

Enquiry No. - 61Q2300063 Dated: 03.06.2022

SPECIAL TERMS & CONDITIONS

NAME OF PROJECT: - PRE BID TIE UP FOR SUPPLY & SERVICES of 400/33KV GIS for Pooling Substation 400/33 kV, 1200 MW (PSS-1, Phase-I & Phase-II of 600 MW each) of Solar / Wind / Hybrid RE Park of 2375 MW Capacity at Great Rann of Kutch Area , Gujarat.

Enquiry No. & Date:

निविदा आमंण सूचना

NOTICE INVITING TENDER

Sir/Madam,

Bharat Heavy Electricals Limited (hereinafter referred to as **BHEL**) is a Central Public Sector Enterprise, having its Branch office at Transmission Business Group, 10TH Floor, Plot no.:- C-20, 1A/1, Joy towers,C Block, Phase 2, Industrial Area, Sector-62, Noida, Distt. Gautambudh Nagar, UP-201301, invites offer in sealed cover under two part bid system (Part-I: Techno commercial Part & Part-II: Price Part) from the competent agencies for **“Pre-Bid Tie-up for Supply & Services of 400 kV Gas Insulated Switchgear (GIS) for addressing tender invited by GIPCL for Pooling Substation 400/33 kV, 1200 MW (PSS-1, Phase-I & Phase-II of 600 MW each) of Solar / Wind / Hybrid RE Park of 2375 MW Capacity at Great Rann of Kutch Area , Gujarat.** Please submit your competitive offer for the above subject work as per the tender terms & conditions.

SCHEDULE TO TENDER

| | | |
|---|--|---|
| 1. | Tender Reference No. | |
| 2. | Date of Issue of Tender: | |
| 3. | Type of Tender: | Open Tender |
| 4. | Tender Title: | “Pre-Bid Tie-up for Supply & Services of 400 kV Gas Insulated Switchgear (GIS) for addressing tender invited by GIPCL for Pooling Substation 400/33 kV, 1200 MW (PSS-1, Phase-I & Phase-II of 600 MW each) of Solar / Wind / Hybrid RE Park of 2375 MW Capacity at Great Rann of Kutch Area , Gujarat” Technical Specification No. TB-PBTU-GIPL-GIS Rev.00 |
| 5. | Tender issuing Authority | Transmission Business Group, 10TH Floor, Plot no.:- C-20, 1A/1, Joy towers, C Block, Phase 2, Industrial Area, Sector-62, Noida, Distt. Gautambudh Nagar, UP-201301 |
| 6. | Last date/ time for receipt of tender: | 06.06.2022 by 11.00 Hrs |
| 7. | Date/ time of opening of (Part-I): | 06.06.2022 at 16.00 Hrs |
| 8. | Offer/Bid submission mode | Tender is invited through e-Procurement System only. The bidder shall submit their bid through e-Procurement platform at https://eprocurebhel.co.in . |
| 9. | Tender will be opened at: | BHEL TBG– HQ Noida of above mentioned address at point no. 5. |
| 10. | Date/Time of price bid opening: | Will be intimated separately to the Techno-commercially qualified bidders in due course of time. |
| Note:- For other instructions; bidder may please refer the Terms & Conditions and Special terms & conditions | | |

All corrigenda, addenda, amendments, Bid Submission extension, clarifications, etc. to the tender will be hosted on website <http://www.bhel.com> and <https://eprocurebhel.co.in> only. Bidders should regularly visit website till the due date of submission to keep themselves updated. Any clarification(s) regarding Notice Inviting Tender (NIT), if required, should be sought before the tender due date from the officials as mentioned in the tender Document.

Thanking you,

For & on behalf of
Bharat Heavy Electricals Ltd.

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PREAMBLE

- Bharat Heavy Electricals Limited (BHEL) (A Government of India Enterprise) incorporated under the Companies Act, 1956, having its Registered office at BHEL House, Siri Fort, New Delhi intends to participate in the tender, invited by **M/s GIPCL for Pooling Substation 400/33 kV, 1200 MW (PSS-1, Phase-I & Phase-II of 600 MW each) of Solar / Wind / Hybrid RE Park of 2375 MW Capacity at Great Rann of Kutch Area , Gujarat.**
- Due date of Tender enquiry for BHEL to submit the bid to GIPCL is 07.06.2022.
- BHEL comply the qualification criteria as EPC bidder (As per Route-3 of the QR of M/s GIPL) and can submit the bid with the support of a GIS Manufacturer only. Accordingly, for complying the tender requirement in totality and to address this tender opportunity, a qualified GIS manufacturer is required to be explored for project specific pre bid tie-up.
- For addressing the above tender, BHEL wish to have a tender specific pre bid tie-up with **400kV GIS Manufacturer who meets the Qualification requirement as outlined in this tender documents (Technical specification).**
- BHEL, therefore, invites sealed bids from eligible bidders for this project as per terms & conditions specified in the tender documents.
- The GIS manufacturer must meet the techno-commercial Qualification requirement as stipulated in technical specification and any subsequent amendment.
- The qualified, lowest evaluated Bidder having requisite capacity and capability to perform the contract for the aforesaid tender as per the provisions of the Bidding Documents shall be pre-selected, for the scope of work contained in the Bidding Documents, for associating with BHEL for addressing the tender invited by M/s GIPL.
- GIS OEM/bidders will have to furnish Performance Bank guarantee as per clause no. 16 & 18 of STC.
- BHEL will assess the technical and financial capability of the bidder (s) as per the qualifying requirement mentioned in the tender documents and will reserve the right to accept/ reject the party.
- The Owner (M/s GIPCL / BHEL reserves the right to request for any additional information at any stage as per their qualifying requirement. If in the opinion of the BHEL, the details furnished by the bidder (s) are incomplete, their price bid shall not be opened.

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- The pre-selected party associating with BHEL shall not be allowed to participate as a bidding company directly; or indirectly through their Subsidiaries, Partnership, Ownership, Individual firm; or through any other route. The party shall submit an undertaking in this respect.
- Each Party shall use all reasonable efforts to secure the award of the Contract. No Party shall, however, have a claim against any other Party arising out of a failure to secure a Contract for the Project except as a result of material breach of this Agreement.
- In case BHEL becomes successful Bidder and receives the LOA from M/s GIPCL, a firm Purchase Order shall be placed to the successful GIS Manufacturer/bidder for execution of relevant scope of work contained in this Bidding Documents.
- The project specific MOU will be signed between BHEL & selected GIS manufacturer for final submission of the bid by BHEL to M/s GIPL.
- In the event of price reduction during negotiation by BHEL with the customer (M/s GIPCL), corresponding reduction will be passed on to the supplier (s) “shall be incorporated in tender
- BHEL reserves the right to cancel/withdraw this invitation for bids without assigning any reason and shall bear no liability whatsoever consequent upon such a decision.
- For tender Qualification apart from documents towards technical experience requirement, following documents shall be sought from the GIS manufacturer along with their bid:
 - i) Consent letter from the proposed GIS manufacturer (on their letter head) for entering into pre-bid tie up with BHEL-TBG.
 - ii) A legally enforceable undertaking (jointly with GIS manufacturer or Collaborator/ Parent/ Principal Company of Subsidiary Company) to guarantee quality, timely supply, performance and warranty obligations as specified for the equipment(s).
- The GIS manufacturer must not be Banned or Delisted or Black Listed by any Government Department / Public Sector Undertaking on due date of submission of bid. The bidder will give a written confirmation in this regard along with the bid.

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- Bidders may please note that the bids obtained shall be opened in-camera. The reverse auction is not applicable for this tender.

SPECIAL TERMS & CONDITIONS

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 **Ms. Gorav Vig, Sr. Engineer (TBEM)**
BHEL, Transmission Business Group
9Th Floor, Plot No: C-20/1/A-1, Joy Towers, Sector-62, Noida-201309, UP, India
Phone: +91 (0) 0120- 6748457
Fax: +91 (0) 0120 – 6748457.
E-mail: gorav@bhel.in
3. For any commercial clarification, kindly contact **Mr. Raj Narayan Ram, Dy. Manager (TBMM);**
BHEL, Transmission Business Group
10th Floor, Plot No: C-20/1/A-1, Joy Towers, Sector-62, Noida-201309, UP, India
Phone: +91 (0) 0120- 6748526
Fax: +91 (0) 0120 – 6748526.
Contact No. 9977142910; E-mail: raj.ram@bhel.in
4. Bidder to submit offer directly to **TENDER BOX (Address mentioned below)** or email to **tmmtenderbox@bhel.in** for part-1 bid (i.e., techno-commercial bid) & **tmmtender.pricebidbox@bhel.in** for Part-2 (i.e. PRICE BID) or **through NIC portal** (<https://eprocurebhel.co.in/nicgep/app>). No other mode for submission of tender is acceptable.
Address is
TENDER BOX
BHEL, TRANSMISSION BUSINESS GROUP
10th FLOOR, C-20/1A/1, JOY TOWERS,
SECTOR-62, NOIDA-201309, UP, INDIA

Offer submission due date and time: 06.06.2022, 11:00 AM

Offer opening due date and time: 06.06.2022, 16:00 PM
5. **PROPOSED DELIVERY PLAN: 8months for phase-I & 14 months for phase-II from BHEL LOA (Considering 14 Months project completion schedule for Schedule-I and 20 Months for Phase-II). Vendor to examine** their best possible delivery plan & mention in **ACTIVITY SCHEDULE**. The

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same shall be submitted in BHEL format along with commercial offer duly signed and stamped by authorized person. 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.

6. **Permissible Technical & Commercial Deviations:** No permissible technical & commercial deviation has been envisaged. Bidder to strictly follow the same, else offer is liable for rejection.
7. **Bid Validity:** - 9 months from techno-commercial bid opening (considering customer requirement of 6 months)
8. **Type of tender:** This tender is open tender but not a global tender and only **CLASS-I** suppliers as defined under the DPIIT order no. P-45021/2/2017-PP (BE-II) dated 16.09.2021 **are eligible to bid in this tender. Bids received from CLASS-II & Non-Local supplier shall be rejected.** Please refer clause mentioned at **Annexure-1** and Certification at **Annexure-2 / Annexure-3** (whichever is applicable) regarding restrictions under Rule 144 (xi) of General Financial Rules (GFRs), 2017. Bidder to comply with the clause and submit the certification. Non-compliance/ Non-submission of certification will lead to rejection of Offer.
9. **Mandatory tender documents:** Bidder shall submit the following documents along with commercial offer. Bidder to strictly follow the same else offer is liable for rejection.
 - **Compliance of General Financial Rules (GFRs): Annexure-2 or 3** (whichever is applicable).
 - **Local content certificate:** Format is enclosed in **Annexure-A**. Bidder must fill the local content in percentage.
 - **Bidders may please be noted that the minimum local Content in line with PPP-MII order, order ref no.:- A-1/2021-FSC-Part (5) dated 16.11.2021 issued by Govt of India, Ministry of Power for the item GIS is 60%. The bidder has to declare this local content in Annexure-A.**
 - **The Bidder's declaration in Annexure-A for Local content Less than 60% shall not be considered as Class-I supplier and their bid shall be rejected.**
 - **MoP (ministry of Power) compliance:** Bidder to comply the MOP circular dated 02-07-2020 and its subsequent amendment, if any, in prescribed format (**Annexure-B**). Non-compliance/ Non-submission will lead to rejection of Offer.
 - **Integrity pact:** Format is enclosed in **Annexure-C**.

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10. Quantity Variation: The final quantity may vary at contract stage by $\pm 20\%$ of total contract value.

11. PRE-QUALIFYING REQUIREMENT: Bidder must comply the following, else the offer is liable for rejection.

- Technical PQR, which is mentioned in BHEL's technical specification. GIS OEM/bidder to ensure submission of qualification documents as stipulated in Technical PQR along with the bid itself.

Note:

(1). Bidder must submit all supporting documents along with their offer. No deviation against this enquiry is acceptable, else offer shall be rejected.

(2). All documents (including third party documents/supporting documents) in language other than English, certified translated copy in English language should also be furnished.

(3) Offers will be scrutinized based on the qualifying requirements and only those who are technically and financially capable to execute the job and who fulfil the prequalifying requirements (PQR) are eligible to quote against above NIT. However, final acceptance of the bidder/offer shall be subject to acceptance of our customer.

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12. IMPORTANT INSTRUCTION TO BIDDER – I;

- a. **PRE-BID MEETING: NOT ALLOWED.**
- b. **SUBMISSION OF MANUFACTURER AUTHORIZATION FORMAT, INTEGRITY PACT AND DECLARATION OF LOCAL CONTENT, A LEGALLY ENFORCEABLE UNDERTAKING (JOINTLY WITH GIS MANUFACTURER):** Bidder to submit undertaking letter in their letterhead by declaring that these documents shall be submitted within 3 days after opening of price bid in case of L1 position. Bidder to indicate percentage of local content in their undertaking letter.
- c. **OPENING OF BIDS (PART-I & II):** Bidders are not authorized to attend the opening of Part-I & Part-II bid for this tender.
- d. **PROJECT STATUS:** Domestic in nature & GST is applicable for supply & services
- e. **CUSTOMER APPROVAL: The GIS manufacturer/bidder must meet the techno-commercial Qualification requirement as stipulated in technical specification and any subsequent amendment.**
The GIS manufacturer/bidder must not be Banned or Delisted or Black Listed by any Government Department / Public Sector Undertaking on due date of submission of bid. The bidder will give a written confirmation in this regard along with the bid.
- f. **PLACEMENT OF ORDER:** This tender is for tender specific pre bid tie-up only. The Purchase Order shall be placed to the successful GIS Manufacturer/bidder for execution of relevant scope of work contained in this Bidding Documents only if BHEL receives the order from the end customer (GIPCL), which shall be done within 75 DAYS from the date of award by GIPCL. Tender evaluation shall be done based on overall quantity as per NIT, **however PO/LOI shall be placed on L1 bidder at ex-works value for main GIS supply & services and separate PO/LOI for mandatory spares and separate PO/LOI for maintenance equipment & tools & tackles shall be placed (as applicable).** 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.
Price breakup **including mandatory spares**, if any, required during execution of project shall be done only for account purpose and must be supported by logical relationship with original quoted prices.
- g. **INLAND FREIGHT & INSURANCE:** Supplier must ensure availability of their authorized person at site/store during for supervision of unloading for every LOT of dispatch. The Freight & Insurance to be paid by vendor on behalf of BHEL to be reimbursed. Proof of transit insurance should be submitted along with dispatch documents.

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Note: Transit Insurance policy shall be in Bidder's scope and that should also have a provision of 30 days extended cover at site/ store.

- h. **MQP Requirement:** As per specification.
- i. **GeM ID seller:** GeM seller ID is mandatory for the bidders and must be mentioned in their offer. In case at the time of submission of offer GeM seller ID is not available with bidder, then successful tenderer should ensure to have GeM Seller ID prior to award of contract. Department of Expenditure (DOE) OM no. 6/9/2020-PPD dated 24.08.2020 may be referred in this regard.

13. IMPORTANT INSTRUCTION TO BIDDER - II;

- a. **Bidders to fill price in price bid format provided in the tender. Evaluation shall be done on total quoted price. For detail description of BOQ item please refer BOQ attached in technical specification TB-PBTU-GIPL-GIS.**
- b. Packing as per specification is applicable. However, bidder to ensure proper packing to avoid any damage & packing of spares should be separated.
- c. BHEL /Customer or both may witness the inspection as per approved QAP.
- d. The unit prices of addition/ deletion (i.e. optional items) and type test charges (if applicable), as mentioned in BOQ of technical specification shall be considered for evaluation.
- e. Order shall be awarded on ex- works basis for indigenous bidder.
- f. Unloading of material at site is not in scope of bidder.
- g. Validity of offer: **9 MONTHS from the date of OPENING of offer** i.e. opening date of techno-commercial bid (Part-I).

14. DEFECT LIABILITY/GUARANTEE /WARRANTY:

The Guarantee for GIS shall be for a period of **60 calendar months** commencing immediately upon the issue of Taking Over Certificate by GIPCL.

If the Facilities or any part thereof cannot be used by reason of such defect and/ or making good of such defect, the Defect Liability Period of the Facilities or such part, as the case may be, shall be extended by a period equal to the period during which the Facilities or such part cannot be used by the Company because of any of the aforesaid reasons. Upon correction of the defects in the Facilities or any part thereof by repair/ replacement, such repair/replacement shall have the defect liability period of eighteen (18) months from such replacement.

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Note:

1. The tentative date of completion of Facilities is 31.12.2023 for phase –I and 30.06.2024 for Phase-II.
2. Item like MANDATORY SPARES, MAINTENANCE EQUIPMENTS, TOOLS & TACKLES & CONSUMABLES shall be guaranteed for 12 months from the date of use of the spares in the equipment or 18 months from the date of receipt of materials whichever is earlier.

15. Liquidated Damage for Supply (Clause no. 13 of BHEL/TBG/GTC/2016 Rev.01): 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 & F & I Charges for supply per week of delay or part thereof subject to a maximum of 10% of the total PO Ex-Works value & F & I Charges shall be deducted as Liquidated Damages (LD) along with applicable GST (if any) on LD.

16. Performance BG (By GIS bidder to BHEL):

- a) The GIS Manufacturer shall furnish the Performance Bank Guarantee (PBG) equivalent to 10% (ten percent) of the PO Value within 30 days after issuance of LOA valid up to 44 months from the date of LOA.
- b) The GIS manufacturer shall furnish another Performance Bank Guarantee (PBG) equivalent to 3% (three percent) of the PO Value within 30 days before expiry of Defect Liability Period (i.e. 12 Months after taking over). The validity period of Performance Bank Guarantee (PBG) should be for a total period up to 60 months from the date of Taking over of the 1200MW PSS-1.

17. Bidder agrees to submit performance BG required for execution of the contract within the time period mentioned. In case of delay in submission of performance security, enhanced performance security which would include interest (SBI rate + 6%) for the delayed period, shall be submitted by the bidder. Further, if performance security is not submitted till such time the first bill becomes due, the amount of performance security due shall be recovered as per terms and conditions defined in NIT / Contract, from the bills along with due interest.”

18. ADDITIONAL BG (by GIS bidder to GIPCL):

1. The GIS Manufacturer shall furnish the Performance Bank Guarantee (PBG) equivalent to 2% (two percent) of the contract value awarded by GIPCL to BHEL within 30 days after issuance of LOA valid up to 60 months from the date of taking over of the facilities. This performance guarantee shall be in addition to the Contract Performance Guarantee to be submitted by the GIS manufacturer to BHEL.

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2. In case GIS manufacturer wish to qualify under Route-2, GIS manufacturer shall furnish additional Performance Bank Guarantee (PBG) from Collaborator /Parent Company/ Principals equivalent to 3% (three percent) of the Ex-works cost of GIS as per the Contract awarded by GIPCL to BHEL within 30 days after issuance of LOA valid up to 60 months from the date of taking over of the facilities. This performance guarantee shall be in addition to the Contract Performance Guarantee to be submitted by the GIS manufacturer to BHEL.

19. SECURITY/ BID BOND: Within 30 days of the signing the MOU, 1% of the value of MOU shall be taken from the supplier as "Bid Bond" in the form of Bank Guarantee or security deposit etc. till the submission of the performance Bank Guarantee (PBG). For registered GIS supplier, Bid Bond shall not be applicable. After receipt of the PBG and additional BG, the BID Bond shall be returned to the MOU Partner.

20. PRICE BID FORMAT: Bidders to fill price in price bid format (BOQ). Evaluation shall be done on total quoted price against BOQ. For detail description of BOQ item please refer BOQ attached in technical specification TB-PBTU-GIPL-GIS Rev.00.

Bidder to quote their best prices strictly in BHEL's prescribed format of NIT, else 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. In case during detailed engineering stage, it is found that Item mentioned with "NA" is to be supplied, bidder shall supply the same without any cost and delivery implication to BHEL.

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

PRICES: A. 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.

22. TERMS OF PAYMENT:

(i) clause no 3.1 to 3.5 - of GTC are not applicable in this NIT

(ii) Following modified clause shall be applicable in place of existing clause no 3.2,3.5 of GTC;

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

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TERMS OF PAYMENT FOR INDIGENOUS BIDDER:

- A.** 85% of ex-works along with 100% value of GST & 100% F & I Charges 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 ex-works value payment within 60 days from the date of receipt of complete invoice along with documents in 3 sets (original + 2 copies) as follows:
- Invoice.
 - Original certificate of successful completion of Supervision of Erection, Testing including HV Testing & Commissioning at Site issued by BHEL Site Official / Construction Management.

Note: In case of Supervision of Erection, Testing including HV Testing & Commissioning gets delayed beyond 12 months from the date of last supply for the reasons not attributable to supplier, supplier may claim payment of only five (05) % of supply portion by furnishing following documents and balance five (5) % of supply portion will be released after completion of successful completion of Supervision of Erection, Testing including HV Testing & Commissioning at Site issued by BHEL Site Official / Construction Management as mentioned above clause no-22.B of STC.

- a) Invoice
- b) Copy of certificate issued by BHEL site in charge. Confirming that delay in Supervision of Erection, Testing including HV Testing & Commissioning is not attributable to supplier (to be arranged by BHEL TBG)

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- c) Copy of Bank Guarantee of equivalent value initially valid for 6 months from the date of submission of invoice with additional claim period of three months. In case Supervision of Erection, Testing including HV Testing & Commissioning is not successfully completed before expiry of Bank Guarantee, BG shall be kept suitably extended till successful completion of Supervision of Erection, Testing including HV Testing & Commissioning.

C.: 5% of ex-works value payment of total invoice value against completion of final engineering documentation as per technical specification and completion of supervision activity within 60 days from date of receipt of invoice. Documents (original + 2 copies) will be required for payment.

- Invoice.
- Final engineering documentation certificate by BHEL Engg group
- Copy of valid Performance BG.

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 including HV test & Commissioning at Site issued by BHEL Site Official / Construction Management in 3 sets (Original + 2 copies).

23. MODE OF PAYMENT: The following clause shall be applicable in place of clause no 41 of general terms and conditions

- (1) Payment shall be made directly to the supplier/contractor by BHEL through NEFT/RTGS.

24. Promotion of MAKE IN INDIA:

For this procurement, the local content to categorize a supplier as class-I local supplier / class- II local supplier / non-Local supplier and purchase preference to class I local supplier, is as defined in Public Procurement (Preference to Make in India), Order 2017 dated 04.06.2020, issued by DPIIT. In case of subsequent orders issued by the nodal ministry, changing the definition of local content for the items of the NIT, the same shall be applicable even if issued after issue of this NIT but before opening of part II bids against this NIT. **Note: Bidder to specify the percentage of local content as per the format as per Annexure-A**

25. INTEGRITY PACT: INTEGRITY PACT (Refer clause no - 34 of GTC):

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.

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NAME OF PROJECT: - PRE BID TIE UP FOR SUPPLY & SERVICES of 400/33KV GIS for Pooling Substation 400/33 kV, 1200 MW (PSS-1, Phase-I & Phase-II of 600 MW each) of Solar / Wind / Hybrid RE Park of 2375 MW Capacity at Great Rann of Kutch Area , Gujarat.

Enquiry No. & Date:

(a) IP is a tool to ensure that activities and transactions between the Company and its Bidders/ Contractors are handled in a fair, transparent and corruption free manner.

Following Independent External Monitors (IEMs) on the present panel have been appointed by BHEL with the approval of CVC to oversee implementation of IP in BHEL.

| Sl | IEM | Email |
|----|--|----------------------|
| 1 | Shri Arun Chandra Verma, IPS (Retd.) | acverma1@gmail.com |
| 2 | Shri Virendra Bahadur Singh, IPS (Retd.) | vbsinghips@gmail.com |

(b) The IP as enclosed with the tender is to be submitted (duly signed by authorized signatory) along with techno-commercial bid (Part-I, in case of two/ three part bid). Only those bidders who have entered into such an IP with BHEL would be competent to participate in the bidding. In other words, entering into this Pact would be a preliminary qualification.

(c) Please refer Section-8 of IP for Role and Responsibilities of IEMs. In case of any complaint arising out of the tendering process, the matter may be referred to any of the above IEM(s). All correspondence with the IEMs shall be done through email only.

Note:

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

(1)

Name: Mr. Raj Narayan Ram
Deptt: TBMM
Address: BHEL Noida
Phone: 0120 674 8526
Email: raj.ram@bhel.in

(2)

Name: Mr. Nandlal Verma
Deptt: TBMM
Address: BHEL Noida
Phone: 0120 674 8477
Email: nverma@bhel.in

26. REVERSE AUCTION (Clause No. 33 of GTC for Reverse Auction): NOT APPLICABLE

SPECIAL TERMS & CONDITIONS

NAME OF PROJECT: - PRE BID TIE UP FOR SUPPLY & SERVICES of 400/33KV GIS for Pooling Substation 400/33 kV, 1200 MW (PSS-1, Phase-I & Phase-II of 600 MW each) of Solar / Wind / Hybrid RE Park of 2375 MW Capacity at Great Rann of Kutch Area , Gujarat.

Enquiry No. & Date:

27. INDEMNITY (AGAINST PATENTS / TRADEMARKS ETC):

The vendor shall at all times indemnify the purchaser against all claims which may be made in respect of supply from any "rights protected" source protected by way of patent registration of design or trade mark. In the event of any claim in respect of an alleged breach of patents registered design or trademark being made against the purchaser, purchaser shall notify the seller of the same and the seller shall be at liberty, but entirely at their own expenses, to conduct negotiation for settlement or deal with any litigation that may arise there from.

28. INVOLVEMENT OF REPRESENTATIVE:

Bidder must be GIS manufacturer. Purchase Orders will be placed on successful bidder directly for total supplies and services subject to prior approval by BHEL/end Customer.

In a tender, either the Indian agent on behalf of the Principal/OEM or Principal/OEM itself can submit bid but both cannot submit bid simultaneously for the same item/product in the same tender.

If an agent submits bid on behalf of the Principal/OEM, the same agent shall not submit a bid on behalf of another Principal/OEM in the same tender for the same item/product.

29. ADDITIONAL /EXTRA ITEM REQUIRED AT SITE DUE TO DAMAGE REPORTED AT SITE/ THEFT FOR COMPLETION OF PROJECT:

In case of additional requirement of any item specified in BOQ, whether due to damages / theft or any other reason, during contract (i.e., till expiry of contract i.e., end of guarantee period), contractor shall ensure supply of same at unit Price mentioned in purchase order main BOQ (supply and service portion) or BOQ for addition /deletion (if any).

30. ARBITRATION (Clause No. 19 of BHEL/TBG/GTC/2016 Rev.01): This clause shall be read as per **Annexure-D.**

31. HEALTH, SAFETY AND ENVIRONMENT (HSE) OF BHEL: BHEL has their own Health, safety and environment. HSE policy is enclosed for bidder's reference.

32. 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

Enquiry No. - 61Q2300063 Dated: 03.06.2022

SPECIAL TERMS & CONDITIONS

NAME OF PROJECT: - PRE BID TIE UP FOR SUPPLY & SERVICES of 400/33KV GIS for Pooling Substation 400/33 kV, 1200 MW (PSS-1, Phase-I & Phase-II of 600 MW each) of Solar / Wind / Hybrid RE Park of 2375 MW Capacity at Great Rann of Kutch Area , Gujarat.

Enquiry No. & Date:

Enclosures:

- a) **Pre-Qualifying requirement-Annexure Technical/Qualifying Requirement**
- b) Activity Schedule, Commercial & Technical deviation Sheet.
- c) Instruction of DPIIT (**Annexure-1**), **Annexure-2 / 3** (Compliance regarding restrictions under Rule 144 (xi) of General Financial Rules (GFRs), 2017).
- d) Format for declaration of minimum local content (**Annexure-A**).
- e) Format for compliance of MoP order dated 02-07-2020 (**Annexure-B**).
- f) Format of Integrity pact (**Annexure-C**).
- g) Arbitration clause (**Annexure-D**).
- h) Details of Packing list of GIS Module (**Annexure-E**).
- i) A legally enforceable undertaking (jointly with the GIS Manufacturer) (**Annexure-F**).
- j) Format of additional Performance BG.
- k) Copy of HSE policy.
- l) GENERAL TERMS AND CONDITION OF NIT.
- m) BHEL'S PRICE BID FORMAT.
- n) Technical Specification No.:- **TB-PBTU-GIPL-GIS**
- o) All required documents/ credentials meeting BHEL's Technical PQR shall be submitted by GIS OEM/bidder.

GIPL- Annexure: Technical Pre- Qualifying Requirements

400kV Gas Insulated Switchgear with its accessories

Tender Enquiry Document for Pooling Substation 400/33 kV, 1200 MW (PSS-1, Phase-I & Phase-II of 600 MW each) of Solar / Wind / Hybrid RE Park of 2375 MW Capacity at Great Rann of Kutch Area, Gujarat

Tender Enquiry Doc. No. GIPCL/RE Park/PSS/Phase-I

Technical Experience

Bidder must have technical experience as follows,

Route-1

The Bidder must have Designed, Manufactured, **Type Tested**[#] (As per IEC or equivalent standard), Supplied, Erected, Tested & commissioned of at least two (2) number of GIS substations having cumulatively at least 6 (Six) **Circuit Breaker Bays*** of 400kV or above in India only. The two (2) nos. GIS substations above should have been in successfully commissioned and in operations on the date of bid submission. Further, at least one (1) number of above GIS substation must have been commissioned within last seven (7) years as on the ^{##}date of bid submission.

Note:

([#]) Type test requirement of GIS to be supplied and not necessary to be carried out in India. The type tests including short circuit tests should be conducted at CPRI / ERDA / KEEMA / PEHLA / CESI / CERDA / JSIC / Intertek (ASTA).

In case of an Indian GIS manufacturer who has not conducted the type testing of 400kV GIS manufactured in India but the parent company or subsidiary company or group company have conducted the type testing of 400kV GIS manufactured at their works, the type test reports of the parent company or subsidiary company or group company shall be acceptable provided that the design of the 400kV GIS being offered from Indian works is same as that of GIS manufactured & successful type tested from the parent company or subsidiary company or group.

Or,

Y
21/6/22
02/6/22

Kim Shahul
2.6.22

R. A. G.
02/06/22

GIPL- Annexure: Technical Pre- Qualifying Requirements

ROUTE-2

In case the bidder is an Indian entity (subsidiary or affiliate) of a foreign Company not meeting the requirement stipulated in **Route-1** above but has established manufacturing and testing facilities in India for 400 kV or above voltage level GIS, he shall also be considered provided he meets the following requirement.

i) The bidder must have manufactured, at least Six (6) no. cumulatively 400kV or above voltage level **GIS Circuit Breaker Bays (*)** based on the technological support of the Collaborator(s)/ parent company as on the **#date of bid submission** provided further that the Collaborator(s)/ parent company of the bidder meets the qualification requirements as stated in **Route-1** above.

ii) Further, the bidder shall also submit the following along with the bid,

(1) The bidder shall enter into a valid Technical Collaboration agreement with the aforesaid foreign firm for technology transfer/ license to design, manufacture, test and supply of 400 kV or above voltage class GIS equipment in India.

(2) Such bidder shall have to submit the Type Test Reports for GIS identically manufactured by the Collaborator/ Parent Company/ Principals for 400 kV class or above GIS and furnish certificate to this effect from the Collaborator/ Parent Company/ Principals that since manufacturing procedure is same, the tests are applicable to product manufactured in India under phased manufacturing programme. Also the material for GIS should be similarly certified by the Collaborator.

(3) The bidder shall furnish a legally enforceable undertaking (jointly with Parent Company/ Principals or Collaborator) to guarantee quality, timely supply, performance and warranty obligations and be responsible under the contract in accordance with the requirement of the contract.

(4) A confirmation letter from the Collaborator/ Parent Company/ Principals along with the bid stating that Collaborator/ Parent Company/ Principals shall furnish an additional performance guarantee for an amount of **3% of the Ex-works of GIS as per contract awarded by GIPL to BHEL**. This performance guarantee shall be to guarantee their obligations toward the owner as referred hereinbefore or else wherein the NIT conditions. This performance guarantee shall be in addition to the Contract Performance Guarantee to be submitted by the bidder.

Note:

(*) For the purpose of qualification requirement, one no. of circuit breaker bay shall be considered as a bay used for controlling a line or a transformer or a reactor or a bus section or a bus coupler and comprising of at least one circuit breaker, one dis-connector and three nos. of single phase CTs / Bushing CTs.

(##) Date of bid submission mentioned above shall be considered as the original scheduled date of bid opening for this tender.

Y
02/06/22

Vinodh Kapil
2-6-22

R. A. S.
02/06/22

ACTIVITY SCHEDULE

(EACH MFC/LOTS)

PROJECT: PRE BID TIE UP FOR SUPPLY & SERVICES of 440KV/33KV GIS for Pooling Substation 400/33 kV, 1200 MW (PSS-1, Phase-I & Phase-II of 600 MW each) of Solar / Wind / Hybrid RE Park of 2375 MW Capacity at Great Rann of Kutch Area, Gujarat

ENQUIRY NO:

| SN | ACTIVITY | TIME ALLOTTED [in weeks] | CUMULATIVE TIME FROM RECEIPT OF INPUTS FROM BHEL [in weeks] | SCOPE |
|----|---|---------------------------|--|----------------------------|
| 1. | Inputs to vendor from BHEL after issue of PO (Last inputs). | 4 | | IN SCOPE OF BHEL |
| 2. | Submission of Documents necessary for getting manufacturing clearance. | | | IN SCOPE OF SUPPLIER |
| 3. | Review and Approval of documents from BHEL/Customer and issue of manufacturing clearance lot wise as defined. | 6 | | IN SCOPE OF BHEL |
| 4. | Manufacturing time for individual lots. | | | IN SCOPE OF SUPPLIER |
| 5. | Inspection call | | | IN SCOPE OF SUPPLIER |
| 6. | Inspection by BHEL/Customer | 2 | | IN SCOPE OF BHEL |
| 7. | Issue of Dispatch clearance | 2 | | IN SCOPE OF BHEL |
| 8. | Dispatch | | | IN SCOPE OF SUPPLIER |
| 9. | Supervision of ETC works | | | AS PER REQUIREMENT AT SITE |

1. Inspection call should be raised two (02) weeks in advance. Inspection call should be given in the prescribed format only. Inspection calls not in the prescribed format shall not be entertained.
2. Supplier must ensure the completeness and correctness of the requisite documents before submission for approval. Delay in approval on account of incomplete / inadequate information shall be the responsibility of supplier. Bidder to submit revised drawing and documents incorporating comments, if any, within two (02) weeks from the date of comments of BHEL/Customer.
3. **Delay in activity pertaining to BHEL not attributable to vendor as listed above shall be added, if required in case of time extension and will be re-fixed accordingly based on bidder's request & delay analysis.**

**Signature & Seal of
Supplier
Date:**

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 |
|-----|---------------------------------------|------------------------|
| | | |

NIL-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 |
|-----|---------------------------------------|------------------------|
| | | |

NIL-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:.....

ANNEXURE-1

CLAUSES FOR NEW TENDERS:

- I. Any bidder from a country which shares a land border with India will be eligible to bid in this tender only if the bidder is registered with the Competent Authority.
- II. "Bidder" (including the term 'tenderer', 'consultant' or 'service provider' in certain contexts) means any person or firm or company including any member of a consortium or joint venture (that is an association of several persons, or firms or companies), every artificial juridical person not failing in any of the descriptions of bidders stated hereinbefore, including any agency branch or office controlled by such person, participating in a procurement process.
- III. "Bidder from a country which shares a land border with India" for the purpose of this Order means:
 - a. An entity Incorporated, established or registered in such a country; or
 - b. A subsidiary of an entity Incorporated, established or registered in such a country; or
 - c. An entity substantially controlled through entities incorporated, established or registered in such a country; or
 - d. An entity whose *beneficial owner* is situated in such a country, or
 - e. An Indian (or other) agent of such an entity; or
 - f. A natural person who is a citizen of such a country; or
 - g. A consortium or joint venture where any member of the consortium or joint venture falls under any of the above
- IV. The *beneficial owner* for the purpose of (iii) above will be as under:
 1. In case of a company or Limited Liability Partnership, the beneficial owner is the natural person(s), who, whether acting alone or together, or through one or more juridical person, has a controlling ownership interest or who exercises control through other means.

Explanation-

 - a. "Controlling ownership interest+ means ownership of or entitlement to more than twenty-five per cent. of shares or capital or profits of the company;
 - b. "Control" shall include the right to appoint majority of the directors or to control the management or policy decisions including by virtue of their shareholding or management rights or shareholder agreements or voting agreements;
 2. In case of a partnership firm, the beneficial owner is the natural person(s) who, whether acting alone or together, or through one or more juridical person, has ownership of entitlement to more than fifteen percent of capital or profits of the partnership;
 3. In case of an unincorporated association or body of individuals, the beneficial owner is the natural person(s), who, whether acting alone or together, or through one or more juridical person, has ownership of or entitlement to more than fifteen percent of the property or capital or profits of such association or body of Individuals;
 4. Where no natural person is Identified under (1) or (2) or (3) above the beneficial owner is the relevant natural person who holds the position of senior managing official;
 5. In case of a trust, the identification of beneficial owner(s) shall include identification of the author of the trust, the trustee, the beneficiaries with fifteen percent or more interest in the trust and any other natural person exercising ultimate effective control over the trust through a chain of control or ownership.
- V. An Agent is a person employed to do any act for another or to represent another in dealings with third person.

VI. The successful bidder shall not be allowed to sub-contract works to any contractor from a country which shares a land border with India unless such contractor is registered with the Competent Authority.

* The above clause is not applicable to the bidders from those countries (even if sharing a land border with India) to which the Gol has extended lines of credit or in which the Gol is engaged in development projects.

* List of countries to which lines of credit have been extended or in which development projects are undertaken are available on the Ministry of External affairs website (<https://www.mea.gov.in/>)

Annexure-2

Compliance to be submitted in INR 100/- non judicial stamp paper

Sub: Compliance to Government of India order OM No.6/18/2019-PPD dated 23.07.2020 regarding restrictions under Rule 144 (XI) of the General Financial Rules (GFRs), 2017

| SI No. | Description | Bidder's confirmation |
|---------------|--|------------------------------|
| 1 | <i>We, M/s_____have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India; We hereby certify that we are not from such a country.</i> | <i>Agreed</i> |

(Note: Non-compliance of above said Gol Order and its subsequent amendment, (if any), by any bidder(s) shall lead for commercial rejection of their bids by BHEL)

Bidder's authorized signatory with stamp & seal

Compliance to be submitted in INR 100/- non judicial stamp paper

Sub: Compliance to Government of India order OM No.6/18/2019-PPD dated 23.07.2020 regarding restrictions under Rule 144 (XI) of the General Financial Rules (GFRs), 2017

| S.N. | Description | Bidder's confirmation |
|------|---|-----------------------|
| 1 | <p><i>We, M/s_____have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India. We are from such a country which shares a land border with India & have been registered with the Competent Authority as specified in above said order. We hereby certify that we fulfil all requirements in this regard and are eligible to be considered.</i></p> <p><i>Evidence of valid registration by the Competent Authority is attached.</i></p> | Agreed |

(Note: Non-compliance of above said Gol Order and its subsequent amendment, (if any), by any bidder(s) shall lead for commercial rejection of their bids by BHEL)

Bidder's authorized signatory with stamp & seal

| | |
|--|--|
| Item Name : | 400/33 kV GIS for Pooling Substation 400/33 kV, 1200 MW (PSS-1, Phase-I & Phase-II of 600 MW each) Great Rann of Kutch Area, Gujarat |
| Enquiry No. : | |
| Project : | Pre-Bid Tie-up for Supply & Services of 400 kV Gas Insulated Switchgear (GIS) for addressing tender invited by GIPCL for Pooling Substation 400/33 kV, 1200 MW (PSS-1, Phase-I & Phase-II of 600 MW each) of Solar / Wind / Hybrid RE Park of 2375 MW Capacity at Great Rann of Kutch Area , Gujarat |
| Type of project | Transmission / Thermal (Coal or Gas) / Hydro |
| Applicable percentage of Local Content | Bidder to indicate local content in percentage |

Certificate from statutory auditor or cost auditor of the company (in the case of companies) or from a practicing cost accountant or practicing chartered accountant (in respect of suppliers other than companies) giving the percentage of Local Content, in line with PPP-MII order, if applicable [to be submitted on the letter head of the issuer.]

Dear Sir,

We have read and understood the provisions of "Public Procurement (Preference to Make in India) Order, 2017" dated 15/06/2017, its revision dated 28/05/2018 and any subsequent modifications/Amendments, if any [hereinafter, "PPP-MII Order"] issued by Department of Industrial Policy and Promotion (DIPP), Ministry of Commerce and Industry, Government of India.

In line with the provisions of the PPP-MII Order, M/s.[Enter the name of the Bidder] [hereinafter, "Local Supplier"] have submitted an Affidavit of self-certification to M/s. Bharat Heavy Electricals Limited [hereinafter, BHEL] regarding Local Content in Goods/Services/Works to be supplied by the Local Supplier for (Enter the name of the Equipment/Item for Project).], wherein they have agreed to abide by the terms and conditions of the PPP-MII Order.

Further, in line with the PPP-MII Order, the statutory auditor or cost auditor of the company (in the case of companies) or a practicing cost accountant or practicing chartered accountant (in respect of suppliers other than companies) shall provide a certificate giving the percentage of Local Content in the Goods/Service/Works to be supplied by the Local Supplier for (Enter the name of the Equipment/Item for Project).

Accordingly, we, the Statutory Auditor(s) / Cost auditor (applicable in the case of companies) of the Local Supplier / a practicing cost accountant or practicing chartered accountant (applicable in respect of suppliers other than companies), certify that the Local Content as defined under the PPP-MII, in the Goods/Service/Works to be supplied by the Local Supplier for (Enter the name of the Equipment/Item for Project) is percentage [specify the percentage of Local content].

For and on behalf of,

Date:

Authorised persons

Firm Reg No:

Membership No.

Note: This is a guiding format. In case the bidder submits the certificate in a format different from the above, the same may be considered provided it meets the intent and purpose, as may be ascertained by BHEL.

Annexure-B

Vendor Compliance format in bidder letter head

In view of by order No. 25-111612018-PG, Dated 02.07.2020 of Ministry of Power, GOI

Enquiry No/ PO No & Date :

Project : Pre-Bid Tie-up for Supply & Services of 400 kV Gas Insulated Switchgear (GIS) for addressing tender invited by GIPCL for Pooling Substation 400/33 kV, 1200 MW (PSS-1,Phase-I & Phase-II of 600 MW each) of Solar / Wind / Hybrid RE Park of 2375 MW Capacity at Great Rann of Kutch Area , Gujarat

Name of items/Package : 400KV GIS & Associated Equipment.

This is to certify that all equipment, components, and parts imported for use in the Power Supply System and Network are in strict compliance to directions issued by Ministry of Power, Govt. of India vide order No. 25-111612018-PG dated 02.07.2020. The imported component(s), part or assembly item(s) does not carry any malware/Trojan etc.

Note: Non-compliance of MoP Order and its subsequent amendment(s), (if any), by vendor shall lead to rejection of their offer or cancellation of contract, which is awarded by BHEL.

**Bidder's authorized signatory
with stamp & seal**

INTEGRITY PACT

Between

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

and

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

Preamble

The Principal intends to award, under laid-down organizational procedures, contract/s for

_____. The Principal values full compliance with all relevant laws of the land, rules and regulations, and the principles of economic use of resources, and of fairness and transparency in its relations with its Bidder(s)/ Contractor(s).

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

Section 1- Commitments of the Principal

1.1 The Principal commits itself to take all measures necessary to prevent corruption and to observe the following principles:-

1.1.1 No employee of the Principal, personally or through family members, will in connection with the tender for, or the execution of a contract, demand, take a promise for or accept, for self or third person, any material or immaterial benefit which the person is not legally entitled to.

1.1.2 The Principal will, during the tender process treat all Bidder(s) with equity and reason. The Principal will in particular, before and during the tender process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential/ additional information through which the Bidder(s) could obtain an advantage in relation to the tender process or the contract execution.

1.1.3 The Principal will exclude from the process all known prejudiced persons.

1.2 If the Principal obtains information on the conduct of any of its employees which is a penal offence under the Indian Penal Code 1860 and Prevention of Corruption Act 1988 or any other statutory penal enactment, or if there be a substantive suspicion in this regard, the Principal will inform its Vigilance Office and in addition can initiate disciplinary actions:

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

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

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

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

Section 4 - Compensation for Damages

- 4.1 If the Principal has disqualified the Bidder from the tender process prior to the award according to Section 3, the Principal is entitled to demand and recover the damages equivalent Earnest Money Deposit/ Bid Security.
- 4.2 If the Principal has terminated the contract according to Section 3, or if the Principal is entitled to terminate the contract according to section 3, the Principal shall be entitled to

demand and recover from the Contractor liquidated damages equivalent to 5% of the contract value or the amount equivalent to Security Deposit/ Performance Bank Guarantee, whichever is higher.

Section 5 - Previous Transgression

- 5.1 The Bidder declares that no previous transgressions occurred in the last 3 years with any other company in any country conforming to the anti-corruption approach or with any other Public Sector Enterprise in India that could justify his exclusion from the tender process.
- 5.2 If the Bidder makes incorrect statement on this subject, he can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason.

Section 6 - Equal treatment of all Bidders/ Contractors / Sub-contractors

- 6.1 The Principal will enter into agreements with identical conditions as this one with all Bidders and Contractors. In case of sub-contracting, the Principal contractor shall be responsible for the adoption of IP by his sub-contractors and shall continue to remain responsible for any default by his sub-contractors.
- 6.2 The Principal will disqualify from the tender process all bidders who do not sign this pact or violate its provisions.

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

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

Section 8 - Independent External Monitor(s)

- 8.1 The Principal appoints competent and credible Independent External Monitor for this Pact. The task of the Monitor is to review independently and objectively, whether and to what extent the parties comply with the obligations under this agreement.
- 8.2 The Monitor is not subject to instructions by the representatives of the parties and performs his functions neutrally and independently. He reports to the CMD, BHEL.
- 8.3 The Bidder(s)/ Contractor(s) accepts that the Monitor has the right to access without restriction to all contract documentation of the Principal including that provided by the Bidder(s)/ Contractor(s). The Bidder(s)/ Contractor(s) will grant the monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his contract documentation. The same is applicable to Sub-contractor(s). The Monitor is under contractual obligation to treat the information and documents of the Bidder(s)/ Contractor(s) / Sub-contractor(s) with confidentiality in line with Non- disclosure agreement.
- 8.4 The Principal will provide to the Monitor sufficient information about all meetings among the parties related to the contract provided such meetings could have an impact on the contractual relations between the Principal and the Contractor. The parties offer to the Monitor the option to participate in such meetings.

