

निविदा / Enquiry



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

Project : PGCIL JEERAT 765

Enquiry No	Enquiry Dt	Rev No	Rev Dt	PI No	Enquiry Type	Inspection by	Due Dt	Commercial Comments	Technical Comments	Signing Authority
09Q2000239	09-Oct-19	0		09I2000297	Package		22-Oct-19	BHEL NIT TERMS AND CONDITION ARE APPLICABLE	BHEL SPECIFICATION IS APPLICABLE	RAJEEV KUMAR ROY

Document Enclosed

SN	Equipment	HSN Code	Phy Unit	Qty	Plan Dt	Comments
1	SUPPLY- CLAMPS & CONNECTORS : 400KV, 63KA FOR 1S, 3150A, ISOLATOR (HDB) CONNECTOR SUITABLE FOR QUAD MOOSE	0	NO	12.0000		
2	SUPPLY- CLAMPS & CONNECTORS : 400KV, CVT CONNECTOR SUITABLE FOR TWIN BULL	0	NO	6.0000		
3	SUPPLY- CLAMPS & CONNECTORS : 132KV, 31.5KA FOR 1S, 1250A, REACTOR BUSHING CONNECTOR SUITABLE FOR AL TUBE 3 INCH IPS, RIGID TYPE	0	NO	14.0000		
4	SUPPLY- CLAMPS & CONNECTORS : 66KV, 25KA FOR 1S, 1600A, RIGID SPACER SUITABLE FOR TWIN MOOSE	0	NO	20.0000		
5	SUPPLY- CLAMPS & CONNECTORS : 33KV, 25KA FOR 3S, 800A, ISOLATOR (HDB) CONNECTOR SUITABLE FOR CONDUCTOR AS PER TS	0	NO	6.0000		
6	SUPPLY- CLAMPS & CONNECTORS : 33KV, 25KA FOR 1S, 800A, HGF CONNECTOR SUITABLE FOR SINGLE CONDUCTOR AS PER TS	0	NO	6.0000		
7	SUPPLY- CLAMPS & CONNECTORS : 33KV, 25KA FOR 1S, 800A, BUSHING CONNECTOR SUITABLE FOR CONDUCTOR AS PER TS	0	NO	6.0000		
8	SUPPLY- CLAMPS & CONNECTORS : 33KV, 25KA FOR 1S, 800A, LA CONNECTOR SUITABLE FOR CONDUCTOR AS PER TS	0	NO	3.0000		
9	SUPPLY- CLAMPS & CONNECTORS : 66KV, 25KA FOR 3S, 800A, ISOLATOR (HDB) CONNECTOR SUITABLE FOR AL TUBE 3 INCH IPS, RIGID TYPE	0	NO	6.0000		
10	SUPPLY- CLAMPS & CONNECTORS : 33KV, 25KA FOR 3S, 800A, STRAIGHT CONNECTOR SUITABLE FOR AL TUBE 3 INCH IPS TO SINGLE CONDUCTOR AS PER TS	0	NO	20.0000		
11	SUPPLY- CLAMPS & CONNECTORS : 33KV, 25KA FOR 3S, 1600A, STRAIGHT CONNECTOR SUITABLE FOR AL TUBE 3 INCH IPS TO TWIN CONDUCTOR AS PER TS	0	NO	20.0000		
12	SUPPLY- CLAMPS & CONNECTORS : 400KV 50KA FOR 3S 1000A PG CLAMP SUITABLE FOR SINGLE MOOSE TO SINGLE CONDUCTOR AS PER TS	0	NO	24.0000		

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

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

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

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

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

We acknowledge the receipt of tender.

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- (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 : 09Q2000239 Enquiry Dt : 09-Oct-19

निविदा / Enquiry



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

Project : PGCIL JEERAT 765

Enquiry No	Enquiry Dt	Rev No	Rev Dt	PI No	Enquiry Type	Inspection by	Due Dt	Commercial Comments	Technical Comments	Signing Authority
09Q2000240	09-Oct-19	1	09-Oct-19	09I2000298	Package					RAJEEV KUMAR ROY

Document Enclosed

SN	Equipment	HSN Code	Phy Unit	Qty	Plan Dt	Comments
1	SUPPLY- CLAMPS & CONNECTORS : 765KV, CVT CONNECTOR SUITABLE FOR AL TUBE 4.5 INCH IPS, RIGID TYPE	0	NO	6.0000		
2	SUPPLY- CLAMPS & CONNECTORS : STRAIN CLAMP FOR SHIELD WIRE 10.98MM DIA	0	NO	240.0000		
3	CLAMPS & CONNECTORS PG CLAMP FOR SHIELD WIRES OF DIA 10.98MM	0	NO	240.0000		
4	CLAMPS & CONNECTORS PAD CONNECTOR TO SUIT 10.98MM DIA GS WIRE AND 75X12 MM GS FLAT	0	NO	120.0000		
5	SUPPLY- CLAMPS & CONNECTORS : 765KV, LA CONNECTOR SUITABLE FOR AL TUBE 4.5 INCH IPS, SLIDING THROUGH TYPE	0	NO	6.0000		
6	SUPPLY- CLAMPS & CONNECTORS : 765KV, 50KA FOR 1S, 3150A, WT CONNECTOR SUITABLE FOR QUAD BULL	0	NO	4.0000		
7	SUPPLY- CLAMPS & CONNECTORS : 765KV, 50KA FOR 1S, 3150A, WT CONNECTOR SUITABLE FOR AL TUBE 4.5 INCH IPS, EXPANSION TYPE	0	NO	4.0000		
8	SUPPLY- CLAMPS & CONNECTORS : 765KV, 50KA FOR 1S, 3150A, ISOLATOR (KNEE TYPE) CONNECTOR SUITABLE FOR QUAD BULL	0	NO	72.0000		
9	SUPPLY- CLAMPS & CONNECTORS : 765KV, 50KA FOR 1S, 1000A, PG CLAMP SUITABLE FOR SINGLE BULL TO SINGLE CONDUCTOR AS PER TS	0	NO	288.0000		

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

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- (b) We regret to quote. The item in reference is out of our manufacturing range.
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- (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 : 09Q2000240 Enquiry Dt : 09-Oct-19

निविदा / Enquiry



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

Project : PGCIL MEDINIPUR 765

Enquiry No	Enquiry Dt	Rev No	Rev Dt	PI No	Enquiry Type	Inspection by	Due Dt	Commercial Comments	Technical Comments	Signing Authority
09Q2000241	09-Oct-19	0		09I2000299	Package		22-Oct-19	BHEL NIT TERMS AND CONDITION ARE APPLICABLE	BHEL SPECIFICATION IS APPLICABLE	RAJEEV KUMAR ROY

Document Enclosed

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1	SUPPLY- CLAMPS & CONNECTORS : 66KV, 25KA FOR 1S, 1600A, RIGID SPACER SUITABLE FOR TWIN MOOSE	0	NO	20.0000		
2	SUPPLY- CLAMPS & CONNECTORS : 33KV, 25KA FOR 3S, 800A, ISOLATOR (HDB) CONNECTOR SUITABLE FOR CONDUCTOR AS PER TS	0	NO	6.0000		
3	SUPPLY- CLAMPS & CONNECTORS : 33KV, 25KA FOR 1S, 800A, LA CONNECTOR SUITABLE FOR CONDUCTOR AS PER TS	0	NO	3.0000		
4	SUPPLY- CLAMPS & CONNECTORS : 66KV, 25KA FOR 3S, 800A, ISOLATOR (HDB) CONNECTOR SUITABLE FOR AL TUBE 3 INCH IPS, RIGID TYPE	0	NO	6.0000		
5	SUPPLY- CLAMPS & CONNECTORS : 33KV, 25KA FOR 3S, 1600A, STRAIGHT CONNECTOR SUITABLE FOR AL TUBE 3 INCH IPS TO TWIN CONDUCTOR AS PER TS	0	NO	20.0000		
6	SUPPLY- CLAMPS & CONNECTORS : 33KV, 25KA FOR 3S, 800A, STRAIGHT CONNECTOR SUITABLE FOR AL TUBE 3 INCH IPS TO SINGLE CONDUCTOR AS PER TS	0	NO	20.0000		
7	SUPPLY- CLAMPS & CONNECTORS : 400KV, 63KA FOR 1S, 3150A, ISOLATOR (HDB) CONNECTOR SUITABLE FOR QUAD MOOSE	0	NO	12.0000		
8	SUPPLY- CLAMPS & CONNECTORS : 400KV, CVT CONNECTOR SUITABLE FOR TWIN BULL	0	NO	6.0000		
9	SUPPLY- CLAMPS & CONNECTORS : 132KV, 31.5KA FOR 1S, 1250A, REACTOR BUSHING CONNECTOR SUITABLE FOR AL TUBE 3 INCH IPS, RIGID TYPE	0	NO	14.0000		
10	SUPPLY- CLAMPS & CONNECTORS : 33KV, 25KA FOR 1S, 800A, HGF CONNECTOR SUITABLE FOR SINGLE CONDUCTOR AS PER TS	0	NO	6.0000		
11	SUPPLY- CLAMPS & CONNECTORS : 33KV, 25KA FOR 1S, 800A, BUSHING CONNECTOR SUITABLE FOR CONDUCTOR AS PER TS	0	NO	6.0000		
12	SUPPLY- CLAMPS & CONNECTORS : 400KV, 800A, PG CLAMP SUITABLE FOR SINGLE MOOSE TO SINGLE CONDUCTOR AS PER TS	0	NO	24.0000		

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- (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 : 09Q2000241 Enquiry Dt : 09-Oct-19

निविदा / Enquiry



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

Project : PGCIL MEDINIPUR 765

Enquiry No	Enquiry Dt	Rev No	Rev Dt	PI No	Enquiry Type	Inspection by	Due Dt	Commercial Comments	Technical Comments	Signing Authority
09Q2000242	09-Oct-19	0		09I2000300	Package		22-Oct-19	BHEL NIT TERMS AND CONDITION ARE APPLICABLE	BHEL SPECIFICATION IS APPLICABLE	RAJEEV KUMAR ROY

Document Enclosed

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1	SUPPLY- CLAMPS & CONNECTORS : 765KV, 50KA FOR 1S, 3150A, ISOLATOR (KNEE TYPE) CONNECTOR SUITABLE FOR QUAD BULL	0	NO	96.0000		
2	CLAMPS & CONNECTORS PG CLAMP FOR SHIELD WIRES OF DIA 10.98MM	0	NO	264.0000		
3	CLAMPS & CONNECTORS PAD CONNECTOR TO SUIT 10.98MM DIA GS WIRE AND 75X12 MM GS FLAT	0	NO	132.0000		
4	SUPPLY- CLAMPS & CONNECTORS : 765KV, CVT CONNECTOR SUITABLE FOR AL TUBE 4.5 INCH IPS, RIGID TYPE	0	NO	12.0000		
5	SUPPLY- CLAMPS & CONNECTORS : 765KV, LA CONNECTOR SUITABLE FOR AL TUBE 4.5 INCH IPS, SLIDING THROUGH TYPE	0	NO	12.0000		
6	SUPPLY- CLAMPS & CONNECTORS : 765KV, 50KA FOR 1S, 3150A, WT CONNECTOR SUITABLE FOR AL TUBE 4.5 INCH IPS, EXPANSION TYPE	0	NO	8.0000		
7	SUPPLY- CLAMPS & CONNECTORS : 765KV, 50KA FOR 1S, 3150A, WT CONNECTOR SUITABLE FOR QUAD BULL	0	NO	8.0000		
8	SUPPLY- CLAMPS & CONNECTORS : 765KV, 50KA FOR 1S, 1000A, PG CLAMP SUITABLE FOR SINGLE BULL TO SINGLE CONDUCTOR AS PER TS	0	NO	384.0000		
9	SUPPLY- CLAMPS & CONNECTORS : STRAIN CLAMP FOR SHIELD WIRE 10.98MM DIA	0	NO	264.0000		

