successful operation for at least 2 years as on the date of bid opening.

28.12 Fire Fighting System

The bidder or his sub-vendor should have designed, supplied, tested, erected and commissioned at least one number fire protection system of the each type described in (i), (ii), (iii) and (iv) below in installations such as power plants, substations, refineries, fertilizer plants or other industrial or commercial installations. Such systems must have been designed to the recommendations of Tariff Advisory Committee of India or any other international reputed

CORONA AND RADIO INTERFERENCE VOLTAGE (RIV) TEST

1.0 General

Unless otherwise stipulated, all equipment together with its associated connectors, where applicable, shall be tested for external corona (for 400 kV & above) both by observing the voltage level for the extinction of visible corona under falling power frequency voltage and by measurement of radio interference voltage (RIV) for 132 kV above.

2.0 Test Levels

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

3.0 Test Methods for RIV

- 3.1 RIV tests shall be made according to measuring circuit as per International Special-Committee on Radio Interference (CISPR) Publication 16-1(1993) Part -1. The measuring circuit shall preferably be tuned to frequency with 10% of 0.5 MHz but other frequencies in the range of 0.5 MHz to 2 MHz may be used, the measuring frequency being recorded. The results shall be in microvolts.
- 3.2 Alternatively, RIV tests shall be in accordance with NEMA standard Publication No. 107-1964, except otherwise noted herein.
- 3.3 In measurement of, RIV, temporary additional external corona shielding may be provided. In measurements of RIV only standard fittings of identical type supplied with the equipment and a simulation of the connections as used in the actual installation will be permitted in the vicinity within 3.5 meters of terminals.
- 3.4 Ambient noise shall be measured before and after each series of tests to ensure that there is no variation in ambient noise level. If variation is present, the lowest ambient noise level will form basis for the measurements. RIV levels shall be measured at increasing and decreasing voltages of 85%, 100%, and 110% of the specified RIV test voltage for all equipment unless otherwise specified. The specified RIV test voltage for 400kV, 220kV, 132kV is listed in the detailed specification together with maximum permissible RIV level in microvolts.
- 3.5 The metering instruments shall be as per CISPR recommendation or equivalent device so long as it has been used by other testing authorities.
- 3.6 The RIV measurement may be made with a noise meter. A calibration procedure of the frequency to which noise meter shall be tuned shall establish the ratio of voltage at the high voltage terminal to voltage read by noise meter.

4.0 Test Methods for Visible Corona

The purpose of this test is to determine the corona extinction voltage of apparatus, connectors etc. The test shall be carried out in the same manner as RIV test described above with the exception that RIV measurements are not required during test and a search technique shall be used near the onset and extinction voltage, when the test voltage is raised

- d) Results and observations with regard to location and type of interference sources detected at each step.
- e) Test voltage shall be recorded when measured RIV passes through 100 microvolts in each direction.
- f) Onset and extinction of visual corona for each of the four tests required shall be recorded.

ANNEXURE – B

SEISMIC WITHSTAND TEST PROCEDURE

The seismic withstanding test on the complete equipment (for 132 kV and above) shall be carried out alongwith supporting structure.

The Bidder shall arrange to transport the structure from his Contractor's premises/UPPTCL sites for the purpose of seismic withstand test only.