- 8.5 The role of IEMs is advisory, would not be legally binding and it is restricted to resolving issues raised by an intending bidder regarding any aspect of the tender which allegedly restricts competition or bias towards some bidders. At the same time, it must be understood that IEMs are not consultants to the Management. Their role is independent in nature and the advice once tendered would not be subject to review at the request of the organization.
- 8.6 For ensuring the desired transparency and objectivity in dealing with the complaints arising out of any tendering process, the matter should be examined by the full panel of IEMs jointly as far as possible, who would look into the records, conduct an investigation, and submit their joint recommendations to the Management.
- 8.7 The IEMs would examine all complaints received by them and give their recommendations/ views to CMD, BHEL, at the earliest. They may also send their report directly to the CVO and the Commission, in case of suspicion of serious irregularities requiring legal/ administrative action. IEMs will tender their advice on the complaints within 10 days as far as possible.
- 8.8 The CMD, BHEL shall decide the compensation to be paid to the Monitor and its terms and conditions.
- 8.9 IEM should examine the process integrity, they are not expected to concern themselves with fixing of responsibility of officers. Complaints alleging mala fide on the part of any officer of the organization should be looked into by the CVO of the concerned organisation.
- 8.10 If the Monitor has reported to the CMD, BHEL, a substantiated suspicion of an offence under relevant Indian Penal Code/ Prevention of Corruption Act, and the CMD, BHEL has not, within reasonable time, taken visible action to proceed against such offence or reported it to the Vigilance Office, the Monitor may also transmit this information directly to the Central Vigilance Commissioner, Government of India.
- 8.11 The number of Independent External Monitor(s) shall be decided by the CMD, BHEL.
- 8.12 The word 'Monitor' would include both singular and plural.

Section 9 - Pact Duration

- 9.1 This Pact shall be operative from the date IP is signed by both the parties till the final completion of contract for successful bidder and for all other bidders 6 months after the contract has been awarded. Issues like warranty / guarantee etc. should be outside the purview of IEMs.
- 9.2 If any claim is made/ lodged during currency of IP, the same shall be binding and continue to be valid despite the lapse of this pact as specified above, unless it is discharged/ determined by the CMD, BHEL.

Section 10 - Other Provisions

- 10.1 This agreement is subject to Indian Laws and jurisdiction shall be registered office of the Principal, i.e. New Delhi.

- 10.2 Changes and supplements as well as termination notices need to be made in writing. Side agreements have not been made.
- 10.3 If the Contractor is a partnership or a consortium, this agreement must be signed by all partners or consortium members.
- 10.4 Should one or several provisions of this agreement turn out to be invalid, the remainder of this agreement remains valid. In this case, the parties will strive to come to an agreement to their original intentions.
- 10.5 Only those bidders / contractors who have entered into this agreement with the Principal would be competent to participate in the bidding. In other words, entering into this agreement would be a preliminary qualification.

 For & On behalf of the Principal

 For & On behalf of the Bidder/
 Contractor

(Office Seal)

(Office Seal)

Place-----

Date-----

Witness:_____

Witness:_____

(Name & Address) _____

(Name & Address) _____

CLAUSE NO. 19 OF GTC: ARBITRATION CLAUSE SHALL BE READ AS BELOW:

(A) CONCILIATION (MODEL CONCILIATION CLAUSE FOR CONDUCTING CONCILIATION PROCEEDINGS UNDER THE BHEL CONCILIATION SCHEME, 2018)

The Parties agree that if at any time (whether before, during or after the arbitral or judicial proceedings), any Disputes (which term shall mean and include any dispute, difference, question or disagreement arising in connection with construction, meaning, operation, effect, interpretation or breach of the agreement, contract or the Memorandum of Understanding (whichever is inapplicable), which the Parties are unable to settle mutually), arise inter-se the Parties, the same may, be referred by either party to Conciliation to be conducted through Independent Experts Committee to be appointed by competent authority of BHEL from the BHEL Panel of Conciliators.

Notes:

1. No serving or a retired employee of BHEL/Administrative Ministry of BHEL shall be included in the BHEL Panel of Conciliators.
2. Any other person(s) can be appointed as Conciliator(s) who is/are mutually agreeable to both the parties from outside the BHEL Panel of Conciliators.

The proceedings of Conciliation shall broadly be governed by Part-III of the Arbitration and Conciliation Act 1996 or any statutory modification thereof and as provided in **Annexure-A to this GCC (Enclosed)**.

The Annexure-A together with its appendices will be treated as if the same is part and parcel hereof and shall be as effectual as if set out herein in these GCC.”

(B) ARBITRATION (WITH SOLE ARBITRATOR)

- 1.1. Except as provided elsewhere in this Contract, in case amicable settlement is not reached between the Parties, in respect of any dispute or difference; arising out of the formation, breach, termination, validity or execution of the Contract; or, the respective rights and liabilities of the Parties; or, in relation to interpretation of any provision of the Contract; or, in any manner touching upon the Contract, then, either Party may, by a notice in writing to the other Party refer such dispute or difference to the Sole Arbitrator and such Arbitrator appointed by Head of the BHEL Unit/Region/Division issuing the Contract.
- 1.2. The Arbitrator shall pass a reasoned award and the award of the Arbitrator shall be final and binding upon the Parties.
- 1.3. Subject as aforesaid, the provisions of Arbitration and Conciliation Act 1996 (India) and amended in 2015 and further amendment passed in 2019 or statutory modifications or re-enactments thereof and the rules made thereunder and for the time being in force shall apply to the arbitration proceedings under this clause. The seat of arbitration shall be New Delhi. The language of arbitration shall be English and the documents shall be submitted in English.
- 1.4. The cost of arbitration shall initially be borne equally by the Parties subject to the final apportionment of the cost of the arbitration in the award of the Arbitrator.
- 1.5. Notwithstanding the existence or any dispute or differences and/or reference for the arbitration, the Contractor shall proceed with and continue without hindrance the performance of its

CLAUSE NO. 19 OF GTC: ARBITRATION CLAUSE SHALL BE READ AS BELOW:

obligations under this Contract with due diligence and expedition in a professional manner except where the Contract has been terminated by either Party in terms of this Contract.

1.6. **SETTLEMENT OF COMMERCIAL DISPUTES BETWEEN CPSES INTER SE AND CPSE(S) AND GOVERNMENT DEPARTMENT(S)/ ORGANISATION(S) – ADMINISTRATIVE MECHANISM FOR RESOLUTION OF CPSES DISPUTES (AMRCD) – REGARDING**

Vide Dept. of Public Enterprises OM No. F. No. 4(1)/2013-DPE(GM)/FTS-1835 dated 22.05.2018 it has been conveyed that *"To make the mechanism more effective and binding on the disputing parties, a new mechanism namely Administrative Mechanism for resolution of CPSEs Disputes (AMRCD) having two level (tier) structure has been evolved in consultation with various stakeholders to replace the existing PMA mechanism which stands wound up from the date of issue of this OM."* Accordingly, the existing Permanent Machinery of Arbitration (PMA) stands wound up with effect from 22.05.2018 and cases relating to disputes or differences relating to the interpretation and application of the provisions of commercial contract(s) between CPSEs / Port Trust / Central or State Government Department / Organisations (excluding disputes concerning Railways, Income Tax, Customs and Excise Departments) shall be taken up by either party for its resolution through Administrative Mechanism for Resolution of CPSEs Disputes (AMRCD).

(C) JURISDICTION AND GOVERNING LAWS

The Courts at New Delhi shall have exclusive jurisdiction over any matter arising out of or in connection with this Contract. This Contract shall be construed as per and be governed by the Laws of India.

Annexure-A

ANNEXURE TO MODEL CONCILIATION CLAUSE FOR CONDUCT OF CONCILIATION UNDER THE BHEL CONCILIATION SCHEME, 2018

BRIEF PROCEDURE FOR CONDUCT OF CONCILIATION PROCEEDINGS

1. The proceedings of Conciliation shall broadly be governed by Part-III of the Arbitration and Conciliation Act 1996 or any statutory modification thereof and as provided herein:
2. The party desirous of resorting to Conciliation shall send an invitation/notice in writing to the other party to conciliate specifying all points of Disputes with details of the amount claimed. The party concerned shall not raise any new issue thereafter. Parties shall also not claim any interest on claims/counter-claims from the date of notice invoking Conciliation till the conclusion of the Conciliation proceedings.
3. The party receiving the invitation/notice for Conciliation shall within 30 days of receipt of the notice of Conciliation intimate its consent for Conciliation along with its counter-claims, if any.
4. The Conciliation in a matter involving claim or counter-claim (whichever is higher) up to Rs 5 crores shall be carried out by sole Conciliator nominated by BHEL while in a matter involving claim or counter-claim (whichever is higher) of more than Rs 5 crores Conciliation shall be carried out by 3 Conciliators nominated by BHEL.
5. The Parties shall be represented by only their duly authorized in-house executives/officers and neither Party shall be represented by a Lawyer.
6. The first meeting of the IEC shall be convened by the IEC by sending appropriate communication/notice to both the parties as soon as possible but not later than 30 days from the date of his/their appointment. The hearings in the Conciliation proceeding shall ordinarily be concluded within two (2) months and, in exceptional cases where parties have expressed willingness to settle the matter or there exists possibility of settlement in the matter, the proceedings may be extended by the IEC by a maximum of further 2 months with the consent of the Parties subject to cogent reasons being recorded in writing.
7. The IEC shall thereafter formulate recommendations for settlement of the Disputes supported by reasons at the earliest but in any case within

15 days from the date of conclusion of the last hearing. The recommendations so formulated along with the reasons shall be furnished by the IEC to both the Parties at the earliest but in any case within 1 month from the date of conclusion of the last hearing.

8. Response/modifications/suggestions of the Parties on the recommendations of the IEC are to be submitted to the IEC within time limit stipulated by the IEC but not more than 15 days from the date of receipt of the recommendations from the IEC.
9. In the event, upon consideration, further review of the recommendations is considered necessary, whether by BHEL or by the other Party, then, the matter can be remitted back to the IEC with request to reconsider the same in light of the issues projected by either/both the Parties and to submit its recommendations thereon within the following 15 days from the date of remitting of the case by either of the Parties.
10. Upon the recommendations by the Parties, with or without modifications, as considered necessary, the IEC shall be called upon to draw up the Draft Settlement Agreement in terms of the recommendations.
11. When a consensus can be arrived at between the parties only in regard to any one or some of the issues referred for Conciliation the draft Settlement Agreement shall be accordingly formulated in regard to the said Issue(s), and the said Settlement Agreement, if signed, by the parties, shall be valid only for the said issues. As regards the balance issues not settled, the parties may seek to resolve them further as per terms and conditions provided in the contract.
12. In case no settlement can be reached between the parties, the IEC shall by a written declaration, pronounce that the Conciliation between the parties has failed and is accordingly terminated.
13. Unless the Conciliation proceedings are terminated in terms of para 22 (b), (c) & (d) herein below, the IEC shall forward his/its recommendations as to possible terms of settlement within one (1) month from the date of last hearing. The date of first hearing of Conciliation shall be the starting date for calculating the period of 2 months.

14. In case of 3 members IEC, 2 members of IEC present will constitute a valid quorum for IEC and meeting can take place to proceed in the matter after seeking consent from the member who is not available. If necessary, videoconferencing may be arranged for facilitating participation of the members. However, the IEC recommendations will be signed by all members. Where there is more than one (1) Conciliator, as a general rule they shall act jointly. In the event of differences between the Members of IEC, the decision/recommendations of the majority of the Members of IEC shall prevail and be construed as the recommendation of the IEC.
15. The Draft Settlement Agreement prepared by the IEC in terms of the consensus arrived at during the Conciliation proceedings between the Parties shall be given by the IEC to both the parties for putting up for approval of their respective Competent Authority.
16. Before submitting the draft settlement agreement to BHEL's Competent Authority viz. the Board Level Committee on Alternative Dispute Resolution (BLCADR) for approval, concurrence of the other party's Competent Authority to the draft settlement agreement shall be obtained by the other party and informed to BHEL within 15 days of receipt of the final draft settlement agreement by it. Upon approval by the Competent Authority, the Settlement Agreement would thereafter be signed by the authorized representatives of both the Parties and authenticated by the members of the IEC.
17. In case the Draft Settlement Agreement is rejected by the Competent Authority of BHEL or the other Party, the Conciliation proceedings would stand terminated.
18. A Settlement Agreement shall contain a statement to the effect that each of the person(s) signing thereto (i) is fully authorized by the respective Party(ies) he/she represents, (ii) has fully understood the contents of the same and (iii) is signing on the same out of complete freewill and consent, without any pressure, undue influence.
19. The Settlement Agreement shall thereafter have the same legal status and effect as an arbitration award on agreed terms on the substance of the dispute rendered by an arbitral tribunal passed under section 30 of the Arbitration and Conciliation Act, 1996.
20. Acceptance of the Draft Settlement Agreement/recommendations of the Conciliator and/or signing of the Settlement Agreement by BHEL shall

however, be subject to withdrawal/closure of any arbitral and/or judicial proceedings initiated by the concerned Party in regard to such settled issues.

21. Unless otherwise provided for in the agreement, contract or the Memorandum of Understanding, as the case may be, in the event of likelihood of prolonged absence of the Conciliator or any member of IEC, for any reason/incapacity, the Competent Authority/Head of Unit/Division/Region/Business Group of BHEL may substitute the Conciliator or such member at any stage of the proceedings. Upon appointment of the substitute Conciliator(s), such reconstituted IEC may, with the consent of the Parties, proceed with further Conciliation into the matter either de-novo or from the stage already reached by the previous IEC before the substitution.

22. The proceedings of Conciliation under this Scheme may be terminated as follows:

- a. On the date of signing of the Settlement agreement by the Parties; or,
- b. By a written declaration of the IEC, after consultation with the parties, to the effect that further efforts at conciliation are no longer justified, on the date of the declaration; or,
- c. By a written declaration of the Parties addressed to the IEC to the effect that the Conciliation proceedings are terminated, on the date of the declaration; or,
- d. By a written declaration of a Party to the other Party and the IEC, if appointed, to the effect that the Conciliation proceedings are terminated, on the date of the declaration.
- e. On rejection of the Draft Settlement Agreement by the Competent Authority of BHEL or the other Party.

23. The Conciliator(s) shall be entitled to following fees and facilities:

| Sl No | Particulars | Amount |
|--------------|--|---|
| 1 | Sitting fees | Each Member shall be paid a Lump Sum fee of Rs 75,000/- for the whole case payable in terms of paragraph No. 27 herein below. |
| 2 | Towards drafting of settlement agreement | In cases involving claim and/or counter-claim of up to Rs 5crores. Rs 50,000/- (Sole Conciliator) |

| Sl No | Particulars | Amount |
|-------|--|---|
| | | <p>In cases involving claim and/or counter-claim of exceeding Rs 5 crores but less than Rs 10 crores. Rs 75,000 (per Conciliator)</p> <p>In cases involving claim and/or counter-claim of more than Rs 10 crores. Rs 1,00,000/- (per Conciliator)</p> <p>Note: The aforesaid fees for the drafting of the Settlement Agreement shall be paid on Signing of the Settlement Agreement after approval of the Competent Authority or Rejection of the proposed Settlement Agreement by the Competent Authority of BHEL.</p> |
| 3 | Secretarial expenses | <p>Rs 10,000/- (one time) for the whole case for Conciliation by a Sole Member IEC.</p> <p>Where Conciliation is by multi member Conciliators –Rs 30,000/- (one time)- to be paid to the IEC</p> |
| 4 | <p>Travel and transportation and stay at outstation</p> <p>i) Retired Senior Officials of other Public Sector Undertakings (pay scale wise equivalent to or more than E-8 level of BHEL)</p> | <p>As per entitlement of the equivalent officer (pay scale wise) in BHEL.</p> |
| | Others | <p>As per the extant entitlement of whole time Functional Directors in BHEL.</p> |

| Sl No | Particulars | Amount |
|-------|-------------------|--|
| | | Ordinarily, the IEC Member(s) would be entitled to travel by air Economy Class. |
| 5 | Venue for meeting | Unless otherwise agreed in the agreement, contract or the Memorandum of Understanding, as the case may be, the venue/seat of proceedings shall be the location of the concerned Unit / Division / Region / Business Group of BHEL. Without prejudice to the seat/venue of the Conciliation being at the location of concerned BHEL Unit / Division / Region / Business Group, the IEC after consulting the Parties may decide to hold the proceedings at any other place/venue to facilitate the proceedings. Unless, Parties agree to conduct Conciliation at BHEL premises, the venue is to be arranged by either Party alternately. |

24. The parties will bear their own costs including cost of presenting their cases/evidence/witness(es)/expert(s) on their behalf. The parties agree to rely upon documentary evidence in support of their claims and not to bring any oral evidence in IEC proceedings.
25. If any witness(es) or expert(s) is/are, with the consent of the parties, called upon to appear at the instance of the IEC in connection with the matter, then, the costs towards such witness(es)/expert(s) shall be determined by the IEC with the consent of the Parties and the cost so determined shall be borne equally by the Parties.
26. The other expenditures/costs in connection with the Conciliation proceedings as well as the IEC's fees and expenses shall be shared by the Parties equally.
27. Out of the lump sum fees of Rs 75,000/- for Sitting Fees, 50% shall be payable after the first meeting of the IEC and the remaining 50% of the Sitting Fees shall be payable only after termination of the conciliation proceedings in terms of para 22 hereinabove.

28. The travelling, transportation and stay at outstation shall be arranged by concerned Unit as per entitlements as per Serial No. 3 of the Table at para 23 above, and in case such arrangements are not made by the BHEL Unit, the same shall be reimbursed to the IEC on actuals limited to their entitlement as per Serial No. 4 of the Table at Para 23 above against supporting documents. The IEC Member(s) shall submit necessary invoice for claiming the fees/reimbursements.
29. The Parties shall keep confidential all matters relating to the conciliation proceedings. Confidentiality shall extend also to the settlement agreement, except where its disclosure is necessary for purposes of its implementation and enforcement or as required by or under a law or as per directions of a Court/Governmental authority/regulatory body, as the case may be.
30. The Parties shall not rely upon or introduce as evidence in any further arbitral or judicial proceedings, whether or not such proceedings relate to the Disputes that is the subject of the Conciliation proceedings:
 - a. Views expressed or suggestions made by the other party in respect of a possible settlement of the Disputes;
 - b. admissions made by the other party in the course of the Conciliator proceedings;
 - c. proposals made by the Conciliator;
 - d. The fact that the other Party had indicated his willingness to accept a proposal for settlement made by the Conciliator.
31. The Parties shall not present the Conciliator(s) as witness in any Alternative Dispute Resolution or Judicial proceedings in respect of a Disputes that is/was the subject of that particular Conciliation proceeding.
32. None of the Conciliators shall act as an arbitrator or as a representative or counsel of a Party in any arbitral or judicial proceeding in respect of a Disputes that is/was the subject of that particular Conciliation proceeding.
33. The Parties shall not initiate, during the Conciliation proceedings, any arbitral or judicial proceedings in respect of a Disputes that is the subject matter of the Conciliation proceedings except that a Party may initiate arbitral or judicial proceedings where, in his opinion, such proceedings are necessary for preserving his rights including for preventing expiry of period of limitation. Unless terminated as per the provisions of this Scheme, the Conciliation proceedings shall continue

notwithstanding the commencement of the arbitral or judicial proceedings and the arbitral or judicial proceedings shall be primarily for the purpose of preserving rights including preventing expiry of period of limitation.

34. The official language of Conciliation proceedings under this Scheme shall be English unless the Parties agree to some other language.

Format 2 to BHEL Conciliation Scheme, 2018

**FORMAT FOR SEEKING CONSENT FOR REFERRING THE DISPUTES TO
CONCILIATION THROUGH IEC**

To,

M/s. (Stakeholder's name)

**Sub: Resolution of the Disputes through conciliation by Independent
Expert Committee (IEC).**

Ref: Contract No/MoU/Agreement/LOI/LOA& date _____.

Sir,

With reference to above referred Contract/MoU/Agreement/LOI/LOA, you have raised certain Disputes/claims. Vide your letter dated____ you have requested BHEL to refer the Disputes/claims to IEC for Conciliation.

We are enclosing herewith Format (3) for giving consent and the terms and conditions of BHEL Conciliation Scheme, 2018 governing conciliation through IEC. You are requested to give your unconditional consent to the said terms and conditions of the Scheme by returning the same duly sealed and signed on each page. On receipt of your consent, matter will be put to the Competent Authority for consideration and decision.

Please note that BHEL has also certain claims against you (if applicable). BHEL reserves its right to agree or not to agree conciliation of the said disputes through BHEL and this letter is being issued without prejudice to BHEL's rights and contentions available under the contract and law.

Yours faithfully,

Representative of BHEL

Format 3 to BHEL Conciliation Scheme, 2018
FORMAT FOR GIVING CONSENT BY
CONTRACTOR/VENDOR/CUSTOMER/COLLABORATOR/CONSORTIUM PARTNERS FOR REFERRING THE DISPUTES TO CONCILIATION THROUGH IEC

To,

BHEL

.....

Sub: Resolution of Disputes through Conciliation by Independent Expert Committee (IEC).

Ref: Contract/MoU/Agreement/LOI/LOA No & date____

With reference to above referred contract, our following bills/invoices/claims submitted to BHEL are still unpaid giving rise to Disputes:

| SL. no. | Claim Description | Bill submitted to BHEL (no. and date) | Amount of the bill/claim | Amount received from BHEL | Outstanding Amount |
|---------|-------------------|---------------------------------------|--------------------------|---------------------------|--------------------|
| | | | | | |
| | | | | | |
| | | | | | |

Accordingly we request you to kindly refer the Disputes in respect of above claims to IEC for Conciliation.

We hereby agree and give our unconditional consent to the terms and conditions of BHEL Conciliation Scheme, 2018 governing conciliation through IEC. We have signed the same on each page and enclosed it for your consideration.

Yours faithfully,

(Signature with stamp)

Authorized Representative of Contractor

Name, with designation

Date

Format 5 to BHEL Conciliation Scheme, 2018
STATEMENT OF CLAIMS/COUNTER CLAIMS TO BE SUBMITTED TO
THE IEC BY BOTH THE PARTIES

1. Chronology of the Disputes
2. Brief of the Contract/MoU/Agreement/LOI/LOA
3. Brief history of the Disputes:
4. Issues:
5. Details of Clam(s)/Counter Claim(s):

| SI. No. | Description of claim(s)/Counter Claim | Amount (in INR)Or currency applicable in the contract | Relevant contract clause |
|----------------|--|--|---------------------------------|
| | | | |
| | | | |
| | | | |

6. Basis/Ground of claim(s)/counter claim(s) (along with relevant clause of contract)

Note– *The Statement of Claims/Counter Claims may ideally be restricted to maximum limit of 20 pages. Relevant documents may be compiled and submitted along with the statement of Claims/Counter Claims. The statement of Claims/Counter Claims is to be submitted to all IEC members and to the other party by post as well as by email.*

ANNEXURE-E

Project : Pre-Bid Tie-up for Supply & Services of 400 kV Gas Insulated Switchgear (GIS) for addressing tender invited by GIPCL for Pooling Substation 400/33 kV, 1200 MW (PSS-1, Phase-I & Phase-II of 600 MW each) of Solar / Wind / Hybrid RE Park of 2375 MW Capacity at Great Rann of Kutch Area , Gujarat

Enquiry No :

Name of Package: 400/33 kV GIS & Associated equipment.

DETAILS OF PACKAGES

| S. N. | Discriptions | ESTIMATED QUANTITY |
|--------------|---|---------------------------|
| 1 | NO OF PACKAGES/CASES | |
| 2 | SIZE (MAXIMUM & MINIMUM) | |
| 3 | WEIGHT | |
| 4 | NOS OF COC CONTAINERS (TYPES & QTY), IF ANY | |

Note:

1. The above is required only to facilitate the store at site.
2. Bidder to submit standard storage instruction along with offer.



APPENDIX-27: DEED OF JOINT UNDERTAKING

27(A). FORM OF JOINT DEED OF UNDERTAKING BY THE COLLABORATOR/ PARENT/ PRINCIPAL COMPANY OF SUBSIDIARY COMPANY/ JV COMPANY/ GROUP COMPANY ALONGWITH THE BIDDER/MANUFACTURER {applicable to Bidder Qualifying through Route-2 & Route-4 of the Qualification Requirement}

(ON NON-JUDICIAL STAMP PAPER OF APPROPRIATE VALUE)

THIS DEED OF UNDERTAKING executed this day of Two Thousand and by M/s., a Company incorporated under the laws of and having its Registered Office at (hereinafter called the "Collaborator/ Parent/Principal Company" which expression shall include its successors, executors and permitted assigns), and M/s., a Company incorporated under the laws of having its Registered Office at (hereinafter called the "Bidder/Manufacturer" which expression shall include its successors, executors and permitted assigns) and Ms/., a Company incorporated under the laws of having its Registered Office at (hereinafter called the "Bidder" which expression shall include its successors, executors and permitted assigns) in favour of (*insert names of the Owner*) a Company incorporated under the Companies Act of 1956 having its registered office at (*insert registered address of the Owner*)..... (hereinafter called the "Owner" which expression shall include its successors, executors and permitted assigns)

WHEREAS the "Owner" invited Bid as per its Specification No. for the execution of (*insert name of the package alongwith project name*).....

AND WHEREAS Clause No., Section, of, Vol.-... forming part of the Bid Documents inter-alia stipulates that the Bidder / Manufacturer alongwith its Collaborator/ Parent/Principal Company must fulfill the Qualifying Requirements for the *..... and be jointly and severally bound and responsible for the successful performance of the *..... offered in the event the Bid submitted by the Bidder is accepted by the Owner resulting in a Contract.

AND WHEREAS the Bidder has submitted its Bid to the Owner vide Proposal No. dated based on the collaboration/association of the Collaborator/ Parent/Principal Company with the Bidder/Manufacturer.

NOW THEREFORE THIS UNDERTAKING WITNESSETH as under:

- 1.0 In consideration of the award of Contract by the Owner to the Bidder (hereinafter referred to as the "Contract") we, the Collaborator/ Parent/Principal Company and the Bidder/Contractor/manufacturer do hereby declare that we shall be jointly and severally bound unto the (*insert name of the Owner*), for the successful performance of the *..... and shall be fully responsible for the design, manufacture, testing, supply on FOR destination delivery at site basis and supervision of unloading at site, storage, erection, testing & commissioning and successful performance of the *..... in accordance with the Contract Specifications.
- 2.0 Without in any way affecting the generality and total responsibility in terms of this Deed of Undertaking, the Collaborator/ Parent/Principal Company in particular hereby agrees to depute their technical experts from time to time to the Bidder's/ Contractor's/ Manufacturer's Works/ Owner's Project site as mutually considered necessary by the Owner, Bidder/ Contractor/ Manufacturer and the Collaborator/ Parent/Principal Company to ensure:



- (i) A valid technology transfer agreement, including license to manufacture and supply from India, between the Collaborator/ Parent/Principal Company (the technology provider) and the Bidder / Contractor covering the type, size and rating of the *.....sets specified, valid minimum up to the end of the defect liability period of the contract. The technology transfer agreement necessarily covers transfer of technological know-how for *..... in the form of complete transfer of design dossier, design software's, drawings and documentation, quality system manuals and imparting relevant training to the personnel of the Bidder / Contractor.
- (ii) Proper design, engineering, manufacture, testing, supply transportation and delivery at site and supervision of unloading at site, storage, erection, testing & commissioning and successful performance of the equipment in accordance with Contract Specifications and
- (iii) If necessary, the Collaborator/ Parent/Principal Company shall advise the Manufacturer/ Contractor suitable modifications of designs and implement necessary corrective measures to discharge the obligations under the contract.

3.0 We further confirm that

The Parent/ Principal Company shall have a minimum equity participation of 51% in the Indian Subsidiary Company for a lock-in period of seven (7) years from the date of incorporation of Indian Subsidiary Company or upto the end of defect liability period of the contract whichever is later.

(OR)

The Parent/ Principal Company and the Group Company shall have a common source of control, directly or indirectly, so as to exercise a minimum equity participation of 26% or appoint more than 50% of members of Board of Directors in the Group Company. The promoter of the Group Company shall maintain the minimum equity participation in the Group Company for a lock-in period of seven (7) years from the date of incorporation of Group Company or upto the end of defect liability period of the contract whichever is later.

(OR)

The Parent/ Principal Company shall have a minimum equity participation of 26% in the Joint Venture Company for a lock-in period of seven (7) years from the date of incorporation of Joint Venture Company or upto the end of Defect Liability Period of the contract, whichever is later.

The Indian GIS Manufacturer shall have a minimum equity participation of 51% in the Joint Venture Company for a lock-in period of seven (7) years from the date of incorporation of Joint Venture Company or upto the end of Defect Liability Period of the contract, whichever is later.

(applicable in case bidder is a Subsidiary Company/ Group Company/ JV Company (JVC) who intends to meet the Financial Position requirement specified in the Qualification requirement based on its Parent/ Principal Company)

- 4.0 This Deed of Undertaking shall be construed and interpreted in accordance with the laws of India and the Courts in Vadodara shall have exclusive jurisdiction in all matters arising under the Undertaking.
- 5.0 As a security, the Collaborator/ Parent/Principal Company shall apart from the Contractor's performance guarantee, furnish a Contract Performance Guarantee from its Bank in favour of the Owner in a form acceptable to the Owner. The value of such guarantee shall be equivalent



to 3% of the Ex-works cost of such equipment(s) manufactured in India as identified in the Contract awarded by the Owner to the Bidder/Contractor and it shall be part of guarantee towards the faithful performance/compliance of this Deed of Undertaking in terms of the Contract. The guarantee shall be unconditional, irrevocable and valid for the entire period of the Contract, namely till the end of the Defect Liability Period of *..... under the Contract. The Bank Guarantee amount shall be payable to the Owner on demand without any reservation or demur. This shall be in addition to the Contract Performance Guarantee furnished by the Contractor.

6.0 We, the Collaborator/ Parent/Principal Company and Bidder/ Contractor/ Manufacturer agree that this Undertaking shall be irrevocable and shall form an integral part of the Contract and further agree that this Undertaking shall continue to be enforceable till the Owner discharges it. It shall become operative from the effective date of Contract.

IN WITNESS WHEREOF the Collaborator/ Parent/Principal Company, and the Bidder/Contractor/Manufacturer have through their Authorised Representatives executed these presents and affixed Common seals of their respective Companies, on the day, month and year first above mentioned.

| | |
|----------------------|--|
| WITNESS | (For Collaborator/ Parent/Principal Company) |
| Signature | (Signature of the authorized representative) |
| Name | Name |
| Office Address | Common Seal of Company |

| | |
|----------------------|--|
| WITNESS | (For Bidder) |
| Signature | (Signature of the authorized representative) |
| Name | Name |
| Office Address | Common Seal of Company |

| | |
|----------------------|--|
| WITNESS | (For Manufacturer) |
| Signature | (Signature of the authorized representative) |
| Name | Name |
| Office Address | Common Seal of Company |



Note:

1. For the purpose of executing the Deed of Joint Undertaking, the non-judicial stamp papers of appropriate value shall be purchased in the name of executant(s).
2. The Undertaking shall be signed on all the pages by the authorised representatives of each of the partners and should invariably be witnessed.
3. This Deed of Joint Undertaking duly certified by the Company Secretary shall be submitted along with the bid.
4. In the event the Bidder is a Manufacturer and the Collaboration is between Collaborator and the Bidder, then the Joint deed of undertaking shall be modified accordingly.
5. *The name(s) of equipment for which Joint deed of undertaking is to be submitted is to be inserted viz.,400kV GIS etc.
6. The manufacturer may be having ongoing collaboration agreement or had collaboration agreement in the past with the collaborator.



**27 (B). FORM OF DEED OF JOINT UNDERTAKING TO BE EXECUTED BY THE
BIDDER/CONTRACTOR ALONGWITH INDIAN GIS MANUFACTURER WHO HAS BEEN
ASSOCIATED FOR SOURCING OF GIS EQUIPMENT {applicable to Bidder Qualifying
through Route-3 of the Qualification Requirement}**

(ON NON-JUDICIAL STAMP PAPER OF APPROPRIATE VALUE)

This DEED OF UNDERTAKING executed this day of..... Two Thousand by
M/s....., a Company incorporated under having its
Registered Office at hereinafter called the "Bidder/Contractor" which
expression shall include its successors, administrators, executors and permitted assigns and M/s.
....., registered under the Indian Companies Act of 1956 or 2013, as the
case may be, and having its Registered Office at hereinafter called the
"Associate" which expression shall include its successors, administrators, executors and permitted
assigns, in favour of (*insert names of the Owner*), a Company incorporated under
the Indian Companies Act of 1956 having its registered office at (*insert registered address
of the Owner*)..... (hereinafter called the "Owner" which expression shall include its successors,
executors and permitted assigns).

WHEREAS the "Owner" invited Bid as per its Specification No. for the execution of
(*insert name of the package alongwith project name*)

AND WHEREAS Clause No., Section, of, Vol.-... forming part of the
Bidding Documents inter-alia stipulates that the Bidder/Contractor can also participate provided the
Bidder meets the requirement and associates with a GIS manufacturer for sourcing of GIS equipment,
who meets the stipulated requirement as applicable of Cl. No. 2.1, Section-2, Vol.-I of this RFP
document and submits a Deed of Joint Undertaking jointly executed by the Bidder/Contractor and its
Associate in which the Bidder and its Associate are jointly and severally bound and responsible for the
successful performance of the GIS Portion of the Contract specified in the bidding documents in the
event the Bid submitted by the Bidder is accepted by the Owner resulting in a Contract.

AND WHEREAS the Bidder has submitted its Bid to the Owner based on above stipulation and has
agreed to furnish this Deed of Undertaking to be enforceable in the event of the award of the Contract
by the Owner.

AND WHEREAS the Bidder and Associate are executing an irrevocable Deed of Joint Undertaking that
they shall be held jointly and severally liable and bound unto the Owner for successful performance of
the GIS portion of the Contract fully meeting the stipulated technical requirements, guaranteed
parameters and characteristics as per bidding documents, in the event the Bid submitted by the Bidder
is accepted by the Owner resulting in a Contract.

NOW THEREFORE, THIS UNDERTAKING WITNESSETH AS UNDER:

- 1.0 In consideration of the award of Contract by the Owner to the Bidder / Contractor (hereinafter
referred to as the "Contract") we, the Bidder/Contractor and the Associate do hereby agree and
undertake that we shall be jointly and severally responsible to the Owner for design, erection,
testing and commissioning of complete GIS portion of the Contract and perform all obligations
including the technical guarantee for the complete package..
- 2.0 In case of any breach of the Contract committed by the Contractor, we, the Associate do
hereby undertake, declare and confirm that we shall be fully responsible for design,
manufacturing, erection, testing and commissioning of complete GIS switchyard under the



Contract and undertake to carry out all obligation and responsibilities under this Deed of Joint Undertaking in order to discharge the Contractor's obligations and responsibilities stipulated in the Contract with respect to GIS portion of the Contract. Further, if the Owner sustains any loss or damage on account of any breach with respect to GIS portion of the Contract, we, the Associate and the Contractor jointly and severally undertake to promptly indemnify, and pay such losses/damages caused to the Owner on its written demand without any demur, reservation, contest or protest in any manner whatsoever.

3.0 Without in any way affecting the generality and total responsibility in terms of this Deed of Undertaking, the Bidder/Contractor hereby agrees to ensure the following:

- (i) The Associate will be fully responsible for design, engineering, manufacture, erection, testing, commissioning and putting into satisfactory operation of complete GIS switchyard to the satisfaction of the Owner.

Further, the Associate shall depute their technical experts from time to time to the Contractor's works/Owner's project site as required by Owner and agreed to by the Contractor/Associate to facilitate the successful performance of switchyard with respect to GIS portion as stipulated in the Contract.

Further, the Associate shall ensure proper design, engineering, manufacture, erection, testing, commissioning and successful performance of GIS switchyard covered under the said Contract in accordance with the stipulations of the Contract specifications and if necessary the Associate shall advise the Contractor suitably modifications of design and implement necessary corrective measure to discharge the obligations under the Contract.

- (ii) In the event the Associate and the Contractor fail to demonstrate successful performance of switchyard, the Associate and the Contractor shall promptly carry out all the corrective measures at their own expenses and shall promptly provide corrected designs to the Owner.
- (iii) The Contractor and Associate will be fully responsible for the quality of all equipment/main assemblies/components manufactured at their works or at their vendor's works or fabricated/constructed at site, and their repairs or replacement if necessary for incorporation on the switchyard with respect to GIS portion of the Contract and timely delivery thereof the meet the completion schedule under the Contract.
- (iv) In case of any issue related to failure and repair of GIS equipment, the Bidder / Contractor and the Associate shall ensure the following:
- The Associate's Service Engineer(s) shall be deputed to concerned site within 24 Hours plus actual journey time to attend the problem after receiving the information of the same from Owner.
 - The Associate shall ensure readily availability in their Indian works at least one no. of each type of GIS Module used in the installation under the Contract.

4.0 This Deed of Undertaking shall be construed and interpreted in accordance with the laws of India and the Courts in Vadodara shall have exclusive jurisdiction in all matters arising under the Undertaking.

5.0 As a security, the Associate shall apart from the Contractor's performance guarantee, furnish a Contract Performance Guarantee from its Bank in favour of the Owner in a form acceptable to



the Owner. The value of such guarantee shall be equivalent to 2% (two percent) of the Contract value awarded by the Owner to the Bidder/Contractor and it shall be part of guarantee towards the faithful performance/compliance of this Deed of Undertaking in terms of the Contract. The guarantee shall be unconditional, irrevocable and valid for the entire period of the Contract, namely till the end of the Defect Liability Period under the Contract. The Bank Guarantee amount shall be payable to the Owner on demand without any reservation or demur. This shall be in addition to the Contract Performance Guarantee to be furnished by the Contractor.

We further agree that this undertaking shall be without any prejudice to the various liabilities of the Bidder / Contractor, including the Contract Performance Security as well as other obligations of the Bidder / Contractor in terms of the Contract.

6.0 We, the Associate and Bidder/Contractor agree that this Undertaking shall be irrevocable and shall form an integral part of the Contract and further agree that this Undertaking shall continue to be enforceable till the Owner discharges it. It shall become operative from the effective date of Contract.

IN WITNESS WHEREOF the Contractor and the Associate have through their Authorised Representatives executed these presents and affixed Common seals of their respective Companies on the day, month and year first above mentioned.

| | |
|----------------------|--|
| WITNESS | [For Bidder/Contractor] |
| Signature | (Signature of the authorized representative) |
| Name | Name |
| Office Address | Common Seal of Company |

| | |
|----------------------|--|
| WITNESS | [For Associate] |
| Signature | (Signature of the authorized representative) |
| Name | Name |
| Office Address | Common Seal of Company |

Note:

1. For the purpose of executing the Deed of Undertaking, the non-judicial stamp papers of appropriate value shall be purchased in the name of executant.
2. The Undertaking shall be signed on all the pages by the authorised representative(s) of the Bidder and the Associate and should invariably be witnessed.



APPENDIX-15: LIST OF BANKS (FOR BANK GUARANTEE)

Bank Guarantee from the following Banks will be acceptable for GIPCL

| SCHEDULED PUBLIC SECTOR BANKS (INDIAN) | SCHEDULED FOREIGNBANKS |
|---|--|
| <ol style="list-style-type: none"> 1. State Bank of India. 2. State Bank of Bikaner and Jaipur 3. State Bank of Hyderabad 4. State Bank of Mysore. 5. State Bank of Patiala. 6. State Bank of Travancore. 7. Allahabad Bank 8. Andhra Bank 9. Bank of Baroda 10. Bank of India 11. Bank of Maharashtra 12. Canara Bank 13. Central Bank of India 14. Corporation Bank 15. Dena Bank 16. Indian Bank 17. Punjab National Bank 18. Punjab and Sind Bank 19. Syndicate Bank 20. Union Bank of India 21. UCO Bank 22. Vijaya Bank | <ol style="list-style-type: none"> 23. American Express Bank Ltd. 24. Bank of American NT&SA 25. Bank of Tokyo Ltd. 26. BNP Paribas 27. Barclays Bank Plc 28. Citi Bank NA. 29. Deutsche Bank A.G. 30. Hongkong & Shanghai Banking Corpn. 31. Standard Chartered Bank 32. JPMorgan Chase Bank NA |
| SCHEDULED PRIVATE SECTOR BANKS(INDIAN) <ol style="list-style-type: none"> 1. ING Vysya Bank 2. Axis Bank Ltd. 3. ICICI Bank 4. HDFC Bank 5. Yes Bank 6. Indus Ind Bank 7. Kotak Mahindra Bank | |

- The Bank Guarantee submitted should have the clear one time validity in all respect and up to the completion period. If by any reason the Contract Period is extended, the Bidder shall undertake to renew the Bank Guarantee at least one month before the expiry of the validity failing which GIPCL will be at liberty to encash the same.



APPENDIX-16 (B): FORMAT OF BANK GUARANTEE FOR SECURITY DEPOSIT/ PERFORMANCE BANK GUARANTEE

To be executed on non-judicial stamped paper of approximate value)

BG No.

Date

1. WHEREAS Gujarat Industries Power Company Limited having its office at Post: Ranoli, Dist. Vadodara – 391 350, Gujarat State, India (hereinafter referred to as “The Company/Owner” which expressions shall unless repugnant to the subject or context includes its legal representatives, successors and assigns) has entered into a contract with M/s. / has placed a purchase order on M/s.....(hereinafter referred to as “Contractor(s)/ Seller(s)” which expression shall unless repugnant to the subject or context includes their legal representatives, successors and assigns) foron the terms and conditions as set out inter alia, in the Company’s contract No./ P.O. No.....dateand various documents forming part thereof hereinafter referred to as the “said contract” which expression include all amendments, modifications and/ or variations thereto and where as the Contractor(s)/Seller(s) has agreed for due execution of the entire contract and guarantees its performance including any parts executed through any other agencies/ subcontractors AND WHEREAS one of the conditions of the “said contract” is that “contractor(s)/seller(s) shall furnish to the owner a Bank Guarantee from a bank for% (.....percent) of the total value of the “said contract” against due and faithful performance of the “said contract” including performance guarantee obligations of the contractor(s)/seller(s) for execution/ supplies made under the “said contract.”
2. WeBank having its branch office atdo hereby agree and undertake to pay the amount due and payable under this guarantee without any demur merely on a demand from the Company stating that in the opinion of the Company, which is final & binding, the amount claimed is due by reason of default made by the Contractor(s)/ Seller(s) in performing any of the terms & conditions of the said Contract including defect liability obligations, in fulfilling the performance guarantee obligation or loss or damage caused to or would be caused to or suffered by the Company by reason of any breach by the said Contractor (s)/ Seller(s) of any of the terms & conditions of the contract. Any such demand made on the Bank by the owner shall be conclusive as regards the amount due and payable by the Bank under this guarantee. However, our liability under this guarantee shall be restricted to Rs. (Rupees.....only).
3. We undertake to pay to the Company any money so demanded notwithstanding any dispute or disputes raised by the contractor(s)/ Seller(s) in any suit or proceeding pending before any office, court or tribunal relating thereto our liability under this present guarantee being absolute and unequivocal. The payment so made by us under this bond shall be a valid discharge of our liability for payment there under. Our liability to pay is not dependent or conditional on the owner proceeding against the Contractor(s)/ Seller(s).



4. The guarantee herein contained shall not be determined or affected or suspended by the liquidation or winding up, dissolution or change of constitution or insolvency of the said Contractor(s)/ Seller(s) but shall in all respect and for all purposes be binding and operative until payment of all money due or liabilities under the said contract(s)/ Order(s) are fulfilled.
5. This guarantee will remain valid up _____ days or _____ whichever is earlier. The Bank undertakes not to revoke this guarantee during its currency without previous consent of the OWNER/PURCHASER and further agrees that if this guarantee is extended for a period as mutually agreed between bidder & owner/purchaser, the guarantee shall be valid for a period so extended provided that a written request for such extension is received before the expiry of validity of guarantee.
6. WeBank further agree with the Company that the company shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said Contract(s)/ Order(s) or to extend the time of performance by the said Contractor(s) Seller(s) from time to time or to postpone for any time or from time to time any of the powers exercisable by the Company against the said Contractor(s)/ Seller(s) and to forbear or enforce any of the terms and conditions relating to the said Contract(s)/ Order(s) and we shall not be relieved from our liability by reason of any such variation, or extension being granted to the said Contractor (s) / Seller(s) or for any forbearance, act or omission on the part of the Company or any indulgence by the Company to the said Contractor(s)/ Seller(s) or by any such matter or thing whatsoever which under the law relating to sureties would, but for this provision, have affect of so relieving us.
7. Notwithstanding anything contained herein before, our liability shall not exceed Rs.....(Rupees.....only) and shall remain in force till.....Unless a demand or claim under this Guarantee is made on us within three months from the date of expiry we shall be discharged from all the liabilities under this guarantee.

Date.....

.....Bank

Corporate Seal of the Bank

By its constitutional Attorney
Signature of duly Authorized person
On behalf of the Bank
With Seal & Signature code

Note: BGs to be furnished from any of the banks listed at Appendix 15.

| | | |
|---|---|--|
|  | Transmission Business Group HSE Department, HQ, Noida | |
| | HSE Policy | |

1. BHEL HSE Policy



In BHEL, Health, Safety and Environment (HSE) responsibilities are driven by our commitment to protect our employees and people we work with, community and environment. BHEL believes in zero tolerance for unsafe work/non-conformance to safety and in minimizing environmental footprint associated with all its business activities. We commit to continually improve our HSE performance by:

- Developing safety and sustainability culture through active leadership and by ensuring availability of required resources.
- Ensuring compliance with applicable legislation, regulations and BHEL systems.
- Taking up activities for conservation of resources and adopting sound waste management by following Reduce/Recycle/Reuse approach.
- Continually identifying, assessing and managing environmental impacts and Occupational Health & Safety risks of all activities, products and services adopting approach based on elimination/substitution/reduction/control.
- Incorporating appropriate Occupational Health, Safety and Environment criteria into business decisions, design of products & systems and for selection of plants, technologies and services.
- Imparting appropriate structured training to all persons at workplace and promoting awareness amongst customers, contractors and suppliers on HSE issues.
- Reviewing periodically this policy and HSE Management Systems to ensure its relevance, appropriateness and effectiveness.
- Communicating this policy within BHEL and making it available to interested parties.