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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 : 09Q2000242 Enquiry Dt : 09-Oct-19

SPECIAL TERMS & CONDITIONS FOR SUPPLY OF CLAMPS & CONNECTORS FOR POWERGRID MEDNIPUR- JEERAT PROJECT

Enquiry No & Date:

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 **MISS MUNEET MEHATA, 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- 6748597/8531
Fax: +91 (0) 0120 – 6748580.
e-mail: muneet@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 & mention 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. **Permissible Technical & Commercial Deviations:** No permissible technical & commercial deviation has been envisaged. Bidder strictly to follow the same otherwise offer is liable for rejection.
7. **PQR (Pre-qualification requirement):** Bidder must comply with technical specification of tender enquiry otherwise offer is liable for rejection. Bidder should be a approved vendor for 765kV clamps having valid MQP as on first techno-commercial bid opening date.
8. **Clause No 07 of GTC (PERFORMANCE BG): Option-B is applicable** in case not opt any option as per NIT condition, however validity of PERFORMANCE BG will cover the defect liability period as mentioned in NIT.

SPECIAL TERMS & CONDITIONS FOR SUPPLY OF CLAMPS & CONNECTORS FOR POWERGRID MEDNIPUR- JEERAT PROJECT

Enquiry No & Date:

9. **PRICE BID FORMAT:** Bidder to quote their best prices in BHEL's prescribed format of NIT, otherwise their offer shall be liable to be rejected. Bidder has to mention "quoted" (in each applicable cell) in UN-PRICED BID. In case that cell is Not Applicable, "NA" must be mentioned in that particular cell. Prices shall be mentioned in Price bid schedule only.

10. **Clause No. 2.1 of general Terms & Conditions for tender Enquiry / Contract should be as follows:**

PRICES: A. all prices shall be FIRM. 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.

11. **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/POWO 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 /POWO 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 87% (being hydro/thermal project).

12. **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.

**SPECIAL TERMS & CONDITIONS
FOR SUPPLY OF CLAMPS & CONNECTORS FOR POWERGRID MEDNIPUR-
JEERAT PROJECT**

Enquiry No & Date:

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

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

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

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

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

In addition to above RA guidelines, bidder note that

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

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

**SPECIAL TERMS & CONDITIONS
FOR SUPPLY OF CLAMPS & CONNECTORS FOR POWERGRID MEDNIPUR-
JEERAT PROJECT**

Enquiry No & Date:

(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.

13. IMPORTANT INSTRUCTION:

- Final acceptance of technical qualified vendor for placement of order is subject to approval of CUSTOMER.
- Bidder must be approved in POWERGRID as on first techno-commercial bid opening date else offer is liable for rejection.
- All boxes / Containers are to be distinctly marked with boldly written "TBG" mark on it.
- PO/LOI shall be placed to L1 bidder project wise. However evaluation shall be done based on overall quantity as per NIT.

14. 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

15. Following confirmation to be provided by vendor:

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

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

NAME & SEAL OF TENDERER

Enclosed:

- a. Activity Schedule, commercial & technical deviation.
- b. GENERAL TERMS AND CONDITION OF NIT.
- c. BHEL'S PRICE BID FORMAT.

SCHEDULE OF PRICE BID

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

PROJECT: POWERGRID MEDNIPUR-JEERAT PROJECT
ITEM: CLAMPS & CONNECTORS.
ENQUIRY NO:

SN	DESCRIPTION OF ITEM	UNIT	QTY	HSN CODE	UNIT PRICE EX. WORKS (Rs.)	TOTAL EX. WDRKS (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
POWERGRID MEDNIPUR PROJECT											
1	SUPPLY- CLAMPS & CONNECTORS : 33KV, 25KA FOR 1S, 800A, HGF CONNECTOR SUITABLE FOR SINGLE CONDUCTOR AS PER TS	Nos	6								
2	SUPPLY- CLAMPS & CONNECTORS : 33KV, 25KA FOR 3S, 1600A, STRAIGHT CONNECTOR SUITABLE FOR AL TUBE 3 INCH IPS TO TWIN CONDUCTOR AS PER TS	Nos	20								
3	SUPPLY- CLAMPS & CONNECTORS : 400KV, CVT CONNECTOR SUITABLE FOR TWIN BULL	Nos	6								
4	SUPPLY- CLAMPS & CONNECTORS : 33KV, 25KA FOR 3S, 800A, ISOLATOR (HDB) CONNECTOR SUITABLE FOR CONDUCTOR AS PER TS	Nos	6								
5	SUPPLY- CLAMPS & CONNECTORS : 400KV, 63KA FOR 1S, 3150A, ISOLATOR (HDB) CONNECTOR SUITABLE FOR QUAD MOOSE	Nos	12								
6	SUPPLY- CLAMPS & CONNECTORS : 66KV, 25KA FOR 3S, 800A, ISOLATOR (HDB) CONNECTOR SUITABLE FOR AL TUBE 3 INCH IPS, RIGID TYPE	Nos	6								
7	SUPPLY- CLAMPS & CONNECTORS : 132KV, 31 5KA FOR 1S, 1250A, REACTOR BUSHING CONNECTOR SUITABLE FOR AL TUBE 3 INCH IPS, RIGID TYPE	Nos	14								
8	SUPPLY- CLAMPS & CONNECTORS : 66KV, 25KA FOR 1S, 1600A, RIGID SPACER SUITABLE FOR TWIN MOOSE	Nos	20								
9	SUPPLY- CLAMPS & CONNECTORS : 33KV, 25KA FOR 3S, 800A, STRAIGHT CONNECTOR SUITABLE FOR AL TUBE 3 INCH IPS TO SINGLE CONDUCTOR AS PER TS	Nos	20								
10	SUPPLY- CLAMPS & CONNECTORS : 400KV, 800A, PG CLAMP SUITABLE FOR SINGLE MOOSE TO SINGLE CONDUCTOR AS PER TS	Nos	24								
11	SUPPLY- CLAMPS & CONNECTORS : 33KV, 25KA FOR 1S, 800A, LA CONNECTOR SUITABLE FOR CONDUCTOR AS PER TS	Nos	3								
12	SUPPLY- CLAMPS & CONNECTORS : 33KV, 25KA FOR 1S, 800A, BUSHING CONNECTOR SUITABLE FOR CONDUCTOR AS PER TS	Nos	6								
13	SUPPLY- CLAMPS & CONNECTORS : 765KV, 50KA FOR 1S, 3150A, ISOLATOR (KNEE TYPE) CONNECTOR SUITABLE FOR QUAD BULL	Nos	96								
14	SUPPLY- CLAMPS & CONNECTORS : 765KV, LA CONNECTOR SUITABLE FOR AL TUBE 4 5 INCH IPS, SLIDING THROUGH TYPE	Nos	12								
15	SUPPLY- CLAMPS & CONNECTORS : 765KV, 50KA FOR 1S, 3150A, WT CONNECTOR SUITABLE FOR QUAD BULL	Nos	8								
16	SUPPLY- CLAMPS & CONNECTORS : STRAIN CLAMP FOR SHIELD WIRE 10 98MM DIA	Nos	264								
17	SUPPLY- CLAMPS & CONNECTORS : 765KV, CVT CONNECTOR SUITABLE FOR AL TUBE 4 5 INCH IPS, RIGID TYPE	Nos	12								
18	CLAMPS & CONNECTORS PAD CONNECTOR TO SUIT 10 98MM DIA GS WIRE AND 75X12 MM GS FLAT	Nos	132								
19	SUPPLY- CLAMPS & CONNECTORS : 765KV, 50KA FOR 1S, 1000A, PG CLAMP SUITABLE FOR SINGLE BULL TO SINGLE CONDUCTOR AS PER TS	Nos	384								
20	SUPPLY- CLAMPS & CONNECTORS : 765KV, 50KA FOR 1S, 3150A, WT CONNECTOR SUITABLE FOR AL TUBE 4 5 INCH IPS, EXPANSION TYPE	Nos	8								
21	CLAMPS & CONNECTORS PG CLAMP FOR SHIELD WIRES OF DIA 10 98MM	Nos	264								
POWERGRID JEERAT PROJECT											
1	SUPPLY- CLAMPS & CONNECTORS : 33KV, 25KA FOR 3S, 800A, ISOLATOR (HDB) CONNECTOR SUITABLE FOR CONDUCTOR AS PER TS	Nos	6								
2	SUPPLY- CLAMPS & CONNECTORS : 132KV, 31 5KA FOR 1S, 1250A, REACTOR BUSHING CONNECTOR SUITABLE FOR AL TUBE 3 INCH IPS, RIGID TYPE	Nos	14								
3	SUPPLY- CLAMPS & CONNECTORS : 400KV, CVT CONNECTOR SUITABLE FOR TWIN BULL	Nos	6								
4	SUPPLY- CLAMPS & CONNECTORS : 33KV, 25KA FOR 3S, 1600A, STRAIGHT CONNECTOR SUITABLE FOR AL TUBE 3 INCH IPS TO TWIN CONDUCTOR AS PER TS	Nos	20								
5	SUPPLY- CLAMPS & CONNECTORS : 400KV 50KA FOR 3S 1000A PG CLAMP SUITABLE FOR SINGLE MOOSE TO SINGLE CONDUCTOR AS PER TS	Nos	24								
6	SUPPLY- CLAMPS & CONNECTORS : 33KV, 25KA FOR 1S, 800A, BUSHING CONNECTOR SUITABLE FOR CONDUCTOR AS PER TS	Nos	6								

SCHEDULE OF PRICE BID

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

PROJECT: POWERGRID MEDNIPUR-JEERAT PROJECT

ITEM: CLAMPS & CONNECTORS.