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

IEC-60117	-	Graphical Symbols
IEC-60156,	-	Method for the Determination of the Electrical Strength of Insulation Oils.
IEC-60270,	-	Partial Discharge Measurements.
IEC-60376	-	Specification and Acceptance of New Sulphur Hexafluoride
IEC-60437	-	Radio Interference Test on High Voltage Insulators.
IEC-60507	-	Artificial Pollution Tests on High Voltage Insulators to be used on AC Systems.
IEC-62271-1	-	Common Specification for High Voltage Switchgear & Controlgear Standards.
IEC-60815	-	Guide for the Selection of Insulators in respect of Polluted Conditions.
IEC-60865 (P1 & P2)	-	Short Circuit Current - Calculation of effects.
ANSI-C.1/NFPA.70	-	National Electrical Code
ANSI-C37.90A	-	Guide for Surge Withstand Capability (SWC) Tests
ANSI-C63.21,	-	Specification for Electromagnetic Noise and
C63.3	-	Field Strength Instrumentation 10 KHz to 1 GHZ
C36.4ANSI-C68.1	-	Technique for Dielectric Tests
ANSI-C76.1/IEEE21	-	Standard General Requirements and Test Procedure for Outdoor Apparatus Bushings.
ANSI-SI-4	-	Specification for Sound Level Meters
ANSI-Y32-2/C337.2	-	Drawing Symbols
ANSI-Z55.11	-	Gray Finishes for Industrial Apparatus and Equipment No. 61 Light Gray
NEMA-107T	-	Methods of Measurements of RIV of High Voltage Apparatus
NEMA-ICS-II	-	General Standards for Industrial Control and Systems Part ICSI-109
CISPR-1	-	Specification for CISPR Radio Interference Measuring Apparatus for the frequency range 0.15 MHz to 30 MHz
CSA-Z299.1-1978h	-	Quality Assurance Program Requirements
CSA-Z299.2-1979h	-	Quality Control Program Requirements
CSA-Z299.3-1979h	-	Quality Verification Program Requirements

Synthetic testing

- | | | |
|---------------|---|---|
| IEC-62155 | - | Hollow pressurized and unpressurized ceramic and glass insulators for use in electrical equipment with rated voltages greater than 1000 V |
| IEC-62271-110 | - | High-voltage switchgear and controlgear - Part 110: Inductive load switching |
| IEC-62271-109 | - | High-voltage switchgear and controlgear - Part 110: Inductive load switching |

CURRENT TRANSFORMERS, VOLTAGE TRANSFORMERS AND COUPLING

CAPACITOR VOLTAGE TRANSFORMERS

- | | | |
|---------------------|---|--|
| IS-2705- (P1 to P4) | - | Current Transformers. |
| IS:3156- (P1 to P4) | - | Voltage Transformers. |
| IS-4379 | - | Identification of the Contents of Industrial Gas Cylinders |
| IEC-60044-1 | - | Current transformers. |
| IEC-60044-2 | - | Inductive Voltage Transformers. |
| IEC-60044-4 | - | Instrument Transformes : Measurement of Partial Discharges |
| IEC-60044-5 | - | Instrument transformers - Part 5: Capacitor voltage transformers |
| IEC-60358 | - | Coupling capacitors and capacitor dividers. |
| IEC-60481 | - | Coupling Devices for power Line Carrier Systems. |
| ANSI-C5713 | - | Requirements for Instrument transformers |
| ANSIC92.2 | - | Power Line Coupling voltage Transformers |
| ANSI-C93.1 | - | Requirements for Power Line Carrier Coupling Capacitors |
| BUSHING | | |
| IS-2099 | - | Bushings for Alternating Voltages above 1000V |
| IEC-60137 | - | Insulated Bushings for Alternating Voltages above 1000V |

SURGE ARRESTERS

- | | | |
|-----------------|---|---|
| IS-3070 (PART2) | - | Lightning arresters for alternating current systems |
|-----------------|---|---|

measuring instruments & their accessories.

Disconnecting Switches

IEC-62271-102	-	High-voltage switchgear and controlgear - Part 102: Alternating current disconnectors and earthing switches
IEC-60129	-	Alternating Current Disconnectors (Isolators) and Earthing switches
IEC-1129	-	Alternating Current Earthing Switches Induced Current switching
IEC-60265 (Part 1 & 2)	-	High Voltage switches
ANSI-C37.32	-	Schedule of preferred Ratings, Manufacturing Specifications and Application Guide for high voltage Air Switches, Bus supports and switch accessories
ANSI-C37.34	-	Test Code for high voltage air switches
NEMA-SG6	-	Power switching equipment