June 5, 2018



Atul Sobti
Chairman & Managing Director

Creating  of tomorrow

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

GENERAL TERMS AND CONDITIONS FOR TENDER ENQUIRY / CONTRACT

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

| Sr. No. | |
|---------|---|
| 1. | <p>INSTRUCTION TO BIDDERS :</p> <p>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.</p> <p>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 :-</p> <p style="padding-left: 40px;">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</p> <p>1.3 In case tender enquiry is floated through the e-procurement system, offer / bid has to be submitted through the e-procurement system ONLY as per instructions given in the e-procurement portal (https://bheleps.buyjunction.in).</p> <p>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.</p> <p>1.5 Bids are to be submitted duly signed with seal in two parts :-</p> <p style="padding-left: 40px;">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.</p> <p style="padding-left: 40px;">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.</p> <p>1.6 The Part-I and Part-II Bids are to be sealed in separate envelopes and</p> |

| Sr. No. | |
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| | <p>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.</p> <p>1.7 For any technical clarification, please contact official mentioned in the tender enquiry / NIT.</p> <p>1.8 For any commercial clarification please contact official issuing tender enquiry / NIT.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>1.13 Non-conformities / errors / discrepancies in quoted prices in price bids shall be dealt as follows :-</p> <p>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.</p> <p>b) If there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail and the total shall be corrected.</p> |

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| | <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>Note : Representative / official deputed by the bidder to witness tender opening must produce authorization letter for the same.</p> |
| 2. | <p>PRICES :</p> <p>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.</p> <p>2.2 Unless specifically indicated in the NIT, the prices shall be on INR basis.</p> <p>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 :-</p> <p>a) Ex-works Price: Ex-works price including packing & forwarding charges.</p> |

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| | <p>b) Freight: Freight for door delivery up to destination / site / store are to be quoted separately.</p> <p>c) Insurance: Insurance for door delivery up to destination / site / store are to be quoted separately.</p> <p>d) Type Test Charges: If asked in the technical specification, it is to be quoted separately for each test.</p> <p>e) Charges for Supervision of Erection, Testing & Commissioning (ETC) at Site: To be quoted separately if specified in NIT/Price Schedule.</p> <p>f) Charges for Testing & Commissioning at Site: To be quoted separately if specified in NIT/Price Schedule.</p> <p>g) Charges for Erection, Testing & Commissioning at Site: To be quoted separately if specified in NIT/Price Schedule.</p> <p>h) Training Charges: To be quoted separately if specified in NIT/Price Schedule.</p> <p>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.</p> <p>Note :</p> <p>i) Unless otherwise specified in the NIT, the purchase order shall be placed on Ex-works basis for Indian bidders.</p> <p>ii) Prices quoted by Indian bidders shall be in Indian Rupees only.</p> <p>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.</p> <p>iv) Unless otherwise specified in the NIT, Unloading at Site / Destination shall not be in the scope of the supplier.</p> <p>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.</p> |
| 3. | <p>TERMS OF PAYMENT :</p> <p>3.1 For Supply only in scope of the supplier</p> <p>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 :</p> <ul style="list-style-type: none"> · LR / GR duly endorsed by BHEL Site Official. · Material Receipt Certificate issued by BHEL Site Official. · GST Compliant Tax Invoice · Packing List (Case-wise) · Copy of Transit Insurance Certificate from underwriters. · Material Inspection Clearance Certificate (MICC) issued by BHEL Quality Management · Guarantee Certificate · Copy of Performance Bank Guarantee (PBG) · Certificate of acceptance of Type Test Reports issued by BHEL Engineering Management wherever specifically mentioned in the Purchase Order. |

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| | <p>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</p> <p>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 :</p> <ul style="list-style-type: none"> · 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. <p>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 :</p> <ul style="list-style-type: none"> · 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 <p>3.3 For Supply where Erection, Testing & Commissioning (ETC) at Site is in scope of the supplier</p> <p>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 :</p> <ul style="list-style-type: none"> · 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 <p>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 :</p> <ul style="list-style-type: none"> · 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 <p>3.4 For Type Test Charges</p> <p>100% payment along with applicable GST within 60 days from the date of receipt</p> |

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| | <p>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.</p> <p>3.5 For Charges for Supervision of Erection, Testing & Commissioning at Site</p> <p>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).</p> <p>3.6 For Charges for Testing & Commissioning at Site</p> <p>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).</p> <p>3.7 For Training Charges</p> <p>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).</p> <p>Note :</p> <ul style="list-style-type: none"> i) Supplier has to submit invoice(s) as per PO or approved billing break-up of prices (if applicable as per NIT). ii) In case of supplies for overseas project, Material Receipt Certificate issued by BHEL Authorized Representative shall also be acceptable. iii) In case of Transit Insurance under Open Insurance Policy, Intimation / Declaration of Transit Insurance as per terms of the relevant Open Insurance Policy along with copy of Open Insurance Policy from underwriters shall also be acceptable. iv) Supplier has to ensure commencement of transit insurance from the date not later than LR / GR date. v) Supplier has to submit Tax Invoice(s). Supplier should ensure that Tax Invoice should comply all statutory requirements under GST Law to enable BHEL to avail input credit vi) MSMED Act, 2006 and the rules made thereunder as amended from time to time shall be applicable for release of payment to suppliers qualified & registered as Micro & Small Enterprises based on documents mentioned in the NIT for MSME. vii) Supplier has to submit PBG (as per BHEL format) & Guarantee Certificate as per |

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| | <p>PO terms.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p> |
| 4. | <p>INTEREST LIABILITY :</p> <p>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.</p> |
| 5. | <p>GUARANTEE :</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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</p> |

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| | <p>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.</p> <p>Note :</p> <p>i) In case of Illumination System, items viz. Lamps, Tubes, Ballast, Starters, Capacitors & Fuses will not be under Guarantee after commissioning.</p> <p>ii) In addition to the above guarantee period, Extended Guarantee / Warranty, if any, shall be as per NIT / Technical Specifications.</p> <p>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.</p> |
| 6. | <p>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.</p> |
| 7. | <p>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 :-</p> <p><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.</p> <p><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.</p> <p><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.</p> <p>Note :</p> <p>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.</p> <p>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</p> |

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| | <p>before expiry of validity of the PBG.</p> <p>iii) Unless otherwise specified in the NIT, deviation taken for non-submission of PBG / Deposit, as applicable, shall not be accepted.</p> <p>iv) Supplier has to confirm one of the applicable options for submission of PBG / Deposit before placement of PO.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p> |
| 8. | <p>SUBMISSION OF DRAWINGS / DOCUMENTS FOR APPROVAL :</p> <p>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.</p> <p>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.</p> |
| 9. | <p>FINAL DOCUMENTATION :</p> <p>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.</p> |
| 10. | <p>INSPECTION :</p> <p>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.</p> <p>Supplier shall send inspection call on prescribed format / web site only, with an</p> |

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| | <p>advance notice of 15 days.</p> <p>Supplier to ensure submission of all routine / acceptance test reports, inspection reports and all other documents related to inspection, immediately to BHEL.</p> <p>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.</p> |
| 11. | <p>DESPATCH DOCUMENTS :</p> <p>Despatch documents to be immediately sent to BHEL on despatch are as follows :-</p> <ul style="list-style-type: none"> • 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. | <p>DELIVERY PERIOD :</p> <p>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.</p> <p>Time required for type test, if applicable, is to be separately indicated.</p> <p>Note :</p> <p>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.</p> |
| 13. | <p>LIQUIDATED DAMAGES FOR DELAYED DELIVERY:</p> <p>In case of delay in execution of Purchase Order beyond the contractual delivery time, an amount of 0.5% of the total Purchase Order value for supply (incl. taxes and duties, freight & insurance as applicable) per week of delay or part thereof subject to a maximum of 10% of the total Purchase Order value for supply (incl. taxes and duties, freight & insurance as applicable) shall be deducted as Liquidated Damages (LD) along with applicable GST (if any) on LD.</p> <p>However, in case of staggered (lot-wise) contractual delivery schedule, an amount of 0.5% of the total Purchase Order value for supply (incl. taxes, duties, freight & insurance as applicable) of delayed lot per week of delay or part thereof subject to maximum of 10% of the total Purchase Order value.(Incl taxes, duties, Freight & Insurance as applicable) shall be deducted as Liquidated Damages (LD) along with applicable GST (if any) on LD.</p> <p>Note :</p> <ol style="list-style-type: none"> i) In case of any amendment / revision in P.O./WO, the LD shall be linked to the amended / revised Purchase Order / Contract value and delivery / completion time / schedule, if applicable. ii) LR / GR date or invoice date (whichever is later) for indigenous supplies and BL / AWB date for FOB / CIF (if applicable) for imported supplies shall be treated as the date of dispatch for levying LD as above. iii) However, for indigenous supply, if time period between date of receipt of material at site / destination by Site Official & the date of LR / GR or invoice (whichever is later) is more than 30 days, where distance from place of despatch as per LR / GR is upto 1000 Kms or if time period between date of receipt of material at site / destination by Site Official & the date of LR / GR or invoice (whichever is later) is more than 45 days, where distance from place of despatch as per LR / GR is more than 1000 Kms, such excess period shall also be considered for LD |

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| | <p>purpose.</p> <p>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.</p> |
| 14. | <p>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.</p> |
| 15. | <p>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.</p> <p>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.</p> |
| 16. | <p>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.</p> |
| 17. | <p>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.</p> <p>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.</p> <p>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.</p> |
| 18. | <p>LOADING CRITERIA : List of permissible deviations & loading criteria thereof are as follows :-</p> <p>a) Payment Terms Base rate of SBI (as applicable on the date of bid opening / techno-commercial bid opening in case of two part bids) + 6% shall be considered for loading for the</p> |

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| | <p>period of relaxation sought by bidder(s) against terms of payment in the NIT.</p> <p>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).</p> <p>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 :-</p> <p>i) Port handling / clearing charges: @ 1% of CIF value to arrive at Customs Assessable Value.</p> <p>ii) Custom Duty (including CVD & SAD) as per NIT prevailing on date of price bid opening.</p> <p>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.</p> <p>Note : Additional deviations (if considered acceptable by BHEL) & the loading criteria shall be communicated to all the qualified bidders before price bid opening.</p> |
| 19. | <p>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.</p> |
| 20. | <p>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.</p> |
| 21. | <p>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.</p> <p>If Supplier / Contractor is an individual or proprietary concern and the individual or the proprietor dies or the partnership is dissolved or substantially affected, then unless BHEL is satisfied that legal representative of individual Supplier / Contractor or proprietor of proprietary concern and surviving partners of partnership firm are capable of carrying out and completing the Purchase Order / Contract, BHEL shall be entitled to cancel the Purchase Order / Contract as to its incomplete portion and without being in any way liable to payment of any compensation to legal</p> |

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| | <p>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.</p> <p>Terms and Conditions shall not get affected in case of de-merger / amalgamation / taking-over / re-constitution etc.</p> |
| 22. | <p>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.</p> <p>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.</p> <p>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.</p> |
| 23. | <p>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.</p> |
| 24. | <p>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.</p> <p>If at any time during the continuance of the Purchase Order / Contract, the performance in whole or in part by either party of any obligations under the Purchase Order / Contract is prevented or delayed by reason of any war hostilities, acts of the public enemy, restrictions by Govt. of India, civil commotion, sabotage, fires, floods, explosion, epidemics, quarantine restrictions, strike, lock-outs or acts of God (hereinafter referred to as "event"), which are not in control of Supplier / Contractor or BHEL, then provided notice of the happening of such event is given by either party to the other within fifteen (15) days from the date of occurrence thereof, neither party shall by reason of such event be entitled to terminate the Purchase Order /</p> |

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| | <p>Contract nor shall have any claim for damages against each other in respect of such non-performance and delay in performance. Performance under the Purchase Order / Contract shall be resumed immediately after such event has come to an end or ceased to exist and decision of BHEL as to whether the deliveries have to be resumed or not shall be final, conclusive and binding on the parties hereto.</p> <p>In the event of the parties hereto not able to agree that a force majeure event has occurred, the parties shall submit the disputes for resolution pursuant to the provisions hereunder, provided that the burden of proof as to whether a force majeure event has occurred shall be upon the party claiming such an event.</p> <p>Notwithstanding above provisions, BHEL shall reserve the right to cancel the Purchase Order / Contract, wholly or partly, in order to meet the overall project schedule and make alternative arrangements for completion of delivery and other schedules.</p> |
| 25. | <p>MANUFACTURING QUALITY PLAN (MQP) : Supplier to submit approved MQP in line with requirement of BHEL/customer.</p> |
| 26. | <p>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.</p> |
| 27. | <p>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.</p> |
| 28. | <p>ORDER OF PRECEDENCE : The order of precedence shall be as follows :-</p> <ol style="list-style-type: none"> Special Terms & Conditions (STC) for Tender Enquiry / Contract, if any 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 <p>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.</p> |
| 29. | <p>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.</p> <p>In case of shipment by sea or air, the packing shall be sea-worthy or air-worthy respectively and of international standards.</p> <p>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.</p> <p>Packing List shall be submitted as per standard format along with advance set of documents for claiming payment which shall also indicate :-</p> <ol style="list-style-type: none"> Case / Packing size (as applicable). Gross weight and net weight of each package. Detailed contents of the package with quantity of each item separately. <p>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.</p> <p>Note :</p> <p>Foreign suppliers to furnish details to arrange inland transportation by BHEL, if applicable, as follows :-</p> |

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| | <ul style="list-style-type: none"> 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. | <p>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 :-</p> <ul style="list-style-type: none"> 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. | <p>MICRO, SMALL & MEDIUM ENTERPRISES (MSME) : MSMED Act 2006 as amended from time to time & extant regulations of Govt. of India for MSME will be applicable. Micro & Small Enterprises (MSE) can avail the intended benefits only if they submit along with the offer / bid, attested copies of either Acknowledgement of Entrepreneur Memorandum Part-II (EM-II certificate) having deemed validity (five years from the date of issue of acknowledgement in EM-II) or valid NSIC certificate or EM-II certificate along with attested copy of a CA certificate (As per BHEL format where deemed validity of EM-II certificate of five years have expired) applicable for the relevant financial year (latest audited). Date to be reckoned for determining the deemed validity will be the date of opening (for Techno-commercial Bid : Part-I in case of two part bid). Non-submission of such documents will lead to consideration of their bid at par with other bidders. No benefit shall be applicable for this enquiry if any deficiency in the above required documents are not submitted before price bid opening. If the tender is to be submitted through e-procurement portal, then the above required documents are to be uploaded on the portal. Documents should be notarized or arrested (in original) by a Gazetted officer. Copy of Udyog Aadhaar Memorandum with Acknowledgement of Ministry of Micro, Small & Medium Enterprises should also be furnished.</p> |
| 32. | <p>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.</p> |
| 33. | <p>REVERSE AUCTION : BHEL reserve the right to go for Reverse Auction (RA) instead of opening the sealed envelope price bid, submitted by the bidder or price bid submitted by the bidder through e-procurement system. This will be decided after techno-commercial evaluation. All bidders to give their acceptance for participation in RA. Non-acceptance to participate in RA may result in non-consideration of their bids, in case BHEL decides to go for RA. In case BHEL decides to go for Reverse Auction, only those bidders who have given their unconditional acceptance to participate in RA will be allowed to participate in the Reverse Auction. Those bidders who have given their acceptance to participate in Reverse Auction will have to necessarily submit "online sealed bid" in the Reverse Auction. Non-submission of "online sealed bid" by the bidder will be</p> |

| Sr. No. | |
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| | <p>considered as tampering of the tender process and will invite action by BHEL as per extant guidelines in vogue.</p> <p>General Terms and Conditions of RA are available at Annexure. Business Rules for RA shall be sent to the bidders before conducting RA.</p> <p>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.</p> |
| 34. | <p>INTEGRITY PACT :</p> <p>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.</p> |
| 35. | <p>TERMINATION OF CONTRACT :</p> <p>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.</p> <p>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.</p> <p>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.</p> |
| 36. | <p>SHELF LIFE :</p> <p>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.</p> |
| 37. | <p>LIMITATION OF LIABILITY :</p> <p>Notwithstanding any other provisions, except in cases of wilful misconduct and / or criminal negligence / acts,</p> <p>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</p> <p>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.</p> |
| 38. | <p>SHORTAGES / DAMAGES :</p> <p>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 :</p> <p>Any shortages and / or damages in supplies shall be supplied / replenished free of cost by the supplier as early as possible but not later than 30 days from the date of intimation by BHEL to the supplier.</p> |

| Sr. No. | |
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| | <p>b) Against Supply where Erection, Testing & Commissioning (ETC) at Site is in scope of the supplier :</p> <p>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.</p> <p>Note: There shall not be any extension in the contractual delivery time / schedule due to any shortages and / or damages in supplies.</p> |
| 39. | <p>VARIATION OF CONTRACT VALUE / QUANTITY VARIATION :</p> <p>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.</p> |
| 40. | <p>STATUTORY VARIATION :</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>However, any additional tax implication due to delay in delivery, beyond the Contractual Delivery, attributable to supplier shall be borne by supplier.</p> |
| 41. | <p>MODE OF PAYMENT :</p> <p>Payment shall be made directly to the Supplier / Contractor by BHEL through NEFT / RTGS.</p> |
| 42. | <p>CONFIDENTIALITY :</p> <p>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.</p> |

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

Signature of Bidder (Authorized Signatory) with Date & Seal

Validate Print Help

Item Wise BoQ

Tender Inviting Authority: BHEL TBG NOIDA
 Name of Work: 400 kV GIS for GIPCL Rann of Kutch , Gujarat
 NIT No.

| Name of the Bidder/ Bidding Firm / Company : | | | | | | | | | | | | | | |
|--|--|------------------|----------|--------|---|---------------------|--|---|---------------------|---|----------------|--|--|-----------------------|
| PRICE SCHEDULE | | | | | | | | | | | | | | |
| NUMBER # | TEXT # | TEXT # | NUMBER # | TEXT # | NUMBER # | NUMBER | NUMBER | NUMBER | NUMBER | NUMBER | NUMBER # | NUMBER # | NUMBER # | TEXT # |
| Sl. No. | Item Description | Item Code / Make | Quantity | Units | Unit RATE In Figures To be entered by the Bidder in Rs. P | GST (in Percentage) | GST Amount (Unit Rate*Quantity*GST) in Rs. P | Unit Freight & Insurance Charges in Rs. P | GST (in Percentage) | GST Amount on F&I (Unit Rate*Quantity*GST) in Rs. P | HSN / SAC Code | TOTAL Ex-Works + F & I AMOUNT excluding GST in Rs. P | TOTAL Ex-Works + F & I AMOUNT including GST in Rs. P | TOTAL AMOUNT In Words |
| 1 | 2 | 3 | 4 | 5 | 13 | 14 | 15 | 16 | 20 | 21 | 51 | 53 | 54 | 55 |
| 1.01 | SUPPLY- GIS: 400KV, 3150A, SF6 BUS BAR MODULE WITH BUS PT & BUS EARTH SWITCH BAY MODULE (INCLUDING SF6 GAS WITH ADDITIONAL REQUIREMENT, SUPPORT STRUCTURE WITH HARDWARES AND EARTHING MATERIALS) | item1 | 2 | SET | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 1.02 | SUPPLY- GIS: 400KV, 3150A, SF6 BUS COUPLER BAY MODULE (INCLUDING SF6 GAS WITH ADDITIONAL REQUIREMENT, SUPPORT STRUCTURE WITH HARDWARES AND EARTHING MATERIALS) | item2 | 1 | SET | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 1.03 | SUPPLY- GIS: 400KV, 3150A, SF6 TRANSFORMER FEEDER BAY MODULE (INCLUDING SF6 GAS WITH ADDITIONAL REQUIREMENT, SUPPORT STRUCTURE WITH HARDWARES AND EARTHING MATERIALS) | item3 | 4 | SET | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 1.04 | SUPPLY- GIS: 400KV, 4000A, SF6 GIS LINE FEEDER BAY MODULE (INCLUDING SF6 GAS WITH ADDITIONAL REQUIREMENT, SUPPORT STRUCTURE WITH HARDWARES AND EARTHING MATERIALS) | item4 | 1 | SET | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 1.05 | SUPPLY- GIS: 400KV, CONTROLLED SWITCHING DEVICE (CSD) FOR GIS 3-PHASE CIRCUIT BREAKER | item5 | 4 | SET | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 1.06 | SUPPLY- GIS: 400KV, 3150A, SINGLE PHASE GAS INSULATED BUS DUCT OUTSIDE GIS HALL (INCLUDING SF6 GAS, SUPPORT STRUCTURE WITH HARDWARES AND EARTHING MATERIALS) | item6 | 550 | MTRS | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 1.07 | SUPPLY- GIS: 400KV, ONLINE CONTINUOUS PD MONITORING SYSTEM FOR 400KV GIS MODULE | item7 | 1 | Lot | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 1.08 | SUPPLY- GIS: 400KV, ONLINE CONTINUOUS GAS MONITORING SYSTEM FOR 400KV GIS MODULE | item8 | 1 | Lot | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 1.09 | SUPPLY- GIS: LOCAL CONTROL CUBICLES | item9 | 6 | SET | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 1.10 | SUPPLY- GIS: 400kV, 4000A, SF6 END PIECE/ INTERFACE MODULE FOR FUTURE EXTENSION | item10 | 2 | SET | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 1.11 | SUPPLY- GIS: 400KV, 4000A, SINGLE PHASE SF6 TO AIR BUSHING (INCLUDING SF6 GAS, SUPPORT STRUCTURE WITH HARDWARES AND EARTHING MATERIALS) | item11 | 15 | SET | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 1.12 | SUPPLY- GIS: 400kV, SURGE ARRESTER (INCLUDING SF6 GAS, SUPPORT STRUCTURE WITH HARDWARES AND EARTHING MATERIALS) | item12 | 6 | SET | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 2.01 | SUPPLY- GIS: TESTING & MAINTENANCE INSTRUMENTS: SF6 GAS FILLING, EVACUATING & RECOVERY PLANT | item13 | 1 | Set | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 2.02 | SUPPLY- GIS: TESTING & MAINTENANCE INSTRUMENTS: PORTABLE GAS MEASURING ANALYSER WITH PUMP BACK FACILITY OF SF6 GAS | item14 | 1 | Set | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 2.03 | SUPPLY- GIS: TESTING & MAINTENANCE INSTRUMENTS: SF6 GAS MULTI ANALYZER KIT | item15 | 1 | Set | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 2.04 | SUPPLY- GIS: TESTING & MAINTENANCE INSTRUMENTS: SF6 GAS LEAKAGE / POINTER | item16 | 1 | Set | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 2.05 | SUPPLY- GIS: TESTING & MAINTENANCE INSTRUMENTS: SF6 GAS SERVICE CART | item17 | 1 | Set | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 2.06 | SUPPLY- GIS: TESTING & MAINTENANCE INSTRUMENTS: SF6 GAS REFILLING DEVICE | item18 | 1 | Set | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 2.07 | SUPPLY- GIS: TESTING & MAINTENANCE INSTRUMENTS: SF6 GAS DEW POINT MEASUREMENT KIT | item19 | 1 | Set | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 2.08 | SUPPLY- GIS: TESTING & MAINTENANCE INSTRUMENTS: BREAKER OPERATION ANALYZER WITH TRANSDUCESR | item20 | 1 | Set | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |

Validate Print Help

Item Wise BoQ

Tender Inviting Authority: BHEL TBG NOIDA
 Name of Work: 400 kV GIS for GIPCL Rann of Kutch , Gujarat
 NIT No.

| Name of the Bidder/ Bidding Firm / Company : | | | | | | | | | | | | | | |
|--|--|------------------|----------|--------|---|---------------------|---|---|---------------------|--|----------------|--|--|-----------------------|
| PRICE SCHEDULE | | | | | | | | | | | | | | |
| NUMBER # | TEXT # | TEXT # | NUMBER # | TEXT # | NUMBER # | NUMBER | NUMBER | NUMBER | NUMBER | NUMBER | NUMBER # | NUMBER # | NUMBER # | TEXT # |
| Sl. No. | Item Description | Item Code / Make | Quantity | Units | Unit RATE In Figures To be entered by the Bidder in Rs. P | GST (in Percentage) | GST Amount (Unit Rate*Quantity*GST) Rs. P | Unit Freight & Insurance Charges in Rs. P | GST (in Percentage) | GST Amount on F&I (Unit Rate*Quantity*GST) Rs. P | HSN / SAC Code | TOTAL Ex-Works + F & I AMOUNT excluding GST in Rs. P | TOTAL Ex-Works + F & I AMOUNT including GST in Rs. P | TOTAL AMOUNT In Words |
| 1 | 2 | 3 | 4 | 5 | 13 | 14 | 15 | 16 | 20 | 21 | 51 | 53 | 54 | 55 |
| 3.01 | SUPPLY- GIS: SPARES: GIS- SF6 Gas Pressure Relief Devices of Each Type Along With O- Rings | item21 | 4 | SET | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 3.02 | SUPPLY- GIS: SPARES: GIS- SF6 Pressure Gauge Cum Switch or Density Monitors and Pressure Switch As Applicable Each Type (1 Lot= 8% of total population, max 7 nos. and min. 2 nos.) | item22 | 1 | LOT | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 3.03 | SUPPLY- GIS: SPARES: GIS- Coupling Device Of Each Type For Pressure Gauge Cum Switch For Connecting Gas Handling Plant | item23 | 2 | SET | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 3.04 | SUPPLY- GIS: SPARES: GIS- Rubber Gaskets, "O" Rings And Seals for SF6 Gas of each type | item24 | 3 | SET | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 3.05 | SUPPLY- GIS: SPARES: GIS- Molecular Filter for SF6 Gas With Filter Bags (1 Lot= 5% of total weight) | item25 | 1 | LOT | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 3.06 | SUPPLY- GIS: SPARES: GIS- All types of Control Valves for SF6 Gas of each type | item26 | 3 | NO | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 3.07 | SUPPLY- GIS: SPARES: GIS- SF6 Gas In Non-Returnable Cylinders (1 Lot= 20% of total gas quantity) | item27 | 1 | LOT | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 3.08 | SUPPLY- GIS: SPARES: GIS- Locking Device to keep the Dis-Connectors (Isolators) And Earthing Switches in Close Or Open position in case of removal of the Driving Mechanism | item28 | 3 | NO | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 3.09 | SUPPLY- GIS: SPARES: GIS- Spares for Local Control Cabinet Including MCB, Fuses, Timers, Aux. Relays, Contactor, Push Buttons, Switches, Lamps, Annunciation Windows etc. of each type & rating and terminal of each type | item29 | 3 | SET | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 3.10 | SUPPLY- GIS: SPARES: GIS- UHF PD Sensors of each type (1 Lot= 5% of total population, max 5 Nos. and min. 1 No.) | item30 | 1 | LOT | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 3.11 | SUPPLY- GIS: SPARES: GIS- Support Insulator/ Gas Barrier of each type along with associated contacts & shields | item31 | 5 | NO | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 3.12 | SUPPLY- GIS: SPARES: GIS- SF6 to Air Bushing of each type & rating along with conductor and enclosure | item32 | 2 | NO | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 3.13 | SUPPLY- GIS: SPARES: CIRCUIT BREAKER- Complete Circuit Breaker (1 Phase Unit) of each type & rating complete with Interrupter, Main Circuit, Enclosure And Marshaling Box With Operating Mechanism to enable Replacement of Any Type/ Rating Of CB by spare, as applicable | item33 | 3 | SET | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 3.14 | SUPPLY- GIS: SPARES: CIRCUIT BREAKER- Fixed, moving and arcing contacts including insulating nozzles of each type - for Main Chamber | item34 | 1 | SET | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 3.15 | SUPPLY- GIS: SPARES: CIRCUIT BREAKER- Trip Coil Assembly With Resistor, as applicable, (1 Set= 3 Nos. of each type) | item35 | 2 | SET | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 3.16 | SUPPLY- GIS: SPARES: CIRCUIT BREAKER- Closing Coil Assembly With Resistor, As Applicable, (1 Set= 3 Nos. of each type) | item36 | 2 | SET | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 3.17 | SUPPLY- GIS: SPARES: CIRCUIT BREAKER- Relays, Power Contactors, Push Buttons, Timers & MCBs etc. of each type and rating | item37 | 3 | SET | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 3.18 | SUPPLY- GIS: SPARES: CIRCUIT BREAKER- Auxiliary Switch Assembly, (1 Set= 3 Nos. of each type) | item38 | 2 | SET | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 3.19 | SUPPLY- GIS: SPARES: CIRCUIT BREAKER- Operation Counter, (1 Set= 3 Nos. of each type) | item39 | 1 | SET | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |

Enquiry No. - 61Q2300063 Dated: 03.06.2022

Validate Print Help

Item Wise BoQ

Tender Inviting Authority: BHEL TBG NOIDA
 Name of Work: 400 kV GIS for GIPCL Rann of Kutch , Gujarat
 NIT No.

| Name of the Bidder/ Bidding Firm / Company : | | | | | | | | | | | | | | |
|--|---|------------------|----------|--------|---|---------------------|---|---|---------------------|--|----------------|--|--|-----------------------|
| PRICE SCHEDULE | | | | | | | | | | | | | | |
| NUMBER # | TEXT # | TEXT # | NUMBER # | TEXT # | NUMBER # | NUMBER | NUMBER | NUMBER | NUMBER | NUMBER | NUMBER # | NUMBER # | NUMBER # | TEXT # |
| Sl. No. | Item Description | Item Code / Make | Quantity | Units | Unit RATE In Figures To be entered by the Bidder in Rs. P | GST (in Percentage) | GST Amount (Unit Rate*Quantity*GST) Rs. P | Unit Freight & Insurance Charges in Rs. P | GST (in Percentage) | GST Amount on F&I (Unit Rate*Quantity*GST) Rs. P | HSN / SAC Code | TOTAL Ex-Works + F & I AMOUNT excluding GST in Rs. P | TOTAL Ex-Works + F & I AMOUNT including GST in Rs. P | TOTAL AMOUNT In Words |
| 1 | 2 | 3 | 4 | 5 | 13 | 14 | 15 | 16 | 20 | 21 | 51 | 53 | 54 | 55 |
| 3.20 | SUPPLY- GIS: SPARES: CIRCUIT BREAKER- Window-scope/ Observing Window, 3 Nos. of each type | item40 | 2 | SET | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 3.21 | SUPPLY- GIS: SPARES: SPRING OPERATED MECHANISM- Complete Spring Operating Mechanism Including Charging Mechanism etc. of each type | item41 | 1 | SET | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 3.22 | SUPPLY- GIS: SPARES: SPRING OPERATED MECHANISM- Spring Charging Motor | item42 | 3 | NO | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 3.23 | SUPPLY- GIS: SPARES: ISOLATOR- For Maintenance Earth Switch: 3 No. of Single Phase Maintenance Earthing Switch Of Each Type, Dimension, Current & Voltage Including Main Circuit, Enclosure, Driving Mechanism And Support Insulator etc. to enable replacement of any Type/Rating of Earth Switch by spare | item43 | 3 | SET | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 3.24 | SUPPLY- GIS: SPARES: ISOLATOR- Complete set of 3-phase dis-connector of each type including main circuit, enclosure, driving mechanism and support Insulator etc. to enable complete one to one replacement of all applicable type of Isolator by spare | item44 | 3 | SET | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 3.25 | SUPPLY- GIS: SPARES: ISOLATOR- For Fast Earthing Switch: 3 No. of Single Phase Fast Earthing Switch of each Type, Dimension, Current & Voltage Rating Including Main Circuit, Enclosure, Driving Mechanism and Support Insulator etc. to enable replacement of any Type/Rating Of Earth Switch by spare, If Applicable | item45 | 2 | SET | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 3.26 | SUPPLY- GIS: SPARES: ISOLATOR- Copper contact fingers for isolator male & female contact along with corona shield- for one complete (3 phase) isolator of each type and rating | item46 | 3 | SET | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 3.27 | SUPPLY- GIS: SPARES: ISOLATOR- Copper contact fingers for Maintenance Earthing switch male & female contacts along with corona shield, for one complete (3 phase) earthing switch of each type and rating | item47 | 2 | SET | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 3.28 | SUPPLY- GIS: SPARES: ISOLATOR- Copper contact fingers for Fast Earthing switch male & female contacts along with corona shield, for one complete (3 phase) earthing switch of each type and rating (if applicable) | item48 | 2 | SET | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 3.29 | SUPPLY- GIS: SPARES: ISOLATOR- For Isolator: Open / Close Contactor Assembly, Timers, Key Interlock, Interlocking Coils, Relays, Push Buttons, Indicating Lamps Power Contactors, Resistors, Fuses, MCBs & Drive Control Cards etc. for one complete MOM Box (3 - Phase Gang Operated or 1 - Phase Unit) of each type and rating. | item49 | 2 | SET | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 3.30 | SUPPLY- GIS: SPARES: ISOLATOR- For Maintenance Earth Switch: Open / Close Contactor Assembly, Timers, Key Interlock, Interlocking Coils, Relays, Push Buttons, Indicating Lamps Power Contactors, Resistors, Fuses, MCBs & Drive Control Cards etc. for one complete MOM Box (3 - Phase Gang Operated or 1 - Phase Unit) of each type and rating. | item50 | 2 | SET | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 3.31 | SUPPLY- GIS: SPARES: ISOLATOR- For Fast Earthing Switch: Open / Close Contactor Assembly, Timers, Key Interlock, Interlocking Coils, Relays, Push Buttons, Indicating Lamps Power Contactors, Resistors, Fuses, MCBs & Drive Control Cards etc. for one complete MOM Box (3 - Phase Gang Operated or 1 - Phase Unit) of each type and rating. | item51 | 2 | SET | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 3.32 | SUPPLY- GIS: SPARES: ISOLATOR- For Isolator: Limit Switch and Aux. Switches for complete 3-Phase Equipment | item52 | 2 | SET | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 3.33 | SUPPLY- GIS: SPARES: ISOLATOR- For Maintenance Earth Switch: Limit Switch And Aux. Switches for complete 3-Phase Equipment | item53 | 2 | SET | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 3.34 | SUPPLY- GIS: SPARES: ISOLATOR- For Fast Earthing Switch: Limit Switch And Aux. Switches for complete 3-Phase Equipment | item54 | 2 | SET | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 3.35 | SUPPLY- GIS: SPARES: ISOLATOR- For Isolator: Drive Mechanism of each type | item55 | 2 | NO | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 3.36 | SUPPLY- GIS: SPARES: ISOLATOR- For Maintenance Earth Switch: Drive Mechanism of each type | item56 | 2 | NO | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 3.37 | SUPPLY- GIS: SPARES: ISOLATOR- For Fast Earthing Switch: Drive Mechanism of each type | item57 | 1 | NO | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 3.38 | SUPPLY- GIS: SPARES: ISOLATOR- For Isolator: Motor for Drive Mechanism of each type | item58 | 3 | NO | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |

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Item Wise BoQ

Tender Inviting Authority: BHEL TBG NOIDA
 Name of Work: 400 kV GIS for GIPCL Rann of Kutch , Gujarat
 NIT No.

| Name of the Bidder/ Bidding Firm / Company : | | | | | | | | | | | | | | |
|--|--|------------------|----------|--------|---|---------------------|--|---|---------------------|---|----------------|--|--|-----------------------|
| PRICE SCHEDULE | | | | | | | | | | | | | | |
| NUMBER # | TEXT # | TEXT # | NUMBER # | TEXT # | NUMBER # | NUMBER | NUMBER | NUMBER | NUMBER | NUMBER | NUMBER # | NUMBER # | NUMBER # | TEXT # |
| Sl. No. | Item Description | Item Code / Make | Quantity | Units | Unit RATE In Figures To be entered by the Bidder in Rs. P | GST (in Percentage) | GST Amount (Unit Rate*Quantity*GST) in Rs. P | Unit Freight & Insurance Charges in Rs. P | GST (in Percentage) | GST Amount on F&I (Unit Rate*Quantity*GST) in Rs. P | HSN / SAC Code | TOTAL Ex-Works + F & I AMOUNT excluding GST in Rs. P | TOTAL Ex-Works + F & I AMOUNT including GST in Rs. P | TOTAL AMOUNT In Words |
| 1 | 2 | 3 | 4 | 5 | 13 | 14 | 15 | 16 | 20 | 21 | 51 | 53 | 54 | 55 |
| 3.39 | SUPPLY- GIS: SPARES: ISOLATOR- For Maintenance Earth Switch: Motor for Drive Mechanism of each type | item59 | 3 | NO | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 3.40 | SUPPLY- GIS: SPARES: ISOLATOR- For Fast Earthing Switch: Motor for Drive Mechanism of each type | item60 | 3 | NO | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 3.41 | SUPPLY- GIS: SPARES: CURRENT TRANSFORMER- Complete 400kV CT of each Type And Rating with enclosure to enable replacement of any type/ rating of CT by spare | item61 | 2 | NO | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 3.42 | SUPPLY- GIS: SPARES: VOLTAGE TRANSFORMER- Complete EMVT of each type and rating with enclosure to enable replacement of any type/rating of EMVT by spare | item62 | 2 | NO | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 3.43 | SUPPLY- GIS: SPARES: CONTROLLED SWITCHING DEVICE- Controlled Switching Device along with Transducers, Sensors, Contactors, Switches etc. (1 Set= 1 set of each make) | item63 | 1 | SET | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 3.44 | SUPPLY- GIS: SPARES: SURGE ARRESTOR- Complete Surge Arrester with insulating base and Terminal connector & structure with Surge counter/ Monitor of each type and rating | item64 | 2 | SET | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 3.45 | SUPPLY- GIS: SPARES: SURGE ARRESTOR- Surge counter/ monitor. (In addition to above) | item65 | 6 | NO | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 4.00 | Spares-GIS: Recommended O&M Spares for 400kV, 63kA for 3sec, Gas Insulated Switchgear (GIS) as per TS | item66 | 1 | Lot | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 5.01 | SUPPLY- GIS: SPARES: 400KV, OPERATING MECHANISM FOR CIRCUIT BREAKER COMPLETE IN ALL RESPECT | item67 | 1 | Set | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 5.02 | SUPPLY- GIS: SPARES: 400KV, OPERATING MECHANISM FOR DISCONNECTOR | item68 | 1 | Set | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 5.03 | SUPPLY- GIS: SPARES: 400KV, OPERATING MECHANISM FOR MAINTENANCE EARTHING SWITCH COMPLETE IN ALL RESPECT | item69 | 1 | Set | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 5.04 | SUPPLY- GIS: SPARES: 400KV, OPERATING MECHANISM FOR FAST ACTING/ HIGH SPEED GROUNDING SWITCH COMPLETE IN ALL RESPECT | item70 | 1 | Set | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 5.05 | SUPPLY- GIS: SPARES: 400KV, MAINTENANCE EARTHING SWITCH COMPLETE IN ALL RESPECT | item71 | 1 | Set | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 5.06 | SUPPLY- GIS: SPARES: 400KV, FAST ACTING/ HIGH SPEED GROUNDING SWITCH COMPLETE IN ALL RESPECT | item72 | 1 | Set | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 5.07 | SUPPLY- GIS: SPARES: 400KV, SINGLE PHASE BUS BAR | item73 | 1 | Mtrs | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 5.08 | SUPPLY- GIS: SPARES: 400KV, GIS METALLIC ENCLOSURE | item74 | 50 | Kgs | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 5.09 | SUPPLY- GIS: SPARES: 400KV, EXPANSION JOINTS | item75 | 1 | Set | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 5.10 | SUPPLY- GIS: SPARES: 400KV, FLEXIBLE CONNECTIONS | item76 | 1 | Set | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 5.11 | SUPPLY- GIS: SPARES: 400KV, BARRIER INSULATOR | item77 | 1 | Set | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |

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Item Wise BoQ

Tender Inviting Authority: BHEL T&G NOIDA
 Name of Work: 400 kV GIS for GIPCL Rann of Kutch , Gujarat
 NIT No.

| Name of the Bidder/ Bidding Firm / Company : | | | | | | | | | | | | | | |
|--|--|------------------|----------|--------|---|---------------------|--|---|---------------------|---|----------------|--|--|-----------------------|
| PRICE SCHEDULE | | | | | | | | | | | | | | |
| NUMBER # | TEXT # | TEXT # | NUMBER # | TEXT # | NUMBER # | NUMBER | NUMBER | NUMBER | NUMBER | NUMBER | NUMBER # | NUMBER # | NUMBER # | TEXT # |
| Sl. No. | Item Description | Item Code / Make | Quantity | Units | Unit RATE In Figures To be entered by the Bidder in Rs. P | GST (in Percentage) | GST Amount (Unit Rate*Quantity*GST) in Rs. P | Unit Freight & Insurance Charges in Rs. P | GST (in Percentage) | GST Amount on F&I (Unit Rate*Quantity*GST) in Rs. P | HSN / SAC Code | TOTAL Ex-Works + F & I AMOUNT excluding GST in Rs. P | TOTAL Ex-Works + F & I AMOUNT including GST in Rs. P | TOTAL AMOUNT In Words |
| 1 | 2 | 3 | 4 | 5 | 13 | 14 | 15 | 16 | 20 | 21 | 51 | 53 | 54 | 55 |
| 5.12 | SUPPLY- GIS: SPARES: 400KV, NON-BARRIER INSULATOR | item78 | 1 | Set | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 5.13 | SUPPLY- GIS: SPARES: 400KV, GAS SEALS | item79 | 1 | Set | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 5.14 | SUPPLY- GIS: SPARES: 400KV, GAS DENSITY MONITOR SWITCH | item80 | 1 | Set | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 5.15 | SUPPLY- GIS: SPARES: 400KV, GAS PRESSURE SWITCH | item81 | 1 | Set | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 5.16 | SUPPLY- GIS: SPARES: 400KV, TEE BEND | item82 | 1 | Set | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 5.17 | SUPPLY- GIS: SPARES: 400KV, ANGLE BEND | item83 | 1 | Set | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 5.18 | SUPPLY- GIS: SPARES: 400KV, L-BEND | item84 | 1 | Set | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 6.01 | SERVICES- GIS: SUPERVISION OF ERECTION: 400KV, SF6 GIS BAY MODULE (INCLUDING LCC, SF6 GAS WITH ADDITIONAL REQUIREMENT, SUPPORT STRUCTURE WITH HARDWARES AND EARTHING MATERIALS) | item85 | 6 | SET | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 6.02 | SERVICES- GIS: TESTING & COMMISSIONING: 400KV, SF6 GIS BAY MODULE (INCLUDING LCC, SF6 GAS WITH ADDITIONAL REQUIREMENT, SUPPORT STRUCTURE WITH HARDWARES AND EARTHING MATERIALS) | item86 | 6 | SET | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 6.03 | SERVICES- GIS: SUPERVISION OF ERECTION: 400KV, SINGLE PHASE GAS INSULATED BUS DUCT OUTSIDE GIS HALL (INCLUDING SF6 GAS, SUPPORT STRUCTURE WITH HARDWARES AND EARTHING MATERIALS) | item87 | 550 | MTRS | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 6.04 | SERVICES- GIS: TESTING & COMMISSIONING: 400KV, SINGLE PHASE GAS INSULATED BUS DUCT OUTSIDE GIS HALL (INCLUDING SF6 GAS, SUPPORT STRUCTURE WITH HARDWARES AND EARTHING MATERIALS) | item88 | 550 | MTRS | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 6.05 | SERVICES- GIS: SUPERVISION OF ERECTION: 400KV, SINGLE PHASE SF6 TO AIR BUSHING (INCLUDING SF6 GAS, SUPPORT STRUCTURE WITH HARDWARES AND EARTHING MATERIALS) | item89 | 15 | SET | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 6.06 | SERVICES- GIS: TESTING & COMMISSIONING: 400KV, SINGLE PHASE SF6 TO AIR BUSHING (POLYMER) (INCLUDING SF6 GAS, SUPPORT STRUCTURE WITH HARDWARES AND EARTHING MATERIALS) | item90 | 15 | SET | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 6.07 | SERVICES- GIS: SUPERVISION OF ERECTION: 400KV, SINGLE PHASE SF6 TO CABLE TERMINATION MODULE (INCLUDING SF6 GAS, SUPPORT STRUCTURE WITH HARDWARES AND EARTHING MATERIALS) | item91 | 1 | SET | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 6.08 | SERVICES- GIS: TESTING & COMMISSIONING: 400KV, SINGLE PHASE SF6 TO CABLE TERMINATION MODULE (INCLUDING SF6 GAS, SUPPORT STRUCTURE WITH HARDWARES AND EARTHING MATERIALS) | item92 | 1 | SET | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 6.09 | SERVICES- GIS: SUPERVISION OF ERECTION: 360KV, 20kA, CLASS-4 SURGE ARRESTER (INCLUDING SF6 GAS, SUPPORT STRUCTURE WITH HARDWARES AND EARTHING MATERIALS) | item93 | 6 | SET | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 6.10 | SERVICES- GIS: TESTING & COMMISSIONING: 360KV, 20kA, CLASS-4 SURGE ARRESTER (INCLUDING SF6 GAS, SUPPORT STRUCTURE WITH HARDWARES AND EARTHING MATERIALS) | item94 | 6 | SET | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 6.11 | SERVICES- GIS: FINAL SUCCESSFUL HV/ POWER FREQUENCY TESTING OF GIS INCLUDING ARRANGING OF HV TEST KIT ALONG WITH OPERATOR | item95 | 1 | Lot | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 6.12 | SERVICES- GIS: SUPERVISION OF ERECTION: 400KV, CONTROLLED SWITCHING DEVICE (CSD) FOR GIS THREE PHASE CIRCUIT BREAKER | item96 | 7 | SET | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |

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Item Wise BoQ

Tender Inviting Authority: BHEL TBG NOIDA
 Name of Work: 400 kV GIS for GIPCL Rann of Kutch , Gujarat
 NIT No.

| Name of the Bidder/ Bidding Firm / Company : | | | | | | | | | | | | | | |
|--|---|------------------|----------|---------|---|---------------------|---|---|---------------------|--|----------------|--|--|-----------------------|
| PRICE SCHEDULE | | | | | | | | | | | | | | |
| NUMBER # | TEXT # | TEXT # | NUMBER # | TEXT # | NUMBER # | NUMBER | NUMBER | NUMBER | NUMBER | NUMBER | NUMBER # | NUMBER # | NUMBER # | TEXT # |
| Sl. No. | Item Description | Item Code / Make | Quantity | Units | Unit RATE In Figures To be entered by the Bidder in Rs. P | GST (in Percentage) | GST Amount (Unit Rate*Quantity*GST) Rs. P | Unit Freight & Insurance Charges in Rs. P | GST (in Percentage) | GST Amount on F&I (Unit Rate*Quantity*GST) Rs. P | HSN / SAC Code | TOTAL Ex-Works + F & I AMOUNT excluding GST in Rs. P | TOTAL Ex-Works + F & I AMOUNT including GST in Rs. P | TOTAL AMOUNT In Words |
| 1 | 2 | 3 | 4 | 5 | 13 | 14 | 15 | 16 | 20 | 21 | 51 | 53 | 54 | 55 |
| 6.13 | SERVICES- GIS: TESTING & COMMISSIONING: 400KV, CONTROLLED SWITCHING DEVICE (CSD) FOR GIS THREE PHASE CIRCUIT BREAKER | item97 | 7 | SET | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 6.14 | SERVICES- GIS: INSULATION CO-ORDINATION STUDIES GIS SYSTEM COMPLETE | item98 | 1 | LOT | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 7.01 | SERVICES- GIS : REFERENCE UNIT PRICE OF GIS INDIVIDUAL ITEM/ EQUIPMENT - SERVICES FOR SUPERVISION OF ERECTION OF GIS | item99 | 10 | MAN-DAY | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 7.02 | SERVICES- GIS : REFERENCE UNIT PRICE OF GIS INDIVIDUAL ITEM/ EQUIPMENT - SERVICES FOR TESTING & COMMISSIONING OF GIS | item100 | 10 | MAN-DAY | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 7.03 | SERVICES- GIS : REFERENCE UNIT OF GIS INDIVIDUAL ITEM/ EQUIPMENT - HIRING CHARGES OF HV TEST KIT WITH OPERATOR | item101 | 1 | LOT | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| 8.01 | SERVICE: TRAINNG: TRAINING IN CONSTRUCTION, INSTALLATION, COMMISSIONING AND O&m OF GIS BEING SUPPLIED AT MANUFACTURES WORKS/ FACILITY | item102 | 70 | MAN-DAY | | | 0.00 | | | 0.00 | | 0.000 | 0.000 | INR Zero Only |
| Total in Figures | | | | | | | | | | | | 0.000 | 0.000 | Zero Only |
| Quoted Rate in Words | | | | | | | | | | | | INR Zero Only | | |



BHARAT HEAVY ELECTRICALS LIMITED
TRANSMISSION BUSINESS ENGINEERING MANAGEMENT
NOIDA

| | | | | | |
|--|-------------------------|--------------------|--------------------|--------------------|--------------------|
| DOCUMENT NO. | TB-PBTU-GIPL-GIS | Rev 00 | Prepared | Checked | Approved |
| TYPE OF DOC. | TECHNICAL SPECIFICATION | NAME | GV | DKS | VK |
| TITLE 400kV Gas Insulated Switchgear with its accessories | SIGN | <i>[Signature]</i> | <i>[Signature]</i> | <i>[Signature]</i> | <i>[Signature]</i> |
| | DATE | 24.05.2022 | 24.05.2022 | 24.05.2022 | 24.05.2022 |
| | GROUP | TBEM | | | |
| | WO No. | | | | |

CUSTOMER: Gujarat Industries Power Company Limited

PROJECT: Pre Bid Tie up for,
Tender Enquiry Document for Pooling Substation 400/33 kV, 1200 MW (PSS-1, Phase-I & Phase-II of 600 MW each) of Solar/ Wind/ Hybrid RE Park of 2375 MW Capacity at Great Rann of Kutch Area, Gujarat

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|-------------|--|-------------|
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| Section-1.2 | Part B- General Specification | 3 |
| Section-1.3 | Annexure- BOQ_ GIPL Annexure-SLD and Layout Drawing | 7+1+1 |
| Section-2 | Equipment Specification under scope of Supplies | 42 |
| Section-3 | Project details and general technical requirement (For all equipment under the Project) | 66 |
| | Annexure-A & Annexure-B | 1+1 |

Remarks: Bidder to note that data and details of Guaranteed Technical Particulars shall not be reviewed during Technical Evaluation/ Review, hence compliance of Guaranteed Technical Particulars in line with Technical Specification has to be ensured by the bidder.