ENQUIRY NO:

SN	DESCRIPTION OF ITEM	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
7	SUPPLY- CLAMPS & CONNECTORS : 66KV, 25KA FOR 3S, 800A, ISOLATOR (HDB) CONNECTOR SUITABLE FOR AL TUBE 3 INCH IPS, RIGID TYPE	Nos	6								
8	SUPPLY- CLAMPS & CONNECTORS : 66KV, 25KA FOR 1S, 1600A, RIGID SPACER SUITABLE FOR TWIN MOOSE	Nos	20								
9	SUPPLY- CLAMPS & CONNECTORS : 33KV, 25KA FOR 3S, 800A, STRAIGHT CONNECTOR SUITABLE FOR AL TUBE 3 INCH IPS TO SINGLE CONDUCTOR AS PER TS	Nos	20								
10	SUPPLY- CLAMPS & CONNECTORS : 33KV, 25KA FOR 1S, 800A, LA CONNECTOR SUITABLE FOR CONDUCTOR AS PER TS	Nos	3								
11	SUPPLY- CLAMPS & CONNECTORS : 33KV, 25KA FOR 1S, 800A, HGF CONNECTOR SUITABLE FOR SINGLE CONDUCTOR AS PER TS	Nos	6								
12	SUPPLY- CLAMPS & CONNECTORS : 400KV, 63KA FOR 1S, 3150A, ISOLATOR (HDB) CONNECTOR SUITABLE FOR QUAD MOOSE	Nos	12								
13	SUPPLY- CLAMPS & CONNECTORS : 765KV, 50KA FOR 1S, 3150A, WT CONNECTOR SUITABLE FOR AL TUBE 4.5 INCH IPS, EXPANSION TYPE	Nos	4								
14	CLAMPS & CONNECTORS PAD CONNECTOR TO SUIT 10.98MM DIA GS WIRE AND 75X12 MM GS FLAT	Nos	120								
15	SUPPLY- CLAMPS & CONNECTORS : 765KV, CVT CONNECTOR SUITABLE FOR AL TUBE 4.5 INCH IPS, RIGID TYPE	Nos	6								
16	SUPPLY- CLAMPS & CONNECTORS : STRAIN CLAMP FOR SHIELD WIRE 10.98MM DIA	Nos	240								
17	SUPPLY- CLAMPS & CONNECTORS : 765KV, 50KA FOR 1S, 1000A, PG CLAMP SUITABLE FOR SINGLE BULL TO SINGLE CONDUCTOR AS PER TS	Nos	288								
18	SUPPLY- CLAMPS & CONNECTORS : 765KV, 50KA FOR 1S, 3150A, WT CONNECTOR SUITABLE FOR QUAD BULL	Nos	4								
19	CLAMPS & CONNECTORS PG CLAMP FOR SHIELD WIRES OF DIA 10.98MM	Nos	240								
20	SUPPLY- CLAMPS & CONNECTORS : 765KV, 50KA FOR 1S, 3150A, ISOLATOR (KNEE TYPE) CONNECTOR SUITABLE FOR QUAD BULL	Nos	72								
21	SUPPLY- CLAMPS & CONNECTORS : 765KV, LA CONNECTOR SUITABLE FOR AL TUBE 4.5 INCH IPS, SLIDING THROUGH TYPE	Nos	6								
A	TOTAL DELIVERED COST TO BHEL=										

NOTE:

- PLEASE NOTE THAT UNPRICED COPY OF PRICE BID (i.e. WITH ALL PRICES BLANKED) SHALL BE FURNISHED ALONG WITH TECHNO-COMMERCIAL BID.
- REQUIRED COPIES OF FORMAT BE MADE & DETAILS MAY BE ANNEXED.
- THE PRICES MUST BE QUOTED IN THE PRESCRIBED UNIT ONLY.
- BHEL STANDARD SPECIFICATION NO IS APPLICABLE IN LINE WITH ORIGINAL PURCHASE ORDER.

SIGNATURE & SEAL OF TENDERER

Item Name :	CLAMPS & CONNECTORS
Enquiry No. :	
Project :	POWERGIRD MEDNIPUR- JEERAT PROJECT
Type of project	SUBSTAION PACKAGE (AIS)
Applicable percentage of Local Content	87 % (Minimum)

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

Date: / /2019

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

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

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

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

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

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

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

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

- 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.>

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:.....

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:.....

ACTIVITY SCHEDULE

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

SN	ACTIVITY	TIME ALLOTTED [in weeks]	CUMULATIVE TIME FROM RECEIPT OF INPUTS FROM BHEL [in weeks]	SCOPE
1.	Submission of Documents necessary for getting manufacturing clearance like drawings, Data sheet.	2	2	BY SUPPLIER
2.	Review and Approval of documents from BHEL/Customer and issue of manufacturing clearance.	2	4	BHEL SCOPE
3.	Manufacturing Time	12	16	BY SUPPLIER
4.	Inspection call	1	17	BY SUPPLIER
5.	Inspection by BHEL/Customer	1	18	BHEL SCOPE
6.	Issue of Dispatch clearance	1	19	BHEL SCOPE
7.	Dispatch	1	20	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:

**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 (NOT REQUIRED FOR ENQUIRY THROUGH E-PROCUREMENT MODE). 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.

Sr. No.	
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/EPROC/). 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.

Sr. No.	
	1.6 The Part-I and Part-II Bids are to be sealed in separate envelopes and 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

Sr. No.	
	of subtotals, the subtotals shall prevail and the total shall be corrected. 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.

Sr. 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

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	Management wherever specifically mentioned in the Purchase Order. 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

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	100% payment along with applicable GST within 60 days from the date of receipt 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.

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	vii) Supplier has to submit PBG (as per BHEL format) & Guarantee Certificate as per 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.

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

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	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 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.

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

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	more than 1000 Kms, such excess period shall also be considered for LD 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

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	bid opening in case of two part bids) + 6% shall be considered for loading for the period of relaxation sought by bidder(s) against terms of payment in the NIT. b) Liquidated Damages (LD) for Delayed Delivery Loading on LD clause shall be to the extent to which it is not agreed to by the bidder (at offered value). c) In case of foreign bidders, if the quoted prices is on CIF basis only, it shall be loaded to arrive at total FOR (Site / Destination) price, as applicable, by factors as follows - i) Port handling / clearing charges: @ 1% of CIF value to arrive at Customs Assessable Value. ii) Custom Duty (including CVD & SAD) as per NIT prevailing on date of price bid opening. iii) Inland Freight & Transit Insurance: @ 5% of CIF value where distance between site / destination and Port of Discharge is upto 1000 Kms or @ 7% of CIF value where distance between site / destination and Port of Discharge is more than 1000 Kms. Note : Additional deviations (if considered acceptable by BHEL) & the loading criteria shall be communicated to all the qualified bidders before price bid opening.
19.	ARBITRATION : In the event of any dispute emanating from and relating to this contract, the matter shall be referred to the sole arbitration of the person appointed by the competent authority of BHEL. Subject to aforesaid, the provisions of "The Arbitration and Conciliation Act, 1996" and the rules made thereunder as amended from time to time in India shall apply to the arbitration proceedings. The venue of arbitration shall be in New Delhi. Further there shall be no claim for any pre-reference or pendente-lite interest on the claims and any claim for such interest made shall be void. However, in case of contract with Public Sector Enterprise / Undertaking (PSE/PSU) or Govt. Dept., the extant guidelines of Govt. of India shall be followed.
20.	LEGAL SETTLEMENT : Indian Courts at New Delhi / Delhi shall have exclusive jurisdiction to decide the dispute, if any, arising out of or in respect of the contract(s) to which these conditions are applicable. Contract, including all matters connected with contract, shall be governed by the Indian Law, both substantive and procedural, for the time being in force including modification thereto.
21.	SUB-CONTRACTING : In case further subcontracting of BHEL Purchase Order / Contract or part thereof is envisaged by supplier, the same can be done after written permission is obtained from BHEL. However it shall not absolve the Supplier / Contractor of the responsibility of fulfilling BHEL Purchase Order / Contract requirements. In case of subcontracting of Purchase Order / Contract awarded by BHEL or part thereof without such permission, BHEL reserve the right to cancel the Purchase Order / Contract and source such material / component / equipment / system from any other agency at the risk and cost of the Supplier / Contractor. If Supplier / Contractor is an individual or proprietary concern and the individual or the proprietor dies or the partnership is dissolved or substantially affected, then unless BHEL is satisfied that legal representative of individual Supplier / Contractor or proprietor of proprietary concern and surviving partners of partnership firm are capable of carrying out and completing the Purchase Order / Contract, BHEL shall be entitled to cancel the Purchase Order / Contract as to its incomplete portion and

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	without being in any way liable to payment of any compensation to legal 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

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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

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	applicable, as follows :- 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 attested (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

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

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	date of intimation by BHEL to the supplier. 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

BHARAT HEAVY ELECTRICALS LIMITED

TRANSMISSION BUSINESS ENGINEERING MANAGEMENT

NEW DELHI

DOCUMENT No.	TB-395-316-018C	Rev	00		Prepared	Checked	Approved
CUSTOMER Doc. No.				NAME	MM	VK	VK
TYPE OF DOC.	TECHNICAL SPECIFICATION			SIGN			
TITLE 765/400/132/66/52/33 kV CLAMPS AND CONNECTORS				DATE			
				GROUP			
				W.O. No			

CUSTOMER	PowerGrid Medinipur Jeerat Transmission Ltd.
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PROJECT	SUBSTATION PACKAGE-SS01 FOR ESTABLISHMENT OF 765/400KV S/S AT MEDINIPUR & JEERAT (NEW) ASSOCIATED WITH TRANSMISSION SYSTEM PROJECT "765kV STRENGTHENING IN EASTERN REGION (ERSS-XVIII)" UNDER TARIFF BASED COMPETITIVE BIDDING (TBCB) ROUTE.
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NOA Ref:	MJTL/765KV/ERSS-XVIII/SS01/NOA-1/03 (II) dated 29.09.2017
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Annexure – 2 (GTP)
(To be filled during detailed engineering stage)

Annexure – 3 (Check-list)
(To be filled along with offer)

Rev	Date	Altered	Checked	Approved	REVISION DETAILS
Distribution			CUSTOMER	TBMM	O/C
			-	1	1

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PROJECT : 765/400kV S/s at Medinipur & Jeerat
 CUSTOMER: POWERGRID MEDINIPUR JEERAT TRANSMISSION LTD.
 Technical Specification
 765, 400, 132, 66, 52, 33 kV Clamps and connectors

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SECTION-1

SCOPE, SPECIFIC TECHNICAL REQUIREMENTS AND QUANTITIES.

1.0 SCOPE

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

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

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

The equipment is required for the following project:

Name of Customer : PowerGrid Medinipur Jeerat Transmission Ltd.

Project: SUBSTATION PACKAGE-SS01 FOR ESTABLISHMENT OF **765/400KV S/S AT MEDINIPUR & JEERAT** (NEW) ASSOCIATED WITH TRANSMISSION SYSTEM PROJECT "765kV STRENGTHENING IN EASTERN REGION (ERSS-XVIII)" UNDER TARIFF BASED COMPETITIVE BIDDING (TBCB) ROUTE.

Refer Section - 3 for Project Details and General Specifications

1.2 TECHNICAL PARTICULARS FOR SPACERS AND CLAMP & CONNECTORS

Specific technical requirements like rated voltage, rated current, conductor details and type of connectors etc. are given in enclosed Annexure-I (Bill of Quantities for Equipment connectors). Other technical requirements for the connectors shall be as follows:

System operating voltage	765kV	400kV	132kV	66kV	52kV	33kV
Maximum operating voltage	800kV	420kV	145kV	72.5kV	72.5kV	36kV
Short circuit current	50 kA for 1 s	63 kA for 1 sec	31.5kA for 1 sec	25kA for 3 sec	25kA for 3 sec	25kA for 3 sec
Sub conductor spacing	As per BOQ					
Continuous Current	As per BOQ					

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765, 400, 132, 66, 52, 33 kV Clamps and connectors

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Note: The drawing of the equipment with complete final detail (terminal type, material, fixing details) will be furnished during detailed engineering.