PLCC and Line Traps

IS-8792	-	Line traps for AC power system.
IS-8793	-	Methods of tests for line traps.
IS-8997	-	Coupling devices for PLC systems.
IS-8998	-	Methods of test for coupling devices for PLC systems.
IEC-60353	-	Line traps for A.C. power systems.
IEC-60481	-	Coupling Devices for power line carrier systems.
IEC-60495	-	Single sideboard power line carrier terminals
IEC-60683	-	Planning of (single Side-Band) power line carrier systems.
CIGRE	-	Teleprotection report by Committee 34 & 35.
CIGRE	-	Guide on power line carrier 1979.
CCIR	-	International Radio Consultative Committee
CCITT	-	International Telegraph & Telephone Consultative Committee

IEC-Document 2 - Three phase induction motors
(Central Office) NEMA-MGI Motors and Generators

Electronic Equipment and Components

MIL-21B, MIL-833 & MIL-2750

- IEC-60068 (P1 to P5) - Environmental testing
- IEC-60326 (P1 to P2) - Printed boards
Material and workmanship standards
- IS-1363 (P1 to P3) - Hexagon headbolts, screws and nuts of product grade C.
- IS-1364 (P1 to P5) - Hexagon head bolts, screws and nuts of products grades A and B.
- IS-3138 - Hexagonal Bolts and Nuts (M42 to M150)
- ISO-898 - Fasteners: Bolts, screws and studs
- ASTM - Specification and tests for materials

Clamps & Connectors

- IS-5561 - Electric power connectors.
- NEMA-CC1 - Electric Power connectors for sub station
- NEMA-CC 3 - Connectors for Use between aluminium or aluminum-Copper Overhead Conductors

Bus Hardware and Insulators

- IS: 2121 - Fittings for Aluminum and steel cored Al conductors for overhead power lines.
- IS-731 - Porcelain insulators for overhead power lines with a nominal voltage greater than 1000 V.
- IS-2486 (P1 to P4) - Insulator fittings for overhead power lines with a nominal voltage greater than 1000 V.
- IEC-60120 - Dimensions of Ball and Socket Couplings of string insulator units.
- IEC-60137 - Insulated bushings for alternating voltages above 1000 V.
- IEC-60168 - Tests on indoor and outdoor post insulators of ceramic material or glass for Systems with Nominal Voltages Greater than 1000 V.

IS-5082	-	Wrought Aluminum and Aluminum Alloy Bars. Rods, Tubes and Sections for Electrical purposes.
ASTM-B 230-82	-	Aluminum 1350 H19 Wire for electrical purposes
ASTM-B 231-81	-	Concentric - lay - stranded, aluminum 1350 conductors
ASTM-B 221	-	Aluminum - Alloy extruded bar, rod, wire, shape
ASTM-B 236-83	-	Aluminum bars for electrical purpose (Bus-bars)
ASTM-B 317-83	-	Aluminum-Alloy extruded bar, rod, pipe and structural shapes for electrical purposes (Bus Conductors)

Batteries and Batteries Charger

Battery

IS:1651	-	Stationary Cells and Batteries, Lead-Acid Type (with Tubular Positive Plates)
IS:1652	-	Stationary Cells and Batteries, Lead-Acid Type (with Plante Positive Plates)
IS:1146	-	Rubber and Plastic Containers for Lead-Acid Storage Batteries
IS:6071	-	Synthetic Separators for Lead-Acid Batteries
IS:266	-	Specification for Sulphuric Acid
IS:1069	-	Specification for Water for Storage Batteries
IS:3116	-	Specification for Sealing Compound for Lead-Acid Batteries
IS:1248	-	Indicating Instruments
IS:10918	-	Vented type nickel Cadmium Batteries
IEC:60896-21&22	-	Lead Acid Batteries Valve Regulated types – Methods of Tests & Requirements
IEC: 60623	-	Vented type nickel Cadmium Batteries
IEC:60622	-	Secondary Cells & Batteries – Sealed Ni-Cd rechargeable single cell
IEC:60623	-	Secondary Cells & Batteries – Vented Ni-Cd rechargeable single cell
IEC:60896-11	-	Stationary Lead Acid Batteries – Vented Type – General requirements & method of tests
IEEE-485	-	Recommended practices for sizing of Lead Acid