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| | | | | | |
|--------------|------|---------|---------|----------|--|
| Rev. No. | Date | Altered | Checked | Approved | |
| Distribution | | | | To | |
| | | | | Copies | |

SECTION 1: CHECKLIST FOR TECHNICAL EVALUATION

Along with the technical offer/ bids, the bidder should submit this checklist confirming the inclusion of the enclosures as listed below,

| Sl. No. | Documents to be enclosed | Bidder to confirm (Please tick "Confirmed") |
|---------|---|--|
| 1. | Supporting documents for compliance of Technical Qualifying Requirement. | Confirmed |
| 2. | Unpriced BOQ duly mentioning "Quoted" for all the items, signed and sealed. | Confirmed |
| 3. | Annexure-A & B duly filled, signed and sealed. | Confirmed |
| | | |

Note: Any bidder not meeting the above requirement is liable for non-evaluation.

The above checklist is reviewed and verified for,

NIT Reference No.:

Name of Bidder:

Name of Project:

Date:

Bidder's Stamp & Signature

CONTENTS

1. SCOPE
2. SPECIFIC TECHNICAL REQUIREMENTS
3. NOTES FOR BILL OF QUANTITY
4. NOTES FOR MODE OF MEASUREMENT
5. SUPPORT STRUCTURE & HARDWARES (INCLUDING STRUCTURE STEEL)
6. EARTHING MATERIALS OF GIS
7. SCOPE FOR CABLES
8. OTHER GENERAL REQUIREMENTS
9. DRAWINGS / DOCUMENTS REQUIRED FOR ENGINEERING MANUFACTURING CLEARANCE
10. TYPE TESTING
11. QUALITY PLAN
12. SITE SERVICES
 - a. SUPERVISION AT SITE
 - b. TESTING & COMMISSIONING
13. TESTING KITS, TOOLS & TACKLES
14. SPARES
15. PACKING AND DISPATCH
16. EXCLUSION FROM BIDDER'S SCOPE

This document covers broader guideline for bidder's scope of supply & services. The same shall be prevailing on all other section of technical specification.

1. SCOPE

This technical specification covers the requirements of (1.) design, type testing, engineering, fabrication, manufacturing, shop assembly, inspection and testing at manufacturer's works, proper packing, supply and delivery to project site, (2.) supervision of material reconciliation, installation / erection, (3.) execution of site testing & commissioning along with necessary kits, tools & equipment , putting GIS with LCC & its Accessories into successful operation complete with all materials, support structures, anchoring bolts, chemical anchor, accessories, commissioning spares & maintenance spares, special spanners, special tools & tackles, any specific required ancillary services, SF6 gas for first filling & spare etc. including design studies, training of BHEL / Customer personnel for offered GIS & its Accessories complete in all respects for efficient & trouble-free operation mentioned under this specification.

This section covers bidder's scope for GIS with LCC & its Accessories. The offered GIS with LCC & its Accessories shall comply with the Section-1, 2 & 3 of technical specification.

The complete technical specification comprises of following sections:

- Section-1 : Scope, Project Specific Technical Requirements & Bill of Quantities including scope matrix
- Section-2 : Equipment Specification under scope of Supplies
- Section-3 : Project Details & General Technical Requirements (For All Equipment under the Project)
- Section-4 : Annexures
 - Annexure A- Compliance Certificate
 - Annexure B- Schedule of Technical Deviations

The following order of priority shall be followed. In case of conflict between

requirements specified in various documents, the more stringent one shall be followed. BHEL/Customer concurrence shall, however, be obtained before taking a final decision in such matters.

1. Statutory Regulations
2. Section-1(PART-A) Standard Scope Matrix
3. Section-1(PART-B)
4. Section-2
5. Section-3

Bidder shall furnish list of conflicts/ ambiguities/ deviations, if any, along with their technical offer and also furnish the basis that is considered for submitting technical offer. BHEL will address the bidder's listed conflicts prior to award. In case of ambiguity, bidder shall inform BHEL of their interpretation. In case bidder fails to convey the same prior to award, BHEL decision on interpretation shall be considered final if need arises during the execution. No additional cost or extra time on account of conflicts/ ambiguities/ deviations shall be admissible.

In general, no deviation from the requirements specified in various clauses of this specification shall be allowed and hence, a certificate to this effect shall have to be furnished along with the offer (Annexure-A), however bidder shall furnish list of conflicts/ ambiguities/ deviations (Annexure-B), if any.

Please note, any deviation not specifically brought out in Annexure-B (Schedule of Technical Deviations) **shall not be admissible** for any time and 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. Any conflicts/ ambiguities/ deviations mentioned elsewhere in technical offer shall not be reviewed.

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

2. SPECIFIC TECHNICAL REQUIREMENTS

Please refer Section-1(PART-B) of technical specification.

3. NOTE FOR BILL OF QUANTITIES

1. SF6 gas for initial installation of complete GIS System, including wastage during installation, testing and successful commissioning shall be deemed included in the bidder's scope.
2. The offered GIS with LCC & its Accessories shall be complete in all respect in compliance to technical specification and relevant IS / IEC / IEEE standards as applicable. Any other equipment/material required to complete the specified GIS scope of work are inclusive of bidder's scope of supply & services.
3. All essential and desirable accessories are deemed inclusive of offer i.e. and not limited to Gas Monitoring Devices, Pressure Switches, PD sensors, Pressure relief device, insulator, expansion joint/ flexible, bellows/ compensators like lateral mounting units, Axial compensators, Parallel compensators, tolerance compensators and vibration compensators etc. complete in all respect.
4. Total contract value may vary up to $\pm 30\%$ at contract stage.
5. Any Item not quoted mentioned "**Not Applicable**" in bid price schedule and found applicable as per technical specification and system requirement shall be supplied free of cost by bidder without any time / cost implication to BHEL / Customer.
6. Length & route of GIB is purely indicative and same shall be finalized during detailed engineering stage.
7. BHEL reserve rights to amend Bay sequence during contract stage, no separate claim shall be admissible in this regards.
8. Supply scope of Testing & Maintenance Equipment – Scope of supply of following Equipments shall be applicable only if covered in BOQ / BPS.
 - a. SF6 Gas leakage detector
 - b. Gas filling and evacuating plant: (Gas Processing unit)
 - c. SF6 gas analyser
 - d. Portable Partial Discharge(PD) monitoring system
 - e. Online Partial Discharge Monitoring System
9. **Main Bus** 1 / 2 / ~~Transfer Bus~~ etc. Gas Insulated Bus Bars running across the length of the switchgear to interconnect each of the bay modules (as per layout) and necessary interfaces (as applicable under the technical requirement) is deemed inclusive in the scope. The same may or may not be indicated with

break-up in BOQ / BPS.

Remark: BPS: Bid Price Schedule

4. NOTES ON MODE OF MEASUREMENT

1. The price of Bus-duct inside the GIS hall (upto **outer** wall face of GIS Hall) shall be integral part of the respective bay module and it will not be paid separately. However, the payment of bus-duct for outside the GIS hall along with support structure shall be paid as per running meters in line with provision of Technical Specification & Bid Price schedule.
2. In the case of outdoor type GIS, Gas Insulated Bus Duct (GIB) length of bus duct outside the GIS BAY MODULE shall be considered for mode of measurement from the end of Bay equipment (VT, LA etc.) to end equipment (SF6 to air bushing / SF6 to oil bushing/ Cable connection module etc.).
3. Any change in bay pitch (distance between bays): In a case where shifting of GIS bays shall be called by BHEL (during contract stage) due to layout requirement / cost optimization / revision / change in civil architectural requirement or due to expansion joint requirement in the GIS building, Bidder to incorporate the same with full compliance of technical requirement. Payment equivalent of BPS / BOQ item under head "Gas Insulated Bus Duct" shall be operated for additional length of Main Bus, subject to such shifting is not attributed to bidder.

5. SUPPORT STRUCTURE & HARDWARES (INCLUDING STRUCTURE STEEL)

Structural Steel, Support Structure & Hardwares (required for installation of complete GIS system with LCC & its Accessories etc.) are deemed inclusive of bidder's scope of supply. The same may or may not be indicated with break-up in BOQ / BPS.

All steel structure members shall be hot-dip galvanized after fabrication (excluding floor embedded items for which standard practice is to be followed). All field assembly joints shall be bolted. Field welding shall generally not be acceptable. Noncorrosive metal or plated steel shall be used for bolts and nuts throughout the work.

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 and 900 gm/sq.m for coastal area (if defined in Section-1B / Section-2 of technical specification) 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 and **900 gm/sq.m for coastal area** (if defined in Section-1B / Section-2 of technical specification).

1. Lattice / Pipe structure Materials for support of GIS, Bus Ducts, SF6 to oil bushing/ SF6 to cable connection and SF6 to air bushing/ connection including Anchor Fastener Bolts, Foundation Bolts, Base Plate / Channel / Metallic / Structural Member for seating of GIS system, all floor and wall Embedded Items, wall crossing arrangements, Rails and/ or other items structural items as required. Manufacturer shall provide suitable foundation channels and anchor bolts to support the switchgear assemblies. All mounting bolts, Anchor Fasteners, foundation bolts, nuts and washers, equipment fixing hardware shall be provided to fasten the switchgear base frames to the foundation channels as applicable
2. The GIS Equipment shall be complete with all necessary supports, ladders, galleries, staircases, catwalks, movable platforms or walkways (for accessing the equipment above two meters for maintenance and operation), mechanism cabinets, internal cable raceways etc. for each bay and it shall be of modular construction and extendable design.
3. Structural steel for complete GIS system with LCC & its Accessories is deemed inclusive in bidder's scope of supply.

6. **EARTHING MATERIALS OF GIS**

Bidder to submit detailed calculations and layout drawings for earthing system during detailed engineering stage based on technical specification, bidder's design philosophy, IS/IEC/IEEE requirement as applicable. Bidder to provide the bill of quantity of entire GIS system with LCC & its Accessories

1. Supply of 40 mm MS ROD, 75X12 mm GI Flat, 50X06 mm GI Flat is **not in bidder's scope** of supply.
2. All other earthing materials including complete Hardwares, nut, bolts washers, lug etc. required, as per earthing design shall be in bidder's scope of supply.
3. Installation / Erection of earthing will be done by BHEL team under the supervision of bidder/manufacturer, as per manufacturer's design.

7. SCOPE FOR CABLES

1. Power, control & instrumentation cables for **Cabling** (1.) within GIS, (2.) GIS to LCC, (3.) LCC to LCC shall be deemed inclusive in bidder's scope of supply.
2. Scope includes for completeness for GIS system with LCC & its Accessories
3. Cabling between LCC to LCC shall be applicable if required in bidder's design philosophy.
4. Cables required for bidder supplied GIS sub-system i.e. condition monitoring system (Gas monitoring system, PD monitoring system etc) are to be supplied by bidder as complete system.
5. Necessary Cable Lug, Glands & shroud etc. required for installation of bidder's supplied cable are deemed inclusive in bidder's scope.
6. Bidder to provide detailed "Bill of Quantity" during detailed engineering stage. Cabling & termination schedule for the same shall be provided by successful bidder along with AS BUILT drawing during contract stage.
7. Power Cable TB's (for both AC & DC incoming feeder cables) shall be suitable for termination of requisite cable.

8. OTHER GENERAL REQUIREMENTS

Other general requirements GIS with LCC & its Accessories shall be as follows,

1. Guaranteed Technical Particulars: Bidder to submit detailed GTP in line with technical specification during contract stage for review and approval. GTP & drawings submitted with technical bid shall only be reviewed during contract stage only. Bidder to please note, deviations / conflict if any please be mentioned in schedule of technical deviations only.
2. The positioning of the circuit breaker in the GIS shall be such that it shall be possible to access the circuit breaker of any feeder from the front side for routine inspection, maintenance and repair without interfering with the operation of the adjacent feeders.
3. The physical layout shall ensure free movement of the SF6 Gas Cart and easy access to all components of the GIS for operation and maintenance purposes.
4. Bidder shall submit list of consumables with shelf life of less than six months and same shall be dispatched before commencement of erection or after clearance from BHEL/Customer whichever is earlier. No separate dispatch clearance shall be

- required for consumables. Cost of the same deemed inclusive.
5. Bidder shall offer their latest type tested model to accommodate the specified & allocated space as per attached layout drawing of GIS.
 6. Bidder shall conduct insulation co-ordination studies in line with IEC for establishing surge arrester rating, quantity and any other requirement for successful operation of GIS.
 7. Bidder to submit Study report of VFTO generated for 400kV GIS installation.
 8. Bidder shall check and ensure adequacy of system protection for successful operation of GIS. After checking of system by bidder, GIS shall be installed and if any failure, malfunction of any part occurs after/ during commissioning, same shall be replaced immediately without any extra cost.
 9. Final documentation shall be submitted in hard copy (Four prints) and soft (Three CDs/DVDs)
 10. In the case if CSD is specifically called in BPS / BOQ / Section-1(PART-B) of technical specifications, the same should have display facility at the front for the display of settings and measured values. In case where CSD does not have complete display facility for settings and measured values, bidder to supply one number laptop PC with pre-installed, licensed software for each site. Special cable required for integration is deemed inclusive in bidder's scope.
 11. Bidder to submit all supporting documents in English. If document submitted by bidder is other than English language, self-attested English translated document should also be submitted.

9. DRAWINGS / DOCUMENTS FOR MANUFACTURING CLEARANCE

The drawings/ documents, as follows shall be used for providing technical clearance for manufacturing of GIS and furthermore, it shall be used for delay analysis, if any, from bidder. The first drawing submission will be counted from the date of submitting reasonably correct drawings.

| Sl. No. | Overall Drawings approval required in Cat I /Cat II |
|---------|---|
| LOT-1 | |
| 1 | GIS- Gas Schematics with Single Line Diagram (Including CT VT Parameters) |
| 2 | GIS- Guaranteed Technical Particulars (Including all GIS equipment) |

| | |
|-------|--|
| 3 | GIS- Layout Plan & Section |
| 4 | GIS- Interfacing Drawings for Cable Connection Module / SF6 to Air Bushing / SF6 to Oil Module (as applicable under scope) with Guaranteed Technical Particulars |
| 5 | GIS- Equipment Layout with Earthing philosophy |
| 6 | GIS- Type Test Reports (Including all GIS equipment) |
| 7 | GIS- Quality Assurance Plan & Inspection Test Schedule |
| LOT-2 | |
| 8 | GIS- Earthing Design, philosophy, Layout |
| 9 | GIS- Secondary Engineering Base Design |
| 10 | GIS- Control Schematics for GIS and Local Control Cabinet |
| 11 | GIS- Maintenance Equipment Catalogue with Guaranteed Technical Particulars, test reports |
| 12 | GIS- Quantification for main Items, Spares, Consumables |
| 13 | GIS- Civil Design Specification with Foundation Loading Diagram (Including interfacing details) |
| 14 | Other documents as per Technical Specification / BPS / BOQ shall be finalized during detailed engineering stage. |
| OTHER | |
| 15 | GIS- 3D OGA Drawing (3D-Model with complete editable data base) compatible with Autocad & Primtech for complete GIS & its accessories. |
| 16 | Manuals on unloading, safe storage, transportation, installation, testing, commissioning, routine check, preventive maintenance |

10. TYPE TEST

Please refer Section-1(PART-B) and Section-2 of technical specification for the details of type test requirement. All equipment being supplied shall conform to type tests as per technical specification and shall be subject to routine & acceptance tests in accordance with requirements stipulated under respective sections of technical specification.

11. QUALITY PLAN

Bidder to follow valid customer approved (1.) Manufacturing Quality Plan, (2.) factory acceptance test (FAT) procedure & (3.) Site acceptance test (SAT) procedures, as per Customer procedure. In case the bidder doesn't have Customer approved Quality Plan, it will be the bidder's responsibility to get its Quality Plan approved from the ultimate Customer within 30 days from the date of issue of after award of LOI / PO whichever is earlier.

All materials shall be procured, manufactured, inspected and tested by vendor/ sub-vendor as per approved quality plan. The supplier shall perform all tests necessary to ensure that the material and workmanship conform to the relevant standards and comply with the requirements of the specification.

GIS and its associated materials shall be subject to inspection by BHEL/ Customer / authorized representative at bidder / manufacturing works. Hence, Bidder shall furnish all necessary information concerning the supply to BHEL. During fabrication, the equipment shall be subject to inspection by BHEL/ Customer or by an agency authorized by BHEL/ Customer to assess the progress of work as well as to ascertain that only quality raw material is used.

12. SITE SERVICES

Site service activities shall be carried out at in stages as per requirement or front availability at site, and hence multiple visits for completion of work are envisaged as per site requirements hence any claim in this regards shall not be admissible on account of multiple mobilization or idling during project execution stage.

12.1. SUPERVISION AT SITE

1. Supervision of complete installation / erection of GIS with LCC & its Accessories are in the scope of bidder.
2. Scope also includes verification of materials for proper storage with due

- instructions/ training to site persons for long storage.
3. Standard storage instruction manual specifically specifying the item detailed with details of type of storage.
 4. Supervision for reconciliation and spares / accessories and handing over to customer.
 5. Final documentation

12.2. TESTING & COMMISSIONING

1. The complete GIS System shall be subjected to the site tests as per technical specifications, IEC-62271-203. Bidder to submit site acceptance testing (SAT) procedures and get the same approved from BHEL / Customer before carrying out the site testing at site.
2. Carrying out successful HV/ Power Frequency Testing of GIS as per IEC shall be in scope of bidder, which includes HV test kit with operator, accessories & tools required for completion of HV testing. Bays may be commissioned separately.
3. BHEL shall provide free support at site for HV Test Kit i.e. it's unloading, assembling of HV test kit, dismantling & loading back on carrier.
4. Complete Field testing and commissioning of GIS system with LCC & its Accessories are under the scope of Bidder.
5. Bidder supplied special equipment, T&P if required OEM supervision, the same is to be arranged by bidder, cost of the same shall be deemed inclusive of respective item.
6. Bidder/ OEM shall coordinate with manufacturers of other equipment wherever required and shall freely and readily supply all technical information for this purpose as and when called for.
7. ETC work schedule for all the GIS may vary according to readiness of site. Respective dates for the commencement of erection, testing and commissioning activities of GIS shall be communicated to manufacturers from time to time as per the readiness of site.

13. TESTING KITS, TOOLS & TACKLES

1. All the Instruments/ Testing kits including HV Test Kit, SF6 Gas handling

- Equipments required for successful installation, testing, commissioning, maintenance of offered GIS are to be arranged by bidder on **returnable** basis. Cost of the same shall be deemed inclusive in the offer.
2. Special tools & tackles for installation, maintenance, testing & commissioning of GIS shall be in bidder's scope, it shall be brought at site on **returnable** basis only.
 3. The general Tools and Tackles shall be provided by BHEL, list of the requirement i.e. general tools-tackle, spanners, gauges, slings and other lifting devices, crane, welding machines, drills, general instruments and appliances necessary for the installation of GIS is to be submit by bidder along the technical bid. In case bidder fails to convey the same along with technical bid, BHEL decision on interpretation of general tools tackle shall be considered final and any tools & tackles required shall be brought at site by bidder without any claim.
 4. Bidder to furnish detailed BOQ for non-returnable special Tools and Tackles, if applicable along with unit prices to be handed over to ultimate customer. The prices for the same shall be considered during evaluation.

14. SPARES

1. Any equipment which is not supplied as main equipment or part of main equipment, mandatory spare for that is not applicable.
2. In case contractor offers circuit breaker, dis-connector, current transformer, SF6/Air Bushing etc. under main equipment of higher rating than equipment rating specified in the specifications, the mandatory spare of same higher rating offered by contractor identical to main equipment offered in the package shall be required to be supplied against spares without any cost implication.
3. The Mandatory Spares shall be included in the bid proposal by the bidder. The prices of these spares shall be given by the Bidder in the relevant schedule of Bid Price Schedule and shall be considered for evaluation of bid. It shall not be binding on the Employer to procure all of these mandatory spares.
4. The bidder is clarified that no mandatory spares shall generally be used during the commissioning of the equipment.
5. Start-up & Commissioning spares are included in bidder's scope of supply and shall be included in the base price. Adequate stock of start-up & commissioning

spares shall be made available at the site such that the start-up and commissioning of the equipment /systems, performance testing and handing over the equipment/ systems to the Purchaser can be carried out without any hindrance or delays. The unutilized Start-up & Commissioning spares brought for commissioning purpose by bidder shall be taken back by the bidder.

6. Wherever spares in BPS / BOQ/Technical Specification have been specified as "each type/each rating/each type & rating": If the offered spare/spares is sufficient to replace the respective main equipment of all types/ratings, then such offered spare/spares shall be acceptable. It implies that common spare/spare set fulfilling the spare requirement of all types/ratings shall also be acceptable, provided it is configurable at site itself without special assistance of OEM.
7. Mandatory Spares, wherever mentioned, are envisaged for the equipment/items being supplied under the main equipment heads under present scope meeting the requirements of Technical Specifications. The component/sub-component of an equipment/item specified in BPS / BOQ under Mandatory Spare, which is not applicable as per the offered design of respective main equipment, shall not be referred to.
8. Bidder to submit price break-up of spares during tender stage. It shall not be binding on the BHEL to procure all of these mandatory spares.
9. Bidder/ vendor shall ensure the availability of spare parts and maintenance support services for the offered equipment at least for 15 years from the date of supply. Bidder shall give a notice of at least one year to the Customer & BHEL (both) before phasing out the products/spares to enable the owner for placement of order for spares and services.

15. PACKING AND DISPATCH

1. The equipment shall be carefully packed for transport by sea, rail and road in such a manner that it is protected against the climatic conditions and for any damage during transportation, transit and storage. Packing of the equipment shall be suitable for long storage (minimum 1 year).
2. The GIS transport units shall be shipped in the largest factory assembled units within transport and loading limitations and considering handling facilities on site to reduce the erection and installation work on site to a minimum. Where possible all items of equipment or factory assembled units shall be boxed in substantial crates or containers to facilitate handling in a safe and secure manner.

3. Each individual piece to be shipped, whether crate, container or large unit, shall be marked special notations such as 'Fragile', 'This side up', 'Centre of gravity', 'Weight', 'Owner's particulars', 'PO no.' etc., and other details as per purchase order & technical specification.
4. The equipment may be stored outdoors for long periods before installation. The packing shall be completely suitable for outdoor storage in areas with heavy rains and high ambient temperature.
5. Special precautions shall be taken to protect any parts containing electrical insulation against the ingress of moisture. This applies particularly to the equipment of which each gas section shall be sealed and pressurized prior to shipping. Dry nitrogen/air or dry SF6 gas (in full compliance to technical requirement) shall be used and the pressure shall be such as to ensure that, allowing for reasonable leakage, it will always be greater than the atmospheric pressure for all variations in ambient temperature and the atmospheric pressure encountered during shipment to site and calculating the pressure to which the sections shall be filled to ensure positive pressure at all times during shipment.
6. All blanking plates, caps, seals, etc., necessary for sealing the gas sections during shipment to site shall be provided. Any seals, gaskets, 'O' rings, etc. that will be used as part of the arrangement for sealing off gas sections for shipment of site, shall not be used in the final installation of the equipment at site. Vendor to provide quantity of components accordingly considering permanent installation and commissioning.

16. SPECIFIC- EXCLUSIONS (NOT IN BIDDER'S SCOPE)

The following items are specifically excluded from the bidder's scope of supply & services, irrespective of the same if covered under any section of technical specification other than Section-1 (PART-B). If specific requirement mentioned in the Section-1(PART-B) of technical specification shall overrule this specific exclusion.

1. Any scope of supply / services mentioned in Section-2 or Section-3 of technical specification but not having any relationship with GIS, LCC & its Accessories and not covered in Section-1(PART-B) or BPS / BOQ shall be deemed excluded from bidder's scope.
2. Installation / Erection of GIS with LCC & its Accessories except supervision work.

3. Cable laying & terminations, however supervision work & termination of special cables shall be in bidder's scope.
4. Open & Closed stores at site. (Bidder to provide space requirement in tech bid)
5. Local transportation/ conveyance for bidder's engineers shall be arranged by BHEL between local stay and site.
6. Office assistance shall be provided BHEL including sitting facility etc.
7. Receipt & unloading of material at site except supervision work
8. Terminal connector for SF6 to Air Bushing to conductor or any other interfacing equipment.
9. Watch & Ward of GIS material at BHEL Store
10. Civil Works i.e. GIS Hall, civil works requirement for GIS System. (Please refer clause "Structure-Steel" for bidder's scope of supply)
11. EOT crane, Air Conditioning & Ventilation System, Illumination System & Fire detection & alarm system, however complete input shall be provided for EOT and other system
12. Control Relay & Protection Panels, Numerical Relays, Bus Bar Protection Panel, SAS & ECS system, ACDB, DCDB, Battery & Charger
13. Earthing material i.e. 40 mm MS Rod, 50X6 GI Flat & 75X12 GI Flat for earthing
14. Outdoor AIS Equipments
15. Power & Control cable beyond LCC
16. BHEL / Customer / BHEL appointed 3rd party inspector travel, lodging & boarding charges during testing / inspection.

| Rev Number | Date | Initiated by | Reviewed by | Approved by | Updates |
|------------|-------------|--------------|-------------|-------------|---|
| Rev.0 | 19 Feb 2022 | JAIK | SKS | AG | |
| Rev.1 | 04 March 22 | JAIK | | | Clause 4.1 revised Clause 3.9 added Clause 5 900 gm/sq.m for coastal area |
| Rev.2 | 09 March 22 | JAIK | | | Clause 5 updated (yellow highlight) |

This technical specification is required for Pre-bid tie-up before participation in the following tender:

| | |
|-----------------------------|--|
| Name of the Customer | Gujarat Industries Power Company Limited (GIPL) |
| Name of Main Contractor | Bharat Heavy Electricals Limited |
| Name of the Project/ Tender | Tender Enquiry Document for Pooling Substation 400/33 kV, 1200 MW (PSS-1, Phase-I & Phase-II of 600 MW each) of Solar/ Wind/ Hybrid RE Park of 2375 MW Capacity at Great Rann of Kutch Area, Gujarat |
| Locations | 1. Great Rann of Kutch Area, Gujarat |

[1] SPECIFIC TECHNICAL PARAMETERS

1. Please refer **Section 1/ Section 2** for Specific Technical Parameters.

[2] BILL OF QUANTITIES

1. Please refer following Annexures for Bill of quantities: **Annexure- BOQ_GIPL**.
2. During tender stage, no of GIS bays may vary and hence it shall be finalized after receipt of firm order from Customer.

[3] SPECIFIC TECHNICAL REQUIREMENTS

1. Specific technical requirements of GIS shall be as per **Section 1/ Section 2**.

[4] OTHER TECHNICAL REQUIREMENTS for GIS WITH ITS ACCESSORIES

1. Factor of safety for design of equipment structures and foundations shall be as below:
 - a. Factor of safety for design of equipment structures shall be 1.5 under normal condition and 1.2 under short-circuit condition.
 - b. Factor of safety for design of equipment foundation shall be 1.5 in both normal and short circuit condition as per IS 456.
 - c. Factor of safety for stability of equipment foundation like overturning shall be 2 (without wind or seismic), 1.5 (with wind or seismic) for normal and short circuit condition as per IS 1904."
2. LT Auxiliary Supply
 - a. AC 415V ($\pm 10\%$), 50Hz ($\pm 3\%$), 3 phase, 4 wire solidly earthed
 - b. DC 220V (+10% to -15%), DC, 2 wire, unearthed

[5] TECHNICAL QUALIFYING REQUIREMENTS

The Technical Qualifying Requirement/ criterion shall be as per **GIPL_Annexure TQR**.

Bidder to submit complete supporting documents required for technical qualifying requirement along with technical bid.

[6] TYPE TESTING, INSPECTION, TESTING & INSPECTION CERTIFICATE

Following type test reports from NABL laboratory, as specified in IEC standard 62271- 203 & 62271-100 (amended up to date) shall be submitted for the offered type, rating of GIS invariably with the technical bid. Bid without type test reports will not be considered for evaluation.

The bidder shall submit the type tests reports for the tests conducted on the equipment similar to those to be supplied under this contract and the test(s) should have been conducted at an independent laboratory not earlier than ten (10) years from date of bid opening.

1. Tests to verify the insulation level (Lightning impulse, switching impulse and ac withstand test with PD) test on each GIS device (CB, Dis-connector, bus etc.)
2. Dielectric tests on auxiliary circuits.
3. Tests to prove the radio interference voltage (RIV) level, if applicable.
4. Tests to prove the temperature rise of any part of the equipment and measurement of the resistance of the main circuit.
5. Tests to prove the ability of the main and earthing circuits to carry the rated peak and the rated short time withstand current.
6. Tests to verify the making and breaking capacity of the included switching devices.
7. Tests to prove the satisfactory operation of the included switching devices.
8. Tests to prove the strength of enclosures.
9. Verification of the degree of protection of the enclosure.
10. Gas tightness tests
11. Electromagnetic compatibility tests (EMC).
12. Additional tests on auxiliary and control circuits.
13. Tests on partitions.
14. Tests to prove the satisfactory operation at limit temperatures.
15. Tests to prove performance under thermal cycling and gas tightness tests on insulators.
16. Corrosion test on earthing connections, if applicable.
17. Tests to assess the effects of arcing due to an internal fault.
18. Tests on solid dielectric components (operating rods, spacers, etc.)
19. Seismic test
20. Test on Auxiliary switches (Electrical & Mechanical Endurance, Heat run, IR & HV test)

The test reports of the above type tests for GIS (including type test report on Circuit breaker, Disconnect Switch, Grounding switches, Current and Voltage transformers as per relevant IEC and type tests of SF6/ Air & Oil bushing as per IEC 60137, if applicable shall be submitted for approval as per **Section -2**.

Further, in the event of any discrepancy in the test reports i.e. any test report not acceptable due to any design/manufacturing changes 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 and delivery implication to BHEL/ customer.

Note:

Type test report shall be reviewed for approval in detailed engineering stage only. However, for evaluation purpose, the test reports are to be submitted along with the technical bid.

Annexure_BOQ_GIPL

Pre Bid Tie up for,

Design, engineering, manufacturing, supply, supervision of erection*, testing and commissioning of 440KV Gas Insulated Substation for Pooling Substation 400/33 kV, 1200 MW (PSS-1, Phase-I & Phase-II of 600 MW each) of Solar/ Wind/ Hybrid RE Park of 2375 MW Capacity at Great Rann of Kutch Area, Gujarat

* only supervision of erection shall be in bidder's scope, however testing & commissioning shall be done by bidder.

| Sl. No. | Description |
|----------|---|
| A | 400kV GIS Sub-Station at GIPL at Great Rann of Kutch Area, Gujarat |
| A.1 | Annexure_BOQ_GIPL_MAIN GIS & EQUIPMENT |
| A.2 | Annexure_BOQ_GIPL_SPARES |
| A.3 | Annexure_BOQ_GIPL_SERVICES |

| Sl. No. | Item Description | Unit | Qty. | Remarks |
|----------|--|------|------|---|
| 1 | Supply- GIS: 400kV, 63kA for 3sec, Gas Insulated Switchgear (GIS) as per TS | | | |
| 1.01 | SUPPLY- GIS: 400KV, 3150A, SF6 BUS BAR MODULE WITH BUS PT & BUS EARTH SWITCH BAY MODULE (INCLUDING SF6 GAS WITH ADDITIONAL REQUIREMENT, SUPPORT STRUCTURE WITH HARDWARES AND EARTHING MATERIALS) | SET | 2 | 400kV GIS BAY MODULE with all necessary equipment comprising of following but not limited to, Busbar, Disconnector & Maintenance Grounding Switch, Fast Acting High Speed Earthing Switch, Voltage Transformer, GIS bus duct, Expansion joints & flexible connections, Online Gas Monitoring System including Gas device, Online PD Monitoring System, Pressure Switches etc. as applicable. GIS shall be complete with all necessary terminal boxes, inspection windows, SF6 gas, grounding connection, pipings for gas monitoring system, trays, support structures with mounting hardwares, platforms, ladders, staircases, catwalks, walkways, interconnecting cables with glands, ferrules, lugs etc. However, other applicable equipment such as local control cubicle, surge arrester etc. shall be considered in other line items. Please refer clause 2.2.1/ 2.2.15 of section-2 (TS for 400kV GIS)- Technical Specification with clarifications on pre-bid queries. |
| 1.02 | SUPPLY- GIS: 400KV, 3150A, SF6 BUS COUPLER BAY MODULE (INCLUDING SF6 GAS WITH ADDITIONAL REQUIREMENT, SUPPORT STRUCTURE WITH HARDWARES AND EARTHING MATERIALS) | SET | 1 | 400kV GIS BAY MODULE with all necessary equipment comprising of following but not limited to, Busbar, Circuit Breaker, Disconnector & Maintenance Grounding Switch, Current Transformer, GIS bus duct, Expansion joints & flexible connections, Online Gas Monitoring System including Gas device, Online PD Monitoring System, Pressure Switches, local control cubicles etc. as applicable. GIS shall be complete with all necessary terminal boxes, inspection windows, SF6 gas, grounding connection, pipings for gas monitoring system, trays, support structures with mounting hardwares, platforms, ladders, staircases, catwalks, walkways, interconnecting cables with glands, ferrules, lugs etc. However, other applicable equipment such as local control etc. shall be considered in other line items. Please refer clause 2.2.3/ 2.2.15 of section-2 (TS for 400kV GIS)- Technical Specification with clarifications on pre-bid queries. |
| 1.03 | SUPPLY- GIS: 400KV, 3150A, SF6 TRANSFORMER FEEDER BAY MODULE (INCLUDING SF6 GAS WITH ADDITIONAL REQUIREMENT, SUPPORT STRUCTURE WITH HARDWARES AND EARTHING MATERIALS) | SET | 4 | 400kV GIS BAY MODULE with all necessary equipment comprising of following but not limited to, Busbar, Circuit Breaker, Disconnector & Maintenance Grounding Switch, Voltage Transformer, Current Transformer, SF6 to Air Connection (Pushing) Module, GIS bus duct , Expansion joints & flexible connections, Online Gas Monitoring System including Gas device, Online PD Monitoring System, Pressure Switches, local control cubicles etc. as applicable. GIS shall be complete with all necessary terminal boxes, inspection windows, SF6 gas, grounding connection, pipings for gas monitoring system, trays, support structures with mounting hardwares, platforms, ladders, staircases, catwalks, walkways, interconnecting cables with glands, ferrules, lugs etc. However, other applicable equipment such as local control, controlled switching device etc. shall be considered in other line items. Please refer clause 2.2.3/ 2.2.15 of section-2 (TS for 400kV GIS)- Technical Specification with clarifications on pre-bid queries. |
| 1.04 | SUPPLY- GIS: 400KV, 4000A, SF6 GIS LINE FEEDER BAY MODULE (INCLUDING SF6 GAS WITH ADDITIONAL REQUIREMENT, SUPPORT STRUCTURE WITH HARDWARES AND EARTHING MATERIALS) | SET | 1 | 400kV GIS BAY MODULE with all necessary equipment comprising of following but not limited to, Busbar, Circuit Breaker, Disconnector & Maintenance Grounding Switch, Fast Acting High Speed Earthing Switch, Voltage Transformer, Current Transformer, SF6 to Air Connection (Pushing) Module, GIS bus duct , Expansion joints & flexible connections, Online Gas Monitoring System including Gas device, Online PD Monitoring System, Pressure Switches, local control cubicles etc. as applicable. GIS shall be complete with all necessary terminal boxes, inspection windows, SF6 gas, grounding connection, pipings for gas monitoring system, trays, support structures with mounting hardwares, platforms, ladders, staircases, catwalks, walkways, interconnecting cables with glands, ferrules, lugs etc. However, other applicable equipment such as local control, controlled switching device etc. shall be considered in other line items. Please refer clause 2.2.4/ 2.2.15 of section-2 (TS for 400kV GIS)- Technical Specification with clarifications on pre-bid queries. |
| 1.05 | SUPPLY- GIS : 400KV, CONTROLLED SWITCHING DEVICE (CSD) FOR GIS 3-PHASE CIRCUIT BREAKER | SET | 4 | Please refer clause 2.2.3/ 2.2.5 of section-2 (TS for 400kV GIS)- Technical Specification with clarifications on pre-bid queries. |
| 1.06 | SUPPLY- GIS : 400KV, 3150A, SINGLE PHASE GAS INSULATED BUS DUCT OUTSIDE GIS HALL (INCLUDING SF6 GAS, SUPPORT STRUCTURE WITH HARDWARES AND EARTHING MATERIALS) | MTRS | 550 | Please refer clause 2.2.3/ 2.2.4/ 2.2.6 of section-2 (TS for 400kV GIS)- Technical Specification with clarifications on pre-bid queries. |
| 1.07 | SUPPLY- GIS : 400KV, ONLINE CONTINUOUS PD MONITORING SYSTEM FOR 400KV GIS MODULE | Lot | 1 | Please refer clause 2.2.10/ 2.2.11 of section-2 (TS for 400kV GIS)- Technical Specification with clarifications on pre-bid queries. |
| 1.08 | SUPPLY- GIS : 400KV, ONLINE CONTINUOUS GAS MONITORING SYSTEM FOR 400KV GIS MODULE | Lot | 1 | Please refer clause 2.2.14 of section-2 (TS for 400kV GIS)- Technical Specification with clarifications on pre-bid queries. |
| 1.09 | SUPPLY- GIS : LOCAL CONTROL CUBICLES | SET | 6 | Please refer clause 8.0.0 of section-2 (TS for 400kV GIS)- Technical Specification with clarifications on pre-bid queries. |
| 1.10 | SUPPLY- GIS: 400KV, 4000A, SF6 END PIECE/ INTERFACE MODULE FOR FUTURE EXTENSION | SET | 2 | Please refer clause 2.1.1 (i) of section-2 (TS for 400kV GIS)- Technical Specification with clarifications on pre-bid queries. |
| 1.11 | SUPPLY- GIS : 400KV, 4000A, SINGLE PHASE SF6 TO AIR BUSHING (INCLUDING SF6 GAS, SUPPORT STRUCTURE WITH HARDWARES AND EARTHING MATERIALS) | SET | 15 | Please refer section-2 (TS for 400kV GIS) of Technical Specification. |
| 1.12 | SUPPLY- GIS : 400KV, SURGE ARRESTER (INCLUDING SF6 GAS, SUPPORT STRUCTURE WITH HARDWARES AND EARTHING MATERIALS) | SET | 6 | Please refer section-2 (TS for 400kV GIS) of Technical Specification. |
| 2 | Supply- GIS: Special Tools, Tesing & Maintenance Equipments as per TS | | | |
| 2.01 | SUPPLY- GIS: TESTING & MAINTENANCE INSTRUMENTS: SF6 GAS FILLING, EVACUATING & RECOVERY PLANT | Set | 1 | DILO make mega series with 300 Lires internal tank, or equivalent like WIKA. Please refer clause 2.2.7 of section-2 (TS for 400kV GIS)- Technical Specification with clarifications on pre-bid queries. |