1.3 BILL OF QUANTITIES

ANNEXURE-1A - BOQ for clamps for Medinipur s/s

ANNEXURE-2A - BOQ for clamps for Jeerat s/s

The scope of supply shall also include:

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

Note – Individual quantity may vary up to any extent however total contract value may vary up to $\pm 30\%$

1.4 TYPE TEST

Bidder shall submit valid type test reports (as per relevant IEC/IS Standard) for approval. The type test reports submitted shall be of tests conducted within last 10 years prior to the date of bid opening i.e. **23.11.2016** **. The bidder should have conducted type test on identical or similar equipment/ components to those offered. In case type test reports are found to be technically unacceptable to BHEL/Powergrid, the type test shall be conducted without cost and delivery implication to BHEL.

** For following tests for which type test once conducted shall be applicable (i.e. the requirement of test conducted within last ten years shall not be applicable)

(a) Short time current test

(b) Corona (dry) and RIV (dry) test (for 220 KV and above voltage level clamps)

1.5 QUALITY PLAN

Bidder to follow valid POWERGRID approved Quality Plan as per POWERGRID procedure

Annexure-1A

EKD id	Item Description	Unit	Qty- Medinipur	Qty- Jeerat
4R	765kV , 50kA for 1s, capacitor voltage Transformer , Rigid type connector suitable for 4.5 inch Al. Tube	Nos.	12	6
5TH	765kV , 50kA for 1s, Lightning Arrester , connector suitable for 4.5 inch Al. Tube, through sliding type	Nos.	12	6
6Q	765kV , 50kA for 1s, 3150A, Wave Trap , connector suitable for Quad Bull Conductor	Nos.	8	4
6E	765kV , 50kA for 1s, 3150A, Wave Trap , Rigid type connector suitable for 4.5 inch Al. Tube, , Expansion type	Nos.	8	4
2Q	765kV , 50kA for 1s, 2000 A, Vertical Knee Isolator , Rigid type connector suitable for Quad Bull AAC conductor with horizontal approach	Nos.	96	72
PG1	765kV , 50kA for 1s, 1000A two way PG clamp suitable for single Bull AAC Conductor	Nos.	384	288
PG2	400kV , 63kA for 1s,1000A two way PG clamp suitable for single Moose ACSR Conductor	Nos.	24	24
12Q1	400kV, 63kA for 1s, 3150A RIGID TYPE TERMINAL CONNECTOR FOR ISOLATOR SUITABLE FOR QUAD MOOSE WITH HORIZONTAL APPROACH	Nos.	12	12
14T1	400kV, 63kA for 1s,3150A RIGID TYPE TERMINAL CONNECTOR FOR CVT SUITABLE FOR Twin Bull WITH HORIZONTAL APPROACH	Nos.	6	6
13LRR	132KV,31.5kA for 1s,1250A, RIGID TYPE CONNECTOR FOR 80MVAR REACTOR NEUTRAL BUSHING, SUITABLE FOR 3 inch AL. Tube IPS	Nos.	14	14
66RS	66KV, 25kA for 3s, RIGID TYPE SPACERS FOR TWIN MOOSE CONDUCTOR - 250 MM SPACING	Nos.	20	20
101	Terminal Clamp for 33kV isolator, 25kA for 3s,400A suitable for single 300sqmm conductor	Nos.	6	6
102	Terminal Clamp for 33kV HGF, 25kA for 1s, 400A, suitable for single 300sqmm conductor	Nos.	6	6
103	Terminal Clamp for 33kV LT trf, 25kA for 3s,1000A, suitable for single 300sqmm conductor	Nos.	3	3
104	Terminal Clamp for 33kV LA, 25kA for 3s,400A suitable for single 300sqmm conductor	Nos.	3	3
66IS2	Terminal Clamp for 66kV isolator, 25kA for 3s,630A, suitable for 3 inch Al. tube, rigid type	Nos.	6	6
33IC1	33kV Interconnector , 25kA for 3s, 630A, for connecting 3 inch Al. Tube to single Moose conductor	Nos.	20	20
TGE	TENSION CLAMPS FOR 10.98 MM DIA GS WIRE	Nos.	264	240
PGO	PG CLAMP SUITABLE 10.98MM SHIELD WIRE	Nos.	264	240
GWO	PAD TYPE CLAMP SUITABLE FOR SHIELD WIRE TO 75x12 GI FLAT	Nos.	132	120

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SECTION 2

GENERAL SPECIFICATION

2.1 GENERAL

This section covers the general technical requirements of spacers and clamps & connectors.

2.1.1 Technical Particulars for spacers and Clamp & Connectors

Nominal voltage	system	765kV	400 kV	132 kV	66kV	33kV
Highest voltage	system	800kV	420 kV	145kV	72.5kV	36kV
Current Rating			As per BOQ			
Frequency			50 Hz $\pm 5\%$			
System Earthing			Effectively earthed			
Spacing between sub-conductors of the bus		450mm(for Bull AAC) and 457mm (Hexa Zebra)	450mm for Quad as well for Twin	250mm	N/A	N/A
Corona Voltage	extinction	508kV	320kV	105kV	--	--
Max interference for frequency between 0.5MHz and 2 MHz	Radio voltage	2500 micro-volt at 508kVrms	1000 microvolts at 266 kVrms	500 micro -volt at 92kVrms	--	--

2.2 Applicable Standards

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

List of Standards:

IS 617	Aluminium and aluminium alloy ingots and castings for general engineering purposes.
IS 1363 (All Parts)	Hexagon head bolts, screws and nuts of product grade C
IS 1364 (All Parts)	Hexagon head bolts, screws and nuts of product grades A and B
IS 1367 (Part I)	Technical Supply Conditions for threaded fasteners
IS 1367 (Part 2)	Technical Supply Conditions for threaded fasteners.

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IS 1367 (Part 3)	Technical Supply Conditions for threaded fasteners
IS 1367 (Part 13)	Technical Supply Conditions for threaded fasteners
IS 2121 (Part -1 & 2)	Specification for conductors and earthwire accessories for overhead power lines
IS 2121 (Part -3)	Specification for conductors and earthwire accessories for overhead power lines
IS 2121 (Part -4)	Specification for conductors and earthwire accessories for overhead power lines
IS 5561	Electric power connectors
IS 2633	Methods for testing uniformity of coating of zinc coated articles
IS 1573 on Iron and Steel	Electroplated coating of Zinc
IS 3138	Hexagonal Bolts & Nuts(M42 to M150)
IS 4218 (Parts 1,2 & 4)	Metric Screw Threads
IS 4218:(Part 3)	Metric Screw Threads
IS 4218:(Part 6)	Metric Screw Threads
IS 10162	Spacers & spacer dampers for twin horizontal bundle conductors
ISO 272	Fasteners: Hexagonal Products -Width across Flats
ISO 898	Fasteners: Screws & Studs
NEMA CC1	Electric power connectors for sub-station
NEMA CC3	Connectors for use between Aluminium or Aluminium-Copper Overhead Conductors
IS 816	Code of practice for use of metal arc welding for general construction in mild steel.

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IS 4759	Hot dip zinc coatings on structural steel and other allied products.
IS 2633	Methods for testing uniformity of coating of zinc coated articles.
IS 2629	Recommended practice for hot dip galvanising of iron and steel.

2.3 Clamps and Connectors

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

2.3.1 All power clamps and connectors shall conform to **IS:5561 (latest edition)** & NEMA CC1 and shall be made of materials listed below:

a) For connecting ACSR conductors/Aluminium tube	Aluminum alloy casting, conforming to designation A6 of IS:617 and all test shall conform to IS:617
b) For connecting equipment terminals made of copper with ACSR conductors/Aluminium tube	Bimetallic connectors made from aluminum alloy casting, conforming to designation A6 of IS:617 with 2mm thick bimetallic liner/strip and all test shall conform to IS:617
c) For connecting G.I	Galvanised mild steel shield wire
d) i) Bolts, nuts & Plain, washers	i) Electrogalvanised for sizes below M12. for others hot dip galvanised.
ii) Spring washers for items 'a' to 'c'	ii) Electro-galvanised mild steel suitable for atleast service condition-3 as per IS:1573

2.3.2 Necessary clamps and connectors shall be supplied for all equipment and connections. The requirement regarding external corona and RIV as specified for any equipment shall include its terminal fittings. If corona rings are required to meet these requirements they shall be considered as part of that equipment and included in the scope of work.

2.3.3 Where copper to aluminum connections are required, bi-metallic clamps shall be used, which shall be properly designed to ensure that any deterioration of the

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connection is kept to a minimum and restricted to parts which are not current carrying or subjected to stress

2.3.4 Low voltage connectors, grounding connectors and accessories for grounding all equipment as specified in each particular case, are also included in the scope of Work.

2.3.5 No current carrying part of any clamp shall be less than 10 mm thick. All ferrous parts shall be hot dip galvanised. Copper alloy liner of minimum 2 mm thickness shall be cast integral with aluminum body or 2 mm thick bi-metallic strips shall be provided for Bi-metallic clamps

2.3.6 All casting shall be free from blow holes, surface blisters, cracks and cavities. All sharp edges and corners shall be blurred and rounded off

2.3.7 Flexible connectors, braids or laminated straps made for the terminal clamps for bus posts shall be suitable for both expansion or through (fixed/sliding) type connection of 4" IPS AL tube as required. In both the cases the clamp height (top of the mounting pad to centre line of the tube) should be same.

2.3.8 Clamp shall be designed to carry the same current as the conductor and the temperature rise shall be equal or less than that of the conductor at the specified ambient temperature. The rated current for which the clamp/connector is designed with respect to the specified reference ambient temperature, shall also be indelibly marked on each component of the clamp/connector, except on the hardware

2.3.9 All current carrying parts shall be designed and manufactured to have minimum contact resistance

2.3.10 Clamps and connectors shall be designed to be corona controlled

2.3.11 Bolts and nuts shall have hexagonal heads and threads as per Indian standard. Rated torque of the nuts shall be indicated on drawing

2.3.12 For flexible connectors, braids or laminated straps shall be made from tinned copper strips or aluminium laminates depending upon the clamp. All Aluminium conductors of adequate current, mechanical stability & flexibility can also be provided

2.3.13 **Designs.**

Responsibility of satisfactory design of the clamps/connectors to safely withstand the specified mechanical stresses and carry the rated current without exceeding the temperature rise specified shall solely rest with the bidder

2.3.14 **Clamps and Connectors-Tests**

Clamps and connectors should be type tested as per IS 5561 and shall also be subjected to routine tests as per **IS:5561(latest edition)**. Following type test reports shall be submitted for approval as per clause 1.4, Section-1 except for sl. no (ii) & (iii) for which type test once conducted shall be applicable (i.e. the requirement of test conducted within last ten years shall not be applicable)

i) Temperature rise test (maximum temperature rise allowed is 35°C over 50°C ambient)

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- ii) Short time current test
- iii) Corona (dry) and RIV (dry) test (for 132 KV and above voltage level clamps)
- iv) Resistance test and tensile test

2.4 SPACERS

2.4.1 General :

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

2.4.2 Constructional Features

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

2.4.3 Tests

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

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

- a) **Clamp slip tests**

The sample shall be installed on test span of twin conductor bundle string or quadruple conductor bundle string (as applicable) at a tension of 44.2kN. One of the clamps of the sample when subjected to a longitudinal pull of 2.5kN parallel to the axis of the conductor shall not slip on the conductor. The permanent displacement between the conductor and the clamp of sample measured after removal of the load shall not exceed 1.0 mm. Similar tests be performed on the other clamps of the same sample.