ASTMD-2863	-	Measuring the minimum oxygen concentration to support candle like combustion of plastics (oxygen index)
IS-694	-	PVC insulated cables for working voltages upto and including 1100 Volts.
IS-1255	-	Code of practice for installation and maintenance of power cables, upto and including 33 kV rating
IS-1554 (P1 and P2)	-	PVC insulated (heavy duty) electric cables (part 1) for working voltage upto and including 1100 V.
	-	Part (2) for working voltage from 3.3 kV upto and including 11kV.
IS:1753	-	Aluminium conductor for insulated cables
IS:2982	-	Copper Conductor in insulated cables.
IS-3961 (P1 to P5)	-	Recommended current ratings for cables.
IS-3975	-	Mild steel wires, formed wires and tapes for armouring of cables.
IS-5831	-	PVC insulating and sheath of electric cables.
IS-6380	-	Elastometric insulating and sheath of electric cables.
IS-7098	-	Cross linked polyethylene insulated PVC sheathed cables for working voltage upto and including 1100 volts.
IS-7098	-	Cross-linked polyethyle insulated PVC sheathed cables for working voltage from 3.3kV upto and including 33 kV.
IS-8130	-	Conductors for insulated electrical cables and flexible cords.
IS-1753	-	Aluminum Conductors for insulated cables.
IS-10418	-	Specification for drums for electric cables.
IEC-60096 (part 0 to p4)	-	Radio Frequency cables.
IEC-60183	-	Guide to the Selection of High Voltage Cables.
IEC-60189 (P1 to P7)	-	Low frequency cables and wires with PVC insulation and PVC sheath.
IEC-60227 (P1 to P7)	-	Polyvinyl Chloride insulated cables of rated voltages up to and including 450/750V.
IEC-60228	-	Conductors of insulated cables
IEC-60230	-	Impulse tests on cables and their accessories.

		removing particle matter
IS:3069	-	Glossary of Terms, Symbols and Units Relating to Thermal Insulation Materials.
IS:4671	-	Expanded Polystyrene for Thermal Insulation Purposes
IS:8183	-	Bonded Mineral Wool
IS:3346	-	Evaluation of Thermal Conductivity properties by means of guarded hot plate method
ASTM-C-591-69	-	Standard specification for rigid preformed cellular urethane thermal insulation
IS:4894	-	Centrifugal Fans
BS:848 Fans	-	Method of Performance Test for Centrifugal Fans
IS:325	-	Induction motors, three-phase
IS:4722	-	Rotating electrical machines
IS:1231	-	Three phase foot mounted Induction motors, dimensions of
IS:2233	-	Designations of types of construction and mounting arrangements of rotating electrical machines
IS:2254	-	Vertical shaft motors for pumps, dimensions of
IS:7816	-	Guide for testing insulation resistance of rotating machines
IS:4029	-	Guide for testing three phase induction motors
IS:4729	-	Rotating electrical machines, vibration of, Measurement and evaluation of
IS:4691	-	Degree of protection provided by enclosures for rotating electrical machinery
IS:7572	-	Guide for testing single-phase a.c. motors
IS:2148	-	Flame proof enclosure for electrical apparatus
BS:4999 (Part-51)	-	Noise levels

Galvanizing

IS-209	-	Zinc Ingot
IS-2629	-	Recommended Practice for Hot-Dip galvanizing



		constant speed compression ignition engines for general purposes (above 20 kW)
BS:5514	-	The performance of reciprocating compression ignition (Diesel) engines, utilising liquid fuel only, for general purposes
ISO:3046	-	Reciprocating internal combustion engines performance
IS:554	-	Dimensions for pipe threads where pressure tight joints are required on threads
ASME Power Test Code	-	Internal combustion engine PTC-17
	-	Codes of Diesel Engine Manufacturer's Association, USA