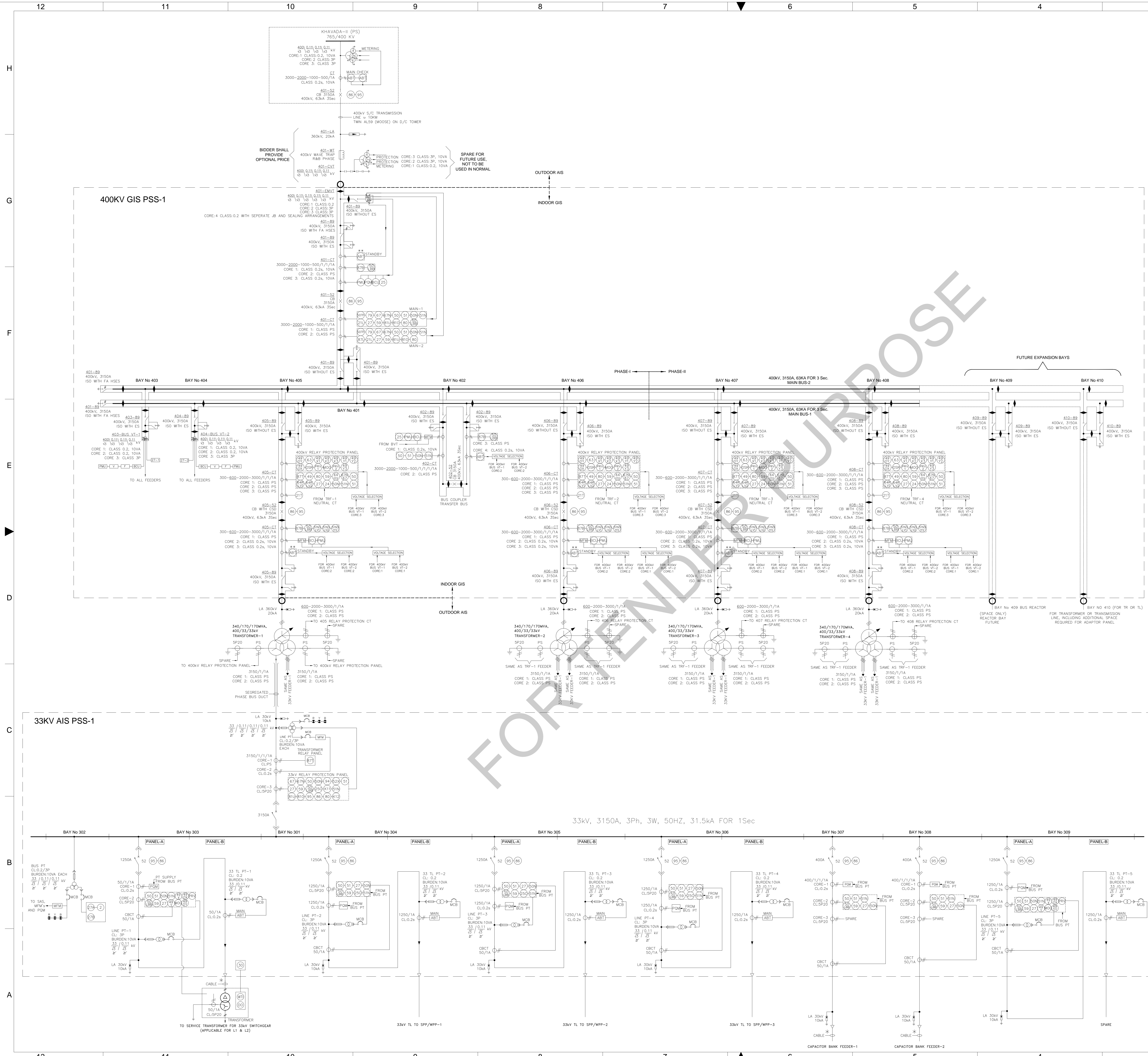
| Sl. No. | Item Description | Unit | Qty. | Remarks |
|---------|--|------|------|--|
| 2.02 | SUPPLY- GIS: TESTING & MAINTENANCE INSTRUMENTS: PORTABLE GAS MEASURING ANALYSER WITH PUMP BACK FACILITY OF SF6 GAS | Set | 1 | DILO MAKE Model: - 3-038R-R303. Please refer clause 2.2.8 of section-2 (TS for 400kV GIS)- Technical Specification with clarifications on pre-bid queries. |
| 2.03 | SUPPLY- GIS: TESTING & MAINTENANCE INSTRUMENTS: SF6 GAS MULTI ANALYZER KIT | Set | 1 | Make DILO, Model No 3-038R-R303. Please refer clause 2.2.8 (1) of section-2 (TS for 400kV GIS)- Technical Specification with clarifications on pre-bid queries. |
| 2.04 | SUPPLY- GIS: TESTING & MAINTENANCE INSTRUMENTS: SF6 GAS LEAKAGE / POINTER | Set | 1 | Make DILO, Model No 3-033-R002 Please refer clause 2.2.8 (2) of section-2 (TS for 400kV GIS)- Technical Specification with clarifications on pre-bid queries. |
| 2.05 | SUPPLY- GIS: TESTING & MAINTENANCE INSTRUMENTS: SF6 GAS SERVICE CART | Set | 1 | DILO Make, Model No B057R17 Please refer clause 2.2.8 (3) of section-2 (TS for 400kV GIS)- Technical Specification with clarifications on pre-bid queries. |
| 2.06 | SUPPLY- GIS: TESTING & MAINTENANCE INSTRUMENTS: SF6 GAS REFILLING DEVICE | Set | 1 | Make DILO Model No 3-001-R002 Please refer clause 2.2.8 (4) of section-2 (TS for 400kV GIS)- Technical Specification with clarifications on pre-bid queries. |
| 2.07 | SUPPLY- GIS: TESTING & MAINTENANCE INSTRUMENTS: SF6 GAS DEW POINT MEASUREMENT KIT | Set | 1 | Make DILO Model No 3-037-R001 Please refer clause 2.2.8 (5) of section-2 (TS for 400kV GIS)- Technical Specification with clarifications on pre-bid queries. |
| 2.08 | SUPPLY- GIS: TESTING & MAINTENANCE INSTRUMENTS: BREAKER OPERATION ANALYZER WITH TRANSDUCESR | Set | 1 | Please refer clause 6.3.0 of section-2 (TS for 400kV GIS)- Technical Specification with clarifications on pre-bid queries. |

| Sl. No. | Item Description | Unit | Qty. | Remarks |
|---------|--|------|------|---------|
| 3 | Spares-GIS: Mandatory Spares for 400kV, 63kA for 3sec, Gas Insulated Switchgear (GIS) as per TS | | | |
| | 400kV GIS | | | |
| 3.01 | SUPPLY- GIS: SPARES: GIS- SF6 Gas Pressure Relief Devices of Each Type Along With O - Rings | SET | 4 | |
| 3.02 | SUPPLY- GIS: SPARES: GIS- SF6 Pressure Gauge Cum Switch or Density Monitors and Pressure Switch As Applicable Each Type (1 Lot= 8% of total population, max 7 nos. and min. 2 nos.) | LOT | 1 | |
| 3.03 | SUPPLY- GIS: SPARES: GIS- Coupling Device Of Each Type For Pressure Gauge Cum Switch For Connecting Gas Handling Plant | SET | 2 | |
| 3.04 | SUPPLY- GIS: SPARES: GIS- Rubber Gaskets, "O" Rings And Seals for SF6 Gas of each type | SET | 3 | |
| 3.05 | SUPPLY- GIS: SPARES: GIS- Molecular Filter for SF6 Gas With Filter Bags (1 Lot= 5% of total weight) | LOT | 1 | |
| 3.06 | SUPPLY- GIS: SPARES: GIS- All types of Control Valves for SF6 Gas of each type | NO | 3 | |
| 3.07 | SUPPLY- GIS: SPARES: GIS- SF6 Gas In Non-Returnable Cylinders (1 Lot= 20% of total gas quantity) | LOT | 1 | |
| 3.08 | SUPPLY- GIS: SPARES: GIS- Locking Device to keep the Dis-Connectors (Isolators) And Earthing Switches in Close Or Open position in case of removal of the Driving Mechanism | NO | 3 | |
| 3.09 | SUPPLY- GIS: SPARES: GIS- Spares for Local Control Cabinet Including MCB, Fuses, Timers, Aux. Relays, Contactor, Push Buttons, Switches, Lamps, Annunciation Windows etc. of each type & rating and terminal of each type | SET | 3 | |
| 3.10 | SUPPLY- GIS: SPARES: GIS- UHF PD Sensors of each type (1 Lot= 5% of total population, max 5 Nos. and min. 1 No.) | LOT | 1 | |
| 3.11 | SUPPLY- GIS: SPARES: GIS- Support Insulator/ Gas Barrier of each type along with associated contacts & shields | NO | 5 | |
| 3.12 | SUPPLY- GIS: SPARES: GIS- SF6 to Air Bushing of each type & rating along with conductor and enclosure | NO | 2 | |
| 3.13 | SUPPLY- GIS: SPARES: CIRCUIT BREAKER- Complete Circuit Breaker (1 Phase Unit) of each type & rating complete with Interrupter, Main Circuit, Enclosure And Marshaling Box With Operating Mechanism to enable Replacement of Any Type/ Rating Of CB by spare, as applicable | SET | 3 | |
| 3.14 | SUPPLY- GIS: SPARES: CIRCUIT BREAKER- Fixed, moving and arcing contacts including insulating nozzles of each type - for Main Chamber | SET | 1 | |
| 3.15 | SUPPLY- GIS: SPARES: CIRCUIT BREAKER- Trip Coil Assembly With Resistor, as applicable, (1 Set= 3 Nos. of each type) | SET | 2 | |
| 3.16 | SUPPLY- GIS: SPARES: CIRCUIT BREAKER- Closing Coil Assembly With Resistor, As Applicable, (1 Set= 3 Nos. of each type) | SET | 2 | |
| 3.17 | SUPPLY- GIS: SPARES: CIRCUIT BREAKER- Relays, Power Contactors, Push Buttons, Timers & MCBs etc. of each type and rating | SET | 3 | |
| 3.18 | SUPPLY- GIS: SPARES: CIRCUIT BREAKER- Auxiliary Switch Assembly, (1 Set= 3 Nos. of each type) | SET | 2 | |
| 3.19 | SUPPLY- GIS: SPARES: CIRCUIT BREAKER- Operation Counter, (1 Set= 3 Nos. of each type) | SET | 1 | |
| 3.20 | SUPPLY- GIS: SPARES: CIRCUIT BREAKER- Window-scope/ Observing Window, 3 Nos. of each type | SET | 2 | |
| 3.21 | SUPPLY- GIS: SPARES: SPRING OPERATED MECHANISM- Complete Spring Operating Mechanism Including Charging Mechanism etc. of each type | SET | 1 | |
| 3.22 | SUPPLY- GIS: SPARES: SPRING OPERATED MECHANISM- Spring Charging Motor | NO | 3 | |
| 3.23 | SUPPLY- GIS: SPARES: ISOLATOR- For Maintenance Earth Switch: 3 No. of Single Phase Maintenance Earthing Switch Of Each Type, Dimension, Current & Voltage Including Main Circuit, Enclosure, Driving Mechanism And Support Insulator etc. to enable replacement of any Type/Rating of Earth Switch by spare | SET | 3 | |
| 3.24 | SUPPLY- GIS: SPARES: ISOLATOR- Complete set of 3-phase dis-connector of each type including main circuit, enclosure, driving mechanism and support Insulator etc. to enable complete one to one replacement of all applicable type of Isolator by spare | SET | 3 | |
| 3.25 | SUPPLY- GIS: SPARES: ISOLATOR- For Fast Earthing Switch: 3 No. of Single Phase Fast Earthing Switch of each Type, Dimension, Current & Voltage Rating Including Main Circuit, Enclosure, Driving Mechanism and Support Insulator etc. to enable replacement of any Type/Rating Of Earth Switch by spare, If Applicable | SET | 2 | |

| Sl. No. | Item Description | Unit | Qty. | Remarks |
|---------|---|------|------|--|
| 3.26 | SUPPLY- GIS: SPARES: ISOLATOR- Copper contact fingers for isolator male & female contact along with corona shield- for one complete (3 phase) isolator of each type and rating | SET | 3 | |
| 3.27 | SUPPLY- GIS: SPARES: ISOLATOR- Copper contact fingers for Maintenance Earthing switch male & female contacts along with corona shield, for one complete (3 phase) earthing switch of each type and rating | SET | 2 | |
| 3.28 | SUPPLY- GIS: SPARES: ISOLATOR- Copper contact fingers for Fast Earthing switch male & female contacts along with corona shield, for one complete (3 phase) earthing switch of each type and rating (if applicable) | SET | 2 | |
| 3.29 | SUPPLY- GIS: SPARES: ISOLATOR- For Isolator: Open / Close Contactor Assembly, Timers, Key Interlock, Interlocking Coils, Relays, Push Buttons, Indicating Lamps Power Contactors, Resistors, Fuses, MCBs & Drive Control Cards etc. for one complete MOM Box (3 – Phase Gang Operated or 1 – Phase Unit) of each type and rating. | SET | 2 | |
| 3.30 | SUPPLY- GIS: SPARES: ISOLATOR- For Maintenance Earth Switch: Open / Close Contactor Assembly, Timers, Key Interlock, Interlocking Coils, Relays, Push Buttons, Indicating Lamps Power Contactors, Resistors, Fuses, MCBs & Drive Control Cards etc. for one complete MOM Box (3 – Phase Gang Operated or 1 – Phase Unit) of each type and rating. | SET | 2 | |
| 3.31 | SUPPLY- GIS: SPARES: ISOLATOR- For Fast Earthing Switch: Open / Close Contactor Assembly, Timers, Key Interlock, Interlocking Coils, Relays, Push Buttons, Indicating Lamps Power Contactors, Resistors, Fuses, MCBs & Drive Control Cards etc. for one complete MOM Box (3 – Phase Gang Operated or 1 – Phase Unit) of each type and rating. | SET | 2 | |
| 3.32 | SUPPLY- GIS: SPARES: ISOLATOR- For Isolator: Limit Switch and Aux. Switches for complete 3-Phase Equipment | SET | 2 | |
| 3.33 | SUPPLY- GIS: SPARES: ISOLATOR- For Maintenance Earth Switch: Limit Switch And Aux. Switches for complete 3-Phase Equipment | SET | 2 | |
| 3.34 | SUPPLY- GIS: SPARES: ISOLATOR- For Fast Earthing Switch: Limit Switch And Aux. Switches for complete 3-Phase Equipment | SET | 2 | |
| 3.35 | SUPPLY- GIS: SPARES: ISOLATOR- For Isolator: Drive Mechanism of each type | NO | 2 | |
| 3.36 | SUPPLY- GIS: SPARES: ISOLATOR- For Maintenance Earth Switch: Drive Mechanism of each type | NO | 2 | |
| 3.37 | SUPPLY- GIS: SPARES: ISOLATOR- For Fast Earthing Switch: Drive Mechanism of each type | NO | 1 | |
| 3.38 | SUPPLY- GIS: SPARES: ISOLATOR- For Isolator: Motor for Drive Mechanism of each type | NO | 3 | |
| 3.39 | SUPPLY- GIS: SPARES: ISOLATOR- For Maintenance Earth Switch: Motor for Drive Mechanism of each type | NO | 3 | |
| 3.40 | SUPPLY- GIS: SPARES: ISOLATOR- For Fast Earthing Switch: Motor for Drive Mechanism of each type | NO | 3 | |
| 3.41 | SUPPLY- GIS: SPARES: CURRENT TRANSFORMER- Complete 400kV CT of each Type And Rating with enclosure to enable replacement of any type/ rating of CT by spare | NO | 2 | |
| 3.42 | SUPPLY- GIS: SPARES: VOLTAGE TRANSFORMER- Complete EMVT of each type and rating with enclosure to enable replacement of any type/rating of EMVT by spare | NO | 2 | |
| 3.43 | SUPPLY- GIS: SPARES: CONTROLLED SWITCHING DEVICE- Controlled Switching Device along with Transducers, Sensors, Contactors, Switches etc. (1 Set= 1 set of each make) | SET | 1 | |
| 3.44 | SUPPLY- GIS: SPARES: SURGE ARRESTOR- Complete Surge Arrester with insulating base and Terminal connector & structure with Surge counter/ Monitor of each type and rating | SET | 2 | |
| 3.45 | SUPPLY- GIS: SPARES: SURGE ARRESTOR- Surge counter/ monitor. (In addition to above) | NO | 6 | |
| 4 | Spares-GIS: Recommended O&M Spares for 400kV, 63kA for 3sec, Gas Insulated Switchgear (GIS) as per TS | Lot | 1 | Bidder to provide O&M spares as per CEA guidelines for min. period of 10years. |
| 5 | Spares-GIS: Reference Unit Price for addition/ deletion of supply items of 400kV, 40kA for 3sec, Gas Insulated Switchgear (GIS) as per TS | | | |
| | Unit Prices of Individual Equipment included here or in mandatory spares are required for any Addition/Deletion of Equipment and replacement of damaged items. Vendor to ensure that the unit prices have a logical relationship with prices of assemblies in main items. Quoting for unit prices is mandatory and shall be considered for evaluation | | | |

| Sl. No. | Item Description | Unit | Qty. | Remarks |
|---------|--|------|------|--|
| 5.01 | SUPPLY- GIS: SPARES: 400KV, OPERATING MECHANISM FOR CIRCUIT BREAKER COMPLETE IN ALL RESPECT | Set | 1 | |
| 5.02 | SUPPLY- GIS: SPARES: 400KV, OPERATING MECHANISM FOR DISCONNECTOR | Set | 1 | |
| 5.03 | SUPPLY- GIS: SPARES: 400KV, OPERATING MECHANISM FOR MAINTENANCE EARTHING SWITCH COMPLETE IN ALL RESPECT | Set | 1 | |
| 5.04 | SUPPLY- GIS: SPARES: 400KV, OPERATING MECHANISM FOR FAST ACTING/ HIGH SPEED GROUNDING SWITCH COMPLETE IN ALL RESPECT | Set | 1 | |
| 5.05 | SUPPLY- GIS: SPARES: 400KV, MAINTENANCE EARTHING SWITCH COMPLETE IN ALL RESPECT | Set | 1 | |
| 5.06 | SUPPLY- GIS: SPARES: 400KV, FAST ACTING/ HIGH SPEED GROUNDING SWITCH COMPLETE IN ALL RESPECT | Set | 1 | |
| 5.07 | SUPPLY- GIS: SPARES: 400KV, SINGLE PHASE BUS BAR | Mtrs | 1 | Complete in all respect. |
| 5.08 | SUPPLY- GIS: SPARES: 400KV, GIS METALLIC ENCLOSURE | Kgs | 50 | |
| 5.09 | SUPPLY- GIS: SPARES: 400KV, EXPANSION JOINTS | Set | 1 | 1set means 1 nos. of each type. |
| 5.10 | SUPPLY- GIS: SPARES: 400KV, FLEXIBLE CONNECTIONS | Set | 1 | 1set means 1 nos. of each type. For Single Phase of any type and any rating. |
| 5.11 | SUPPLY- GIS: SPARES: 400KV, BARRIER INSULATOR | Set | 1 | 1set means 1 nos. of each type. |
| 5.12 | SUPPLY- GIS: SPARES: 400KV, NON-BARRIER INSULATOR | Set | 1 | 1set means 1 nos. of each type. |
| 5.13 | SUPPLY- GIS: SPARES: 400KV, GAS SEALS | Set | 1 | 1set means 1 nos. of each type. |
| 5.14 | SUPPLY- GIS: SPARES: 400KV, GAS DENSITY MONITOR SWITCH | Set | 1 | 1set means 1 nos. of each type. |
| 5.15 | SUPPLY- GIS: SPARES: 400KV, GAS PRESSURE SWITCH | Set | 1 | 1set means 1 nos. of each type. |
| 5.16 | SUPPLY- GIS: SPARES: 400KV, TEE BEND | Set | 1 | 1set means 1 nos. of each type and each rating. |
| 5.17 | SUPPLY- GIS: SPARES: 400KV, ANGLE BEND | Set | 1 | 1set means 1 nos. of each type and each rating. |
| 5.18 | SUPPLY- GIS: SPARES: 400KV, L-BEND | Set | 1 | 1set means 1 nos. of each type and each rating. |
| | | | | |

| Sl. No. | Item Description | Unit | Qty. | Remarks |
|----------|--|---------|------|--|
| 6 | Services- GIS: 400kV, 63kA for 3sec, Gas Insulated Switchgear (GIS) as per TS | | | |
| 6.01 | SERVICES- GIS: SUPERVISION OF ERECTION: 400KV, SF6 GIS BAY MODULE (INCLUDING LCC, SF6 GAS WITH ADDITIONAL REQUIREMENT, SUPPORT STRUCTURE WITH HARDWARES AND EARTHING MATERIALS) | SET | 6 | Supervision of erection of GIS system, complete in all respect including LCC and other accessories. It also includes supervision of unloading & verification of materials for proper storage at site. GIS bay having GIS circuit Breaker is counted as Bay Module. PT Bay module is included in this item. |
| 6.02 | SERVICES- GIS: TESTING & COMMISSIONING: 400KV, SF6 GIS BAY MODULE (INCLUDING LCC, SF6 GAS WITH ADDITIONAL REQUIREMENT, SUPPORT STRUCTURE WITH HARDWARES AND EARTHING MATERIALS) | SET | 6 | Testing and commissioning of complete GIS system, is to be executed by venfor. All testing instruments, kits, T&P etc. are to be arranged by contractor on returnable basis. Please refer relevant section of technical specification for details. GIS bay having GIS circuit Breaker is counted as Bay Module. PT Bay module is included in this item. |
| 6.03 | SERVICES- GIS: SUPERVISION OF ERECTION: 400KV, SINGLE PHASE GAS INSULATED BUS DUCT OUTSIDE GIS HALL (INCLUDING SF6 GAS, SUPPORT STRUCTURE WITH HARDWARES AND EARTHING MATERIALS) | MTRS | 550 | GIB outside the GIS Hall wall shall be considered for mode of measurement. Inside GIB shall be considered as part of respective Feeder Bay and cost of the same shall be deemed inclusive. |
| 6.04 | SERVICES- GIS: TESTING & COMMISSIONING: 400KV, SINGLE PHASE GAS INSULATED BUS DUCT OUTSIDE GIS HALL (INCLUDING SF6 GAS, SUPPORT STRUCTURE WITH HARDWARES AND EARTHING MATERIALS) | MTRS | 550 | |
| 6.05 | SERVICES- GIS: SUPERVISION OF ERECTION: 400KV, SINGLE PHASE SF6 TO AIR BUSHING (INCLUDING SF6 GAS, SUPPORT STRUCTURE WITH HARDWARES AND EARTHING MATERIALS) | SET | 15 | |
| 6.06 | SERVICES- GIS: TESTING & COMMISSIONING: 400KV, SINGLE PHASE SF6 TO AIR BUSHING (POLYMER) (INCLUDING SF6 GAS, SUPPORT STRUCTURE WITH HARDWARES AND EARTHING MATERIALS) | SET | 15 | |
| 6.09 | SERVICES- GIS: SUPERVISION OF ERECTION: 400KV, SINGLE PHASE SF6 TO CABLE TERMINATION MODULE (INCLUDING SF6 GAS, SUPPORT STRUCTURE WITH HARDWARES AND EARTHING MATERIALS) | SET | 1 | |
| 6.10 | SERVICES- GIS: TESTING & COMMISSIONING: 400KV, SINGLE PHASE SF6 TO CABLE TERMINATION MODULE (INCLUDING SF6 GAS, SUPPORT STRUCTURE WITH HARDWARES AND EARTHING MATERIALS) | SET | 1 | |
| 6.11 | SERVICES- GIS: SUPERVISION OF ERECTION: 360KV, 20KA, CLASS-4 SURGE ARRESTER (INCLUDING SF6 GAS, SUPPORT STRUCTURE WITH HARDWARES AND EARTHING MATERIALS) | SET | 6 | |
| 6.12 | SERVICES- GIS: TESTING & COMMISSIONING: 360KV, 20KA, CLASS-4 SURGE ARRESTER (INCLUDING SF6 GAS, SUPPORT STRUCTURE WITH HARDWARES AND EARTHING MATERIALS) | SET | 6 | |
| 6.13 | SERVICES- GIS: FINAL SUCCESSFUL HV/ POWER FREQUENCY TESTING OF GIS INCLUDING ARRANGING OF HV TEST KIT ALONG WITH OPERATOR | Lot | 1 | Carrying out successful HV/ Power Frequency Testing of complete GIS as per IEC including Arrangement of HV Test kit (on returnable basis) shall be in scope of bidder, which includes charges HV test kit with operator, accessories & tools required for completion of HV testing. Bays may be commissioned separately. |
| 6.14 | SERVICES- GIS: SUPERVISION OF ERECTION: 400KV, CONTROLLED SWITCHING DEVICE (CSD) FOR GIS THREE PHASE CIRCUIT BREAKER | SET | 7 | |
| 6.15 | SERVICES- GIS: TESTING & COMMISSIONING: 400KV, CONTROLLED SWITCHING DEVICE (CSD) FOR GIS THREE PHASE CIRCUIT BREAKER | SET | 7 | |
| 6.16 | SERVICES- GIS: INSULATION CO-ORDINATION STUDIES GIS SYSTEM COMPLETE | LOT | 1 | |
| | | | | |
| 7 | Services-GIS: Reference Unit Price for addition/ deletion of supply items of 400kV, 63kA for 3sec, Gas Insulated Switchgear (GIS) as per TS | | | |
| 7.01 | SERVICES- GIS : REFERENCE UNIT PRICE OF GIS INDIVIDUAL ITEM/ EQUIPMENT - SERVICES FOR SUPERVISION OF ERECTION OF GIS | MAN-DAY | 10 | Charges for repetition of services - (if required due to reasons not attributed to the contractor) This item will be executed only if repetition of services is required by BHEL. |
| 7.02 | SERVICES- GIS : REFERENCE UNIT PRICE OF GIS INDIVIDUAL ITEM/ EQUIPMENT - SERVICES FOR TESTING & COMMISSIONING OF GIS | MAN-DAY | 10 | Charges for repetition of services - (if required due to reasons not attributed to the contractor) This item will be executed only if repetition of services is required by BHEL. |
| 7.03 | SERVICES- GIS : REFERENCE UNIT OF GIS INDIVIDUAL ITEM/ EQUIPMENT - HIRING CHARGES OF HV TEST KIT WITH OPERATOR | LOT | 1 | Additional HV test kit charges including charges of operator, HV test kit, accessories & tools required for completion of HV test (Dielectric Test after installation of GIS). This item is executed only if repetition/ additional HV Test is required by BHEL i.e. post successful commissioning of GIS. (if required due to reasons not attributed to the contractor) |
| | | | | |
| 8 | Services-GIS: Training of customer/ owner Personnel as per TS | | | |
| 8.01 | SERVICE: TRAINING: TRAINING IN CONSTRUCTION, INSTALLATION, COMMISSIONING AND O&m OF GIS BEING SUPPLIED AT MANUFACTURES WORKS/ FACILITY | MAN-DAY | 70 | |



LEGEND:-

| | | | |
|--|--|--|--|
| | - BREAKER | | - LIGHTNING ARRESTER |
| | - CURRENT TRANSFORMER (CT) | | A - AMMETER |
| | - THREE, FOUR WINDING POTENTIAL TRANSFORMER (PT) | | PF - POWER FACTOR |
| | - SEGREGATED PHASE BUS DUCT (SPBD) | | MVA - MEGA WATT |
| | - GIS BARRIER | | MVA - MEGA VOLT AMPERE |
| | - DRAW OUT ASSEMBLY | | MVAR - MEGA VOLT AMPERE REACTOR |
| | - LIGHTNING ARRESTER | | PQM - POWER QUALITY METER |
| | - EHV BREAKER | | PMU - PHASOR MEASUREMENT UNIT |
| | - ISOLATOR | | ABT - AVAILABILITY BASED TARIFF |
| | - TERMINATION | | CT - CURRENT TRANSFORMER |
| | - SF6 TO AIR BUSHING | | V - VOLT METER |
| | - WAVE TRAP (WT) & B PHASE ONLY | | VT - VOLTAGE TRANSFORMER |
| | - INDICATION LAMP | | EMVT - ELECTRO MAGNETIC VOLTAGE TRANSFORMER |
| | - MULTI FUNCTION METER | | F - FREQUENCY |
| | - TRIVECTOR METER | | ES - EARTH SWITCH |
| | - KILO AMPS | | CB - CIRCUIT BREAKER |
| | - GAS INSULATED SUBSTATION | | KV - KILO VOLT |
| | - AIR INSULATED SUBSTATION | | CVT - CAPACITIVE VOLTAGE TRANSFORMER |
| | - MAGNETIC OIL GAUGE | | AIS - AIR INSULATED SUBSTATION |
| | - FAST ACTING HIGH SPEED EARTH SWITCH | | PRV - PRESSURE RELIEF VALVE |
| | - SUBSTATION AUTOMATION SYSTEM | | OSR - OIL SURGE RELAY |
| | - TRANSMISSION LINE | | SPP - SOLAR POWER PLANT |
| | - WIND POWER PLANT | | CB WITH CSD - CIRCUIT BREAKER WITH CONTROLLED SWITCHING DEVICE |

PROTECTION DETAILS:-

| | |
|--|---|
| (01) - OIL TEMPERATURE INDICATOR | (52A) - CB CONTACT MULTIPLICATION RELAY |
| (02) - WINDING TEMPERATURE INDICATOR | (52B) - OVER VOLTAGE RELAY |
| (2) - TIMER | (63) - PRESSURE SWITCH DETECTOR |
| (21L) - LINE DISTANCE PROTECTION RELAY | (64) - RESTRICTED EARTH FAULT RELAY |
| (21T) - TRANSFORMER BACKUP IMPEDANCE RELAY | (47) - DIRECTIONAL OVER CURRENT RELAY |
| (24) - OVER FLUXING RELAY | (67N) - DIRECTIONAL EARTH FAULT RELAY |
| (27A/27B) - UNDER VOLTAGE RELAY (40-80%) | (79) - AUTOMATIC RECLOSEING RELAY |
| (29C) - SYNCHRONISM-CHECK RELAY | (80) - DC FAIL RELAY |
| (30) - ANNUNCIATOR RELAY | (81U) - UNDER FREQUENCY RELAY |
| (49) - THERMAL OVERLOAD RELAY | (81O) - OVER FREQUENCY RELAY |
| (49X) - WINDING TEMPERATURE TRIP RELAY | (86) - LOCK OUT RELAY |
| (49Y) - WINDING TEMPERATURE ALARM RELAY | (87T) - TRANSFORMER DIFFERENTIAL PROTECTION RELAY |
| (82) - OIL TEMPERATURE TRIP RELAY | (87L) - LINE DIFFERENTIAL PROTECTION RELAY |
| (82X) - OIL TEMPERATURE ALARM RELAY | (87B) - BUSBAR DIFFERENTIAL PROTECTION RELAY |
| (50) - INSTANTANEOUS OVER CURRENT RELAY | (94) - ANTI PUMPING RELAY |
| (50N) - INST. EARTH FAULT RELAY | (95) - TRIP COIL SUPERVISION RELAY |
| (50S) - STANDBY EARTHFALUT RELAY | (K11) - INTER POSTING RELAY (CLOSE) |
| (51) - LOCAL BREAKER BACKUP RELAY | (K12) - INTER POSTING RELAY (OPEN) |
| (51N) - IDMT OVER CURRENT RELAY | (80) - DC FAIL RELAY |
| (51N) - IDMT EARTH FAULT RELAY | (D0) - DOOR OPEN |
| (52) - AC CIRCUIT BREAKER | (60T) - SWITCH ON TO FAULT |
| | (6CL) - BAY CONTROL UNIT |

- NOTE:-**
- ALL THE RATINGS MENTIONED HERE BY ARE TENTATIVE ONLY AND SHALL BE FINALISED DURING DETAILED ENGINEERING AS PER THE CALCULATIONS. IF ANY RATINGS OR PARAMETERS CHANGES THEN THE SAME SHALL BE PROVIDED BY THE BIDDER WITHOUT ANY EXTRA COST TO OWNER.
 - THIS METERING & PROTECTION SLD FOR TENDER PURPOSE TO OVERVIEW THE SCHEME.
 - TRIP COIL SUPERVISION RELAY FOR CIRCUIT BREAKER, PT FUSE FAILURE PROTECTION AND TRIP CIRCUIT SUPERVISION SHALL BE PROVIDED BY BIDDER.
 - MASTER TRIP RELAY SHALL BE OF ESTABLISH TYPE WITH REMOTE RESET (MECHANICALLY LATCHED) I.E. SIMILAR TO ABB MAKE PPS1/4.
 - INTER TRIPPING CIRCUIT SHALL BE INCORPORATED IN THE SCHEME BETWEEN PRIMARY AND SECONDARY SIDE OF TRANSFORMER.
 - INTERLOCKING LOGIC SHALL BE INCORPORATED IN THE BAY CONTROL UNIT FOR ISOLATORS SIDE OF TRANSFORMER.
 - REPEAT ANNUNCIATION POTENTIAL FREE CONTACTS SHALL BE PROVIDED AND NEATLY WIRED IN TERMINAL BLOCKS FOR TRANSFORMER INTERNAL FAULT.
 - OLTC CONTROLS SHALL BE CONFIGURED IN BAY CONTROL UNIT FOR TRANSFORMER.
 - ANALOG INPUT SHALL BE CONFIGURED FOR TRANSFORMER WINDING & OIL TEMPERATURE AND TAP POSITION OF OLTC IN BAY CONTROL UNIT.
 - NITROGEN FIRE PROTECTION INDICATION SHALL BE INCORPORATED IN BAY CONTROL UNIT AND TRANSFORMER PROTECTION POTENTIAL FREE CONTACT SHALL BE PROVIDED FOR FIRE PROTECTION INITIATION FOR ACTUATING THE FIRE PROTECTION SYSTEM.
 - 87 RELAY SIMILAR MAKE RELAYS WILL BE PROVIDED FOR LOCAL & REMOTE END CIRCUIT BREAKERS.
 - PROTECTION RELAYS & BCB'S PROVIDED SHALL BE OF IEC-61850 COMMUNICATION PROTOCOL ONLY.
 - LINE CVT, WT, LA RATING SHALL SIMILAR PGCIL BAY END.
 - POWER TRANSFORMER AND NIPPS EQUIPMENT SUPPLY IS IN BIDDER'S SCOPE.
 - CENTRAL ELECTRICITY AUTHORITY (CEA) TECHNICAL STANDARDS, REGULATIONS & GRID STANDARDS ARE COMPLIED.
 - PQM METER SHALL BE COMPLYING WITH IEC 6100-4-30 CLAUSE A.
 - 87 METERS LOCATIONS ARE AS BELOW
 - A. MAIN & CHECK ABT METERS LOCATION IS IN OUTDOOR METERING PANEL.
 - B. 400KV SIDE STANDBY ABT METER LOCATIONS IS IN 400KV LINE CRP PANEL.
 - C. 33KV SIDE STANDBY ABT METER LOCATIONS IS IN RESPECTIVE 33KV INCOMER CRP PANELS.
 - D. IN PANEL ROOM SEPARATE RITUAL MAKE COMMON ABT METER PANEL FOR STANDBY METERS OF LINE, TRANSFORMERS AND BUS COUPLER AND FUTURE ABT METERS SHALL BE PROVIDED.
 - THE CT & VT RATIOS & RATINGS / DATA ARE TENTATIVE ONLY. FOR CT & VT, THE RATIO, ALF (ACCURACY LIMIT FACTOR)/SF (INSTRUMENT SECURITY FACTOR), ACCURACY CLASS, BURDEN, KNEE POINT, EXCITATION CURRENT, RCT ETC. SHALL BE AS PER REQUIREMENT AND EPCC CONTRACTOR SHALL FURNISH THE DETAILS WITH CALCULATIONS DURING DETAIL ENGINEERING STAGE. ANY CHANGE IN THE PARAMETERS OF CT & VT REQUIRED AT THE TIME OF DETAILED ENGINEERING SHALL HAVE TO BE INCORPORATED WITHOUT ANY EXTRA COST TO OWNER.
 - LINE CT PARAMETERS (RATIO, KNEE POINT VOLTAGE, ISF, BURDEN ETC.) SHALL BE SAME AS KHAVADA-III PS OF CTUL/PCOIL.
 - REF PROTECTION FOR 33KV MCB SHALL BE PROVIDED IN 33KV SWITCHGEAR. IF RELAY LACKS PROVISION FOR 3sec OF REF.
 - CTs HAVE BEEN INDICATED AS DISTRIBUTED HOWEVER VENDOR MAY CHOOSE TO NOT DISTRIBUTE THE CTs.
 - FOR SPP/WPP FEEDERS, GLAND PLATE / HOLES SHALL BE DESIGNED TO ACCOMMODATE 3 RUNS OF 3 CORE, 500sq.mm ALUMINUM CABLE.
 - MARK CABLE SIZE SHALL BE DETERMINED BY BIDDER DURING DETAIL ENGINEERING.
 - NOT ALL THE EQUIPMENT, INSTRUMENTS FUNCTIONALITY IS SHOWN HERE IN THIS SLD. FOR DETAILS PLEASE REFER THE RFP DOCUMENTS.
 - SPARE FOR SWITCHED LINE REACTOR SHALL BE KEPT BY BIDDER AS A FUTURE PROVISION.
 - CT, PT, CVT, EMVT SEPARATE TERMINAL BOX WITH SEALING REQUIREMENT FOR STANDBY ABT METERS SHALL BE PROVIDED BY BIDDER.

SYSTEM DATA:

| | | |
|---|------------------|--------------------|
| 1. NOMINAL SYSTEM VOLTAGE | 400 kV | 33 kV |
| 2. HIGHEST SYSTEM VOLTAGE | 420 kV | 36 kV |
| 3. NO. OF PHASES | 3 | 3 |
| 4. FREQUENCY | 50 Hz | 50 Hz |
| 5. ONE MIN. POWER FREQUENCY WITHSTAND VOLTAGE | 650 kV(r.m.s) | 95 kV(r.m.s) |
| 6. LIGHTNING WITHSTAND VOLTAGE | 1425 kVp | 170 kVp |
| 7. SHORT CIRCUIT LEVEL | 83 KA FOR 3 Sec. | 31.5 KA FOR 1 Sec. |
| 8. CREEPAGE DISTANCE FOR OUTDOOR EQUIPMENT | 31 mm/kV | 31 mm/kV |
| 9. TYPE OF EARTHING | SOLIDLY GROUNDED | SOLIDLY GROUNDED |
| SAFETY CLEARANCE (MINIMUM) | | |
| a) PHASE TO PHASE | 4200 mm | 1200 mm |
| b) PHASE TO EARTH | 800 mm | 800 mm |
| c) GROUND CLEARANCE | 8000 mm | 3700 mm |
| d) SECTIONAL CLEARANCE | 6500 mm | 2800 mm |

FOR TENDER PURPOSE

| | | | | |
|---|------------|-------------------|----|----|
| 4 | 14.03.2022 | ISSUED FOR TENDER | EJ | KA |
| 3 | 18.02.2022 | ISSUED FOR TENDER | EJ | KA |
| 2 | 23.12.2021 | ISSUED FOR TENDER | EJ | KA |
| 1 | 07.12.2021 | ISSUED FOR TENDER | EJ | KA |

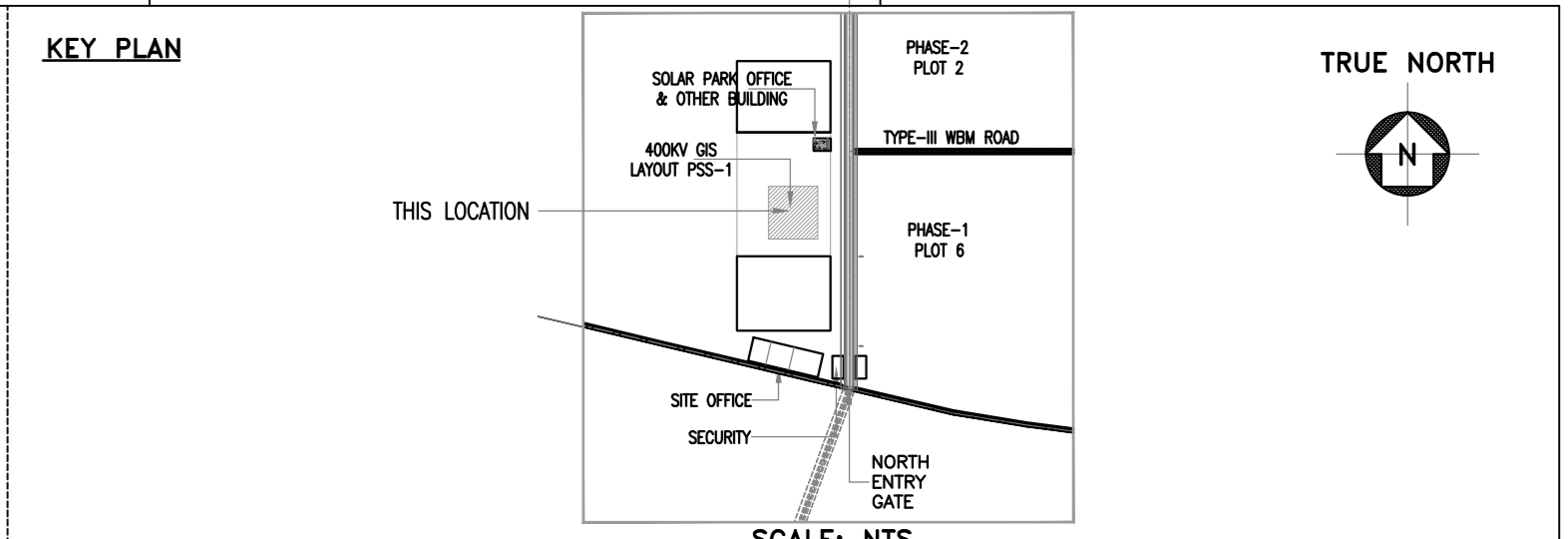
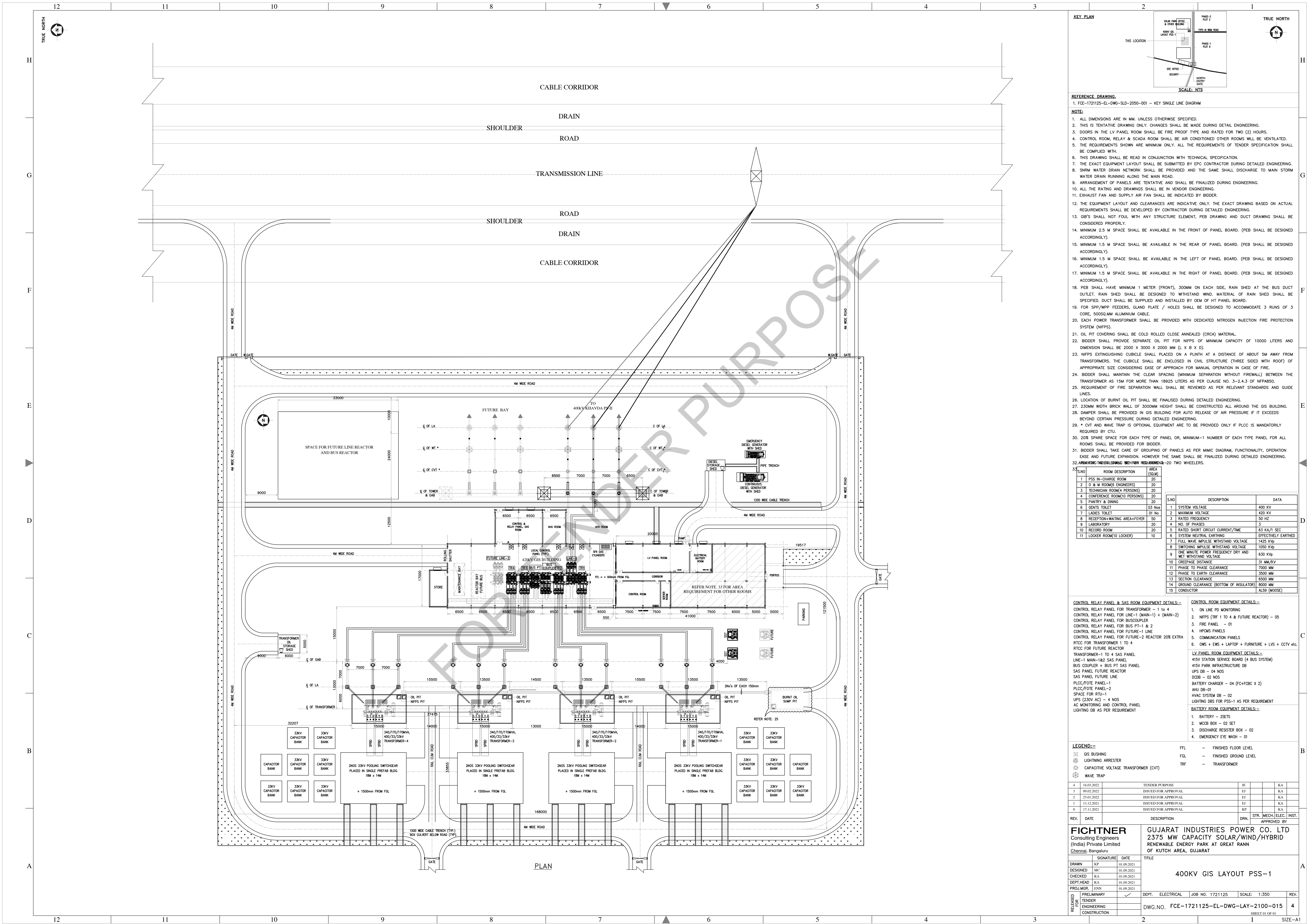
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GUJARAT INDUSTRIES POWER CO. LTD
2375 MW CAPACITY SOLAR/WIND/HYBRID
RENEWABLE ENERGY PARK AT GREAT RANN
OF KUTCH AREA, GUJARAT

400KV SUBSTATION
SINGLE LINE DIAGRAM PSS-1

| | | | | |
|------------|-----|-----------|------------|-------|
| DRAWN | EJ | SIGNATURE | DATE | TITLE |
| DESIGNED | MC | | 01.09.2021 | |
| CHECKED | KA | | 01.09.2021 | |
| DEPT. HEAD | KA | | 01.09.2021 | |
| PROJ. MGR. | ENN | | 01.09.2021 | |

DEPT. ELECTRICAL JOB NO. 1721125 SCALE: NTS REV. 4
DWG. NO. FCE-1721125-EL-DWG-SLD-2100-001



REFERENCE DRAWING:
1. FCE-1721125-EL-DWG-SLD-2050-001 - KEY SINGLE LINE DIAGRAM

- NOTE:**
- ALL DIMENSIONS ARE IN MM. UNLESS OTHERWISE SPECIFIED.
 - THIS IS TENTATIVE DRAWING ONLY. CHANGES SHALL BE MADE DURING DETAIL ENGINEERING.
 - DOORS IN THE LV PANEL ROOM SHALL BE FIRE PROOF TYPE AND RATED FOR TWO (2) HOURS.
 - CONTROL ROOM, RELAY & SCADA ROOM SHALL BE AIR CONDITIONED OTHER ROOMS WILL BE VENTILATED.
 - THE REQUIREMENTS SHOWN ARE MINIMUM ONLY. ALL THE REQUIREMENTS OF TENDER SPECIFICATION SHALL BE COMPLIED WITH.
 - THIS DRAWING SHALL BE READ IN CONJUNCTION WITH TECHNICAL SPECIFICATION.
 - THE EXACT EQUIPMENT LAYOUT SHALL BE SUBMITTED BY EPC CONTRACTOR DURING DETAILED ENGINEERING.
 - SHOW WATER DRAIN NETWORK SHALL BE PROVIDED AND THE SAME SHALL DISCHARGE TO MAIN STORM WATER DRAIN RUNNING ALONG THE MAIN ROAD.
 - ARRANGEMENT OF PANELS ARE TENTATIVE AND SHALL BE FINALIZED DURING ENGINEERING.
 - ALL THE RATING AND DRAWINGS SHALL BE IN VENDOR ENGINEERING.
 - EXHAUST FAN AND SUPPLY AIR FAN SHALL BE INDICATED BY BIDDER.
 - THE EQUIPMENT LAYOUT AND CLEARANCES ARE INDICATIVE ONLY. THE EXACT DRAWING BASED ON ACTUAL REQUIREMENTS SHALL BE DEVELOPED BY CONTRACTOR DURING DETAILED ENGINEERING.
 - GIS'S SHALL NOT FOUL WITH ANY STRUCTURE ELEMENT, PEB DRAWING SHALL BE CONSIDERED PROPERLY.
 - MINIMUM 2.5 M SPACE SHALL BE AVAILABLE IN THE FRONT OF PANEL BOARD. (PEB SHALL BE DESIGNED ACCORDINGLY).
 - MINIMUM 1.5 M SPACE SHALL BE AVAILABLE IN THE REAR OF PANEL BOARD. (PEB SHALL BE DESIGNED ACCORDINGLY).
 - MINIMUM 1.5 M SPACE SHALL BE AVAILABLE IN THE LEFT OF PANEL BOARD. (PEB SHALL BE DESIGNED ACCORDINGLY).
 - MINIMUM 1.5 M SPACE SHALL BE AVAILABLE IN THE RIGHT OF PANEL BOARD. (PEB SHALL BE DESIGNED ACCORDINGLY).
 - PEB SHALL HAVE MINIMUM 1 METER (FRONT), 300MM ON EACH SIDE, RAIN SHED ON THE BUS DUCT OUTLET. RAIN SHED SHALL BE DESIGNED TO WITHSTAND WIND. MATERIAL OF RAIN SHED SHALL BE SPECIFIED. DUCT SHALL BE SUPPLIED AND INSTALLED BY OEM OF HT PANEL BOARD.
 - FOR SPP/WPP FEEDERS, GLAND PLATE / HOLES SHALL BE DESIGNED TO ACCOMMODATE 3 RUNS OF 3 CORE, 5000MM ALUMINIUM CABLE.
 - EACH POWER TRANSFORMER SHALL BE PROVIDED WITH DEDICATED NITROGEN INJECTION FIRE PROTECTION SYSTEM (WNFS).
 - OIL PIT COVERING SHALL BE COLD ROLLED CLOSE ANNEALED (CRA) MATERIAL.
 - BIDDER SHALL PROVIDE SEPARATE OIL PIT FOR NFPFS OF MINIMUM CAPACITY OF 10000 LITERS AND DIMENSION SHALL BE 2000 X 3000 X 2000 MM (L X B X D).
 - NFPFS EXTINGUISHING CUBICLE SHALL BE PLACED ON A PLINTH AT A DISTANCE OF ABOUT 5M AWAY FROM TRANSFORMERS. THE CUBICLE SHALL BE ENCLOSED IN CIVIL STRUCTURE (THREE SIDED WITH ROOF) OF APPROPRIATE SIZE CONSIDERING EASE OF APPROACH FOR MANUAL OPERATION IN CASE OF FIRE.
 - BIDDER SHALL MAINTAIN THE CLEAR SPACING (MINIMUM SEPARATION WITHOUT FIREWALL) BETWEEN THE TRANSFORMER AS 15M FOR MORE THAN 18925 LITERS AS PER CLAUSE NO. 3-2.4.3 OF NFPB50.
 - REQUIREMENT OF FIRE SEPARATION WALL SHALL BE REVIEWED AS PER RELATED STANDARDS AND GUIDE LINES.
 - LOCATION OF BURNT OIL PIT SHALL BE FINALISED DURING DETAILED ENGINEERING.
 - 230MM WIDTH BRICK WALL OF 300MM HEIGHT SHALL BE CONSTRUCTED ALL AROUND THE GIS BUILDING.
 - DAMPER SHALL BE PROVIDED IN GIS BUILDING FOR AUTO RELEASE OF AIR PRESSURE IF IT EXCEEDS BEYOND CERTAIN PRESSURE DURING DETAILED ENGINEERING.
 - * CVT AND WAVE TRAP IS OPTIONAL EQUIPMENT ARE TO BE PROVIDED ONLY IF PLCC IS MANDATORILY REQUIRED BY CTU.
 - 20% SPARE SPACE FOR EACH TYPE OF PANEL OR, MINIMUM-1 NUMBER OF EACH TYPE PANEL FOR ALL ROOMS SHALL BE PROVIDED FOR BIDDER.
 - BIDDER SHALL TAKE CARE OF GROUPING OF PANELS AS PER MIMIC DIAGRAM, FUNCTIONALITY, OPERATION EASE AND FUTURE EXPANSION. HOWEVER THE SAME SHALL BE FINALIZED DURING DETAILED ENGINEERING.
 - 32 AMPERAGE BREAKING WITHIN REQUIREMENT - 20 TWO WHEELERS.

| S.NO | ROOM DESCRIPTION | AREA (SQ.M) |
|------|------------------------------|-------------|
| 1 | PSS IN-CHARGE ROOM | 20 |
| 2 | D & M ROOM(S) ENGINEERS | 20 |
| 3 | TECHNICAL ROOM(S) PERSONS | 20 |
| 4 | CONFERENCE ROOM(TO PERSONS) | 20 |
| 5 | PANTRY & DINING | 20 |
| 6 | GENTS TOILET | 03 Nos |
| 7 | LADIES TOILET | 01 No |
| 8 | RECEPTION-WAITING AREA+FOYER | 50 |
| 9 | LABORATORY | 20 |
| 10 | RECORD ROOM | 20 |
| 11 | LOCKER ROOM(TO LOCKER) | 10 |

| S.NO | DESCRIPTION | DATA |
|------|--|---------------------|
| 1 | SYSTEM VOLTAGE | 400 KV |
| 2 | MAXIMUM VOLTAGE | 420 KV |
| 3 | RATED FREQUENCY | 50 HZ |
| 4 | NO. OF PHASES | 3 |
| 5 | RATED SHORT CIRCUIT CURRENT/TIME | 63 KA/1 SEC |
| 6 | SYSTEM NEUTRAL EARTHING | EFFECTIVELY EARTHED |
| 7 | FULL WAVE IMPULSE WITHSTAND VOLTAGE | 1425 KVP |
| 8 | SWITCHING IMPULSE WITHSTAND VOLTAGE | 1050 KVP |
| 9 | ONE MINUTE POWER FREQUENCY DRY AND WET WITHSTAND VOLTAGE | 630 KVP |
| 10 | CRESPACE DISTANCE | 31 MM/KV |
| 11 | PHASE TO PHASE CLEARANCE | 7000 MM |
| 12 | PHASE TO EARTH CLEARANCE | 3500 MM |
| 13 | SECTION CLEARANCE | 6500 MM |
| 14 | GROUND CLEARANCE (BOTTOM OF INSULATOR) | 8000 MM |
| 15 | CONDUCTOR | AL59 (MOOSE) |

- CONTROL RELAY PANEL & SAS ROOM EQUIPMENT DETAILS:-**
- CONTROL RELAY PANEL FOR TRANSFORMER - 1 TO 4
 - CONTROL RELAY PANEL FOR LINE-1 (MAIN-1) + (MAIN-2)
 - CONTROL RELAY PANEL FOR BUSCOUPLER
 - CONTROL RELAY PANEL FOR BUS PT-1 & 2
 - CONTROL RELAY PANEL FOR FUTURE-1 LINE
 - CONTROL RELAY PANEL FOR FUTURE-2 REACTOR 20% EXTRA
- RTUC FOR TRANSFORMER 1 TO 4**
- RTUC FOR FUTURE REACTOR
 - TRANSFORMER-1 TO 4 SAS PANEL
 - LINE-1 MAIN-1&2 SAS PANEL
 - BUS COUPLER + BUS PT SAS PANEL
 - SAS PANEL FUTURE REACTOR
 - SAS PANEL FUTURE LINE
 - PLCC/FOTE PANEL-1
 - PLCC/FOTE PANEL-2
 - SPACE FOR RTU-1
 - UPS (230V AC) - 4 NOS
 - AC MONITORING AND CONTROL PANEL
 - LIGHTING DBS FOR PSS-1 AS PER REQUIREMENT
 - LIGHTING DBS AS PER REQUIREMENT
- CONTROL ROOM EQUIPMENT DETAILS:-**
- 1. ON LINE PD MONITORING
 - 2. NFPFS (TRF 1 TO 4 & FUTURE REACTOR) - 05
 - 3. FIRE PANEL - 01
 - 4. HPCMS PANELS
 - 5. COMMUNICATION PANELS
 - 6. OWS + EWS + LAPTOP + FURNITURE + LVS + CCTV etc.
- LV PANEL ROOM EQUIPMENT DETAILS:-**
- 415V STATION SERVICE BOARD (4 BUS SYSTEM)
 - 415V PARK INFRASTRUCTURE DB
 - UPS DB - 04 NOS
 - DCDB - 02 NOS
 - BATTERY CHARGER - 04 (FC+FCB X 2)
 - AHU DB-01
 - HVAC SYSTEM DB - 02
 - LIGHTING DBS FOR PSS-1 AS PER REQUIREMENT
- BATTERY ROOM EQUIPMENT DETAILS:-**
- 1. BATTERY - 2SETS
 - 2. MCOB BOX - 02 SET
 - 3. DISCHARGE RESISTER BOX - 02
 - 4. EMERGENCY EYE WASH - 01

- LEGEND:-**
- GIS BUSHING
 - LIGHTNING ARRESTER
 - CAPACITIVE VOLTAGE TRANSFORMER (CVT)
 - WAVE TRAP
 - FFL - FINISHED FLOOR LEVEL
 - FGL - FINISHED GROUND LEVEL
 - TRF - TRANSFORMER

| REV. | DATE | DESCRIPTION | DRN. | STR. | MECH. | ELEC. | INST. |
|------|------------|---------------------|------|------|-------|-------|-------|
| 4 | 16.09.2022 | TENDER PURPOSE | | JE | | | KA |
| 3 | 09.09.2022 | ISSUED FOR APPROVAL | | EJ | | | KA |
| 2 | 25.09.2022 | ISSUED FOR APPROVAL | | EJ | | | KA |
| 1 | 13.12.2021 | ISSUED FOR APPROVAL | | EJ | | | KA |
| 0 | 17.11.2021 | ISSUED FOR APPROVAL | | KP | | | KA |

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Consulting Engineers
(India) Private Limited
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GUJARAT INDUSTRIES POWER CO. LTD
2375 MW CAPACITY SOLAR/WIND/HYBRID
RENEWABLE ENERGY PARK AT GREAT RANN
OF KUTCH AREA, GUJARAT

| REV. | DATE | DESCRIPTION | DEPT. | JOB NO. | SCALE: | REV. |
|--------------|------|-------------|------------|---------|--------|------|
| PRELIMINARY | | | ELECTRICAL | 1721125 | 1:350 | |
| TENDER | | | | | | |
| ENGINEERING | | | | | | |
| CONSTRUCTION | | | | | | |

DWG.NO. FCE-1721125-EL-DWG-LAY-2100-015

400KV GIS LAYOUT PSS-1

SIZE-A1



SECTION – 2.3

400 KV GAS INSULATED SWITCHGEAR (GIS)

1.0.0 INTENT OF SPECIFICATION

This section covers the requirements of 400 KV Gas Insulated Switchgear (GIS) for Pooling Substation.