- b) Fault current test as per CI 5.14.2 of IS : 10162. Alternatively, the same can be carried by simulated short circuit method for which compressive forces shall be based on IEC-60865.

- c) **Corona Extinction Voltage test (Dry)**

This test shall be performed as per procedure mentioned at Annexure-A section -2. Minimum corona extinction voltage shall be 508kV (rms) line to ground for 765 kV, 320KV (rms) line to ground for 400kV, 105kV (rms) line to ground for 132kV spacers respectively.

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d) RIV Test (Dry)

This test shall be performed as per procedure mentioned at Annexure-A. Section-3
Maximum RIV level shall be as per cl. No. 2.1.1 of section -2

e) Resilience test (if applicable)

f) Tension Test

g) Log decrement test (if applicable)

h) Compression test

i) Galvanising test

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

a) Visual examination

b) Dimensional verification

c) Movement test

d) Clamp slip test

e) Clamp bolt torque test (if applicable)

f) Assembly torque test

g) Compression test

h) Tension test

i) Galvanising test

j) Hardness test for neoprene (if applicable)

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

k) Ultimate Tensile Strength Test

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

C. Routine test

a) Visual examination

b) Dimensional verification

SECTION-3

PROJECT DETAILS & GENERAL SPECIFICATION

SITE INFORMATION

	Particular	Details	
a)	Owner	POWERGRID	
b)	Customer	POWERGRID	
c)	Project Title	765/400kV Switchyard at Medinipur & Jeerat	
d)	Location	Medinipur	Jeerat (new)
		West Bengal	West Bengal
e)	Transport Facilities	Nearest rail head - Medinipur	Nearest rail head - Kolkata
SITE CONDITIONS			
a)	Max. ambient air temp.	50°C	
b)	Min. ambient air temp.	0°C	
c)	Max. design ambient temp.	50°C	
d)	Design reference temp.	50°C	
e)	Average Humidity	Max. 100%	
f)	Special corrosion conditions	No	
g)	Solar Radiation		
h)	Atmospheric UV radiation	High	
i)	Altitude above sea level	Less than 1000meter	
j)	Pollution Severity	High Pollution level	
k)	Seismic Zone	As per the seismic zone defined in the relevant BIS / IEC-62271-300 but not less than 0.3g horrrizontal	
WIND DATA			
	Wind velocity	50m/s	
	Average No. of thunderstorm days per annum	As per IS	

Main Electrical Parameters:

Fault Levels: **765kV: 50kA for 1 sec**
 400kV: 63kA for 1 sec
 66kV : 25kA for 3 sec

Creepage Distance **31mm/kV for string insulator hardware and**
 25mm/kV for Equipment

1.0 GENERAL

This Chapter covers Technical Requirements and requirements of auxiliary items

- a) Equipment furnished shall be complete in every respect with all mountings, fittings, fixtures and standard accessories normally provided with such equipment and/or needed for erection, completion and safe operation of the equipment as required by applicable codes unless included in the list of exclusions
- b) Material and components not specifically stated in this specification but which are necessary for satisfactory operation of the equipment and accessories specified in this specification shall be deemed to be included unless specifically excluded and shall be supplied at no extra cost
- c) Whenever a material or article is specified or described by the name of a particular brand, manufacturer or vendor, the specific name mentioned shall be understood as establishing type, function and quality and not as limiting competition
- d) In case any Deviation Schedule, Bid Proposal Sheet, Schedule of Data Requirements (DRS), test reports, or any other document/information are not furnished along-with the bid, the bid is liable to be rejected. Unless brought out clearly, the Bid will be deemed to conform to the specification scrupulously. All deviations from the specification shall be clearly brought out in the respective deviation schedule
- f) The Bidder shall clearly indicate in the bid, the specific standards in accordance with which the works will be carried out.
- g) The equipment must be new, of highest grade, the best quality of their kind, to best engineering practice and latest state of art, and in accordance with purpose for which they are intended and ensure satisfactory performance throughout the service life
- h) All similar parts of the equipment shall be made to gauge and shall be interchangeable with and shall be made of same materials and workmanship as the corresponding parts of the equipment. Where feasible, common components, units shall be employed in different pieces of equipment in order to optimize the spare part stock-up and utilization.
- i) The requirement regarding external RIV as specified for equipment shall include the

terminal fittings and the equipment shall have been tested preferably with fittings, if any.

2.0 SERVICES TO BE PERFORMED BY THE EQUIPMENT BEING FURNISHED

- a) The equipment furnished under this specification shall perform all its functions and operate satisfactorily without showing undue strain, restrike etc.
- b) The equipment shall be able to withstand forces due to wind load, short circuit, system over voltages, fluctuations, frequency variations etc., all forces considered together.

3.0 SUPPORT STRUCTURES (If in the scope of Bidder)

- a) The support structures should be hot dip galvanised with minimum **610 gm/sq-m** net of zinc.
- b) The design calculations taking into account the environmental conditions of the substations shall be furnished for sizing of the structures.

4.0 STANDARDS

- a) The equipment to be furnished under this specification shall conform to latest issue with all amendments of standard specified under respective Chapters of this Specification. The Bidder shall note that standards mentioned in the specification are not mutually exclusive or complete in themselves, but intended to compliment each other. The bidder shall also note that list of standards presented in this specification is not complete. Whenever necessary the list of standards shall be considered in conjunction with specific IS/IEC. 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.
- b) Other internationally accepted standards which ensure equivalent or better performance than that specified in the standards referred shall also be accepted.
- c) In case governing standards for the equipment is different from IS or IEC, the salient points of difference shall be clearly brought out in additional information schedule alongwith English language version of standard or relevant extract of the same. The equipment conforming to standards other than IS/IEC shall be subject to POWERGRID's approval.

5.0 ENGINEERING DATA AND DRAWINGS

- 5.1 The list of drawings/documents which are to be submitted to the Purchaser shall be discussed and finalised by the Purchaser at the time of award. The supplier shall necessarily submit all the drawings/ documents unless anything is waived
- 5.2 The Contractor shall submit 4 (four) sets of drawings/ design documents /data / detailed bill of quantity and 1 (one) set of test reports for the approval of the Purchaser. The contractor shall also submit the softcopy of the above documents in addition to hardcopy.

5.3 Drawings

- 5.3.1 All drawings submitted by the Contractor shall be in sufficient detail to indicate the

type, size, arrangement, material, description, Bill of Materials, weight of each component, break-up for packing and shipment, dimensions, internal & the external connections, fixing arrangement required and any other information specifically requested in the specifications.

5.3.2 Drawings submitted by the Contractor shall be clearly marked with the name of the Purchaser, the unit designation, the specifications title, the specification number and the name of the Project. POWERGRID has standardized a large number of drawings/documents of various make including type test reports which can be used for all projects having similar requirements and in such cases, no project specific approval (except for list of applicable drawings alongwith type test reports) is required. However, distribution copies of standard drawings/documents shall be submitted as per provision of the contract. All titles, noting, markings and writings on the drawing shall be in English. All the dimensions should be in SI units.

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

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

5.5 All engineering data submitted by the Contractor after final process including review and approval by the Purchaser shall form part of the Contract Document and the entire works performed under these specifications shall be performed in strict conformity unless otherwise expressly requested by the Purchaser in Writing.

5.7 Approval Procedure

The scheduled dates for the submission of the drawings as well as for any data/information to be furnished by the Purchaser would be discussed and finalised at the time of award. The following schedule shall be followed generally for approval and for providing final documentation.

i) Approval/comments/ Purchaser on initial	As per agreed by schedule submission
ii) Resubmission (whenever required)	Within 3 (three) weeks from date of comments
iii) Approval or comments	Within 3 (three) weeks of

	receipt of resubmission.
iv) Furnishing of distribution copies (5 hard copies per substation and one scanned copy (pdf format) for Corporate Centre)	2 weeks from the date of approval
v) Furnishing of distribution copies of test reports	
(a) Type test reports (one scanned softcopy in pdf format per substation plus one for corporate centre & one hardcopy per substation)	2 weeks from the date of final approval
(b) Routine Test Reports (one copy for each substation)	-do-
vi) Furnishing of instruction/ manuals (2 copies per substation and one softcopy (pdf format) for corporate centre & per substation)	As per agreed schedule operation
(vii) As built drawings (two sets of hardcopy per substation & one softcopy (pdf format) for corporate centre & per substation)	On completion of entire works

NOTE :

- (1) The supplier may please note that all resubmissions must incorporate all comments given in the earlier submission by BHEL/POWERGRID or adequate justification for not incorporating the same must be submitted failing which the submission of documents is likely to be returned.
- (2) All drawings should be submitted in softcopy form, however substation design drawings like SLD, GA, all layouts etc. shall also be submitted in AutoCAD Version: SLD, GA & layout drawings shall be submitted for the entire substation in case of substation extension also
- (3) The instruction Manuals shall contain full details of drawings of all equipment being supplied under this contract, their exploded diagrams with complete instructions for storage, handling, erection, commissioning, testing operation, trouble shooting, servicing and overhauling procedures.
- (4) If after the commissioning and initial operation of the substation, the instruction manuals require any modifications/ additions/changes, the same shall be incorporated and the updated final instruction manuals shall be submitted by the supplier to BHEL/POWERGRID.
- (5) The manufacturer shall furnish to the Purchaser catalogues of spare parts.
- (6) All As-built drawings/documents shall be certified by site indicating the changes before final submission.