PIPING VALVES & SPECIALITIES

IS:636	-	Non percolating flexible fire fighting delivery hose
IS:638	-	Sheet rubber jointing and rubber inserting jointing
IS:778	-	Gun metal gate, globe and check valves for general purpose
IS:780	-	Sluice valves for water works purposes (50 to 300 mm)
IS:901	-	Couplings, double male and double female instantaneous pattern for fire fighting
IS:902	-	Suction hose couplings for fire fighting purposes
IS:903	-	Fire hose delivery couplings branch pipe nozzles and nozzle spanner
IS:1538	-	Cast iron fittings for pressure pipes for water, gas and sewage
IS:1903	-	Ball valve (horizontal plunger type) including floats for water supply purposes
IS:2062	-	SP for weldable structural steel
IS:2379	-	Colour Code for the identification of pipelines
IS:2643	-	Dimensions of pipe threads for fastening purposes
IS:2685	-	Code of Practice for selection, installation and maintenance of sluice valves
IS:2906	-	Sluice valves for water-works purposes (350 to 1200 mm size)

IS:4729	-	Measurement and evaluation of vibration of rotating electrical machines
IS:5572	-	Classification of hazardous areas for electrical (Part-I) installations (Areas having gases and vapours)
IS:6362	-	Designation of methods of cooling for rotating electrical machines
IS:6381	-	Construction and testing of electrical apparatus with type of protection 'e'
IS:7816	-	Guide for testing insulation for rotating machine
IS:4064	-	Air break switches
IEC DOCUMENT 2 (Control Office) 432	-	Three Phase Induction Motor
VDE 0530 Part I/66	-	Three Phase Induction Motor
IS:9224 (Part-II)	-	HRC Fuses
IS:6875	-	Push Button and Control Switches
IS:694	-	PVC Insulated cables
IS:1248	-	Indicating instruments
IS:375	-	Auxiliary wiring & busbar markings
IS:2147	-	Degree of protection
IS:5	-	Colour Relay and timers
IS:2959	-	Contactors

PG Test Procedures

NFPA-13	-	Standard for the installation of sprinkler system
NFPA-15	-	Standard for water spray fixed system for the fire protection
NFPA-12A	-	Standard for Halong 1301 Fire Extinguishing System
NFPA-72E	-	Standard on Automatic Fire Detectors
Fire Protection Manual by TAC (Latest Edition)		
NFPA-12	-	Standard on Carbon dioxide extinguisher systems
IS:3034	-	Fire of industrial building:
Electrical generating and distributing stations code of practice		

	plates.
IS-1363 (P1 to P3)	- Hexagonal head bolts, screws & nuts of products grade C.
IS-1364	- Hexagon headbolts, screws and nuts of product grades A and B.
IS-1367 (P1 to P18)	- Technical supply condition for threaded steel fasteners.
IS-1599	- Methods for bend test.
IS-1608	- Method for tensile testing of steel products.
IS-1893	- Criteria for earthquake resistant design of structures.
IS-1978	- Line Pipe.
IS-2062	- Steel for general structural purposes.
IS-2595	- Code of practice for Radiographic testing.
IS-3063	- Single coil rectangular section spring washers for bolts, nuts and screws.
IS-3664	- Code of practice for ultrasonic pulse echo testing by contact and immersion methods.
IS-7205	- Safety code for erection of structural steel work.
IS-9595	- Recommendations for metal arc welding of carbon and carbon manganese steels.
ANSI-B18.2.1	- Inch series square and Hexagonal bolts and screws
ANSI-B18.2.2	- Square and hexagonal nuts
ANSI-G8.14	- Round head bolts
ASTM-A6	- Specification for General Requirements for rolled steel plates, shapes, sheet piling and bars of structural use
ASTM-A36	- Specifications of structural steel
ASTM-A47	- Specification for malleable iron castings
ASTM-A143	- Practice for safeguarding against embilement of Hot Galvanized structural steel products and procedure for detaching embrilement
ASTM-A242	- Specification for high strength low alloy structural steel
ASTM-A283	- Specification for low and intermediate tensile strength carbon steel plates of structural quality
ASTM-A394	- Specification for Galvanized steel transmission