2.0.0 SCOPE OF SUPPLY & WORK

2.1.0 400 kV indoor gas insulated switchgear (GIS) and outdoor air insulated switchyard shall be provided for evacuation of net power generated at the plant to the grid. The scope covers design, manufacture, assembly, testing at manufacturer's works before dispatch, packing, marking, shipping, unloading, storage at site, erection, testing and commissioning of factory assembled, metal-enclosed, SF6 GIS, Gas Insulated Bus Ducts and ancillary equipment as specified here under. The GIS shall have double bus single breaker configuration and will comprise following bays/ circuits:

- a) Four (4) Transformer bays
- b) One (1) Line bay
- c) One (1) Bus Coupler bay
- d) Two (2) Bus VTs
- e) Space for one (1) future spare bay (intended for future transformer or transmission line bay with space requirement of adaptor panel)
- f) Space for one (1) future reactor bay with space requirement of adaptor panel

Adequate space for maintenance shall be provided inside the GIS building, in addition to the space required for housing the switchgear, control/ protection/ metering and communication equipment, air conditioning and ventilation, illumination, low and high frequency earthing, control room, offices and stores, electrical laboratory, etc. and required outdoor structures, gantries, lightning protection, etc. Further the scope shall include all equipment/ components/tools/spares required making a complete, reliable and troubling free functional system, even if not specifically listed in this specification. The scope also includes special training of owner's testing, operation and maintenance staff.

Service continuity shall be taken care during design of system

Service continuity shall be as per IEC 62271-203, **Annexure F**

Circuit Breaker: During repair works of Circuit Breaker both busbar should remain in service.

Bus Disconnecting Switch (DS): During repairs work of DS one bus should remain in service. In case bus disconnecter is part of busbar then intermediate compartment should be provided between every bay including bus VT to perform rectification activities keeping adjacent bays in service.

The GIS equipment with the given bus switching arrangement shall be divided into different gas compartments. During the work such as a fault repair or major maintenance, requiring the dismantling of a gas compartment for which more than one compartments may need to be de-gassed.

During a fault in GIS compartment other than Circuit Breaker compartment, maximum one bus bar and/or one feeder is permitted out of service during maintenance and repair/replacement.



Future extension: During future extension and HV testing of extended bay of GIS, at least one busbar of existing GIS should remain in service.

2.2.0 Indoor GIS System

2.2.1 Indoor GIS shall be 3-phase, 400 kV, 3150 A, 63 kA (3 sec), metal enclosed, phase segregated type having double bus arrangement, **Bus Bar Module comprise of**

- a) Six (6) individual passive bus bar enclosures running the length of the switchgear to interconnect each of the circuit breaker bay modules in double main bus system.
- b) Six (6) single phase $400/\sqrt{3}$ kV / 63.5 / 63.5 V inductive type voltage transformers complete with disconnecting switches & safety earthing switches with manual and motor operating mechanisms.
- c) Two (2) terminal boxes/ marshalling boxes for each VT's
- d) **Surge arrestors at GIS bus bars if deemed necessary based on power system studies during detail engineering.**
- e) Two (2) nos. earthing switch at one end of bus bar
- f) Interconnecting wiring and piping
- g) Earthing support structures and platforms
- h) GIS busbar with gas monitoring devices, barriers, pressure switches, UHF PD Sensors, support etc. as required.
- i) **End Piece (Interface) module with the test link for future extension of Bus bar module. The end piece module shall be designed in such a way so that future GIS modules may be tested without extending voltage to existing bus by removing the test link. The end piece module shall be provided on the sides wherever the future extension is envisaged.**

UHF sensors in GIS for PD (Partial Discharge) detection: Adequate number of UHF sensors shall be provided in the offered GIS (of 5 pC and above as per IEC 60270). The number and location of these sensors shall be based on laboratory test on typical design of GIS as per recommendations of CIGRE Document No. 654 (Application Guide for sensitivity verification for UHF Partial discharge detection system for GIS).

2.2.2 Bus-coupler Bay will comprise of

- a) One (1) three phase SF6 insulated circuit breaker complete with spring operated mechanism.
- b) Six (6) multi ratio, multi core single phase current transformers
- c) Two (2) three phase, single pole group operated disconnecter switches, complete with manual and motor driven operating mechanism.
- d) Two (2) three phase, single pole group operated safety earth switches, complete with manual and motor driven operating mechanism.
- e) One (1) Local control cubicle.



2.2.3 **Power transformer circuit breaker bay will comprise of**

- a) One (1) three phase SF6 insulated circuit breaker complete with spring operated mechanism with **Controlled Switching Device (CSD)**.
- b) Six (6) multi ratio, multi core single phase current transformers.
- c) Three (3), three phase, single pole group operated disconnecting switches, complete with manual and motor driven operating mechanism.
- d) Three (3), three phase, single pole group operated safety earth switches, complete with manual and motor driven operating mechanism.
- e) ~~Three (3) single phase outdoor type AIS type surge arrestors for mounting in the transformer yard.~~
- g) ~~Three (3) post insulators for mounting in the transformer yard, to support overhead connection to LA/Surge Arrestors.~~
- h) Three (3) single phase SF6 Ducts and SF6 to air bushings for outdoor circuit termination.
- i) GIS duct with gas monitoring devices, barriers, pressure switches, UHF PD Sensors, support etc. as required
- j) One (1) Local control cubicle.

2.2.4 **400 kV transmission line bays will comprise:**

- a) One (1) three phase SF6 insulated circuit breaker complete with spring operated mechanism.
- b) Six (6) multi ratio, multi core single phase current transformers.
- c) Three (3), three phase, single pole group operated disconnecting switches, complete with manual and motor driven operating mechanism.
- d) Two (2), three phase, single pole group operated safety earth switches, complete with manual and motor driven operating mechanism.
- e) One (1) three phase single pole, high speed earth switch, complete with manual and motor driven operating mechanism.
- f) Three (3) Single phase SF6 Ducts and SF6 to air bushings for outdoor circuit termination
- g) Three (3) inductive type voltage transformers, inside the GIS Compartment.
- h) ~~Three (3) Outdoor AIS type surge arrestors.~~
- i) GIS duct with gas monitoring devices, barriers, pressure switches, UHF PD Sensors, support etc. as required
- j) One (1) Local control cubicle.



2.2.5

Controlled Switching Device (CSD)

- a) 400KV Circuit Breaker shall be equipped with controlled switching device with consequent optimization of switching behavior, when used in Switching of transformers (from 400kV side circuit breakers only)
- b) The CSD shall be provided in 400kV Circuit Breakers for controlling transformers. The requirement of CSD shall be explicitly specified in BOQ under General Technical Specification (Section 1.0, Volume-II). **Section-3**
- c) Technical Requirement for Controlled switching device:
 - i.) The CSD shall be designed to operate correctly and satisfactorily with the excursion of auxiliary A/C & DC voltages and frequency as specified in **Section – 1.0, Volume-II. Section-3**
 - ii.) The CSD shall meet the requirements of IEC-61000-4 16 class IV regarding HF disturbance test and fast transient test shall be as per IEC-61000 – 4-4 level IV and insulation test as per 60255 – 5.
 - iii.) The CSD shall have functions for switching ON & OFF the circuit breakers.
 - iv.) The CSD shall get command to operate the breakers manually at random. The controller shall be able to analyze the current and voltage waves available through the signals from secondary of CTs & CVTs for the purpose of calculation of optimum moment of the switching the circuit breaker and issue command to circuit breaker to operate.
 - v.) The CSD shall have an adaptive control feature to consider the next operating time of the breaker in calculation of optimum time of issuing the switching command. In calculation of net operating time of the breaker the controller must consider all factors that may affect the operating time of the breaker such as, but not limited to, ambient temperature, control voltage variation, SF6 gas density variations etc. Schematic drawing for this purpose shall be provided by the contractor. The accuracy of the operating time estimation by the controller shall be better than + 0.5 ms.
 - vi.) The CSD shall have communication port to facilitate online communication of the control switching device with SCADA directly on 61850 or through gateway which shall be under present scope.
 - vii.) The CSD shall be PC compatible for the setting of various parameters and down loading of the settings and measured values date time of switching etc. Window based software for this purpose shall be supplied by the contractor to be used on the owner's PC.
 - viii.) The CSD shall be suitable for current input of 1 A from the secondary of the CTs. and 110 V (Ph to Ph) from the CVTs. The controller shall withstand transient and dynamic state values of the current from the secondary of the CTs and CVTs.
 - ix.) The CSD shall have time setting resolution of 0.1 ms or better.
 - x.) The CSD shall have sufficient number of output/input potential free contacts for connecting the monitoring equipment and annunciation system available in the control room. Necessary details shall be worked out during engineering the scheme.



- xi.) The CSD shall also record and monitor the switching operations and make adjustments to the switching instants to optimize the switching behavior as necessary. It shall provide self-diagnostic facilities, signaling of alarms and enable downloading of data captured from the switching events.
- xii.) The provision for bypassing the Controlled switching device shall be provided through BCU and SCADA both so that whenever, the CSD is not healthy due to any reason (including auxiliary supply failure), uncontrolled trip/close command can be extended to the circuit Breaker. Alternatively, in case of any non-operation of the CSD after receiving a close/trip command after a pre-determined time delay, the CSD should automatically be bypassed so as to ensure that the trip and close commands are extended to the Trip/Close coils through subsequent command.
- xiii.) The CSD shall be provided with a communication port to facilitate online communication of the CSD with Substation automation system directly on IEC 61850 protocols. If the CSD does not meet the protocols of IEC 61850, suitable gateway shall be provided to enable the communication of CSD as per IEC 61850.

2.2.6 **Gas Insulated Bus (GIB) Duct**

Bus duct shall be single phase enclosed. GIB from outside the GIS Hall wall including support structure to SF6/Air Bushing for interconnection to substation equipment of Line/Transformer Bays shall be considered for mode of measurement. Inner side GIB is to be considered as part of respective Transformer / Line Bay.

The 420kV SF6 gas insulated bus (GIB) ducts shall be complete with all necessary SF6 gas filling, interconnecting power and control wiring, grounding connections, gas monitoring devices, barriers, pressure switches, UHF PD sensors, piping etc. complete in all respect. For all the 400kV GIS bays (Line/Transformer) shall be terminated with GIB duct. All the GIB will be terminated through SF6 to Air Bushings.

2.2.7 **SF6 Gas Filling, Evacuation, Recovery Plant**

This shall include all the necessary gas cylinders for temporarily storing the evacuated SF6 gas. The capacity of the temporary storage facilities shall at least be sufficient for storing the maximum quantity of gas that could be removed when carrying out maintenance or repair work on any pieces of the switchgear and associated equipment + 10% extra SF6. The plant shall be complete with compressor, vacuum pump, dust and moisture filter, all necessary pipes, couplings, flexible tubes and valves for coupling up to the Switchgear for filling or evacuating all the gases. **The Gas handling cart should be DILO make mega series with 300 Ltr internal tank or, equivalent like WIKA.**

2.2.8 **Portable gas measuring analyser with pump back facility of SF6 gas.**

Equipment should measure following:

- i. SO2 content in SF6 gas
- ii. Purity of SF6 gas
- iii. SF6 gas moisture content

The Make shall be **DILO** Model: - 3-038R-R303.

List of SF6 Special Tools are tabulated below:



| | |
|---|---|
| 1 | SF6 Gas Multi Analyzer, Make DILO , Model No 3-038R-R303, with standard equipment's (Transport Case, 6 meter long hose, , DN8, DN20, coupling, 2 meter long cable, USB stick with data files, user manual, router set with case, wireless operation via mobile, two year direct connect service plan and training) with optional Adapter case for measuring device Kit DN8 Testing & Filling (if applicable), optional 6 m long connecting extension hose with self-closing couplings etc. |
| 2 | SF6 Gas Leakage Detector / Pointer Make DILO, Model No 3-033-R002 with spare sensor kit, carrier case, and operating manual. |
| 3 | SF6 gas service carts DILO Make , Model No B057R17 with Digital weighing scales, DN8 hose and coupling - 6-1037-R050 (If required), tool box, shelf plate, DN20 Braided Hose and coupling tongue (if required), and spare part kits. |
| 4 | SF6 Gas Refilling Device Make DILO Model No 3-001-R002 with optional packing and SF6 Bottle connection of required thread. |
| 5 | SF6 Gas Dew Point Measurement Make DILO Model No 3-037-R001 with standard equipment's and optional packing, |

2.2.9 Breaker operation analyzer with transducers.

2.2.10 An on-line continuous Partial Discharge Monitoring (PDM) system shall be designed to provide an automatic facility for the simultaneous collection of PD data at multiple points on the GIS & its associated GIB ducts and Voltage Transformers adopting UHF technique. The data stored shall provide a historical record of the progress of PD sources and shall identify the areas of maximum activity.

2.2.11 On-line continuous Partial Discharge Monitoring (PDM)

- I. The system shall be capable for measuring PD in charged GIS environment as EHV which shall have bandwidth in order of 100 MHz–2GHz with possibility to select a wide range of intermediate bandwidths for best measurement results. The principle of operation shall be based on UHF principle of detection.
- II. The scope shall cover Engineering, supply, installation, testing and commissioning of partial discharge continuous monitoring system, with all necessary auxiliaries and accessories to make a complete system as per technical specification, including site demonstration of successful operation. Any items/accessories necessary to make the system fully functional for the trouble free online PD monitoring of complete GIS installation shall be considered as included in the scope.
- III. The PDM system shall be provided with all its hardware and software, with readily interfacing to the UHF PD couplers installed in the GIS of present bays and future bays plus 20% additional as extra. Details of this shall be submitted during engineering stage for approval.
- IV. The PD Monitoring PC Work Station shall be housed in a lockable cabinet with duplicate keys and shall be located in the control room of the GIS substation. Workstation PCs shall be pre-loaded with all necessary Hardware & Software. The PCs shall have each Combo drive & Retrievable disk drive (1 TB), Ethernet port 100Mbps, printer. The workstation PC shall be powered by suitable dedicated UPS and same is included in the present scope.
- V. The PDM system should have the facility of Real Time display, which will give an instant indication of PD activity coupler wise, with one-second-update period. The PDM system shall be able to capture the PD data triggered by associated switching operations of CBs & isolators.



- VI. The PDM system shall generate alarm when action is required; viz. a) PD alarm (abnormal PD activity indicating a risk of failure) & b) PD system fail alarm to be connected to SAS.
- VII. This is to provide access to historical data and file storage with date and time stamp. Sufficient storage facility shall be available to review historical data updated for the lifetime of switchgear. The substation & headquarters PCs shall have a backup device in the form of a retrievable disk drive of 1TB capacity for this purpose.
- VIII. In order to interpret various types of PD defects, intelligent diagnostics software (expert system) shall be built- in as part of the PDM software capability. This is mainly to reduce the dependence on PD specialist. The bidder shall also make available typical point-on-wave patterns as library pictures to train the user.
- IX. Software Updates: It shall be possible to upgrade / update the system software throughout the lifetime of the system with the ongoing development / refinement in PD technology.
- X. In case of any indication of suspected PD activity by the on line system, further investigation has to be carried out by the contractor for the PD defect identification and location during the warranty period

a) Design of on-line PDM System

- I. The technical proposal for PDM system along with detailed design documentation shall be submitted for GIPCL approval during engineering stage.
- II. To guarantee that sufficient coverage is available for complete GIS installation to monitor PD activity all design details shall be submitted as part of the above for review.
- III. The sensitivity of the offered system shall be in accordance with CIGRE Document No. 654 that will be verified as part of site sensitivity tests.
- IV. UHF attenuation data of GIS shall be submitted for the switching devices, spacers, bends etc.
- V. The signal attenuation level of co-axial cable per meter length and justification for the length of cable connection between the couplers and detector units shall be furnished.
- VI. The overall sensitivity of PD detection system shall take into account the spacing between couplers and the associated cabling, filters, amplifiers, etc.
- VII. The Sub-station GIS layout as a separate drawing indicating position of spacers, spread over of PD sensors with distance, sensor identification, the detector unit identification etc. shall be submitted during engineering stage for approval.
- VIII. The PD sensors shall be identified / coordinated with the corresponding detector unit etc. with proper identification labeling and indicated in the substation PDM SLD.
- IX. Internal arrangement/wiring diagram is to be submitted for detector units/control cabinet etc. All internal items are to be identified / labeled to facilitate troubleshooting.
- X. Supply requirement (AC & DC) to be specified for the complete monitoring system.
- XI. Power supply to PDM PC shall have protection against surges, overload and short circuit. A dedicated on-line UPS system shall also be provided as a backup during supply interruption, to ensure trouble-free & reliable running of the PDM System for a minimum of 15 minutes duration. Ratings of UPS shall be proposed for the approval of GIPCL. The UPS shall have enough capacity to initiate a 'safe' shut down of the PDM PC and the peripherals after this 15-minute period if normal supply fails to resume. The PDM PCs shall restart automatically on resumption of normal supply. The UPS shall not generate spikes during changeover of supply. UPS shall automatically give indication / alarm when it requires battery replacement. Potential Free Contacts shall be generated to signal these events. These contacts shall be wired out to Annunciation / Monitoring systems. Alternately, inverter of



suitable capacity is also acceptable. Critical Process and Status alarms of the PDM system shall be displayed.

- XII. PDM System shall be provided with a user security for accessing the system with a log-on and password entry procedure. The user levels shall be defined as a Master User and other users for the modification of system, update, and entry of parameters or manual operation. System shall be able to generate 3D point on wave pattern whenever any PD activity detected by the system. System shall be able to give online 3D point on wave pattern, online PRPD (phase resolved PD) and online short time trend etc. System shall be able to generate the all the logs related to system fault, system access, PD event, and any changes in system setting etc.
- XIII. Method of electrical isolation/protection provided between PD sensor and detector circuitry in case of flashover/high potential stress inside GIS should be furnished.
- XIV. The selected mode of propagation of PD signal (electromagnetic wave) inside GIS for the design of sensors shall be furnished.
- XV. The protection available for electronics against transient over voltages caused by switching operations shall be furnished.
- XVI. The capacity of each detector unit to be specified to accommodate as many numbers of PD sensors signal.
- XVII. The applicable standards to meet IEC & IEEE requirements for electromagnetic compatibility shall be specified. The offered system should have been tested for the same for working in a 400kV substation environment. The necessary documentation has to be submitted in this regard.
- XVIII. Guaranteed technical particulars & data sheet for various components used in the system shall be submitted.

2.2.12 415 V AC Distribution boards required for complete 400 kV GIS package. Bidder shall reserve feeders for HVAC system & EOT Crane and GIPCL future requirements specified in this tender.

2.2.13 **Electric Overhead Travelling (EOT) Crane** For information

- I. EOT crane for 400kV GIS Hall of suitable capacity shall be provided for erection and maintenance of largest/heaviest GIS components/assembly. The crane shall consist of all special requirements for erection and maintenance of GIS equipment.
- II. EOT cranes shall be provided with pendant control and RF control. Bidder shall ensure that frequency of RF control remote should not interface with frequency of any other equipment.
- III. All EOT Crane Motors shall be provided with 3 phase, 3 element type Electronic protection relay - preferably with digital display and single phasing preventer for motor protection.
- IV. Crane capacity – 6T safe working load
- V. Minimum hook height shall be 9.0 meters or, as per actual requirement whichever is higher.
- VI. Contractor shall completely service the entire crane before taking over certificate is issued.
- VII. Contractor has to carry out demonstration and necessary tests:
 - Running, hauling,
 - No-load test,
 - Load test as per site condition and maximum designed and required capacity



- VIII. Crane shall be capable of lifting and accurately positioning all loads ranging from crane full rated capacity to at least 10 % rated capacity.
- IX. Crane shall be designed under following variable speeds through VVVF drive at full Load:
- Hoisting - 0.3 – 3 Meters per Minute
 - Cross travel - 1.6 – 16 Meters per Minute
 - Long travel - 2.0 – 20 Meters per Minute
- X. EOT crane shall be provide with safety features like walkway, platform. It shall be along the bride rail and on the crabe of EOT crane for cleaning and maintenance of Crane and to give access the GIS Hall high bay lighting fixtures, ventilation duct & grilles. The platform and walkways shall be designed to support any weight to be imposed upon them during crane overhaul.
- XI. Vertical cage ladder and platform with handrail shall be provided to have access to EOT crane.
- XII. Contractor shall submit the capacity calculation of crane for GIS hall considering a factor of safety of rope as at least 5.
- XIII. In case the GIS hall is to be extended, the scope of work also involves extension of EOT crane girders and all necessary Electrical & Mechanical accessories to facilitate movement of existing EOT crane in the extended portion of GIS hall. Cost of the same shall be considered by the bidder.
- XIV. Crane hook approaches shall be of the minimum possible dimensions to ensure maximum coverage of the GIS building area.
- XV. Following tests shall be carried out on EOT crane:
- 1) The crane shall be tested at manufacturer work under full load and 25% overload of hoisting and cross transverse motions as a routine test.
 - 2) Following tests shall be done at site after installation of the crane at site:
 - Check all the accessories for proper function
 - No-Load test
 - Load test as per site condition

2.2.14 Continuous on-line monitoring and diagnostics systems to monitor gas density, gas pressure, leakage, moisture, etc., operating parameters such as current, voltage, temperature, etc. complete with sensors and integration of the systems with plant SAS & HPCMS system. Hybrid density monitor shall be provided.

2.2.15 The first filling of SF6 gas for the equipment supplied plus an additional quantity sufficient for conducting all tests on equipment at the site before placing it into successful operation. SF6 gas shall be supplied in returnable cylinders. In addition about 10 % spare gas (of total used in GIS) by weight shall be supplied in 40 litre non-returnable cylinders.

~~2.3.0 Balance of equipment / accessories like bus post insulators, clamps & connectors, spacers, AL59 Moose Conductors, 4.0" IPS AL pipe, ground wire, insulators & hardware, gantry and equipment structures, bay marshaling kiosks as required to complete the 400kV GIS Substation package. Whatever AIS equipment is required for operation of 400kV pooling substation shall be in scope of bidder.~~



2.4.0 All jumpers and connections.

2.5.0 ~~Protection & Relay panels shall consist of the following~~

- ~~i. Duplicated, decentralized Bus bar Protection Relay panels for Main & Check zones for each 400 kV Bus.~~
- ~~ii. Islanding protection scheme with three channels of under frequency and df/dt functions.~~
- ~~iii. Line Protection relay panels consisting of BPU's with Main -1 & Main -2 Distance protections and Differential protection with distance to fault locators and auto reclose. The Main-I and Main-II protection relays of line feeder shall be fed from separate DC sources and shall be mounted in separate panels.~~
- ~~iv. Transformer Protection relay panels consisting of BPU and numerical backup impedance protection on HV side. LBB & REF relays shall be provided separately from transformer differential relay. However, LBB relay may also be provided as built-in protection function of distributed bus bar protection scheme~~
- ~~v. Relay test kit shall be as per the Annexure D of GTS.~~
- ~~vi. All necessary licensed software for communication with Numerical relays, BPU along with dedicated engineering work station.~~
- ~~vii. The protection circuits and relays shall be electrically and physically segregated into two groups each being independent and capable of providing uninterrupted protection even in the event of one of the protection groups failing, to obtain redundancy, and to take protection systems out for maintenance while the equipment remains in service~~
- ~~viii. Protective relay panels shall be provided with test blocks (MiCom P991 series with CT,PT, Trip Circuit Supervision relay for Breaker and Master Trip relay, auxiliary supply, logical input and output contact) for online testing (secondary injection) without disturbing wiring. Adequate Numbers of multi finger test Plugs (Type Micom P992 and P993 series) shall be provided.~~

2.6.0 Switchyard Automation system (SAS) consisting of following

- ~~a) Bay controller units (BCU) for each switchyard bays~~
- ~~b) Fully dual redundant communication bus~~
- ~~c) SAS I/O Cabinets, marshaling panels~~
- ~~d) Transducers for transmitting electrical analog quantities (Voltage, Current, Active & reactive Power, frequency etc.)~~
- ~~e) All necessary Remote Terminal units (RTU), HMI, engineering work stations at the switchyard control room.~~
- ~~f) One Remote HMI at Central control room along with connectivity and printers~~
- ~~g) All required printers, scanners and consumables like paper, toners, and printer ribbons shall be supplied.~~



- ~~2.7.0 Phasor Measurement Unit (PMU) shall be provided at both end of transmission line, all transformer, Bus coupler, Both 400 KV Bus with all necessary arrangements. For detail specification of PMU, bidder shall refer the respective detail technical specification (Section-2.28, Volume-II).~~
- 2.8.0 Availability based tariff (ABT) Compatible energy meters (SEM's) for each 400 kV Power transformer bays, line bay and Bus coupler bay.
- ~~2.9.0 Standalone disturbance recorder for each switchyard bay. Alternatively Bidder can offer DR function of numerical relay in case if it confirms to all technical conditions as specified.~~
- ~~2.10.0 Two (2), time synchronization equipment for switchyard control room.~~
- 2.11.0 Set of Special Tools & Tackles, Startup & Commissioning spares.
- 2.12.0 Recommended spares for 3 years of operation & maintenance.
- 2.13.0 Any other item(s) not mentioned specifically but necessary for the satisfactory completion of scope of supply as per accepted standards.

3.0.0 CODES AND STANDARDS

The equipment to be furnished under this specification shall be in accordance with the applicable section of the latest version of the relevant IS/IEC standards including amendments, if any, except where modified and / or supplemented by this specification. Some of the applicable standards are listed below:

| | |
|--|---|
| IEC 62271-1 | High-voltage switchgear and control gear Part 1: Common specifications |
| IEC 62271-203 | HV metal enclosed switchgear for rated voltage of 72.5kV and above |
| IEC 62271-100 | High-voltage alternating-current circuit breakers. |
| IEC 62271-102 | Alternating current disconnecter and earthing switches. |
| IEC 60694 | Common clauses for HV switchgear and control gear standards. |
| IEC 61869 | Current transformers & Voltage transformers. |
| IEC 60060 / IEC 60071 | High voltage test techniques./ Insulation coordination |
| IEC 60099-4/ IEC 60859 | Surge arresters/ Cable connections for GIS. |
| IEC 60137 | Bushings for alternating voltage above 1000V. |
| IEC 60255/ IEC 60265 | Electrical Relays./High voltage switches. |
| IEC 60270 | Partial discharge measurement. |
| IEC 60376 / IEC 60480 | Specification and acceptance of new sulfur hexafluoride. / Guide to checking of sulphur hexafluoride (SF6) taken from electrical equipment. |
| IEC 60529/ IEC 60815 | Degrees of protection/ Pollution levels |
| IEC 61000 / IEC 61634 | Electromagnetic compatibility (EMC) / Use and handling of SF6. |
| IEC 61639 | Direct connections Transformer – GIS. |
| IEC 60364/60479/60621/ IEEE std. 80-1986 | Standards for station grounding for GIS CENELEC/ SVDB Pressure vessel codes. All other relevant IS/IEC/IEEE |



| | |
|----------------|---|
| CEA Guidelines | "Availability Of Spares and Inventories for Power Transmission System (Transmission Lines & Substation/Switchyard) Assets" in July, 2020. |
| CEA Guidelines | "General guidelines for 765/400/220/132 kV Substation and Switch-yard of Thermal/Hydro power projects" in June, 2012. |
| CEA Guidelines | "Guidelines for the Validity Period of Type Test(s) conducted on Major Electrical Equipment in Power Transmission System" in May, 2020 |

~~**4.0.0 GENERAL DESIGN REQUIREMENTS OF 400 KV GIS & OUTDOOR SWITCHYARD**~~

~~4.1.0 The layout of the GIS substation shall be such that adequate space for maintenance of equipment is available.~~

~~4.2.0 The layout of the outdoor switchyard shall be such that adequate space for GIS~~

~~4.3.0 The Outdoor AIS type Surge Arrester (SA) shall be connected to at least two separate earth pits.~~

~~4.4.0 All tension insulator strings shall have double tension string arrangement.~~

~~4.5.0 Marshalling Kiosk: One (1) Marshalling Kiosk shall be provided for each outdoor bay.~~

~~4.6.0 Power Transformer Connections:~~

~~4.7.0 The power transformer overhead stringing/AL Bus pipe shall be brought to a bus post insulator and then connected to the transformer bushing to avoid mechanical forces on the outdoor type AIS Surge Arrester (SA).~~

~~4.8.0 The connections from SA to transformer shall be through shortest electrical distance.~~

~~4.9.0 Corona rings & corona bells shall be used wherever required and same shall be of non-magnetic material. The requirements regarding RIV and corona extinction voltage shall include terminal fittings.~~

~~4.10.0 The connectors for termination of conductor on equipment shall be either of rigid or expansion type suitable for AL59 Twin Moose conductor with sub-conductor spacing.~~

5.0.0 EHV SYSTEM PARAMETERS

5.1.0 400 kV System

| | | |
|-----|---|--|
| (a) | Rated maximum voltage, Vm | 420 kV |
| (b) | Rated frequency | 50 Hz |
| (c) | Rated short time current withstand capacity | 63 kA rms for three (3) second |
| (d) | Rated one minute power frequency withstands voltage | a) 650 kV rms between live terminals and earth b) 815 kV rms across isolating distance |
| (e) | Rated lightning impulse withstand voltage | a) 1425 kVp between live terminals b) 1425 (+240) kVp across isolating distance & earth. |



| | | |
|-----|---|--|
| (f) | Rated Switching Impulse withstand voltage (250/2500 micro sec.) dry and wet | a) 1050 kVp (between phases) b) 900 (+345) (across isolating distance) |
| (g) | Phase to phase spacing (minimum) | 4000 mm |
| (h) | Rated terminal load | Adequate to withstand 100 kg static load as well as wind, seismic and short circuit forces without impairing reliability or current carrying capacity. |
| (i) | System neutral earthing | Effectively earthed |
| (j) | Seismic acceleration | 0.5 g horizontal |
| (k) | Support structure height | Adequate so that lowest part of support insulator of equipment is 2550 mm (minimum) from ground and/or plinth level. |
| (l) | Creepage distance | Minimum 31 mm / kV |
| (m) | Electrical Clearances (minimum) shall be as given below and as per relevant statutory rules/codes | |
| 1 | Max. radio interference voltage for frequency between 0.5 MHz and 2 MHz | 1000 micro-volts at 266kV rms. |
| 2 | Corona extinction voltage | 320kV |
| 3 | One-minute power frequency dry withstand voltage (rms) | 650 kV |
| 4 | Phase to earth | 3500 mm |
| 5 | Phase to phase | 4000 mm |
| 6 | Sectional clearance | 6500 mm |
| 7 | Ground clearance | 8000 mm |

6.0.0 DEGREE OF PROTECTION

Degree of protection for various enclosures as per IS: 13947 shall be considered.

7.0.0 DESIGN & CONSTRUCTION REQUIREMENTS FOR 400 kV GIS SYSTEM

7.1.0 The GIS shall comply with IEC 62271-203/60694. The general requirements and special requirements for Gas insulated switchgear are given in this section. Materials and components not specifically stated in this specification but are necessary for the satisfactory operation of the equipment shall be deemed to be included unless specifically excluded and shall be supplied at no extra cost.



- 7.2.0 The switchgear assembly shall be suitable for installation in indoor area. Constructional features shall be selected not only to withstand satisfactorily the specified atmospheric conditions under Project Information but allow for thermal expansion during its normal use. All components of the same rating and construction shall be interchangeable.
- 7.3.0 Gas enclosures shall be designed to withstand high vacuum by provision of suitable reinforcement(s) at all the required locations. The gas filled enclosures shall conform to relevant pressure vessel code of ANSI/IEC
- 7.4.0 Equipment shall be complete with all necessary supports, platforms, ladders, staircases, catwalks, mechanism cabinets, internal cable raceways etc for each bay and it shall be of extensible design.
- 7.5.0 The GIS shall be modular in structure and shall be housed indoor. The modules shall be single phase encapsulation and provided with hooks for handling by overhead cranes to be provided in the building. The modular design shall be capable of extension on either side without any major dismantling.
- 7.6.0 The equipment and connections within each compartment shall be arranged so as to allow removal and replacement of any section both during normal and abnormal (fault) working conditions with minimum disturbance to adjacent pressurized sections.
- ~~7.7.0 The lines shall be terminated on takeoff gantry. The take-off from GIS shall be through bushing and the post insulator, surge arrester shall be outdoor type. The terminations of Generator transformer shall be over head conductors. High speed earth switches shall be provided where ever required.~~
- 7.8.0 The bus bars shall be rated for the duty specified and current rating shall be derived considering maximum possibilities.
- 7.9.0 The metal enclosures for the GIS shall be made up of non-magnetic material and shall be suitable designed and fabricated from mechanical and electromagnetic aspects. The enclosure surface shall be painted suitably for deterioration due to corrosion, humidity, temperature ageing, and attack from fungus, rodents. Interior finishing shall not contain any substances which could contaminate the SF6 gas and its insulating properties over a period of time. The Painting shall be done considering saline atmosphere C5-M zone as per "ISO-12944" for very high saline zone.
- 7.10.0 The enclosures shall be such as to eliminate dangerous electrostatic charges. The enclosures shall meet the pressure vessel requirement as per ASME or equivalent. The modular design shall offer maximum flexibility from the design, operation and maintenance point of view. The enclosures shall be sectionalized with gas tight barriers between sections or compartments. The wall thickness of the enclosure shall be based on the design pressure as well as considering a burn through duration of 0.1 sec.
- 7.11.0 The support insulators and section barriers shall be free from voids and shall be so designed so as to reduce the electrical stresses to the minimum. Gas barrier insulators and support insulators shall have the same basis of design. The support insulator shall have holes on both sides for proper flow of gas. The section barriers and enclosure walls shall be gas tight (permissible leakage rate of 0.5% per annum) and capable of withstanding the maximum pressure differential i.e. vacuum on one side and maximum gas pressure on other side.
- 7.12.0 Minimum assembly work is envisaged during installation. Each section shall have plug-in or easily removable connection pieces to allow easy replacement of any component with minimum disturbance to the remainder of the equipment.



- 7.13.0 Inspection windows / access openings shall be provided at the switchgear to ensure that each switchgear component can be inspected / monitored during installation and future maintenance.
- 7.14.0 The manufacturer shall guarantee that the pressure loss within each individual gas filled compartment shall not be more than half percent (0.5 %) per year.
- 7.15.0 Each Gas filled compartment shall be equipped with static filters, density switches, filling valve and safety diaphragm. The filters shall be capable of absorbing any water vapor as well as any byproducts of SF6 during interruption.
- 7.16.0 Each gas compartment shall be fitted with pressure relief device for evacuating, gas filling, and for checking the gas pressure /density. Gas pressure and density shall be continuously monitored and displayed by a suitable temperature compensated instrument, which will provide an alarm signal in case of pressure drop before the allowable minimum pressure is reached.
- 7.17.0 The internal components shall be maintenance free for at least 10 years. Routine replacements of insulating gas shall not be required in intervals of less than ten years.
- 7.18.0 The thermal rating of all current carrying parts shall be minimum one second for the rated symmetrical short circuit current.
- 7.19.0 The manufacturer should propose appropriate methods for determination of location of fault.
- 7.20.0 The arrangement of individual switchgear bays shall be such so as to have reasonable free space, neat, logical arrangement and adequate accessibility to all external components.
- 7.21.0 It should be impossible to unwillingly touch live parts of the switchgear. All interlocks that will prevent potentially dangerous mal-operations shall be provided both electrical & mechanical.
- 7.22.0 The enclosure surface shall be smooth with no projection or irregularities which may cause visible corona. No corona shall be visible in complete darkness when the equipment is subjected to specified test voltage.
- 7.23.0 The enclosure shall be of continuous design and shall confirm to clause 10 of IEEE 80: 2000. The enclosure shall be sized for carrying induced current equal to the rated current of bus. The enclosure shall be designed to practically eliminate the external electromagnetic field. And there by electromagnetic stresses even under short circuit conditions.**
- 7.24.0 The average intensity of electromagnetic field shall not be more than 50 micro tesla. The Bidder shall furnish all calculations and documents in support of above during detailed engineering.**
- 7.25.0 The CT's for GIS shall be of external or internal mounted with SF6 Gas insulated type. The secondary terminals shall be brought out in a dustproof enclosure. 0.2s Class metering core of CT and 0.2 Class core of EMVT to be used for ABT (SEM's) meters shall be brought out in separate temper proof enclose with required sealing arrangements.**
- 7.26.0 The switchgear shall have provision for connection with ground mat risers. This shall consist of grounding pads to be connected the ground mat risers with in the vicinity of the equipment.



7.27.0 Indication & Verification of Switch position:

- a) All circuit breakers, isolators and earth switches shall have externally mounted indicators to show clearly the 'open' and 'Close' positions. The indications shall be mechanically coupled directly to the main contact operating drive or linkage and shall be mounted in a position where they are clearly visible. The positions shall be designated as 'Open' and 'Close'. Use of color code alone to differentiate position indication is not acceptable.
- b) The Bidder shall offer equipment fitted with viewing ports on each isolator and earth switch for viewing and illuminating the position of switch. Viewing port shall be of a type whereby the open/close position can be checked without any danger to the eyes should a flashover occur at that time. Viewing port shall be of toughened glass (Acrylic, polycarbonate etc. are not permitted).

7.28.0 During an operation, the level of noise emitted by the switchgear should not exceed the prescribed value in the relevant standard.

8.0.0 LOCAL CONTROL CUBICLE / PANEL

- 8.1.0 Individual local control cubicles / panels for each circuit shall be supplied to facilitate local control of circuit breakers, isolators and earth switches. These panels shall also house the various relays, timers etc. to realise specified interlock requirement among circuit breakers, isolators and earth switches. The contacts, signals and conditions originating from/going to the switchgear, associated auxiliary, monitoring equipment and CT/VT wiring from the terminal boxes shall be wired up to the local control panels. However, CT/VT cores used for ABT (SEM's) meters shall be directly wired up to ABT metering panel without any intermediate junction boxes / any other boxes or panels.
- 8.2.0 Completely separate and isolated circuit shall be used for operating mechanism control, tripping alarms and auxiliary devices. CLOSE and TRIP circuits shall be kept isolated to their final mechanical or electrical actuators. Trip circuits shall have individual monitoring facilities.
- 8.3.0 Mimic diagrams shall be provided on local control panels. The mimic strips shall be made of anodized aluminium and shall be screwed onto the panel. Colours of the various voltages of the mimic bus shall be subject to the approval of the Purchaser/comply with relevant IEC standard. The width of mimic strip shall not be less than 5 mm. Discrepancy switches and semaphore indicator shall be provided on the mimic diagram as approved in during detailed engineering.

9.0.0 SWITCHES/MCBS

- 9.1.0 Switches/MCBs shall be hand operated, air break, heavy duty, quick make, quick break type conforming to applicable IEC standards.
- 9.2.0 It shall be the responsibility of the Manufacturer to fully coordinate the overload and short circuit tripping of the MCBs with the sub circuit MCBs/fuses to provide satisfactory discrimination.
Switch handle shall have provision for locking in both fully open and fully closed positions. MCBs shall preferably be provided with suitable locking facility.
- 9.3.0 Single throw isolating switches for complete isolation of the DC control circuits shall be provided.



10.0.0 FUSES (if required)

- 10.1.0 Only HRC fuses shall be used & shall have a rupturing capacity of not less than 80 kA at 220V DC.
- 10.2.0 Fuses shall be provided with visible operation indicators to show that they have operated.

11.0.0 CONTROL & AUXILIARY POWER SUPPLY

- 11.1.0 Control and selector switches shall be of the rotary type provided with properly designated escutcheon plates clearly marked to show the operating positions. Control switches shall have momentary contacts, spring return to normal, with pistol grip handle. Selector switches shall have stay put contacts with oval handles. The local/remote selector switch shall be lockable in both positions. Colour of these switches shall be black. The number of contacts and their operation in each switch position shall be as per the requirements of the connected circuit. The switches shall be rated for minimum 10 A at 240V AC and 1 A inductive break at specified DC voltage.
- 11.2.0 All control equipment shall be suitable for operation on specified DC system.
- 11.3.0 Separate circuits with switches, fuses, etc. of adequate rating shall be provided for control of space heater, lighting and power receptacle. These shall be on 240 V, ph AC supply, unless specified otherwise.
- 11.4.0 D.C. & A.C. power supply shall be done in a manner which will enable isolation of individual equipment. Common supply bus shall be formed in the cubicle and then power supply shall be distributed to individual equipment through MCBS/fuses.

12.0.0 RELAYS

- 12.1.0 Relays for various controls, monitoring and blocking functions of particular circuit element shall be numerical installed in associated local control panel. All relay shall have dust tight covers.
- 12.2.0 Necessary auxiliary relays for alarm, time-delay relays, voltage relays as required for control and protection shall be mounted inside the local control panel. Voltage operator relays shall have sufficient thermal capacity for continuous energization, using external resistors, if necessary.
- 12.3.0 Auxiliary relays shall be rated to operate satisfactorily between 80% and 110% of the specified rated voltage.
- 12.4.0 Each relay shall be provided with at least 3 NO and 3 NC potential free contacts for external use.
- 12.5.0 Coils of all the relays shall be adequately rated to avoid spurious operation of relays on D.C. system ground or induced surges.
- 12.6.0 All relays shall be tropicalised and shall be suitable for maximum ambient temperature of 50°C.
- 12.7.0 Make and type of relay shall be subject to approval of the Purchaser.
- 12.8.0 Master trip relay shall be Bistable Relay (ABB PSU 14x or equivalent) with remote reset and its coil supervision system.