6.0 MATERIAL WORKMANSHIP

6.1 General Requirement

- 6.1.1 Where the specification does not contain references to workmanship, equipment materials and components of the covered equipment, it is essential that the same must be new, of highest grade of the best quality of their kind, conforming to best engineering practice and suitable for the purpose for which they are intended.
- 6.1.2 In case where the equipment materials or components are indicated in the specification as "similar" to any special standard, the Purchaser shall decide upon the question of similarity. When required by the specification or when required by the Purchaser, the Contractor shall submit, for approval, all the information concerning the materials or components to be used in manufacture. Machinery equipment, materials and components supplied, installed or used without such approval shall run the risk of subsequent rejection, it being understood that the cost as well as the time delay associated with the rejection shall be borne by the supplier.
- 6.1.3 The design of the Works shall be such that installation, future expansions, replacements and general maintenance may be undertaken with a minimum of time and expenses. Each component shall be designed to be consistent with its duty and suitable factors of safety, subject to mutual agreements. All joints and fastenings shall be devised, constructed and documented so that the component parts shall be accurately positioned and restrained to fulfill their required function. In general, screw threads shall be standard metric threads. The use of other thread forms will only be permitted when prior approval has been obtained from the BHEL/POWERGRID.
- 6.1.4 Whenever possible, all similar part of the Works shall be made to gauge and shall also be made interchangeable with similar parts. All spare parts shall also be interchangeable and shall be made of the same materials and workmanship as the corresponding parts of the Equipment supplied under the Specification. Where feasible, common component units shall be employed in different pieces of equipment in order to minimize spare parts stocking requirements. All equipment of the same type and rating shall be physically and electrically interchangeable.
- 6.1.5 All materials and equipment shall be installed in strict accordance with the manufacturer's recommendation(s). Only first-class work in accordance with the best modern practices will be accepted. Installation shall be considered as being the erection of equipment at its permanent location. This, unless otherwise specified, shall include unpacking, cleaning and lifting into position, grouting, levelling, aligning, coupling of or bolting down to previously installed equipment bases/foundations, performing the alignment check and final adjustment prior to initial operation, testing and commissioning in accordance with the manufacturer's tolerances, instructions and the Specification. All factory assembled rotating machinery shall be checked for alignment and adjustments made as necessary to re-establish the manufacturer's limits. Suitable guards shall be provided for the protection of personnel on all exposed rotating and / or moving machine parts and shall be designed for easy installation and removal for maintenance purposes. The spare equipment(s) shall be installed at designated locations and tested for healthiness.
- 6.1.6 The supplier shall apply oil and grease of the proper specification to suit the machinery, as is 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

supplier shall apply all operational lubricants to the equipment installed by him.

6.1.7 All oil, grease and other consumables used in the Works/ Equipment shall be purchased in India unless the Contractor 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 POWERGRID in establishing equivalent Indian make and Indian Contractor. The same shall be applicable to other consumables too.

6.1.8 Corona and radio interference voltage test and seismic withstand test (for 132kV and above voltage level) procedures for equipments shall be in line with the procedure given at Annexure-A and B respectively.

6.2 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.

6.2.1 Space Heaters

6.2.1.1 The heaters shall be suitable for continuous operation at 240V as supply voltage. On-off switch and fuse shall be provided.

6.2.1.2 One or more adequately rated thermostatically connected heaters shall be supplied to prevent condensation in any compartment. The heaters shall be installed in 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.

6.2.1.3 Suitable anti condensation heaters with the provision of thermostat shall be provided.

6.2.2 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 treatment will interfere with the operation or performance of the equipment. Such surfaces or parts shall be protected against the application of the varnish.

6.2.3 Ventilation opening

Wherever ventilation is provided, the compartments shall have ventilation openings with fine wire mesh of brass to prevent the entry of insects and to reduce to a minimum the entry of dirt and dust. Outdoor compartment openings shall be provided with shutter type blinds and suitable provision shall be made so as to avoid any communication of air / dust with any part in the enclosures of the Control Cabinets, Junction boxes and Marshalling Boxes, panels etc.

6.2.4 Degree of Protection

The enclosures of the Control Cabinets, Junction boxes and Marshalling Boxes, panels etc. to be installed shall provide degree of protection as detailed here under:

- a) Installed out door: IP- 55
- b) Installed indoor in air conditioned area: IP-31
- c) Installed in covered area: IP-52
- d) Installed indoor in non air conditioned area where possibility of entry of water is limited: IP-41.
- e) For LT Switchgear (AC & DC distribution Boards) : IP-52

The degree of protection shall be in accordance with IS 13947 (Part-I) / IEC-60547(Part-I) / IS 12063 / IEC-60529. Type test report for degree of protection test, shall be submitted for approval.

6.3 RATING PLATES, NAME PLATES AND LABELS

Each main and auxiliary item of substation is to have permanently attached to it in a conspicuous position a rating plate of non-corrosive material upon which is to be engraved manufacturer's name, year of manufacture, equipment name, type or serial number together with details of the loading conditions under which the item of substation in question has been designed to operate, and such diagram plates as may be required by the Purchaser. The rating plate of each equipment shall be according to IEC requirement.

All such nameplates, instruction plates, rating plates of transformers, reactors, CB, CT, CVT, SA, Isolators, C & R panels and PLCC equipments shall be bilingual with Hindi inscription first followed by English. Alternatively two separate plates one with Hindi and the other with English inscriptions may be provided.

6.4 FIRST FILL OF CONSUMABLES, OIL AND LUBRICANTS

All the first fill of consumables such as oils, lubricants, firing compounds, touch up paints, soldering/brazing material for all copper piping of circuit breakers and essential chemicals etc. which will be required to put the equipment covered under the scope of the specifications into successful Operation, shall be furnished by the supplier unless specifically excluded under the exclusions in these specifications and documents.

7.0 DESIGN IMPROVEMENTS / COORDINATION

- 7.1 The bidder shall note that the equipment offered by him in the bid only shall be accepted for supply. However the Purchaser or the Contractor may propose changes in the specification of the equipment or quality thereof and if the Purchaser & contractor agree upon any such changes the specification shall be modified accordingly.
- 7.2 If any such agreed upon change is such that it affects the price and schedule of completion, the parties shall agree in writing as to the extent of any change in the price and/or schedule of completion before the Contractor proceeds with the change. Following such agreement, the provision thereof shall be deemed to have been amended accordingly.
- 7.3 The supplier shall be responsible for the selection and design of appropriate equipments to provide the best co-ordinated performance of the entire system. The basic design requirements are detailed out in this Specification. The design of various components, sub-assemblies and assemblies shall be so done that it facilitates easy field assembly and maintenance.

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- 7.4 The supplier has to coordinate designs and terminations with the agencies (if any) who are Consultants/Contractor for the Purchaser. The names of agencies shall be intimated to the successful bidders
- 7.5 The supplier will be called upon to attend design co-ordination meetings with the Engineer, other Contractor's and the Consultants of the Purchaser (if any) during the period of Contract. The Contractor shall attend such meetings at his own cost at POWERGRID Corporate Centre, Gurgaon (Haryana) or at mutually agreed venue as and when required and fully cooperate with such persons and agencies involved during those discussions.

8.0 QUALITY ASSURANCE PROGRAMME

- 8.1 To ensure that the equipment and services under the scope of this Contract whether manufactured or performed within the supplier's Works or at his Sub-contractor's premises or at the Purchaser's site or at any other place of Work are in accordance with the specifications, the supplier shall adopt suitable quality assurance programme to control such activities at all points necessary. The detailed programme shall be submitted by the contractor after the award for reference. A quality assurance programme of the supplier shall generally cover the following:
- (a) His organisation structure for the management and implementation of the proposed quality assurance programme;
 - (b) Documentation control system;
 - (c) Qualification data for bidder's key personnel;
 - (d) The procedure for purchases of materials, parts components and selection of sub-Contractor's services including vendor analysis, source inspection, incoming raw material inspection, verification of material purchases etc.
 - (e) System for shop manufacturing and site erection controls including process controls and fabrication and assembly control;
 - (f) Control of non-conforming items and system for corrective actions;
 - (g) Inspection and test procedure both for manufacture and field activities.
 - (h) Control of calibration and testing of measuring instruments and field activities;
 - (i) System for indication and appraisal of inspection status;
 - (j) System for quality audits;
 - (k) System for authorising release of manufactured product to the Purchaser
 - (l) System for maintenance of records;
 - (m) System for handling storage and delivery; and
 - (n) A quality plan detailing out the specific quality control measures and procedures adopted for controlling the quality characteristics relevant to each item of equipment furnished and/or services rendered.

POWERGRID/BHEL or his duly authorised representative reserves the right to carry out quality audit and quality surveillance of the system and procedure of the supplier/his vendor's quality management and control activities.

8.2 Quality Assurance Documents

The supplier would be required to submit all the Quality Assurance Documents as stipulated in the Quality Plan at the time of POWERGRID/BHEL inspection of equipment/material

9.0 TYPE TESTING, INSPECTION, TESTING & INSPECTION CERTIFICATE

9.1 All equipment being supplied shall conform to type tests as per technical specification and shall be subject to routine tests in accordance with requirements stipulated under respective sections

9.2 The reports for all type tests as per technical specification shall be furnished by the supplier alongwith equipment / material drawings. However, type test reports of similar equipments/ material already accepted in POWERGRID shall be applicable for all project with similar requirement. The type tests conducted earlier 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 POWERGRID or representative authorized by POWERGRID or Utility or representative of accredited test lab or reputed consultant

The test reports submitted shall be of the tests conducted within last 10 (ten) years prior to the date of bid opening i.e. **23.11.16**. In case the test reports are of the test conducted earlier than 10 (ten) years prior to the date of bid opening, the contractor shall repeat these test(s) at no extra cost to BHEL.

However, in case of instrument transformers, the following type tests should have been conducted within 5 (five) years prior to the date of bid opening

- i) Lightning Impulse Test
- ii) Switching Impulse Test
- iii) Multiple Chopped Impulse Test (For CT)
- iv) Chopped Impulse Test (For CVT)

In case the test reports are of these tests (for instrument transformers) as mentioned above are conducted earlier than 5 (five) years prior to the date of bid opening i.e. **23.11.16** the contractor shall repeat these test(s) at no extra cost to the purchaser

Further, in the event of any discrepancy in the test reports i.e. any test report not acceptable due to any design/manufacturing changes (including substitution of components) or due to non-compliance with the requirement stipulated in the Technical Specification or any/all type tests not carried out, same shall be carried out without any additional cost implication to the Purchaser.

The supplier shall intimate the BHEL/POWERGRID the detailed program about the tests atleast two (2) weeks in advance in case of domestic supplies & six (6) weeks in advance in case of foreign supplies.

Further, in case type tests are required to be conducted/repeated and the deputation of Inspector/Purchaser's representative is required, then all the expenses shall be borne by the supplier.

9.3 The Purchaser intends to repeat the type tests on Power Transformer and Shunt Reactor except Dynamic short circuit tests on transformers, for which test charges shall be payable as per provision of contract. The price of conducting type tests

shall be included in Bid price and break up of these shall be given in the relevant schedule of Bid Proposal Sheets. These Type test charges would be considered in bid evaluation. In case Bidder does not indicate charges for any of the type tests or does not mention the name of any test in the price schedules, it will be presumed that the particular test has been offered free of charge. Further, in case any Bidder indicates that he shall not carry out a particular test, his offer shall be considered incomplete and shall be liable to be rejected. BHEL/POWERGRID reserves the right to witness any or all the type tests. The BHEL/POWERGRID also reserves the right to waive the repeating of type tests partly or fully and in case of waiver, test charges for the same shall not be payable.

The Purchaser shall bear all expenses for deputation of purchaser's representative(s) for witnessing the type tests under this clause except in the case of re-deputation if any, necessitated due to no fault of the purchaser.

For outdoor receptacles, trefoil clamps, diesel engine, alternator, motors, cable glands, lighting fixtures, ACSR/AAC conductor, IPS aluminum tube and junction boxes, type test reports are not required to be submitted for the makes indicated at Annexure-E /POWERGRID approved list of subvendors. For the new makes(other than those indicated at Annexure-E / POWERGRID approved list of subvendors), type test reports as per relevant standard shall be submitted for POWERGRID's approval.