		high temperature service
ASTM-A345	-	Flat rolled electrical steel for magnetic applications
ASTM-A197	-	Cupola malleable iron
ANSI-B2.1	-	Pipe threads (Except dry seal)
ANSI-B16.1	-	Cast iron pipe flanges and flanged fitting. Class 25, 125, 250 and 800
ANSI-B16.1	-	Malleable iron threaded fittings, class 150 and 300
ANSI-B16.5	-	Pipe flanges and flanged fittings, steel nickel alloy and other special alloys
ANSI-B16.9	-	Factory-made wrought steel butt welding fittings
ANSI-B16.11	-	Forged steel fittings, socket-welding and threaded
ANSI-B16.14	-	Ferrous pipe plug, bushings and locknuts with pipe threads
ANSI-B16.25	-	Butt welding ends
ANSI-B18.1.1	-	Fire hose couplings screw thread.
ANSI-B18.2.1	-	Inch series square and hexagonal bolts and screws
ANSI-B18.2.2	-	Square and hexagonal nuts
ANSI-B18.21.1	-	Lock washers
ANSI-B18.21.2	-	Plain washers
ANSI-B31.1	-	Power piping
ANSI-B36.10	-	Welded and seamless wrought steel pipe
ANSI-B36.9	-	Stainless steel pipe

Other Civil Works Standards

IS-269	-	33 grade ordinary portland cement.
IS2721	-	Galvanized steel chain link fence fabric
IS-278	-	Galvanized steel barbed wire for fencing.
IS-383	-	Coarse and fine aggregates from natural sources for concrete.
IS-432 (P1 and P2)	-	Mild steel and medium tensile steel bars and hard-drawn steel wire for concrete reinforcement.
IS-456	-	Code of practice for plain and reinforced concrete.

National Building Code of India 1970

USBR E12	-	Earth Manual by United States Department of the interior Bureau of Reclamation
ASTM-A392-81	-	Zinc/Coated steel chain link fence fabric
ASTM-D1557-80	-	test for moisture-density relation of soils using 10-lb (4.5 kg) rammer and 18-in. (457 mm) Drop.
ASTM-D1586	-	Penetration Test and Split-Barrel
(1967)	-	Sampling of Soils
ASTM-D2049-69	-	Test Method for Relative Density of Cohesionless Soils
ASTM-D2435	-	Test method for Unconsolidated, (1982) Undrained Strengths of Cohesive Soils in Triaxial Compression.
BS-5075	-	Specification for accelerating Part I Admixtures, Retarding Admixtures and Water Reducing Admixtures.
CPWD	-	Latest CPWD specifications

ACSR MOOSE CONDUCTOR

IS:6745	Methods for Determination of BS:443-1969 Mass of zinc coating on zinc coated Iron and Steel Articles
IS:8263	Methods for Radio Interference
IEC:437-1973	Test on High Voltage Insulators NEMA:107-1964 CISPR
IS:209	Zinc Ingot BS:3436-1961
IS:398	Aluminum Conductors for IEC:209-1966
Part - V	Overhead Transmission Purposes
BS:215(Part-II)	Aluminium Conductors galvanized IEC:209-1966 steel reinforced extra high
BS:215(Part-II)	voltage (400 kV and above)
IS:1778	Reels and Drums for BS:1559-1949 Bare Conductors
IS:1521	Method for Tensile Testing ISO/R89-1959 of steel wire

	(non-flameproof type).
IS:10322	Specification for flood light.
IS:10322	Specification for decorative lighting outfits.
IS:10322	Luminaries for street lighting
IS:2418	Tubular fluorescent lamps
IS:9900	High pressure mercury vapour lamps.
IS:1258	Specification for Bayonet lamp fluorescent lamp.
IS:3323	Bi-pin lamp holder tubular fluorescent lamps.
IS:1534	Ballasts for use in fluorescent lighting fittings. (Part-I)
IS:1569	Capacitors for use in fluorescent lighting fittings.
IS:2215	Starters for fluorescent lamps.
IS:3324	Holders for starters for tubular fluorescent lamps
IS:418	GLS lamps
IS:3553	Water tight electric fittings
IS:2713	Tubular steel poles
IS:280	MS wire for general engg. Purposes

Conduits, Accessories and Junction Boxes

IS:9537	Rigid steel conduits for electrical wiring
IS:3480	Flexible steel conduits for electrical wiring
IS:2667	Fittings for rigid steel conduits for electrical wiring
IS:3837	Accessories for rigid steel conduits for electrical wiring
IS:4649	Adaptors for flexible steel conduits.
IS:5133	Steel and Cast Iron Boxes
IS:2629	Hot dip galvanising of Iron & Steel.