12.9.0 All numerical relays shall have built in disturbance recording feature.

12.10.0 All protective relays shall be numerical type with IEC 61850 communication interface and should have Interoperability during integration of numerical relays to communicate over IEC61850 protocol with RTU/SAS/IEDs of different OEMs.

13.0.0 PUSH BUTTONS AND LED INDICATING LAMPS

All push buttons shall be of push to actuate type having 2 NO and 2 NC self-reset contacts. They shall be provided with integral escutcheon plates, engraved with functions. Push button contacts shall be rated for 10 A at 240 V AC and 1 A inductive breaking at specified DC voltage. Push buttons shall be provided with true color integral LED lamps.

14.0.0 SPACE HEATER

Strip type space heaters of adequate capacity shall be provided inside each cabinet/control panel. Heaters shall be complete with rotary type ON-OFF switch, HRC fuse on phase or a single-pole MCB with overload and short circuit protection, link on the neutral and a thermostat to cut off the heater at 45 °C. The heaters shall be suitable for operation on a 240V, 1 phase 50 Hz supply. Space Heaters material shall be of SS304.

15.0.0 INTERNAL WIRING

15.1.0 Cabinets/Panels shall be supplied completely wired ready for external connections at the terminal blocks. All wiring shall be carried out with wires of 650 V grade, stranded copper conductors. The insulation shall be halogen free and flame retardant. Power circuits shall be wired with stranded copper conductors of adequate sizes to suit the rated current, the minimum size shall be 2.5 sq. mm. Unless otherwise specified, control alarm and indication circuits shall be wired with stranded, tinned copper conductors of sizes not smaller than 1.5 sq. mm. CT and VT circuits shall be wired with stranded copper conductor of size not smaller than 2.5 sq. mm.

15.2.0 Engraved identification ferrules, marked to correspond with the wiring diagram shall be fitted at both ends of each wire. All wiring shall be terminated on terminal blocks. Terminals shall be adequately rated for the circuit current, minimum rating shall be 10 A. Control wiring shall be protected against mechanical damage.

15.3.0 CT and PT terminals shall have disconnecting and other device terminals shall be of stud type.

15.4.0 The wire terminations shall be made with solder less crimping type of tinned copper lugs.

15.5.0 Wiring shall be colour coded and be firmly supported, neatly installed by lacing and taping readily accessible and connected to equipment terminals and terminal blocks. Halogen free, flame retardant plastic wiring channels/throughs with strap on covers shall be used for this purpose.

16.0.0 LOCAL ALARM/ANNUNCIATION

16.1.0 Window type alarm annunciation shall be provided on local control panels of each bay for the specified abnormal conditions. The alarm windows shall have provision for differentiating cleared and uncleared faults and flashing for new faults. Annunciator shall have RS-485 Modbus two way communication with remote reset by potential free contact integrated to SCADA system.



16.2.0 Windows for the following unhealthy conditions shall be provided:

- a. Low Gas pressure for each gas compartment of the bay.
- b. Low-very Low Gas pressure for each gas compartment of the bay.
- c. High gas pressure for each gas compartment of the bay.
- d. Lock Out or, Tripping mechanism
- e. Breaker pole discrepancy
- f. CB motor run time exceed
- g. CB's DC MCB motor trip
- h. Isolator open/close incomplete
- i. Control supply fails.

16.3.0 In addition to the above, the manufacturer may add any other condition, as felt necessary for annunciation. Auto reclosing facility should be available. Minimum three nos. of facia / windows (Wired up to TB) shall be available for spare / future use by the Owner.

17.0.0 LABELS AND DIAGRAM PLATE, RATING PLATES

17.1.0 Every GIS equipment and devices mounted in the cabinet/control panel shall be provided with individual labels with equipment designation/rating. Also, the cabinet/control panel shall be provided on the front with a non-rusting label engraved with the designation of the cabinet/control panel.

17.2.0 Inside the door, a metal pouch shall be provided along with as built drawings copy of the respective panel.

17.3.0 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, Customer Name, year of manufacture, equipment name, type & 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 Owner. The rating plate of each equipment shall be according to IS/IEC requirement.

17.4.0 All such nameplates, instruction plates, rating plates of transformers, Circuit Breaker, Current Transformer, CVT, Surge Arrester, Disconnecting Switches, C&R Panels and PLCC equipment shall be bilingual with Gujarati inscription first followed by English. Alternatively two separate plates with one Gujarati and the other with English inscriptions may be provided.

18.0.0 EARTHING

18.1.0 The Bidder shall provide a "Main Ground Bus" for the specified short circuit current magnitude and duration to which all intentionally earthed parts of the assembly shall be bonded.

18.2.0 High frequency earthing for GIS shall be provided.

18.3.0 It shall be the responsibility of the Manufacturer to provide a sufficient number of earth connections so that dangerous voltages are not induced in the enclosure by the fault currents circulating in the inner conductor. The earthing terminal shall have clamping screw or bolt of at least 12mm for connection to earthing conductor. The connecting point shall be marked with the 'Protection Earthing Symbol' as per IEC-60417.

18.4.0 Provision shall be made for future extension and/or bonding to ground bus of other switchgear.

18.5.0 The Bidder shall furnish full details of the circulating currents expected to flow from the switchgear metal cladding to enable the Purchaser to design the main earthing grid.



18.6.0 Every section of the SF6 switchgear equipment including all panels, cubicles, kiosks and boxes shall be solidly bonded to the earthing system, by at least two independent leads.

18.7.0 The design of the earthing system shall be such as to ensure the safety and protection of all operating and maintenance personnel under all normal and fault conditions. The earthing of GIS shall be as per the standard CIGRE -44 "Earthing of GIS-an application guide".

19.0.0 OTHER CONSTRUCTION REQUIREMENTS

19.1.0 The switchgear assembly shall be suitable for installation in indoor area. Constructional features shall be selected not only to withstand satisfactorily the specified atmospheric conditions under Project Information but allow for thermal expansion during its normal use.

19.2.0 The typical layout for 400 kV GIS building shall be one storied building housing GIS Bays with Local control panel/cabinet etc. with space provision for future reactor bay and other one bay extension for future use if any including future requirement of adaptor panel.

19.3.0 The GIS Building shall have the space for operator's cabin/rooms for GIPCL staff and maintenance bay as per standard requirements.

~~19.4.0 The GIS building shall be of pre-fabricated type as per prevailing standard and shall be with illumination & ventilation.~~

~~19.5.0 Control & Relay panel and SAS/SCADA system, LT DBs, Panels, DC Batteries, Battery Chargers, UPS etc. with cable trays for the switchyard shall be housed in PEB type substation control building. And shall be completed in all respect including required illumination, earthing, lightning protection and different rooms as per tender drawing of substation control building. However during detail engineering, if the building size comes to be higher size then the same shall be constructed by PSS package vendor without any extra claim to Owner.~~

~~19.6.0 The GIS floor shall be of epoxy. The outdoor switchyard shall be of PCC flooring.~~

~~19.7.0 The switchyard area shall have at two locations storm and drain water pit along with sump pump. The same shall be supplied & installed by 400kV pooling substation package vendor only. However, the no. of locations shall be finalized during detail engineering based on actual requirement.~~

~~19.8.0 Electrical Insulating mat (as per IS: 15652) shall be provided for all the associated LT panels (in front as well as back of the panel) under the PSS package scope.~~

~~19.9.0 The PEB type Substation control building shall have following minimum provisions:~~

- ~~a) Pooling substation In-Charge room~~
- ~~b) Operation & Maintenance engineer room~~
- ~~c) Electrical Battery Room~~
- ~~d) AHU Room~~
- ~~e) Toilets (one for officers near control room/ for workers)~~
- ~~f) Conference room~~
- ~~g) LV Panel room~~
- ~~h) Air conditioned control room.~~
- ~~i) Switchgear Room~~
- ~~j) LAB~~
- ~~k) Pantry~~



~~However the requirements of rooms shall be finalized during detail engineering based on final requirement & approval of Owner without any extra claim to owner.~~

20.0.0 PERFORMANCE GUARANTEE

- a) The Bidder shall guarantee the successful and satisfactory operation of the equipment furnished under this contract and shall meet the ratings and performance requirements as stipulated in this specification.
- b) Bidder shall conduct the performance guarantee testing in line with the stipulations of specification including but not limited to data specified in Vol.-II, Section-3.0 (Technical Data Sheets And Schedules) and shortfall of guaranteed ratings should be satisfactorily rectified and /or replaced, within a time period decided by the OWNER. After rectification, re-testing shall be carried out by Bidder till the satisfactory performance in the opinion of OWNER is achieved. No extra cost shall be charged to the OWNER for such rectification and re- testing. However, if even after modification and rectification, the Bidder is not able to demonstrate the guarantees by re-testing, OWNER at his discretion may reject the equipment and recover the payment- already made or accept the equipment only after deducting from the contract price an amount equivalent to the deficiency of the equipment system as assessed by the OWNER.
- c) The Bidder shall further guarantee that the equipment provided by him shall be free from the defects in design, material and workmanship and shall upon written notice from the OWNER, fully rectify, free of expenses to the OWNER such defects as developed under the normal use of the said equipment within the period of guarantee / warranty.

21.0.0 QUALITY ASSURANCE, INSPECTION & TESTING

The Bidder shall carry out a comprehensive inspection and testing program during manufacture of the equipment.

The makes of all major bought out items shall be subject to Owner's approval. The Bidder shall also prepare a comprehensive inspection and testing program for all bought out/sub-contracted items and shall submit the same to the Owner.

GIS shall be completely assembled with all fittings & accessories meant for the particular breaker before offering for inspection & testing by Owner.

22.0.0 LIST OF TESTS TO BE CONDUCTED FOR 400 KV GIS PACKAGE

22.1.0 Type Tests

1. Tests to verify the insulation level of the equipment and dielectric tests on auxiliary circuits.
2. Tests to prove the radio interference voltage (RIV) level (if applicable)
3. Tests to prove the temperature rise of any part of the equipment and measurement of the resistance of the main circuit.
4. Tests to prove the ability of the main and earthing circuits to carry the rated peak and the rated short-time withstand current
5. Tests to verify the making and breaking capacity of the included switching devices
6. Tests to prove the satisfactory operation of the included switching devices
7. Tests to prove the strength of enclosures
8. Verification of the degree of protection of the enclosure
9. Gas tightness tests
10. Electromagnetic compatibility tests (EMC)



11. Additional tests on auxiliary and control circuits
12. Tests on partitions
13. Tests to prove the satisfactory operation at limit temperatures
14. Tests to prove performance under thermal cycling and gas tightness tests on Insulators
15. Corrosion test on earthing connections (if applicable)

The Contractor shall submit the type tests reports for the tests conducted on the equipment similar to those to be supplied under this contract and the test(s) should have been conducted at an independent laboratory not earlier than ten (10) years from date of Letter of Intent (LoI).

Type tests including the Short Circuit Test should be conducted at CPRI / ERDA / KEEMA / PEHLA / CESI / CERDA / JSIC / Intertek (ASTA). GIS make shall be indigenous.

In case the contractor is not able to submit valid report of the type test(s) or in the case type test report(s) are not found to be meeting the specification requirements, the contractor shall conduct all such tests under this contract free of cost. The owner shall have right to witness the type tests. Waiver of type tests will not be entertained.

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

22.2.0 Routine Tests

All the acceptance and routine tests as per the specification and the relevant standards shall be carried out. Charges for these shall be deemed to be included in the equipment price. For all indoor GIS & outdoor switchyard equipment, routine tests shall be conducted as per relevant IEC standards.

The routine tests in line with IEC shall be conducted on GIS & shall also include the following.

- a) Pressure test on all individual enclosures.
- b) Gas leakage test on all modules after assembly
- c) Circuit breaker tests
 - 1) All mechanical operation like visual checks, timing test, operation of magnetic release. Operating test of motor and hydraulic or pressure mechanism etc.
 - 2) Measurement of resistance
 - 3) Check of auxiliary and control circuit (2000 V for 1 minute)
 - 4) Power frequency voltage dry test of main circuit.
- d) Tests on disconnect switches and ground switches
 - 1) Visual check of fifty operating cycles at rated supply voltage
 - 2) Visual check of ten operating cycle at specified maximum voltage
 - 3) Visual check of ten operating cycle at specified minimum voltage
 - 4) Measurement of resistance of main circuit.
 - 5) Check of auxiliary and control circuit 2000 V for 1 minute
 - 6) Power frequency voltage dry test of main circuit.
- e) Current transformer tests are IEC 185, clause 9.2 in NABL accredited laboratory
 - 1) Verification of terminal markings.
 - 2) Power frequency with stand tests on secondary windings.
 - 3) Power frequency with stand tests between sections
 - 4) Inter turn over voltage test
 - 5) Power frequency withstand voltage test on primary voltage measurement of partial discharges
 - 6) Test for accuracy
- f) Potential transformer tests as per IEC 186 clause 10.2 in NABL accredited laboratory
 - 1) Verification of terminal markings.



- 2) Power frequency with stand tests on secondary windings.
- 3) Power frequency with stand tests between sections
- 4) Induced over voltage withstand test
- 5) Measurement of partial discharges (150% of rated max. phase)
- 6) Test for accuracy
- g) Pressure and gas tightness test
- h) Tests on complete assembled feeder bay
- 1) Dielectric voltage with stand
- I. Power frequency voltage test
- II. Lightning Impulse withstand voltage test
- III. Switching Impulse withstand voltage test
- IV. Partial discharge test
- 2) Measurement of the resistance of the main circuit
- 3) Gas tightness test
- i) All test on local control cabinets as IEC

22.3.0 Field Tests

Before assembly and installation, all parts of switch gear shall be checked properly and during inspection if any damage found, the same shall be repaired or equipment replaced by Bidder. After installation complete assembly shall be field tested as per IEC. The testing equipment including high voltage testing kit shall be arranged by Bidder which may be taken back by the Bidder. The following field tests shall be performed:

- a) Dielectric Test
 - 1) Power frequency voltage withstand test
 - 2) Partial discharge measurement test
- b) Visual inspection, checks and verifications
- c) Mechanical operation tests of circuit breakers, isolated and grounding switches and high speed grounding switches.
- d) Gas leakage test.
- e) Insulation resistance measurement
- f) DC resistance measurement of the main circuit
- g) Gas density monitor check
- h) Inter lock test
- i) Measurement of moisture content
- j) Manual operating check of circuit breakers, isolators and grounding switches.
- k) Voltage tests on the main circuit as per IEC 517.
- l) Power frequency test of auxiliary & control circuit (2kV rms for 1 minute)
- m) Voltage transformer should withstand 1 minute power frequency test

23.0.0 SPARES

23.1.0 Spares

23.1.1 The Bidder shall include in his scope:

- (a) Start-up / commissioning spares as necessary.
- (b) Mandatory Spares
- (c) Recommended Spares

Bidder shall also state for each item of spares both mandatory and recommended, the normal expected service life. The spares shall be as per provided as per CEA guidelines "Availability of Spares and Inventories for Power Transmission System (Transmission Lines &



Substation/Switchyard) Assets" in July, 2020 or as specified in this RFP documents whichever is higher / stringent.

- 23.1.2 The spares shall be delivered at the site well in time as per the schedule agreed during the award of contract, well before the start up and commissioning of the plant.
- 23.1.3 All spares supplied under this contract shall be strictly interchangeable with the parts for which they are intended to replace. The spares shall be treated and packed for long storage under the climatic conditions prevailing at site.
- 23.1.4 Each spare part shall be clearly marked or labelled on outside of the packing with the description as indicated elsewhere in the specification.
- 23.1.5 In all cases, containers or other packages is liable to be opened for examination as may be considered necessary by the Purchaser.

23.2.0 Start Up & Commissioning Spares

Start Up spares (also termed as 'commissioning spares') are those spares which will be required during the startup and commissioning of the equipment / systems and until performance testing. It is the responsibility of the Bidder to supply all necessary spares as required until the equipment / systems are handed over to the Purchaser. An adequate stock of startup spares shall be made available at the site such that the start up and commissioning of the equipment / systems, performance testing and handing over the equipment / systems to the Purchaser can be carried out without hindrance and delays. Bidder shall furnish the list of Start Up and Commissioning Spares to be brought by them to ensure smooth commissioning of the plant.

23.3.0 Mandatory Spares

The list of mandatory spares, which are considered essential by the Purchaser, is indicated elsewhere in the Specification and Bidder shall include the unit price and total price for all these spares. The Prices for mandatory must be given separately and shall be used for Bid Evaluation.

23.4.0 Recommended Spares

In addition to the spares mentioned above, Bidder shall also furnish in the Schedule of Recommended Spares a detailed list of recommended spare parts for three (3) years normal operation with unit prices. The Purchaser reserves the right to buy any of the recommended spare parts as considered necessary by them.

A detailed list of recommended spares shall also be furnished by the Bidder for ten years of operation and maintenance of the plant. This list shall also take into consideration the mandatory spares indicated elsewhere in the specification. The prices of any recommended spares, which are not common with mandatory spares, shall be subject to review by the Purchaser and shall be finalised after mutual discussion.

24.0.0 SPECIAL TOOLS & TACKLES

A set of special tools and tackle which are necessary or convenient for erection, commissioning and putting into satisfactory operation, maintenance and overhauling of the equipment shall be supplied. The tools shall be shipped in separate containers, clearly marked with the name of the equipment for which they are intended. For Online Partial Discharge system special tools for cutting and crimping of coaxial cable with 'N Connectors' shall be supplied.



25.0.0 BIDDER DATA / INFORMATION TO BE SUBMITTED BY THE BIDDER ALONG WITH THE BID

Bidder shall furnish the following drawings & documents along with bid

- a) Data Sheets
- b) Dimensional general arrangement drawings showing the equipment position and identification including control block.
- c) Type Test Reports.
- d) Technical leaflets and catalogues of equipment supplied.
- e) Experience list for similar rating equipment.

26.0.0 DRAWINGS AND DOCUMENTS TO BE SUBMITTED AFTER AWARD OF CONTRACT

- 26.1.0 Development of General arrangement drawings
- 26.2.0 Development of detailed layout (Plan & section / elevation) drawings
- 26.3.0 Development of Single line drawings with parameters of equipment and details of protection
- 26.4.0 Development of protection & control philosophy, selection of protection, control and annunciation schemes.
- 26.5.0 Development of interlocking schemes
- 26.6.0 Design and Development of earthing system
- 26.7.0 Insulation coordination and lightning protection design calculations
- 26.8.0 Lighting system design, Lux level calculations and conduit wiring diagrams
- 26.9.0 Development of power & control cable laying and termination schedules.
- 26.10.0 Development of erection key diagrams with bill of material.
- 26.11.0 Development cable trench layout and sections & release of construction drawings.
- 26.12.0 Calculations for electric & magnetic field strength, corona extinction voltage for conductor and height of bus/equipment height selection.
- 26.13.0 Relay setting calculations along with programming charts
- 26.14.0 All drawings related to 400 kV GIS substation package.
- 26.15.0 Shop inspection and testing procedures along with QAP
- 26.16.0 Routine Test Certificates reports for all equipment under this package.
- 26.17.0 Complete erection, testing commissioning of all the equipment required for complete 400 kV GIS pooling substation package. The field testing equipment required for site testing shall be arranged by the Bidder.



SECTION – 2.4

400 KV GAS INSULATED EQUIPMENT

A) CIRCUIT BREAKERS

1.0.0 CODES & STANDARDS

| | | |
|------|--------------------------|---|
| i. | Gas Insulated Switchgear | IEC 62271-203 / IEC 60694 IEEE C37.122-1993, CIGRE – 44 "Earthing of GIS an application guide (Elecra no. 151, dec'93), IEC 62271-306,305, IEC 60859, IEC 60071, IEC 62271-102, IEC 60137, IS 2705, IS 3156 |
| ii. | Circuit Breakers | IEC 62271-100, IS: 2516, IEC 60480 |
| iii. | SF6 Gas | IEC 60376 |
| iv. | SF6 Cylinders | IS: 4379, IS: 7285 |
| v. | Air Receivers | BS: 5179, BS: 5500 |
| vi. | Air Piping | BS: 2871 |

2.0.0 TYPE

Indoor SF6, single pressure puffer type re-strikes free and without opening resistors

3.0.0 RATING

3.1.0 400 kV Circuit Breaker

| | | |
|----|--------------------------------------|--|
| a) | Voltage | 420 kV |
| b) | No. of poles | 3 |
| c) | Rated Continuous Current | As required |
| d) | Rated Short Circuit Breaking Current | 63 kA, 3 sec, with percentage of DC component as per IEC 62271-100 corresponding to minimum opening time under operating conditions specified. |
| e) | Short Circuit Making Current | 157.5 kAp |
| f) | Rated Line charging Breaking Current | 400 A |
| g) | Rated Break Time | Not more than 40 ms |
| h) | Rated Closing Time | Not more than 45 ms |
| i) | Class | E2-M2-C2 |



4.0.0 OPERATIONAL REQUIREMENTS

- 4.1.0 Rated Operating Duty Cycle O-0.3 sec. – CO- 1 min- CO
- 4.2.0 Re-Closing Single and three phase high speed auto re-closing
- 4.3.0 Trip and closing coil voltage : 220V DC
- 4.4.0 Auxiliary contacts : As required plus 5NO and 5NC contacts per pole per CB wired up to TB as future spare
- 4.5.0 Noise level : As per IEC 61672
- 4.6.0 Controls
- 4.7.0 Closing Circuits : Shall operates correctly at all values of supply voltage between 85% and 110% of rated voltage.
- 4.8.0 Trip Circuits : Two independent tripping circuits, valves, pressure switches and coils to be provided for connection to different set of relay. The circuits shall operate correctly under all operating conditions upto rated breaking capacity and at all values of supply voltage between 70% to 100% of rated supply voltage. However even at 50% of rated supply voltage the breaker shall be able to operate. Trip coil supervision to be provided in both open and close position.
- 4.9.0 Operation : Shall have both local and remote operation of breaker with local/remote lockable selector switch and close and trip control switch/push buttons shall be provided in the breaker control cabinet.
- 4.10.0 Pressure Switch Contacts : Shall have density meter and pressure switch contacts suitable for direct use as permissive in closing and tripping circuits. Separate contacts to be used for each of tripping and closing circuits. Fail safe logic/schemes to be employed if multiplying relays used.
- 4.11.0 Supply Voltage monitoring : DC supply voltage for all auxiliary circuits to be monitored. Provision to be made for remote annunciations and operation lockout in case of supply failure.
- 4.12.0 Out of phase closing : One closing operation under phase opposition with twice rated voltage across terminals.



- 4.13.0 Safety aspect : Breaker position to be maintained on loss of operating media and/or quenching media pressure.
- 4.14.0 Central Control Cabinet : A central control cabinet shall be provided which shall house all the control equipment required for operation, indication, lockout and all requirements as per detailed list given below:
a) Local/remote changeover switch
b) Operation counter
c) Annunciator
d) SF6 pressure gauges
e) Power supply control switches
f) Fuses
g) Anti-pumping relay
h) Pole discrepancy relay
i) AC/DC supervision relays
- 4.15.0 The circuit breaker shall also be capable of
a) Interrupting line charging current as per IEC without any restrike and without use of opening resistors
b) Clearing short line fault current with source impedance behind the bus equivalent to symmetrical fault current specified
- 5.0.0 DESIGN AND CONSTRUCTIONAL FEATURES**
- 5.1.0 Interrupter shall be with adsorbing product box to minimize the effect of SF6 decomposing product and moisture.
- 5.2.0 SF6 Density Monitoring
(i) SF6 Density shall be monitored and regulated on each pole using individual pressure switches and pressure gauges.
(ii) Density Monitor shall be adequately temperature compensated
(iii) It shall be possible to dismantle the monitor without draining SF6 gas & also to remove SF6 gas from each pole separately for maintenance purpose.
- 5.3.0 D.C. Supply : Dual DC supply shall be provided for connection to independent trip circuits, monitoring & control circuits.
- 5.4.0 Aux. switch : Aux. switch of breaker to be positively driven by operating rod.



- 5.5.0 Operating Mechanism
- 5.5.1 Type : hydro-spring or spring-spring charged or combination of these with Anti-pumping and trip free features.
- 5.5.2 Housing : Operating box/cabinet shall be accessible to man standing on ground and shall be hot dip galvanized
- 5.5.3 Operation indicator : A mechanical indicator to show open/close position of breaker shall be provided which should be visible with housing closed
- 5.5.4 Power supply. : Dual AC power supply with changeover facility.
- 5.5.5 Spring Operated Mechanism
- (i) Shall be complete with motor, opening and closing spring with limit switch for automatic charging and shall generally meet all the design and operation requirements for satisfactory and trouble free operation.
 - (ii) Motor shall be rated to fully charge the closing springs in less than 30 seconds and shall have adequate thermal rating for repeated sequence of closing and opening operations of breaker.
 - (iii) Closing action of mechanism shall compress/charge the opening spring so that it is ready for tripping. Closing springs shall be immediately charged after the closing operation. After failure of power supply, at least one CO operation should be possible. Breaker operation shall be prevented when spring is in partial charged condition. Indication of spring in charged condition shall be provided in local and remote cabinet.
- 5.5.6 Hydro-spring Drive mechanism
- (i) The Circuit Breaker can be operated by Hydro-spring mechanism which shall be complete with motor as per manufacturer's type tested design.
 - (ii) The mechanism shall be housed in a dust proof cabinet and shall have IP: 41 degree of protection.
 - (iii) The operating mechanism shall be suitable for high-speed reclosing.
 - (iv) During reclosing the breaker contacts shall close fully and then open. The mechanism shall be anti-pumping and trip free (as per IEC definition) under every method of closing.
 - (v) The Mechanism shall be such that the opening and closing of contacts shall take place through common spring. The transfer of energy for operation may take place through oil.
- 5.6.0 Multi-break interrupters shall have uniform voltage distribution across them.
- 5.7.0 Breakers shall have provision for attaching operational analyzer.



5.8.0 Bidder shall supply spare SF6 gas equal to 20% of the total requirement for the station.

5.9.0 **SF6 Gas**

SF6 gas shall in general confirm to IEC 60376 but for following recommendations:

| | |
|------------------|---------------------|
| Air | ≤ 250 ppm by weight |
| CF ⁴ | ≤ 250 ppm by weight |
| H ₂ O | ≤ 5 ppm by weight |
| Mineral oil | ≤ 5 ppm by weight |

6.0.0 **MANDATORY MAINTENANCE EQUIPMENT**

The following (1 no. each) shall be supplied along with circuit breakers.

6.1.0 SF6 gas handling equipment

Shall be of proven make and shall be supplied complete with all necessary pipes, plants, coupling, flexible tube and valves and shall comprise of the following:

(i) SF6 Gas filling and evacuating plant

Portable plants shall evacuate SF6 to required vacuum and fill to required pressure in a complete three pole breaker within a reasonable time.

ii) SF6 gas filtering, drying, storage and recycling plant

a) Shall have a capacity to store and handling at least 300 liters of SF6 Gas & suitable to transfer SF6 gas directly from breaker to plant reservoir. The SF6 Gas service cart should be DILO make , Model No B057R17 with Digital weighing scales, DN8 hose and coupling - 6-1037-R050 (If required), tool box, shelf plate, DN20 Braided Hose and coupling tongue (if required), and spare part kits..

b) Shall include necessary equipment for purging the plant before filling SF6.

c) Shall be mounted on trolley or rollers.

d) Shall include devices to measure purity, moisture content (or dew point measurement), air content, decomposition products, etc. of SF6 gas. The devices shall have built-in calibration facility & the sensitivity shall not be affected by dust, humidity, heat, wind, etc.

6.2.0 SF6 gas Leakage Detector / Pointer should be DILO make , Model No 3-033-R002 with spare sensor kit, carrier case, and operating manual. It shall have an accuracy of at least 5ppm. & shall reach all point on the breaker where leakages are possible. Shall be free from induced voltage effects.

6.3.0 **Operational Analyzer**

(i) Shall be one complete system of DILO make of Model No 3-038R-R303 for out-door use with necessary transducers (three to record speed and travel of 3 poles of breaker), cables, pickups, attachments, etc.

(ii) Shall have provision to record at least 12 function of breaker.



- (iii) Shall be suitably shielded against induced charges.
- (iv) Shall record breaker contact movement during opening, closing, auto re-closing and make break operations, speed of contacts at various stages of operation, travel of contacts, opening time, closing time, make break time, etc.
- (v) Shall have output on plain paper requiring no special storage facility.
- (vi) Shall be suitable for outdoor use and shielded against induced charges. with Transport Case, 6 meter long hose, , DN8, DN20, coupling, 2 meter long cable, USB stick with data files, user manual, router set with case, wireless operation via mobile, two year direct connect service plan and training) with optional Adapter case for measuring device Kit DN8 Testing & Filling (if applicable), optional 6 m long connecting extension hose with self-closing couplings etc.

B) DISCONNECTING SWITCHES & EARTH SWITCHES

1.0.0 CODES AND STANDARDS

Disconnecting Switches and Earth Switches IEC: 62271-102 IS: 9921

2.0.0 TYPE

Three separate poles mechanically coupled and group operated, motor as well as manual operated

3.0.0 RATING

3.1.0 Disconnecting Switches (DS)

| For 400 kV: | | |
|--------------------|---|---|
| (i) | Rated continuous Current | As required |
| (ii) | Short circuit making current | 157.5 kAp |
| (iii) | Rated Mechanical Terminal Load | As per Table III of IEC |
| (iv) | Auxiliary contacts | As required plus 4 NO + 4 NC per DS as spare |
| (v) | Temperature Rise | As per Table V of IEC 60694 for specified ambient |
| (vi) | Rated withstand voltage across isolating distance - Power frequency - Lightning impulse | 650 kV 1425 kVp |
| (vii) | Rated capacitive current make and break capacity | 0.50A |
| (viii) | Class | M2 |



3.2.0 Earth Switch (ES)

| For 400 KV: | | |
|-------------|-------------------------------|--|
| (i) | Short circuit making capacity | 157.5 kAp |
| (ii) | Rated short time current | 63 kA |
| (iii) | Auxiliary contacts | As required plus 4 NO + 4 NC per ES as spare |
| (iv) | Class | M2-E1 |

4.0.0 DESIGN AND CONSTRUCTIONAL FEATURES – DISCONNECTING SWITCHES

- 4.1.0 The three pole group operated disconnectors shall be operated by electric motor suitable for use on 220 V DC system and shall be equipped with a manual operating mechanism for emergency use. The motor shall be protected against over current and short circuit.
- 4.2.0 Disconnectors shall be designed as per relevant IEC. These shall be suitable to make and break the charging currents during their opening and closing. They shall also be able to make and break loop current which appears during transfer between bus bars. The contact shielding shall also be designed to prevent restrikes and high local stresses caused by transient recovery voltages when these currents are interrupted.
- 4.3.0 The disconnecting switches shall be arranged in such a way that all the three phases operate simultaneously. All the parts of the operating mechanism shall be able to withstand starting torque of the motor mechanism without damage until the motor overload protection operates.
- 4.4.0 It shall be possible to operate the disconnecting switches manually by cranks or hand wheels. The contacts shall be both mechanically and electrically disconnected during the manual operation.
- 4.5.0 The operating mechanisms shall be complete with all necessary linkages, clamps, couplings, operating rods, support brackets and grounding devices. All the bearings shall be permanently lubricated or shall be of such a type that no lubrication or maintenance is required.
- 4.6.0 The opening and closing of the disconnectors shall be achieved by either local or remote control. The local operation shall be by means of a two-position control switch located in the bay module control cabinet.
- 4.7.0 Remote control of the disconnectors from the control room shall be made by means of remote/ local transfer switch.
- 4.8.0 The disconnector operations shall be inter-locked electrically with the associated circuit breakers in such a way that the disconnector control is inoperative if the circuit breaker is closed.



- 4.9.0 Each disconnector shall be supplied with auxiliary switch having six normally open and six normally closed contacts wired up to TB for future use over and above those required for switchgear interlocking and automation purposes. The auxiliary switch contacts are to be continuously adjustable such that, when required, they can be adjusted to make contact before the main switch contacts.
- 4.10.0 The signaling of the closed position of the disconnector shall not take place unless it is certain that the movable contacts will reach a position in which the rated normal current, peak withstand current and short-time withstand current can be carried safely.
- 4.11.0 The signaling of the open position of the disconnector shall not take place unless the movable contacts have reached such a position that the clearance between the contacts is at least 80 percent of the rated isolating distance.
- 4.12.0 All auxiliary switches and auxiliary circuits shall be capable of carrying a current of at least 10 A DC continuously.
- 4.13.0 The auxiliary switches shall be capable of breaking at least 2 A in a 220 V DC circuit with a time constant of not less than 20 milliseconds.
- 4.14.0 The disconnectors and safety grounding switches shall have a mechanical key (pad locking key) and electrical inter-locks to prevent closing of the grounding switches when isolator switches are in the closed position and to prevent closing of the disconnectors when the grounding switch is in the closed position.
- 4.15.0 The local control of the Isolator and high-speed grounding switches from the bay module control panel should be achieved from the individual control switches with the remote/local transfer switch set to local.
- 4.16.0 All electrical sequence interlocks will apply in both remote and local control modes.
- 4.17.0 Each disconnector shall have a clearly identifiable local, positively driven mechanical position indicator, together with position indicator on the bay module control cabinet and provisions for taking the signals to the control room. The details of the inscriptions and colouring for the indicator are given as under:

| | SIGN | COLOUR |
|------------------------|-------------|---------------|
| Open position | Open | Green |
| Closed position | Closed | Red |

- 4.18.0 All the disconnecting switches shall have arrangement allowing easy visual inspection of the travel of the switch contacts in both open and close positions, from the outside of the enclosure.
- 4.19.0 The disconnecting switches shall be provided with rating plates and shall be accessible for inspection.
- 4.20.0 The disconnecting switches shall be capable of being padlocked in both the open and closed positions with the operating motor automatically disengaged. The padlocking device shall be suitable for a standard size lock with a 10 mm shank. The padlock must be visible and directly lock the final output shaft of the operating mechanism. Integrally mounted lock when provided shall be equipped with a unique key for such three phase group. Master key is not permitted.



5.0.0 DESIGN AND CONSTRUCTIONAL FEATURES FOR SAFETY EARTH SWITCHES

5.1.0 The three pole group operated disconnectors shall be operated by electric motor suitable for use on 220 V DC systems and shall be equipped with a manual operating mechanism for emergency use. The motor shall be protected against over current and short circuit.

5.2.0 Each safety grounding switch shall be electrically interlocked with its associated disconnector and circuit breaker such that it can only be closed if both the circuit breaker and disconnector are in open position. Safety grounding switch shall also be mechanically key interlocked with its associated disconnector.

5.3.0 Each safety grounding switch shall have clearly identifiable local positive driven mechanical indicator together with position indicator on the bay module control cabinet and provision for taking the signal to control room.

5.4.0 The details of the inscriptions and colouring for the indicator are given as under:

| | SIGN | COLOUR |
|------------------------|-------------|---------------|
| Open position | Open | Green |
| Closed position | Closed | Red |

5.5.0 Interlocks shall be provided so that manual operation of the switches or insertion of the manual operating device will disable the electrical control circuits.

5.6.0 Each earth switch shall be fitted with auxiliary switches having 6 NO & 6 NC contacts for use of owner wired up to TB over and above those required for local interlocking, position & indication purpose.

5.7.0 Provision shall be made for padlocking the earth switches in either the open position or closed position

5.8.0 All portions of the Earth switch and operating mechanism required for grounding shall be connected together utilizing a flexible copper conductors having a minimum cross section area of 50 Sq mm

5.9.0 The main grounding connections on each grounding switch shall be rated to carry the full short circuit rating of the switch for 1 second and shall be equipped with a silver plated terminal connector suitable for steel strap of adequate rating for connection to the grounding grid

5.10.0 The Safety Earth switches shall confirm to the requirement of IEC 62271-102

5.11.0 Mechanical position indication shall be provided locally at each switch and remotely at each bay module control cabinet / substation automation system.



C) HIGH SPEED EARTH SWITCHES

1.0.0 CODES AND STANDARDS

Disconnecting Switches and Earth Switches IEC : 62271-102, IS: 9921

2.0.0 TYPE

Indoor, SF6 Gas Insulated, Class shall be M1-E1.

3.0.0 DESIGN & CONSTRUCTIONAL FEATURES

3.1.0 Earth switches located at the beginning of feeder module shall be of high speed, make proof type and will be used to discharge the respective charging currents, in addition to their safety grounding function. These grounding switches shall be capable of interrupting the inductive currents and to withstand the associated Transient Enclosure Voltage (TEV).

3.2.0 Single phase switches shall be provided with operating mechanism suitable for 220 V DC

3.3.0 The switches shall be fitted with a stored energy closing system to provide fault making capacity

3.4.0 The short circuit making current rating of each ground switch shall be atleast equal to its peak withstand current rating of 157.5 kA. The switches shall have inductive /capacitive current switching capacity as per IEC-62271-102

3.5.0 Each high speed make grounding switch shall have clearly identifiable local positive driven mechanical indicator together with position indicator on the bay module control cabinet and provision for taking the signal to control room.

3.6.0 The details of the inscriptions and colouring for the indicator are given as under:

| | SIGN | COLOUR |
|------------------------|-------------|---------------|
| Open position | Open | Green |
| Closed position | Closed | Red |

3.7.0 High speed earth switch operation should be possible locally from the bay module control cabinet, or remotely from the control room in conjunction with opening of the associated disconnecter.

3.8.0 These high speed grounding switches shall be electrically interlocked with their associated circuit breakers and disconnectors so that the grounding switches cannot be closed if the circuit breakers and disconnectors are closed.

3.9.0 Interlocks shall be provided so that the insertion of the manual operating devices will disable the electrical control circuits.

3.10.0 Each high speed earth switch shall be fitted with auxiliary switches having 6 NO & 6 NC auxiliary contacts for use by owner wired up to TB over and above those required for local interlocking, position & indication purpose. All contacts shall be wired to terminal blocks in the local bay control cabinet. Provision shall be made for padlocking the ground switches in their open or closed position



- 3.11.0 The main grounding connections on each grounding switch shall be rated to carry the full short circuit rating of the switch for 1 second and shall be equipped with a silver plated terminal connector suitable for steel strap of adequate rating for connection to the grounding grid
- 3.12.0 The high speed Earth switches shall confirm to the requirement of IEC 62271-102



D) SF6 TO AIR TRANSITION BUSHINGS

- 1.0.0 All bushings shall have an impulse and power frequency withstand level that is greater than or equal to the level specified for the switchgear.
- 2.0.0 Bushing shall be composite/polymer type robust and suitable for hot line washing and shall be provided with "water cut sheds". The same shall be designed considering the saline atmosphere and seismic zone –V. The housing & weather sheds should have silicon content of minimum 30% by weight. It should protect the bushing against environmental influences, external pollution and humidity.
- 3.0.0 Puncture strength of bushings shall be greater than the dry flash-over value. When operating at normal rated voltage, there shall be no electric discharge between the conductors and bushing which would cause corrosion or injury to conductors, insulators or supports by the formation of substances produced by chemical action. No radio interference shall be caused by the bushing when operating at the normal rated voltage.
- 4.0.0 All hardware used for current carrying parts shall be SS 304 and other iron parts shall be hot dip galvanized considering high saline conditions of site as recommended in IS/ISO.
- 5.0.0 All joints shall be air tight. Surface of the joints shall be turned up; insulator parts by grinding and metal parts by machining. Bushing design shall be so as to ensure uniform compressive pressure on the joints. The hollow silicon composite insulators shall comply with the requirements of IEC 61462 and the relevant parts of IEC-62217.
- 6.0.0 All current carrying contact surfaces shall be silver faced.
- 7.0.0 Bidder shall furnish details of precaution taken to prevent bimetallic corrosion wherever dissimilar materials (such as Copper, Aluminium) are used, including the following.
- a) Aluminium conductor in the bus duct and the current carrying part in the bushing.
 - b) Terminal clamp and the current carrying part in the bushing if bushing stud is not of Copper.
- 8.0.0 A test tap shall be provided for measurement of Capacitance & Tan delta factor.



E) INSTRUMENT TRANSFORMERS

1.0.0 CODES AND STANDARDS

| | |
|----------------------|---------------------------------------|
| Current Transformers | IEC 61869, BS:3938, IS: 2705 |
| Voltage Transformers | IEC 186, IEC 186A, IEC 358, IS : 3156 |
| Insulating Oil | IS : 335 |

2.0.0 TYPE

Current Transformers : Single primary internal mounted resin casted type with **SF6 gas insulated core** as the condition is saline.

Voltage Transformers : Shall be metal enclosed gas insulated inductive type.

3.0.0 RATING

3.1.0 Rated Insulation Levels for Instrument Transformers

| | | |
|-----|--|-------------|
| i) | Rated lightning impulse withstand Voltage | 1425 kVp |
| ii) | One minute power frequency withstand voltage | 650 kV rms. |

3.2.0 Current Transformers

| | | |
|-------|---|--|
| (i) | Rated primary current | As required. For Line CT, PS Class core and tariff metering core, Secondary Amp (1A or 5A), ratio, knee point voltage, VA Burden, ISF, ALF etc. shall be same as Khavada-II, PS |
| (ii) | Rated dynamic current | 157.5 kA peak |
| (iii) | One minute power frequency withstand voltage between secondary terminal and earth | 3 kV rms |
| (iv) | Partial discharge | 10 pico-Coulombs max 1 |
| (v) | Temperature rise | -----As per IEC----- |



3.3.0 Voltage transformers

| | | |
|--------|---|---|
| (i) | Rated primary Voltage | 420 kV |
| (ii) | One minute power frequency withstand voltage - Between LV (HF) terminal and earth - For secondary Winding | 650 kV rms 3 kV rms |
| (iii) | Rated capacitance | ----- |
| (iv) | Standard reference range of are valid | 96% to 102% for protection and 99% to 101% for measurement. |
| (v) | Temp rise of Electromagnetic Unit | As per IEC: 186 |
| (vi) | Rated voltage factor | 1.2 continuous; 1.5 for 30seconds |
| (vii) | Phase angle error | +/- 20 minutes for metering |
| (viii) | Partial discharge level | 10 pico Columbs max |
| (ix) | Rated thermal burden | 1500 VA |

For CT & VT, the ratio, ALF/ISF, accuracy class, Burden, knee point, excitation current, Rct etc. shall be as per requirement and EPC contractor shall furnish the details with calculations during detail engineering stage. For ABT (SEM's) meter CT & VT cores parameters are as per approved requirement of competent authority. Any change in the parameters of CT & VT required at the time of detailed engineering shall have to be incorporated without any extra cost. Bidder shall refer the **Section-1.0, General Technical Specification** for this package for schedule for General Technical Particulars to be filled by Bidder.

4.0.0 DESIGN AND CONSTRUCTION FEATURES

4.1.0 Current Transformers

4.1.1 The current transformers and accessories shall conform to IEC: 61869-1 and other relevant standards except to the extent explicitly modified in the specification.

4.1.2 The current transformers shall have class B type insulation and shall be suitable for high speed auto reclosure.

4.1.3 The particulars of the various cores may change within reasonable limits as per the requirements of protection relay supplier. The manufacturer is required to have these values confirmed from the purchaser before proceeding with design of the cores. The other characteristics of CTs shall be as given in Technical Parameter of Current Transformer.

4.1.4 Where multi-ratio current transformers are required the various ratios shall be obtained by changing the effective number of turns on the secondary winding.

4.1.5 Rating and diagram plates shall be as specified in the IEC specification incorporating the year of manufacture. The rated extended current rating voltage and rated thermal current shall also be marked on the name plate.



- 4.1.6 The diagram plates shall show the terminal markings and the relative physical arrangement of the current transformer cores with respect to the primary terminals (P1 & P2).
- 4.1.7 The position of each primary terminal in the current transformer SF6 gas section shall be clearly marked by two plates fixed to the enclosure at each end of the current transformer.
- 4.1.8 The current transformers incorporated into the GIS will be used for protective relaying and metering and shall be of metal-enclosed type. The secondary windings shall be air insulated and mounted inside the metal enclosure. All the current transformers shall have effective electromagnetic shields to protect against high frequency transients.
- 4.1.9 Each current transformer shall be equipped with a marshalling box with terminals for the secondary circuits, which are connected to the local control cubicle. The star/delta configuration and the inter connection to the line protection panels will be done at the CT terminal block located in the local control cubicle.
- 4.1.10 For Tariff metering core (0.2s) of current transformer separate (dedicated) secondary terminal box shall be provided with required sealing arrangements / facility as per requirement of concerned authorities. The terminal box shall be tamper proof in all respect. Cables for CT secondary from each phase of CT shall be directly connected to tariff metering panel (i.e. no intermediate marshaling box / any other junction box etc. is permitted). CT (0.2s) class for Tariff metering shall be tested from NABL accredited lab.
- 4.1.11 Current transformers guaranteed burdens and accuracy class are to be intended as simultaneous for all cores.
- 4.1.12 The rated extended primary current shall be 150% at all ratios.
- 4.1.13 The instrument security factor at all ratios shall be less than five (5) for metering core. However for tariff metering core ISF shall be same as of Khavada-II PS bay.
- 4.1.14 The wiring diagram, for the interconnections of the three single phase CTs shall be provided inside the marshalling box.
- 4.1.15 Provisions shall be made for primary injection testing either within CT or outside.
- 4.1.16 Electromagnetic shields to be provided against high frequency transients typically 1- 30 MHz
- 4.1.17 Tariff metering CT of GIS is specified and preferred due to inherent technical advantages, however, if GIS CT is not acceptable by competent authorities than EPC contactor shall provide AIS CT in place of tariff metering core of GIS CT. EPC contactor shall finalized this in advance with valid justification.
- 4.2.0 Voltage Transformers**
- 4.2.1 The voltage transformers shall conform to IEC 61869-2 and other relevant standards except to the extent explicitly modified in the specification.
- 4.2.2 The VA burden for tariff metering core of Transmission Line VT shall be same as of Khavada-II PS (PGCIL/CTUIL S/s).