- 9.4 The Purchaser, his duly authorised representative and/or outside inspection agency acting on behalf of the Purchaser shall have at all reasonable times free access to the Contractor's/sub-vendors premises or Works and shall have the power at all reasonable times to inspect and examine the materials and workmanship of the Works during its manufacture or erection if part of the Works is being manufactured or assembled at other premises or works, the Contractor shall obtain for the Engineer and for his duly authorised representative permission to inspect as if the works were manufactured or assembled on the Contractor's own premises or works. Inspection may be made at any stage of manufacture, despatch or at site at the option of the Purchaser and the equipment if found unsatisfactory due to bad workmanship or quality, material is liable to be rejected.
- 9.5 The supplier shall give the Purchaser /Inspector fifteen (15) days written notice for on-shore and six (6) weeks notice for off-shore material being ready for joint testing including contractor and POWERGRID. Such tests shall be to the Contractor's account except for the expenses of the Inspector. The Purchaser/inspector, unless witnessing of the tests is virtually waived, will attend such tests within fifteen (15) days of the date of which the equipment is notified as being ready for test/inspection, failing which the Contractor may proceed alone with the test which shall be deemed to have been made in the Inspector's presence and he shall forthwith forward to the Inspector duly certified copies of tests in triplicate.
- 9.6 The Purchaser or Inspector shall, within fifteen (15) days from the date of inspection as defined herein give notice in writing to the Contractor, of any objection to any drawings and all or any equipment and workmanship which in his opinion is not in accordance with the Contract. The Contractor shall give due consideration to such objections and shall either make the modifications that may be necessary to meet the said objections or shall confirm in writing to the Purchaser /Inspector giving reasons therein, that no modifications are

necessary to comply with the Contract.

9.7 When the factory tests have been completed at the Contractor's or Sub-Contractor's works, the Purchaser/Inspector shall issue a certificate to this effect within fifteen (15) days after completion of tests but if the tests are not witnessed by the Purchaser/Inspector, the certificate shall be issued within fifteen (15) days of receipt of the Contractor's Test certificate by the Engineer/Inspector. Failure of the Purchaser/Inspector to issue such a certificate shall not prevent the Contractor from proceeding with the Works. The completion of these tests or the issue of the certificate shall not bind the Purchaser to accept the equipment should it on further tests after erection, be found not to comply with the Contract. The equipment shall be dispatched to site only after approval of test reports and issuance of CIP by the Purchaser.

9.8 In all cases where the Contract provides for tests whether at the premises or at the works of the Contractor or of any Sub-Contractor, the Contractor except where otherwise specified shall provide free of charge such items as labour, materials, electricity, fuel, water, stores, apparatus and instruments as may be reasonably demanded by the Purchaser/Inspector or his authorised representative to carry out effectively such tests of the equipment in accordance with the Contract and shall give facilities to the Purchaser/Inspector or to his authorised representative to accomplish testing.

9.9 The inspection by Purchaser and issue of Inspection Certificate thereon shall in no way limit the liabilities and responsibilities of the Contractor in respect of the agreed quality assurance programme forming a part of the Contract.

9.10 The Purchaser will have the right of having at his own expenses any other test(s) of reasonable nature carried out at Contractor's premises or at site or in any other place in addition of aforesaid type and routine tests to satisfy that the material comply with the specification.

9.11 The Purchaser reserves the right for getting any field tests not specified in respective sections of the technical specification conducted on the completely assembled equipment at site. The testing equipments for these tests shall be provided by the Purchaser.

10.0 TESTS

10.1 Pre-commissioning Tests

On completion of erection of the equipment and before charging, each item of the equipment shall be thoroughly cleaned and then inspected jointly by the Purchaser and the Contractor for correctness and completeness of installation and acceptability for charging, leading to initial pre-commissioning tests at Site. The list of pre-commissioning tests to be performed are given in respective chapters and shall be included in the Contractor's quality assurance programme.

10.2 Commissioning Tests

10.2.1 The available instrumentation and control equipment will to be used during such tests and the Purchaser will calibrate, all such measuring equipment and devices as far as practicable.

10.2.2 Any special equipment, tools and tackles required for the successful completion of the Commissioning Tests shall be provided by the Contractor free of cost.

10.2.3 The specific tests requirement on equipment have been brought out in the respective chapters of the technical specification.

10.3 The Contractor shall be responsible for obtaining statutory clearances from the concerned authorities for commissioning the equipment and the switchyard. However necessary fee shall be reimbursed by POWERGRID on production of requisite documents.

11.0 PACKAGING & PROTECTION

11.1 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. On request of the Purchaser, the Contractor shall also submit packing details/associated drawing for any equipment/material under his scope of supply, to facilitate the Purchaser to repack any equipment/material at a later date, in case the need arises. While packing all the materials, the limitation from the point of view of availability of Railway wagon sizes in India should be taken into account. The Contractor 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 Contractor. Purchaser takes no responsibility of the availability of the wagons.

11.2 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 protecting device. All ends of all valves and pipings and conduit equipment connections shall be properly sealed with suitable devices to protect them from damage.

12.0 FINISHING OF METAL SURFACES

12.1 All metal surfaces shall be subjected to treatment for anti-corrosion protection. All ferrous surfaces for external use unless otherwise stated elsewhere in the specification or specifically agreed, shall be hot-dip galvanized after fabrication. High tensile steel nuts & bolts and spring washers shall be electro galvanized to service condition 4. All steel conductors including those used for earthing/grounding (above ground level) shall also be galvanized according to IS:2629.

12.2 HOT DIP GALVANISING

12.2.1 The minimum weight of the zinc coating shall be 610 gm/sq.m and minimum average thickness of coating shall be 86 microns for all items having thickness 6mm and above. For items lower than 6mm thickness requirement of coating thickness shall be as per relevant ASTM. For surface which shall be embedded in concrete, the zinc coating shall be 610 gm/sq. m minimum.

12.2.2 The galvanized surfaces shall consist of 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, etc. The presence of any of these defects noticed on visual or microscopic inspection shall render the material liable to rejection.

12.2.3 After galvanizing, no drilling or welding shall be performed on the galvanized parts of the equipment excepting that nuts may be threaded after galvanizing.

Sodium dichromate treatment shall be provided to avoid formation of white rust after hot dip galvanization.

12.2.4 The galvanized steel shall be subjected to six one minute dips in copper sulphate solution as per IS-2633.

12.2.5 Sharp edges with radii less than 2.5 mm shall be able to withstand four immersions of the Standard Proceco test. All other coatings shall withstand six immersions. The following galvanizing tests should essentially be performed as per relevant Indian Standards:

- Coating thickness
- Uniformity of zinc
- Adhesion test
- Mass of zinc coating

12.2.6 Galvanized material must be transported properly to ensure that galvanized surfaces are not damaged during transit. Application of zinc rich paint at site shall not be allowed.

12.3 PAINTING

12.3.1 All sheet steel work shall be degreased, pickled, phosphated in accordance with the IS-6005 "Code of practice for phosphating iron and sheet". All surfaces, which will not be easily accessible after shop assembly, shall beforehand be treated and protected for the life of the equipment. The surfaces which are to be finished painted after installation or require corrosion protection until installation, shall be shop painted with at least two coats of primer. Oil, grease, dirt and swarf shall be thoroughly removed by emulsion cleaning. Rust and scale shall be removed by pickling with dilute acid followed by washing with running water, rinsing with slightly alkaline hot water and drying.

12.3.2 After phosphating, thorough rinsing shall be carried out with clean water followed by final rinsing with dilute dichromate solution and oven drying. The phosphate coating shall be sealed with application of two coats of ready mixed, stoving type zinc chromate primer. The first coat may be "flash dried" while the second coat shall be stoved.

12.3.3 After application of the primer, two coats of finishing synthetic enamel paint shall be applied, each coat followed by stoving. The second finishing coat shall be applied after inspection of first coat of painting.

12.3.4 The exterior and interior colour of the paint in case of new substations shall preferably be RAL 7032 for all equipment, marshalling boxes, junction boxes, control cabinets, panels etc. unless specifically mentioned under respective sections of the equipments. Glossy white colour inside the equipments /boards/panels/junction boxes is also acceptable. The exterior colour for panels shall be matching with the existing panels in case of extension of a substation. Each coat of primer and finishing paint shall be of slightly different shade to enable inspection of the painting. A small quantity of finishing paint shall be supplied for minor touching up required at site after installation of the equipments.

12.3.5 In case the Bidder proposes to follow his own standard surface finish and protection procedures or any other established painting procedures like

electrostatic painting etc., the procedure shall be submitted alongwith the Bids for Purchaser's review & approval.

- 12.3.6 The colour scheme as given below shall be followed for Fire Protection and Air Conditioning systems

S.No.	PIPE LINE	Base colour	Band colour
Fire Protection System			
1	Hydrant and Emulsifier system pipeline	FIRE RED	-
2	Emulsifier system detection line – water	FIRE RED	Sea Green
3	Emulsifier system detection line – Air	FIRE RED	Sky Blue
4	Pylon support pipes	FIRE RED	
Air Conditioning System			
5	Refrigerant gas pipeline – at compressor suction	Canary Yellow	-
6	Refrigerant gas pipeline – at compressor discharge	Canary Yellow	Red
7	Refrigerant liquid pipeline	Dark Admiralty Green	-
8	Chilled water pipeline	Sea Green	-
9	Condenser water pipeline	Sea Green	Dark Blue

- 12.3.7 For aluminium casted surfaces, the surface shall be with smooth finish. Further, in case of aluminium enclosures the surface shall be coated with powder (coating thickness of 60 microns) after surface preparation for painting.

13.0 HANDLING, STORING AND INSTALLATION

- 13.1 In accordance with the specific installation instructions as shown on manufacturer's drawings or as directed by the Purchaser or his representative, the Contractor shall unload, store, erect, install, wire, test and place into commercial use all the equipment included in the contract. Equipment shall be installed in a neat, workmanlike manner so that it is level, plumb, square and properly aligned and oriented. Commercial use of switchyard equipment means completion of all site tests specified and energisation at rated voltage.
- 13.2 Contractor may engage manufacturer's Engineers to supervise the unloading, transportation to site, storing, testing and commissioning of the various equipment being procured by them separately. Contractor shall unload, transport, store, erect, test and commission the equipment as per instructions of the manufacturer's supervisory Engineer(s) and shall extend full cooperation to them.
- 13.3 The contractor shall have to ensure that the hard and flat indoor and outdoor storage areas are in place prior to commencement of delivery of material at site. Contractor shall also ensure availability of proper unloading and material handling equipment like cranes etc. and polyester/nylon ropes of suitable capacity to avoid damage during unloading and handling of material at site. All indoor equipments shall be stored indoors. Outdoor equipment may be

stored outdoors but on a hard and flat raised area properly covered with waterproof and dustproof covers to protect them from water seepage and moisture ingress. However, all associated control panels, marshalling boxes, operating boxes etc. of outdoor equipments are to be stored indoors only. Storage of equipment on top of another one is not permitted. If the wooden packing is used, Material opened for joint inspection shall be repacked properly as per manufacturer's recommendations. During storage of material, regular periodic monitoring of important parameters like oil level / leakage, SF₆ / Nitrogen pressure etc. shall be ensured by the contractor.