Lighting Panels

IS:13947	LV Switchgear and Control gear(Part 1 to 5)
IS:8828	Circuit breakers for over current protection for house hold
	and similar installations.
IS:5	Ready mix paints

IS:8623 (Part-I) gear	Specification for low voltage switchgear and control assemblies
IS:13947 (Part-I) gear,	Specification for low voltage switchgear and control Part 1 General Rules
IS:13947 (part-2) gear,	Specification for low voltage switchgear and control Part 2 circuit breakers.
IS:13947 (part-3) gear.	Specification for low voltage switchgear and control Part 3 Switches, Disconnectors, Switch-disconnectors and fuse combination units
IS:13947 (part-4) gear.	Specification for low voltage switchgear and control Part 4 Contactors and motors starters.
IS:13947 (part-5) gear.	Specification for low voltage switchgear and control Part 5 Control-circuit devices and switching elements
IS:13947 (part-6) gear.	Specification for low voltage switchgear and control Part 6 Multiple function switching devices.
IS:13947 (part-7) gear.	Specification for low voltage switchgear and control Part 7 Ancillary equipments
IS:12063	Degree of protection provided by enclosures
IS:2705	Current Transformers
IS:3156	Voltage Transformers
IS:3231	Electrical relays for power system protection
IS:1248	Electrical indicating instruments
IS:722	AC Electricity meters
IS:5578	Guide for Marking of insulated conductors of apparatus terminals
IS:13703 (part 1) or	Low voltage fuses for voltage not exceeding 1000V AC 1500V DC Part 1 General Requirements
IS:13703 (part 2) or	Low voltage fuses for voltage not exceeding 1000V AC 1500V DC Part 2 Fuses for use of authorized persons

	Project:	400/220/132 kV GIS Substation at Shamli, U.P.
	Customer:	Uttar Pradesh Transmission Corporation Ltd (UPPTCL)
	Contractor:	Bharat Heavy Electricals Limited
	Document No.	TB-406-316-TS-CC, Rev.00
	Technical Specification:	Clamps & Connectors

SECTION-4

Guaranteed Technical Particulars For Clamps, Connectors and Spacers

As per UPPTCL/PGCIL Format – To be Submitted during Contract Execution Stage

	Project:	400/220/132 kV GIS Substation at Shamli, U.P.
	Customer:	Uttar Pradesh Transmission Corporation Ltd (UPPTCL)
	Contractor:	Bharat Heavy Electricals Limited
	Document No.	TB-406-316-TS-CC, Rev.00
	Technical Specification:	Clamps & Connectors

	tests are as per UPPTCL procedure mentioned in Section-1, Annexure-1.		
4	Valid Type Test Reports (of identical Clamps & Connectors/ spacers) for all offered Clamps & connectors/ spacers as per spec are available i.e, not older than 07-09-2013. (List as mentioned below).	Yes available.	
	The onus is on vendor to check the applicability of Type test reports vis-à-vis the clamps offered.	Yes	
	In case the type test reports are not found valid at detailed engineering stage, the same will have to be conducted without any price and delivery implication to BHEL	Yes	

FOR CLAMPS & CONNECTORS

Sl. No.	TESTS	YES/NO
A	Type tests	
1.	Temperature rise test	
2.	Short time current test	
3.	Resistance test	
4.	Tensile test	
5.	Galvanization test	
6.	Measurement of RIV (dry) and Corona extinction voltage test (dry). – as per UPPTCL procedure	

FOR SPACERS

Sl. No.	TESTS	YES/NO
A	Type tests	
1	Movement test	
2	Clamp slip test	