- 13.4 In case of any doubt/misunderstanding as to the correct interpretation of manufacturer's drawings or instructions, necessary clarifications shall be obtained from the Purchaser. Contractor shall be held responsible for any damage to the equipment consequent to not following manufacturer's drawings/instructions correctly.
- 13.5 Where assemblies are supplied in more than one section, Contractor shall make all necessary mechanical and electrical connections between sections including the connection between buses. Contractor shall also do necessary adjustments/alignments necessary for proper operation of circuit breakers, isolators and their operating mechanisms. All components shall be protected against damage during unloading, transportation, storage, installation, testing and commissioning. Any equipment damaged due to negligence or carelessness or otherwise shall be replaced by the Contractor at his own expense.
- 13.6 Supplier shall be responsible for examining all the shipment and notify the Purchaser immediately of any damage, shortage, discrepancy etc. for the purpose of Purchaser's information only. The Contractor shall submit to the Purchaser every week a report detailing all the receipts during the weeks. However, the Contractor shall be solely responsible for any shortages or damages in transit, handling and/or in storage and erection of the equipment at Site. Any demurrage, wharfage and other such charges claimed by the transporters, railways etc. shall be to the account of the Contractor.
- 13.7 The supplier shall be fully responsible for the equipment/material until the same is handed over to the Purchaser in an operating condition after commissioning. Contractor shall be responsible for the maintenance of the equipment/material while in storage as well as after erection until taken over by Purchaser, as well as protection of the same against theft, element of nature, corrosion, damages etc.
- 13.8 Where material / equipment is unloaded by Purchaser before the Contractor arrives at site or even when he is at site, Purchaser by right can hand over the same to Contractor and there upon it will be the responsibility of Contractor to store the material in an orderly and proper manner.
- 13.9 The Contractor shall be responsible for making suitable indoor storage facilities, to store all equipment which requires indoor storage.
- 13.10 The words 'erection' and 'installation' used in the specification are synonymous.
- 13.11 Exposed live parts shall be placed high enough above ground to meet the requirements of electrical and other statutory safety codes.

13.12 Equipment Bases

A cast iron or welded steel base plate shall be provided for all rotating equipment which is 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 a neat design with pads for anchoring the units, shall have a raised lip all around, and shall have threaded drain connections

14.0 TOOLS AND TACKLES

The Contractor shall supply with the equipment one complete set of all special tools and tackles for the erection, assembly, dis-assembly and maintenance of the equipment. However, these tools and tackles shall be separately, packed and brought on to Site.

15.0 AUXILIARY SUPPLY

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

Normal Voltage	Variation In Voltage	Frequency In HZ	Phase/Wire	Neutral connection
415V	$\pm 10\%$	$50 \pm 5\%$	3/4 Wire	Solidly Earthed.
240V	$\pm 10\%$	$50 \pm 5\%$	1/2 Wire	Solidly Earthed.
220V	190V to 240V	DC	-	Isolated 2 wire System
48V	-	DC	-	2 wire system (+) earthed

Combined variation of voltage and frequency shall be limited to $\pm 10\%$.

16.0 SUPPORT STRUCTURE (If In the scope of supplier)

- 16.1 The equipment support structures shall be suitable for equipment connections at the first level i.e 14.0 meter, 8.0 meter and 5.9 meter from plinth level for 765 kV, 420 kV and 245 kV substations respectively. All equipment support structures shall be supplied alongwith brackets, angles, stools etc. for attaching the operating mechanism, control cabinets & marshalling box (wherever applicable) etc.

16.2 Support structure shall meet the following mandatory requirements:

- 16.2.1 The minimum vertical distance from the bottom of the lowest porcelain part of the bushing, porcelain enclosures or supporting insulators to the bottom of the equipment base, where it rests on the foundation pad shall be 2.55 metres.

17.0 CLAMPS AND CONNECTORS INCLUDING TERMINAL CONNECTORS

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

- | | |
|-----------------------------------|--|
| a) For connecting ACSR conductors | Aluminum alloy casting, conforming to designation A6 |
|-----------------------------------|--|

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

17.11 Tests

- 17.11.1 Clamps and connectors should be type tested as per IS:5561 and shall also be subjected to routine tests as per IS:5561. Following type test reports shall be submitted for approval as per clause 9.2 above except for sl. no.(ii) & (iii) for which type test once conducted shall be applicable (i.e. the requirement of test conducted within last ten years shall not be applicable).
- i) Temperature rise test (maximum temperature rise allowed is 35°C over 50°C ambient)
 - ii) Short time current test
 - iii) Corona (dry) and RIV (dry) test (for 220 KV and above voltage level clamps)
 - iv) Resistance test and tensile test

ANNEXURE-A

CORONA AND RADIO INTERFERENCE VOLTAGE (RIV) TEST

1. General

Unless otherwise stipulated, all equipment together with its associated connectors, where applicable, shall be tested for external corona (for 400kV & 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 132kV and above.

2. Test Levels:

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

3. Test Methods for RIV:

- 3.1 RIV tests shall be made according to measuring circuit as per International Special-Committee on Radio Interference (CISPR) Publication 16-1(1993) Part -1. The measuring circuit shall preferably be tuned to frequency with 10% of 0.5 Mhz but other frequencies in the range of 0.5 MHz to 2 MHz may be used, the measuring frequency being recorded. The results shall be in microvolts.
- 3.2 Alternatively, RIV tests shall be in accordance with NEMA standard Publication No. 107-1964, except otherwise noted herein.
- 3.3 In measurement of RIV, temporary additional external corona shielding may be provided. In measurements of RIV only standard fittings of identical type supplied with the equipment and a simulation of the connections as used in the actual installation will be permitted in the vicinity within 3.5 meters of terminals.
- 3.4 Ambient noise shall be measured before and after each series of tests to ensure that there is no variation in ambient noise level. If variation is present, the lowest ambient noise level will form basis for the measurements. RIV levels shall be measured at increasing and decreasing voltages of 85%, 100%, and 110% of the specified RIV test voltage for all equipment unless otherwise specified. The specified RIV test voltage for 765kV, 400 kV, 220 KV is listed in the detailed specification together with maximum permissible RIV level in microvolts.
- 3.5 The metering instruments shall be as per CISPR recommendation or equivalent device so long as it has been used by other testing authorities.
- 3.6 The RIV measurement may be made with a noise meter. A calibration procedure of the frequency to which noise meter shall be tuned shall establish the ratio of voltage at the high voltage terminal to voltage read by noise meter.

4. Test Methods for Visible Corona

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

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

- a) Background noise before and after test
- b) Detailed procedure of application of test voltage
- c) Measurements of RIV levels expressed in micro volts at each level
- d) Results and observations with regard to location and type of interference sources detected at each step.
- e) Test voltage shall be recorded when measured RIV passes through 100microvolts 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 132kV and above) shall be carried out along with supporting structure.

The Bidder shall arrange to transport the structure from his Contractor's premises/POWERGRID 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 POWERGRID.

PROJECT : 765/400kV S/s at Medinipur & Jeerat
CUSTOMER: POWERGRID MEDINIPUR JEERAT TRANSMISSION LTD.

Annexure - 1

ANNEXURE - 1
SCHEDULE OF TECHNICAL DEVIATIONS

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

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

Date:

Tenderer's Stamp & Signature

PROJECT : 765/400kV S/s at Medinipur & Jeerat

CUSTOMER: POWERGRID MEDINIPUR JEERAT TRANSMISSION LTD.

Technical Specification

TB-395-316-018C

Clamps and connectors

REV.00

ANNEXURE – 2

GUARANTEED TECHNICAL PARTICULARS FOR SPACERS

(To be submitted by the supplier at the contract execution stage)

GUARANTEED AND TECHNICAL PARTICULARS FOR CLAMPS AND CONNECTORS

Shall be submitted for all applicable class

- | | |
|---|----------|
| 1) Manufacture's name and address | 1)..... |
| 2) Applicable standards | 2)..... |
| 3) Application | 3)..... |
| 4) Type | 4)..... |
| 5) For connection to | 5)..... |
| a) Conductor size and arrangement | (a)..... |
| b) Equipment terminal and arrangement | (b)..... |
| 6) Material (state percentage - composition of constituents and impurities present) | 6)..... |
| a) Clamp body | (a)..... |
| b) Bolts and nuts | (b)..... |
| c) Spring washers | (c)..... |
| d) Liners, if any | (d)..... |
| 7) Rated current (A) | 7)..... |
| 8) Maximum temperature rise over reference ambient temperature when carrying rated current (°C) | 8)..... |
| 9) Rated terminal load and factor of safety Kg) | 9)..... |
| 10) Minimum thickness of any part (mm) | 10)..... |
| 11) Weight of clamp complete with hardware (Kg) | 11)..... |
| 12) Machine accuracy for matching surface | 12)..... |
| 13) Service (Indoor/Outdoor) | 13)..... |

PROJECT : 765/400kV S/s at Medinipur & Jeerat

CUSTOMER: POWERGRID MEDINIPUR JEERAT TRANSMISSION LTD.

Technical Specification

765,400,145, 66,52,33kV Clamps and connectors

TB-395-316-018A

REV.00

Annexure - 3

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

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

BHEL ENQUIRY. NO:

BIDDER OFFER REFERENCE:

1A. TECHNICAL REQUIREMENTS (FOR CLAMPS & CONNECTORS)

(1) S.No.	(2)/(3) Parameter/ Requirement	(4) Yes / No	(5) Remarks in case reply in Col (4) is NO
1.	Material of Clamps/Fittings		
a)	Clamp body (Designation 4600 of IS 617)	YES/NO	
b)	Bolts, nuts and plain washers (Electro galvanised for sizes below M12, for others hot dip galvanised.)	YES/NO	
c)	Spring washers (Spring steel -E.G)	YES/NO	
2.	Continuous current rating of the clamps/fittings (Is it compatible with the conductor rating/ equipment rating as per BOQ)	YES/NO	
3.	Maximum temperature rise (35°C) of the clamps/fittings over ambient temperature (50°C) when carrying estimated fault current of 40 kA for 1 sec for 765kV and 31.5kA for 1 sec. for 132kV	YES/NO	
4.	Minimum thickness of any part is 10 mm	YES/NO	
5.	Min Corona extinction voltage (kV)		
a)	508 kVrms for 765 kV Voltage Class	YES/NO	
b)	320 kVrms for 400 kV Voltage Class	YES/NO	
c)	105 kVrms for 132 kV Voltage Class	YES/NO	
6.	All hardware required for connecting to the respective equipment terminals included in supplier scope	YES/NO	

1B. TECHNICAL REQUIREMENTS (FOR SPACERS)

(1) S.No.	(2)/(3) Parameter/ Requirement	(4) Yes / No	(5) Remarks in case reply in Col (4) is NO
1.	Spacing between sub-conductors 450mm for Bull AAC and 457mm for Hexa Zebra	YES/NO	
2.	Min Corona extinction voltage (kV)		
a)	508 kVrms for 765 kV Voltage Class	YES/NO	
b)	320 kVrms for 400 kV Voltage Class	YES/NO	
c)	105 kVrms for 132 kV Voltage Class	YES/NO	

2. TYPE TESTS

Whether Type test reports of the tests conducted earlier (not more than ten years from the date of bid opening i.e. 23.1.16 on similar material submitted. **YES/NO**

If type test report submitted, indicate report number.

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