- 4.2.3 Voltage transformers shall be of the inductive type with SF6 gas insulated. The earth end of the high voltage winding and the ends of the secondary winding shall be brought out in the terminal box.
- 4.2.4 Rating and diagram plate shall be provided complying with the requirements of the IEC specification incorporating the year of manufacture and including turns ratio, voltage ratio, burden, connection diagram etc.
- 4.2.5 The beginning and end of each secondary winding shall be wired to suitable terminals accommodated in a terminal box mounted directly on the voltage transformer section of the SF6 switchgear.
- 4.2.6 For Tariff metering core (0.2) of voltage transformer separate (dedicated) secondary terminal box shall be provided with required sealing arrangements / facility as per requirement of concerned authorities. The terminal box shall be tamper proof in all respect. Cables for VT secondary from each phase of VT shall be directly connected to tariff metering panel (i.e. no intermediate marshaling box / any other junction box etc. is permitted). VT (0.2) class shall be with manual selector switch for each tariff meters. The 0.2 class VT shall be tested from NABL accredited lab.
- 4.2.7 VT secondary terminal box of tariff metering core shall have MCB of required rating for protection of secondary circuit with auxiliary monitoring/ signaling contacts. Signaling contacts shall provide annunciation in local annunciator as well as in SCADA system for monitoring of tripping status.
- 4.2.8 All terminals shall be stamped or otherwise marked to correspond with the marking on the diagram plate. Provision shall be made for earthing of the secondary windings inside the terminal box.
- 4.2.9 The transformer shall be able to sustain full line to line voltage without saturation of transformer.
- 4.2.10 The voltage transformers shall be located in a separate bay module on the bus and will be connected phase-to ground and shall be used for protection, metering and synchronization.
- 4.2.11 The voltage transformers shall be of inductive type, nonresistant and shall be contained in their own-SF6 compartment, separated from other parts of installation. The voltage transformers shall be effectively shielded against high frequency electromagnetic transients. The voltage transformers shall have three secondary windings.
- 4.2.12 Voltage transformers secondary shall be protected by MCB of suitable rating with auxiliary contacts for monitoring for each winding. The secondary terminals of the VT's shall be terminated to the stud type disconnecting terminal blocks in the secondary boxes via the fuse.
- 4.2.13 The voltage transformer should be thermally and dielectrically safe when the secondary terminals are loaded with the guaranteed thermal burdens.
- 4.2.14 The accuracy of 0.2 on secondary should be maintained throughout the entire burden range on all the three windings without any adjustments during operation.
- 4.2.15 Tariff metering VT of GIS is specified and preferred due to inherent technical advantages, however, if GIS VT is not acceptable by competent authorities than EPC contactor is free to use metering core of CVT already available for future use. However, EPC contactor shall finalize this in advance with valid justification.



4.2.16 The diagram for the interconnection of the VTs shall be provided inside the marshalling box.

5.0.0 Vendor shall provide the TYPE TEST reports, perform & submit the ROUTINE TEST & FIELD TEST reports for all individual GIS equipment (Breaker, Disconnecting Switches with ES, HSES, CT, VT, SF6 Gas to Air Bushing etc.) as per IS/IEC Standards of relevant equipment for Owners' Approval.



GUJARAT INDUSTRIES POWER CO. LTD

Gujarat

**2375 MW CAPACITY SOLAR/WIND/HYBRID
RENEWABLE ENERGY PARK AT GREAT
RANN OF KUTCH AREA, GUJARAT**

TENDER ENQUIRY DOCUMENT

FOR

**POOLING SUBSTATION 400/33 KV, 1200 MW (PSS-1,
PHASE-I & PHASE-II OF 600 MW EACH) OF SOLAR/
WIND / HYBRID RE PARK OF 2375 MW CAPACITY
AT GREAT RANN OF KUTCH AREA, GUJARAT**

[Tender Enquiry Doc. No. GIPCL/RE Park/PSS/Phase-I]

VOLUME - II

TECHNICAL SPECIFICATION

FICHTNER Consulting Engineers (India) Private Limited
Chennai, India



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1.0.0 INTENT OF SPECIFICATION

- 1.1.0 This specification covers the requirements of **400 kV GIS with 340MVA, 400/33/33kV Step-up Power transformers, 33 kV switchgear, Hybrid Park Control Monitoring System and associated auxiliary systems including civil & structural works for 400/33kV Pooling Substation-1 (1200 MW, Phase-I & Phase-II of 600 MW each)** for efficient and trouble-free operation of the 2375 MW Solar/Wind/Hybrid Renewable Energy park at Great Rann of Kutch Area, Gujarat.
- 1.2.0 It is not the intent to specify completely herein all details of design and manufacture. However, the equipment shall conform in all respects to high standards of design engineering and workmanship and shall be capable of performing in continuous commercial operation up to agreed guarantee.
- 1.3.0 The general terms and conditions, instruction to Bidders and other attachments referred to elsewhere be hereby made part of the technical specification. Bidder's offer shall conform to all requirements stipulated in the specification.
- 1.4.0 Supplies and services shall be rendered in conformity with proven design principles, taking into account the current technology. The requirements of the contract must be fulfilled in its entirety. The supplies and services shall be rendered inclusive of all appliances and interconnecting arrangements with other supplies, necessary for installation of all accessories, needed for proper and reliable continuous operation and for satisfactory maintenance and repair. It is not the intent to completely specify all the details of design, construction and installation herein. Nevertheless, the equipment and installation shall conform to a high standard of engineering, design and workmanship in all respect and shall be capable of performing continuous satisfactory operation.
- 1.5.0 The work to be carried out shall be all in accordance with the requirements, conditions, appendices etc. given in Technical Specifications together with those stated in other Parts/ Sub-Parts/tender drawings of Bid Documents which shall be considered as a part of this volume as completely as if bound herewith.
- 1.6.0 Bidders are requested to carefully examine and understand the specifications and seek clarifications, if required, to ensure that they have understood the specifications. Such clarifications should be sought within a specific time period. Bidder's offer should not carry any parts like clarifications, interpretations and/or assumptions. However, if the bidder feels that, in his opinion, certain features brought out in his offer are superior to what has been specified, these may be highlighted separately.
- 1.7.0 DELETED.
- 1.8.0 DELETED.
- 1.9.0 In case of any conflicts / contradiction among various clauses / Parts / Appendix / Annexure/chapters / appendices / tender drawings of bid documents, the most stringent requirement shall govern; decision of the Owner shall always be final & binding on the Bidder/Successful bidder. No extra claims shall be allowed on this account.
- 1.10.0 The scope of the bidder includes complete design and engineering, technical co-ordination (including participation and arranging technical co-ordination meetings), finalization of drawings/ documents, submission of engineering drawing / documents and processing of their approvals by the Owner.



- 1.11.0 Further, the scope shall also include submission, in proper shape & format, of all types of manuals, handbooks & documents in requisite numbers to the Owner at different phases of the project as per the requirement of Owner.
- 1.12.0 Bidder shall furnish all relevant data required by the Owner, at interface points within schedule as agreed prior to award of contract.
- 1.13.0 The bidder shall be responsible for providing all materials, equipment and services, specified or otherwise which are required to fulfill the intent of ensuring operability, maintainability, and reliability of the total work covered under this specification within his quoted price. This work shall be consistent with modern practice and shall be in compliance with all applicable codes, standards, guides, statutory regulations and safety requirements in force on the date of award of this contract.
- 1.14.0 The Bidder shall furnish as per Data Requirements, Schedules and other applicable sections, full details regarding all equipment and systems including complete Bill of Materials, Design basis & aspects, drawings, data, information, technical literature and other details required to fully establish the capability and performance of the equipment and systems offered by him. Any bid not containing sufficient details to fully describe the equipment and systems offered or sufficient details regarding past experience for meeting the qualifying requirements may be treated as non-responsive and hence rejected.
- 1.15.0 The drawings enclosed with the specification are indicating the minimum requirement and all bidders shall comply with it. Any further improvement required during detailed engineering and execution shall also be implemented by bidder. Bidder shall confirm that the type, make, model of all bought out items supplied by the bidder under the specification shall be subject to the approval of the Owner during detailed engineering stage.
- 1.16.0 Further, the bidder must comply the below and submit / provide the undertaking during supply of each material/equipment/plant under this EPC package of PSS-1:

In the event of the choosing & finalizing the sub-vendor, 'Class-I local supplier' as defined under Public Procurement (Preference to Make in India) Order, 2017 issued by Department for promotion of Industry and Internal Trade (DPIIT), Ministry of Commerce and Industry, Government of India vide order dated 15/06/2017, its revision dated 16/09/2020 (PPP-MII Order) read in conjunction with 'Public Procurement (Preference to Make in India) to provide for Purchase Preference (linked with local content) in respect of Power Sector' order dated 16/11/2021 issued by Ministry of Power (MoP Order) and subsequent modifications/ amendments if any

Presently, the local content requirement to categorize a supplier as 'Class-I local supplier' is minimum 60%.

Firms who are not 'Class-I local supplier' shall not be eligible to bid.

Further, entities of countries which have been identified by the Nodal Ministry/Department identified under PPP-MII order, as not allowing Indian companies to participate in their Government procurement for any item related to that Nodal Ministry/Department, except for the list of items published by the Ministry/Department permitting their participation. The term 'entity' of a country shall have the same meaning as under the FDI Policy of DPIIT as amended from time to time. (Bidder has to give an undertaking for each equipment as per Appendix-31, Sec-7, Vol.-I)



2.0.0 SCOPE OF WORK AND SERVICES

2.1.0 The scope of this specification shall include provision of 400 kV pooling substation for power evacuation to proposed Khavda PS-II (CTUIL / ISTS), 400/33/33 kV transformers to step up power from Solar/Wind plants, 33 kV pooling switchgear for pooling power received from solar/wind plants, 33 kV busduct for connection between step-up power transformer and switchgear, LV service transformers to derive 415 V supply, DG sets to provide emergency backup, Battery & charger to provide DC supply, UPS with battery to provide UPS supply, Control & relay panels, Substation automation system, Hybrid Park Control Monitoring System (HPCMS), Power & control cables, Cable trays, Lighting system, Earthing & lightning protection, Switchyard control building, GIS Building Substation structures, foundation & civil works for all the equipment & structures covered etc. as detailed below.

2.2.0 The scope of work covers design, engineering, manufacture, assembly and testing at works, packing / dispatch and transportation to site (including transit insurance), storage, erection, testing and commissioning of the following for Pooling Substation-1 (PSS-1 of 1200MW) :

- Double bus single breaker 400 kV GIS Substation
- Outdoor Substation Equipment like Surge Arrestors, CVT, Wave Trap
- PLCC communication & FOTE at GIPCL and remote (CTUIL / ISTS) end substations.
- 400/33/33 kV, 340/170/170 MVA Step-up Power transformers
- NIFPS system for EHV Step-up Power Transformer
- 33 kV switchgear installed in prefab Enclosure Arrangement
- 33 kV Busduct between 340MVA Transformers & 33 kV switchgears
- 33kV Capacitor Banks
- Low voltage (33/0.415kV) oil type outdoor service transformers
- Diesel Generator Sets
- 220 V DC system
- 230 V UPS system
- 415 V Station Service Board
- 415 V Park Infrastructure DB
- PMU at GIPCL pooling substation end
- Tariff ABT Meters (SEM's)
- Power Quality Meters (PQM) at GIPCL PSS end and CTUIL / ISTS Substation end
- AL59 Moose Conductor for AIS portion
- Aluminum Bus Pipe 4" IPS for AIS portion
- 420kV Gas to Air Bushings for incomer and outgoing feeders
- EOT Crane with RF remote control of adequate capacity.
- 33 kV Cables between 33 kV switchgear and LV service transformers
- LV Power Cables
- Control cables
- Signal cables, Fiber optic cables and Communication cables
- Cable trays, supports, clamps & accessories
- Earthing system
- Lightning protection system
- Illumination system
- Cabling accessories
- Fire stop sealing system
- Project / PSS-1 signboard
- Safety items like danger & other sign boards, insulating mats, fire buckets.
- Furniture for all the workstations and Printers and Office
- Air-conditioning & ventilation system
- Fire protection system
- Hybrid Park Control & Monitoring System (HPCMS) including the following-



- a) HPCMS system shall be designed for redundant power supply and redundant communication system. Such that failure at single node or component does not affect the operation and communication of Hybrid park with CEA/POSOCO/PGCIL/RLDC/Regulatory authorities. Failure of any one link of Power or communication shall be alarmed and recorded in event of SCADA.
 - b) Hybrid Park Control and Monitoring System (HPCMS)-Main SCADA, which collects data from all the Field SCADA at the Solar Power Plants/ Wind Power Plants, Weather Monitoring stations and SAS at the Switchyard.
 - c) Power Plant Controller-PPC system, which manages the Generation and Power Flow from Hybrid park maintaining the required network parameters, viz, Voltage, PF, Active Power etc.
 - d) Redundant GPS for Time Synchronizing all the Systems in the Hybrid Park on NTP protocol
 - e) Data Connectivity between HPCMS-Main SCADA/PPC and other systems viz., Fire Alarm, Fire Fighting, Access System, CCTV System, Desalination and Water Distribution Systems. (Desalination and Water Distribution system is in others' scope, only data connectivity provisions are in the scope of bidder)
 - f) PSS building CCTV monitoring system shall be placed in Control Room, Contractor / Bidder shall keep sufficient space in Control Room layout for CCTV Monitor, NVR system cabinet and cable raceway.
 - g) Interface with SPP/WPP's SCADA & PPC for data collection and control.
 - h) Power Tel broadband over OPGW is required. Bidder shall be responsible for making application for connectivity and follow up with Power Tel, installing and commissioning of router and connecting it with GIPCL router (in scope of bidder) for access of internet in computer.
 - i) Interconnection with PQM at GIPCL end and CTUIL / ISTS Substation end
 - j) Other hardware associated to control & monitoring in the main control room like historian station, large video screens for North & South sites, operator Work station / engineering work station, printers, network components including router and firewall as depicted in Configuration diagram of HPCMS Architecture, attached under Annexure –F and as required for the completeness of the system.
 - k) The system shall be designed for 2375MW. In the Phase-I, the items required for monitoring & control of 1200MW (PSS-1) shall be procured. Those materials required for 1200MW (PSS-2) shall be procured at later. However, the engineering & design shall be done for complete 2375MW (PSS-1 & 2) and required provisions for integrating these systems shall be kept and also required space arrangement shall be kept for smooth execution of the project.
 - l) All work at CTUIL / ISTS Substation end for PQ meter and its PPC RIO panel, FOTE (data+ voice+ tele protection), PLCC (data+ voice+ tele protection), Power Tel Broadband, Splicing in FODP/FODF, installation of FODP/FODF, Approach cable splicing in FODP/FODF and laying up to transmission tower shall be in scope of bidder. Taking CTUIL / ISTS / RLDC work permit, clearance, approval of location where all system shall be installed, power supply for system and construction, tools and tackles, vehicle permit etc. shall be scope of bidder.
- Optional price to be provided by bidder for the following items:
 - a) 400kV, 1 Phase Wave trap & CVT (Outdoor AIS Equipment)
 - b) PLCC & FOTE panel
 - c) Line Differential Relay & Distance Relay and associated items at CTUIL / ISTS substation for GIPCL incoming 400 kV Transmission Line.
 - d) PMU & PQM at CTUIL / ISTS substation for GIPCL incoming 400 kV Transmission Line.
 - e) Software required for Hybrid Park Power Forecasting & Scheduling.

2.3.0 The scope of work covers design, engineering, supply of all materials, construction, fabrication / assembly and testing at works, packing / dispatch / loading / unloading and transportation (including internal transportation and material handling at site) to site (including transit



insurance) and erection of the following **Civil, Structural and Architectural works** of Pooling Substation-1:

1. Site related investigations.
 - a. Topographic survey.
 - b. Geotechnical investigation.
2. Site Development works
 - a. Site Grading including Soil stabilization and slope protection.
 - b. Green Belt, Landscape development and horticulture including associated water supply system.
 - c. Compound wall with gates.
 - d. Internal roads and Culverts.
 - e. Storm water drains and interconnection to outside main drains.
3. Structural Steel works in 400 kV Pooling Substation.
 - a. Towers and gantry girders in the Substation
 - b. Equipment supporting structures for all Outdoor Substation equipment including GABs
4. Buildings and Civil Works
 - a. Foundation for all substation structures / masts / gantries / bus duct of 400 kV Pooling Substation.
 - b. Prefab building for 400kV GIS bays with LCC including EOT crane & ventilation, illumination and other associated works complete in nature.
 - c. Prefab Substation control building with all facilities like toilets, septic tank, soak pit, water supply, plumbing, ventilation, illumination and other associated works complete in nature.
 - d. RCC works (Foundations, trenches, etc.) for 33kV Switchgear Buildings (PEB).
 - e. Crushed stone paving in Substation
 - f. Anti-weed treatment in Substation.
 - g. Transformer foundations with soak pit.
 - h. NIFPS Pit, Walkways, Support structures for all the equipment.
 - i. Civil & structural base plate / channel arrangement for all the panels.
 - j. Rail cum road foundations for transformer.
 - k. RCC Fire wall between the transformers (if required).
 - l. Transformer Burnt oil pit.
 - m. RCC Cable trenches.
 - n. Foundation for DG Sets.
 - o. Diesel Storage Shed
 - p. Transformer Oil Storage Shed
 - q. High Mast and Street Lighting Foundations
 - r. Septic tanks and soak pits.
 - s. Service and Potable Water Supply System
 - t. Cable trenches for GIPCL /Owner requirement as shown in the drawing no: FCE-1721125-EL-DWG-LAY-2100-015
 - u. Box Culvert arrangement for cable crossing internal road of PSS
5. Any other civil and structural works, which is not specifically mentioned in this document but required to complete the total 400 / 33kV GIS Pooling substation as EPC is also included in the scope of work.

2.4.0 Any other equipment / items not specifically mentioned in the specification, but which are required for successful erection, testing, commissioning and satisfactory operation and maintenance of the Substation in all respects consistent with the best engineering practices are deemed to be included in the scope.

2.5.0 Technical Parameters indicated in drawings and detailed technical specification for equipment is minimum requirement. **Actual rating shall be as per system studies** conducted by bidder. Any change in parameter shall be at no extra cost to Owner.



2.6.0 The Pooling Substation-1 is of 1200 MW capacity and shall be executed in two phases viz. Phase-I & II of each 600 MW capacity. However, Engineering of the Pooling Substation-1 shall be done in single mode during phase-1 itself. ~~The division of equipment / items in two phases is clearly shown in Annexure-B.~~

~~2.7.0 Detailed bill of quantity (BOQ) is listed in Annexure B.~~

2.8.0 The items and respective quantities indicated therein are only indicative. Vendor shall include other items not specially indicated in the BOQ but are required for the execution of the contract in the Price Schedules. All equipment / items for which BOQ has been indicated in the Schedule shall be payable on unit rate basis. During actual execution, any variation in such quantities shall be paid based on the unit rate under each item incorporated in Letter of Award. Wherever the quantities of items / works are not indicated, the Vendor is required to estimate the quantity required for entire execution and completion of works and incorporate their price in the respective price schedule. The unit rate shall remain firm and no escalation is allowed till the end of the contract period.

2.9.0 The scope of supply shall also include the following:

- First fill of consumables, if any
- Spare parts required for successful commissioning. Bidder shall submit the list.
- ~~Mandatory Spares as listed in Annexure-C.~~
- Recommended Spares for three years operation & maintenance (O&M), for the equipment which are not covered in Annexure-C.
- ~~Special tools for operation & maintenance (O&M) as listed in Annexure-D.~~
- AMC support for 400kV GIS, 400kV Transformers with NIFPS, Battery Chargers, UPS, PLCC, FOTE Panel & related system, SAS, HPCMS, Fire Protection system, EOT crane, Capacitor Bank, DG Sets (Mechanical & Electrical both).
- AMC support for all the software
- Stationaries & Consumables for all the Workstations and printers for a period of one year

The item-wise price of all these items shall be given by the Vendor in the relevant schedule. O&M spares shall be considered for evaluation of bid. It shall not be binding on the Owner to procure all the O&M spares.

O&M spares, Mandatory spares and special tools & tackles being purchased by the Owner shall not be used during the commissioning of the equipment. Any spares and special tools and tackles required for commissioning purpose shall be in the scope of the Vendor. The Vendor shall submit the list of commissioning spares based on his experience.

2.10.0 The scope of services shall include the following:

- Preservation, Unloading and storage of all equipment and materials at site
- Construction, Erection, Procurement testing and commissioning
- Preparation and submission of drawings / documents in soft and hard form as per drawing / documentation submission schedule for getting approval from Owner/GIPCL.
- System studies like Load Flow, Short Circuit, Switching Transient & Insulation co-ordinations shall be carried out with the latest version of reputed software (ETAP, Siemens PSSE or as per requirement of concerned RLDC / ISTS system authorities) & PSCAD/EMTDC software to confirm the adequacy of the equipment ratings proposed in this specification. Required system files for validation shall be provided to the owner. The reports shall be submitted in soft and hard copies.
- Relay Setting calculations, short circuit force, sag tension, cable sizing, sizing calculation for auxiliary transformer & other auxiliary equipment etc.
- Submission of Quality Plans and getting them approved by Owner



- Submission of progress report and and timely adherence to the project time line (which includes all coordination with various vendor for technical details/data interfacing and external agency/regulatory office coordination).
- Participation in project review / technical co-ordination meetings
- All necessary co-ordination with other vendors / Vendors on site for erection, testing and commissioning of equipment and accessories.
- Overall co-ordination with internal / external agencies
- All necessary clearances and approval by CEA/ CEIG, CEA, CTUIL / PGCIL, POSCO, WRLDC / RLDC / NLDC / LDC's / PESO or, any other statutory bodies related to PSS package.
- Preparation and submission of all as-built drawings in soft (including editable source files) and hard copies.
- Obtaining Owner's approval and written acceptance of satisfactory performance
- Handing over of installation for commercial operations
- Collection of all site related data
- Soil investigation including electrical soil resistivity measurements
- Construction power and water facilities shall be bidder's responsibility
- All necessary arrangements for obtaining all data pertaining to meteorological forecasts on a regular basis and further performing solar/ wind power prediction by the HPCMS (Hybrid Park Control & Monitoring System)for the entire Hybrid Park
- Obtaining measurements of actual production in the Hybrid Park, and auxiliary consumption preferably received online
- Minor civil works incidental to the erection of equipment / structures / towers.
- Training of Owner's personnel in O&M activities
- Training of Owner's personnel in for HPCMS, PPC, SAS and other software.

3.0.0 EXCLUSIONS

The following items of work are specifically excluded from the scope of the specifications:

- 400 kV Transmission lines
- 33kV Switchgear at Solar/Wind Power plant end
- 33 kV Cable including cable termination kit & cable gland from Pooling switchgear to Solar/Wind plant
 - LT outgoing cables and its' termination from Park Infrastructure DB (shown as others scope in drawing for 415V SLD (drawing no: FCE-1721125-EL-DWG-SLD-2100-006) attached herewith this specification).
- For HPCMS, the exclusions shall be as per below:
 - a) Individual solar/ wind power plant automation system
 - b) ERP system

4.0.0 TERMINAL POINTS

- For line bays, 400 KV line will be terminated at the incoming line bay tension insulators by Transmission line contractor.
- LV Service Board Cable Terminal points:
 - a) All cables between 415V LV Station Service Board and Lighting Distribution Boards (as required nos.) shall be laid by bidder.
 - b) All cables to 415V LV Distribution boards in GIS building and Substation Control Building shall be laid by bidder.
 - c) All cables from Lighting DB for the purpose of lighting within the pooling substation package, i.e. Outdoor Yard Lighting, GIS building illumination, control room building illumination, internal roads & area lighting for PSS package area etc. shall be laid by bidder.



- d) All cables from 415V Park Infrastructure Distribution Board to Power Distribution Board / ACDB for buildings other than GIS building and Substation Control Building shall not be laid by PSS package vendor. Thus outgoing terminal for those feeders at 415V Park Infrastructure Distribution Board shall be terminal point for PSS vendor.
 - e) All cables from Park Infrastructure DB to Road (other than PSS area) Lighting DBs / panels shall not be laid by PSS package vendor. Thus outgoing terminal for those feeders at Park Infrastructure DBs shall be terminal point for PSS vendor.
 - f) Any other type & size of cables & wires within the Pooling Substation-1 (PPS-1) package such as to EOT Crane panel, transformer marshaling kiosk, GIS, 33kV Pooling Switchgears (Indoor type), DG, UPS, Battery & Battery Chargers, DCDB, ACDB, HVAC units, Ventilation fans, and all auxiliaries including the HPCMS etc. shall be laid by bidder.
- 33 kV terminals for cable connections from Solar/Wind plant at 33 kV pooling switchgear
 - Terminal points for HPCMS shall be as below table:

| | | |
|---|---|---|
| 1 | Cables, cable trays and accessories including supply, laying and termination. | No Terminal Point. i) Complete supply, installation and laying by bidder between bidder supplied equipment. ii) Complete supply, installation and laying by bidder for all cables between systems / equipment where one end equipment is supplied by bidder. iii) Cable from SPP/WPP to PSS-1 end Common communication panel shall be in scope of the individual SPP/WPP. All the glanding, splicing, termination, ferruling of the interfacing cables shall be in the scope of SPP/WPP. iv) The optical fiber cable dressing (use of conduit or cable tray), lugging, glanding, termination, splicing and termination of OFC with all accessories, patch cord cable laying and termination, ferrule, cable tag for all cables shall be in scope of bidder. v) The control, communication and other cables, laying in conduit, cable tray, glanding, cross ferruling, lugging, cable tag, termination at both end shall be in scope of bidder. |
| 2 | GPS master clock Time Synchronization | Terminal point at the Network Switches for other Systems in the park requiring time synchronization signals. Cable laying, dressing and identification between GPS master clock and other system in park shall be in scope of bidder. Installation of antenna, connection to GPS server shall be in scope of bidder. |



| | | |
|----|--|--|
| 3 | HPCMS-SCADA | No Terminal Point. |
| 4 | PPC Controllers | Bidder shall refer the drawing no: FCE-1721125-CI-DWG-CMS-4100-002 |
| 5 | PLC of Desalination plant and Water distribution management system | Not in scope of PSS bidder. However, required hardware for monitoring of Desalination plant from HPCMS (PSS-1) shall be provided by bidder as mentioned in Annexure-B of this document. |
| 6 | Gateway , VOIP | No terminal Point. All work and supply in scope of bidder |
| 7 | FODP | Supply and Installation of FODP, Splicing of OPGW Cables, FO Approach cables laying, termination, splicing is in scope of PSS-1 vendor. Supply & Installation of OPGW cable is in scope of Transmission Line (other) vendor. |
| 8 | PLCC / FOTE | No terminal Point. All work and supply at GIPCL PSS-1 end and at remote end (CTUIL / ISTS Substation) shall be in scope of bidder. |
| 9 | Broadband router | Installation ,erection and power supply shall be in scope of bidder |
| 10 | Fire system | Cable termination in SCADA panel is in scope of bidder |
| 11 | PMU and its data communication with CTUIL S/s and HPCMS | No terminal Point. All work and supply in scope of bidder |

5.0.0 GENERAL REQUIREMENTS

5.1.0 Project information is given in **Annexure – A**.

5.2.0 The Vendor shall fully familiarize himself with the site conditions. The Vendors are advised to visit the Substation site and acquaint themselves with the topography and infrastructure. The successful bidder (Vendor) shall be fully responsible for providing all equipment, materials, system and services which are required to complete the construction and successful commissioning, operation and maintenance of the Substation in all respects.

5.3.0 The Vendor shall obtain and pay for all permits, licenses and statutory approvals from local authorities for completion of work. Original copies of these approvals shall be delivered to the Owner or his authorized representative and will become property of the Owner. It must be understood and agreed that such factors have properly been understood and considered while submitting the bid. No claim whatsoever will be entertained by the Owner. Neither any change in the time schedule of the Contract nor any financial adjustments arising thereof shall be permitted by the Owner.

5.4.0 All materials and equipment furnished for permanent installation shall be new, unused and undamaged. Asbestos containing materials are not allowed.



5.5.0 The Vendor shall adopt suitable numbering system complaint to ISTS system to provide identification numbering. All electrical devices, control and instrumentation equipment and other items of similar nature shall be permanently identified.

5.6.0 Similar equipment and components shall be of same make. Equipment of same type and rating shall be interchangeable.

5.7.0 The Vendor shall be responsible for safety of human and equipment during working. It will be the responsibility of the Vendor to co-ordinate and obtain Electrical Inspector's clearance before commissioning. Any additional items and modifications due to observation of such statutory authorities shall be provided by the Vendor at no extra cost to the Owner.

5.8.0 Required construction power and construction water shall be arranged by bidder only.

5.8.1 The Vendor shall arrange stores for storing the equipment during erection. All equipment during storage shall be protected against damage due to acts of nature or accidents. The storage instructions of the equipment manufacturer / Owner shall be strictly adhered to.

5.8.2 Single line diagrams, general arrangement drawings, layouts etc. are enclosed with the specification for reference. List of these drawings is given in **Annexure – F**. The Substation shall be engineered further based on these drawings. These drawings are preliminary, conceptual and tentative and not all requirements, functionality, equipment, instruments, and specifications are part of these drawings.

5.8.3 All drawings, schedules and annexure appended to this specification shall form part of the specification. These drawings are meant to give a general idea to the Bidder / Vendor. No information / data shown / not shown in these drawings shall be construed to relieve the Vendor of his responsibility to carry out the work as per this specification and / or construction drawings released during detail engineering.

5.8.4 In case of any discrepancy between the drawings and text of specification, the stringent one shall prevail. Further, Vendor is advised to get these informed to the Owner.

5.8.5 All the equipment and accessories covered under this specification shall be designed, manufactured and tested in accordance with the latest revision of the standards mentioned under respective section. They shall also conform to the requirements of latest editions / amendments of the following:

- Indian Electricity Act and rules framed there-under
- Fire insurance regulations
- Regulations laid down by the office of the Chief Electrical Inspector to Government
- CEA guidelines / regulations
- CBIP manual on substations
- CBIP manual for Transformers
- CEA standard technical specification for Transformers
- CBIP manual for Busducts
- NFPA (National Fire Protection Association) codes and standards
- PESO (Petroleum and Explosives Safety Organization)
- Any other regulations laid down by the local / central authorities

6.0.0 GALVANIZING AND PAINTING

6.1.0 All support structures shall be hot dip galvanized. Thickness of galvanizing shall not be less than 910 gm/sq.m for saline environment. The galvanized surfaces shall consist of a continuous and uniformly thick coating firmly adhering to the steel surface. The finished surface shall be clean and smooth and free from defects.



- 6.2.0 For outdoor equipment, all enclosures shall be factory-painted with epoxy-based paint. Painting procedure shall be suitable for saline environment as per ISO 12944. Corrosivity grade C5-M Grade shall be used for outdoor equipment. Shade of paint shall be RAL 7035. Painting shall be carried out by approved process. Sufficient quantity of touch-up paint shall be furnished for application at site.
- 6.3.0 All indoor equipment, panels and cabinets shall be pre-treated as per IS 6005 before being factory-painted with epoxy based paint shade of paint shall be RAL 7035. Corrosivity grade C4 Grade shall be used for indoor equipment. Painting shall be carried out by approved process. Sufficient quantity of touch-up paint shall be furnished for application at site.
- 6.4.0 Clause 7.0.0 of General Technical Specification shall supersede the clause on Painting or Galvanizing in Section 2 (Detailed Technical Specification) for respective equipment.

7.0.0 PACKING

- 7.1.0 All the equipment shall be suitably protected, coated, covered or boxed and crated to prevent damage or deterioration during transit, handling and storage at site. The Vendor shall be responsible for any loss or damage during transportation, handling and storage due to improper packing.
- 7.2.0 The successful Bidder/vendor shall prepare detailed packing list of all packages & containers, bundles & loose materials forming each & every consignment dispatched to 'Site'. All packing details with packet identification number shall be sending in soft copy to owner.
- 7.3.0 All coated surfaces shall be protected against abrasion, impact, discoloration and any other damage. Surfaces which are damaged shall be replaced.
- 7.4.0 All exposed threaded portions shall be suitably protected with either a metallic or a non-metallic protecting device. All ends of valves, piping and conduit equipment connections shall be properly sealed with suitable devices to protect them from damage.
- 7.5.0 All equipment, especially electrical equipment, controls and insulations shall be provided with adequate protection against moisture / water.
- 7.6.0 The successful bidder shall prepare detailed packing list of all packages, containers, bundles and loose materials forming each and every consignment dispatched to 'Site'.
- 7.7.0 Packing shall be taken care according to coastal and high saline area.
- 7.8.0 Bulky / Heavy spare items which are meant to be kept for long storage shall not be packed in Biodegradable material i.e. wood, corrugated board etc. These items shall be packed with special materials which can withstand extreme weather conditions and shall be made of long lasting, non-corrosive, anti-rusting materials.

8.0.0 QUALITY ASSURANCE & INSPECTION

- 8.1.0 Equipment offered shall be of type tested and proven type. In case type test reports are not found to be meeting the specification requirements, Vendor shall conduct, free of cost to the Owner, all such type tests according to the relevant standards.



- 8.2.0 Proposed vendor list is given in **Annexure- E**.
- 8.3.0 The Vendor shall adopt suitable quality assurance program to ensure that the equipment and services under the scope of Contract whether manufactured or performed within the Vendor's works or at his sub-Vendor's premises or at the Owner's site or at any other place of work are in accordance with the specification. Such program shall be outlined by the Vendor and shall be finally accepted by the Owner / authorized representative after discussion. The quality assurance (QA) program shall be generally in line with ISO 9001.
- 8.4.0 All materials, components and equipment covered under this specification shall be procured, manufactured, erected, commissioned and tested at all stages, as per a comprehensive QA program. It is the Vendor's responsibility to draw up and implement such program duly approved by the Owner.
- 8.5.0 Manufacturing quality plan (MQP) shall detail out for all the components and equipment, various tests / inspections to be carried out as per the requirements of this specification and standards mentioned therein, quality practices and procedures followed by Vendor's / sub-Vendor's quality control organization, the relevant reference documents, acceptance norms etc. during all stages of manufacturing including raw material procurement, in-process manufacturing, assembly and final testing / performance testing. The quality plans shall be submitted to Owner in soft form for review and comment. Hard copies of final quality plans shall be submitted for stamping and approval in addition to soft copies.
- 8.6.0 Field quality plan (FQP) shall detail out for all the equipment, the quality practices, procedures etc. to be followed by the Vendor's 'site quality control organization', during various stages of site activities starting from receipt of materials / equipment at site.
- 8.7.0 The Vendor shall carry out inspection and testing of components and equipment during manufacture at his works, at his sub-Vendor's works and at site to ensure compliance with the specification, quality and conformance to functional and performance requirements.
- 8.8.0 The Vendor shall carry out all tests / inspections required to establish that the items / equipment conform to the requirements of the specification and relevant codes / standards specified in the specification, in addition to carrying out tests as per the approved quality plans. Quality audit / surveillance / approval of the test results and inspection and acceptance of material will not, however, prejudice the right of the Owner to reject the equipment if it does not comply with the specification when erected or does not give complete satisfaction in service. Also they shall not limit the liabilities and responsibilities of the Vendor in ensuring complete conformance of the materials / equipment supplied to relevant specification, standards, data sheet, drawing etc.
- 8.9.0 The sub-vendor whose equipment are offered shall have designed, manufactured, tested and supplied the same for the specified system voltage and which are in satisfactory operation for at least five (5) years as on date of bid opening.
- 8.10.0 Enclosure for control and relay panels, control panels, relay panels, RTCC panels, NIFPS Electrical panels, LCC, SAS panels, ABT meter panels, PLCC, FOTE, FODP, Battery Chargers, UPS, HPCMS, CCTV, Junction Boxes for CVT, Fire panels, Weather station panel / junction box, Lighting panels, Main Lighting DB etc. shall be of Rittal make.
- 8.11.0 For all spares and replacement items, the quality requirements for the supply of main equipment shall be applicable.
- 8.12.0 Repair / rectification procedures required, if any, shall be subject to the approval of the Owner / authorized inspection agency.



8.13.0 Before dispatching structures from fabrication shop, proto-type of each structure shall be shop assembled and checked for fabrication tolerance. Also, if desired by the Owner, the same shall be presented for inspection and testing at an approved testing facility.

9.0.0 GUARANTEE

9.1.0 Vendors shall guarantee that system engineered and equipment offered shall meet the requirements as stipulated in this specification and as confirmed by them in technical data sheets.

9.2.0 All manufacturers' guarantees for all bought out items / equipment etc. shall be made available to the Owner and shall be valid for the entire liability period. If such guarantees are not issued by manufacturer, the Vendor shall guarantee the bought out items for the entire defects liability period along with his guarantee for the plant as a whole.

9.3.0 In the event of failure of any particular equipment which fails more than three times during the guarantee period, the Vendor shall replace the entire equipment at his own cost with another equivalent make as approved by Owner. Manufacturer's / Vendor's guarantee, as mentioned for such replaced equipment shall also be made available to the Owner and shall be kept valid at least for one year from the date of last replacement at site.

10.0.0 TIME SCHEDULE

The following shall be the schedule for completion of work for this package which shall be from the date of issue of order:

| Work | Schedule |
|--|---|
| Design, engineering, manufacture, testing, transport and delivery at site, loading, unloading, handling at site, storage, construction, erection, testing, commissioning and Taking Over of overall system for Pooling Sub-station 400/33 kV, 1200 MW (PSS-1, Phase-I & Phase-II of 600 MW each) | 14 months from date of Lol for Phase-I and 20 months from date of Lol for Phase-II. (Only single LOI shall be issued for both phases) |

11.0.0 DRAWINGS, DATA AND MANUAL

11.1.0 **To Be Submitted Along with Bid in three hard copies and soft copy in pen drive:**

- Technical offer
- Technical schedules duly filled up and stamped and signed on all the sheets.
- Type test certificate of similar type of comparable rating of step-up power transformer (400/33/33 kV, 340 MVA).
- Type test certificate of similar type of comparable rating for all equipment & system.
- Catalogs/drawings leaflets for major items

11.2.0 **To Be Submitted After Award of Contract:**

The minimum requirements of data, drawings and instruction manuals for this package as listed below, in addition to the requirements of various clauses of Technical Specification, and other applicable Sections to be submitted in multiple copies to the Owner. All communications in the drawings, documentations, technical literatures and manuals will be in English language. The Bidder shall prepare an exhaustive Master Drawing List (MDL) of all drawings/documents/manuals to be submitted during detailed engineering stage (including those from sub-Bidders). The MDL shall contain drawing/document no., rev. no, title, scheduled date of submission, actual date of submission, approval status (Category & date), etc. The exact format shall be as approved by Owner. The Bidder shall furnish the MDL to Owner before Notification of Award (NOA). This shall be discussed and finalized during pre-award discussions. The MDL will be



modified by Bidder periodically to take care of detailed engineering requirements. The MDL shall be submitted by Bidder for Owner's information every month with latest status.

- An exhaustive Master Deliverable List (MDL) for drawing & documents
- Technical data sheet
- List of deliverable items & packing list.
- Bill of quantity
- Documents as listed in various sections
- Detailed erection and commissioning procedure
- Test procedures
- Type test certificates for all equipment
- Manufacturing quality plan
- Field quality plan
- O&M manual
- As-built drawings
- System Architecture Drawing.
- Hardware Specification
- Functional design document
- Block Diagram
- Guaranteed technical parameters, Functional design specification and guaranteed availability and reliability
- Calculation of power supply dimensioning
- Control Room Layout
- GIS Building and 33kV Switchyard/Switchgear layout
- Overall PSS-1 layout covering all electrical & civil facilities.
- Complete documentation of implemented protocols between various elements
- Any other drawings / documents listed in respective equipment sections

11.3.0 Drawing / documents distribution schedule will be firmed-up during finalization of Contract.

11.4.0 For all technical tables and diagrams, calculation results, drawings, test data and scales adopted in the design, the Standard International unit system (SI) as per International Standardization Organization (ISO) shall be uniformly employed.

11.5.0 All engineering documents and drawings shall be of international "A" series sizes (A0, A1, A2, A3 and A4).

11.6.0 All engineering drawings shall be supplied as AutoCAD soft copies.

11.7.0 All calculation (except special design software) shall be provided in excel file, list, schedules shall be provided in excel file.

12.0.0 TRAINING

Bidder shall be responsible for providing training to Owner's personnel on offered systems at Bidder's Works/Bidder's Associate's Work/Site. It shall include training operators in the use of system, in operation and maintenance of the equipment to the extent that the Owner's personnel can make maintenance of the systems and shall be as per Clause no. 2.10.0 of this General Technical Specification (GTS).

The bidder shall provide a training of suitable duration on all supplied materials **especially GIS, CSD, Transformer, SAS, CRP, HPCMS, PLCC, FOTE, SDH, Battery Chargers, UPS, PMU, equipment, converters, servers, special tools, testing kits etc.** for Customer/Client's personnel to provide working knowledge of the equipment, operation and diagnostic tools, supervision and



monitoring using local craft terminal. The training may be provided by the Contractor or its sub-vendor at the site itself, preferably during installation, and will include training materials and presentation equipment. No separate charges for training shall be payable to the Contractor.

Specialized training shall be provided to the persons manning the centralized monitoring center and to the field support staff to ensure quick fault detection and restoration of the communication system. Training shall be provided to the maintenance persons on all communication equipment for its operation and maintenance.



ANNEXURE-A: PROJECT INFORMATION

| | | | |
|-------|--|---|--|
| 1.0.0 | Owner | : | Gujarat Industries Power Company Limited |
| 1.1.0 | Owner's Engineer | : | FICHTNER Consulting Engineers (I) Pvt Ltd |
| 1.2.0 | Project | : | 2375 MW Solar/Wind/Hybrid RE Park |
| 1.3.0 | Site location | : | Khavda Village, Great Rann of Kutch, District Bhuj, Gujarat |
| 1.4.0 | Nearest airport | : | Bhuj |
| 1.5.0 | Nearest railway station | : | Bhuj |
| 2.0.0 | Meteorological Information | | |
| 2.1.0 | Ambient temperature | | |
| | Extreme high | : | 39.5°C |
| | Extreme low | : | 9°C |
| 2.2.0 | Design ambient temperature for electrical equipment | : | 50°C |
| 2.3.0 | Relative humidity for design | : | 95% |
| 2.4.0 | Basic wind speed and wind pressure | : | 47 m/s |
| 2.5.0 | Seismic Zone | : | Zone – V as per IS 1893 |
| 2.6.0 | Corrosion Zone | : | C5-M as per ISO 12944 (Severe as per Corrosion Advisory Bureau, Metals Research Committee, CSIR) |
| 3.0.0 | Electrical Details | | |
| 3.1.0 | Electrical voltage levels | | |
| | a) Power frequency | : | 50Hz (+)3% to (-)5% |
| | b) EHV system | : | 400 kV (±) 5% volts, 3 phase, solidly earthed system |
| | c) HV system | : | 33 kV (±)10% volts, 3 phase, solidly earthed system |
| | d) LV system | : | 415 Volts (±)10%, 3 phase, 4 wire, solidly earthed system |
| | e) Auxiliary supply | : | 240V (±)10%, 1 phase |
| | f) Control supply for Station service Board | : | 220VDC (+)10% (-)15% |
| | g) DC supply for Control of Substation, HT/LT Breaker | : | 220V (+)10% to (-) 15%, unearthed system |
| | h) UPS supply | : | 230V (±)10%, 1 phase |
| 3.2.0 | Short circuit levels | | |
| | a) 400 kV system | : | 63kA for 3 second |
| | b) 33 kV system | : | 31.5kA for 1 second |
| | c) 415 V system | : | 25kA for 1 second |



ANNEXURE- B: BILL OF QUANTITY

PHASE - I

| Sl. No. | Item | Unit | Quantity |
|---------|---|------|----------|
| | Supply, Construction, Erection, testing & commissioning of the following equipment/System | | |
| | 400 kV pooling substation | | |
| 1) | Factory assembled, metal-enclosed, SF6 GIS bay including GIB and relevant support structures with associated Breaker with CSD, CT, Disconnecting Switch & EMVT and other required accessories etc. for Power Transformers | Nos. | 02 |
| 2) | Factory assembled, metal-enclosed, SF6 GIS bay including GIB and relevant support structures with associated Breaker, CT, Disconnecting Switch & EMVT and other required accessories etc. for Line bay | No. | 01 |
| 3) | Factory assembled, metal-enclosed, SF6 GIS bay for Bus Coupler bay | No. | 01 |
| 4) | Factory assembled, metal-enclosed, SF6 GIS bay for 02 nos. Bus VT | No. | 01 |
| 5) | Space for future Bays – No of Equipment required to be considered (02 for Phase-2 transformers, 01 for reactor & 01 for spare bay) | Nos. | 04 |
| 6) | Single phase oil filled capacitive voltage transformer – Outdoor Equipment (AIS) | | |
| | a) For 400kV line feeder | Nos. | 03 |
| 7) | 400 KV, 1 phase surge arrester – Outdoor Equipment (AIS) | | |
| | a) For line feeder | Nos. | 03 |
| | b) For transformer feeder | Nos. | 12 |
| 8) | 400kV, 1 Phase Wave trap – Outdoor Equipment (AIS) | Nos | 02 |
| 9) | 420kV SF6 Gas to Air Bushings with complete accessories & associated structures etc. | Nos. | 09 |
| 10) | Power line carrier communication system with EPAX at GIPCL pooling substation | Set | 01 |
| 11) | Relay panel with numerical relay(Separate panels for Main-I and Main-II protection of each bay) | | |
| | a) For line feeder | Set | 1 |
| | b) For transformer feeders | Sets | 2 |
| | c) For bus bar protection | Set | 1 |
| | d) For bus coupler | Set | 1 |
| 12) | Substation automation system (SAS) complete with EWS & 64" LED Smart TV etc. | Lot | 1 |
| 13) | Online Partial Discharge Monitoring System for 400 KV GIS S/s | Lot | 1 |
| 14) | Common Tariff metering panel with all standby meters for 400 KV system including provision of spare meters. (Number of panels will be as per requirement) | Lot | 1 |
| 15) | Spare ABT Meters (Duty Tested) for 33 kV system | Nos. | 4 |



| Sl. No. | Item | Unit | Quantity |
|---------|--|------|----------|
| 16) | CMRI, Laptop, External auxiliary supply device for ABT Meter reading during no auxiliary power to meter, modems and other accessories of ABT meters as specified in RFP | Lot | 1 |
| 17) | Workstation for tariff meters complete with software and hardware for interconnecting all the tariff meters | Set | 1 |
| 18) | Insulating mats for PSS (Front and Back of each electrical Panel) | Lot | 1 |
| 19) | Phasor Measurement Unit (PMU) for 400kV PSS Bays | Set | 1 |
| a. | Phasor Measurement Unit (PMU) at CTUIL/ISTS S/s end | Set | 1 |
| b. | Time System (GPS Receiver) | Set | 1 |
| c. | Substation Grade Layer-3 LAN Switches with minimum 4 x 10/100 Mbps Ethernet ports and 2 x 1 Gbps Ethernet ports | Set | 1 |
| d. | Integration - PMU with PDC at RLDC and SLDC | Set | 1 |
| 20) | Power Quality Meters (PQM) at CTUIL/ISTS S/s end | Set | 1 |
| 21) | Bus post insulators (AIS) | Lot | 1 |
| 22) | CVT junction box (AIS) | Lot | 1 |
| 23) | Porcelain/Polymer string Insulators for AIS | Lot | 1 |
| 24) | Hardware for String Insulators for AIS | Lot | 1 |
| 25) | Shield / Earth wires for AIS | Lot | 1 |
| 26) | Fittings, clamps, connectors, spacers, hardware, earth electrodes etc. for shield wires (AIS) | Lot | 1 |
| 27) | AL59 equivalent to Moose Conductors (587 Sq mm OD) | Lot | 1 |
| 28) | 4" IPS AL Bus pipe (AIS) | Lot | 1 |
| 29) | Fittings, clamps, connectors, spacers, hardware etc. for AL59 conductor & AL bus pipe (AIS) | Lot | 1 |
| 30) | 33/0.433 kV, 1.25 MVA Oil filled, Outdoor type station service transformers (<i>Capacity in tentative shall be finalized during detail engineering and may increase which bidder cannot put claim on Customer/Client</i>). | Nos. | 2 |
| | Extra Transformer oil for 33/0.433 kV Transformer (in drums of 210 Ltrs each). 10% of the oil used in transformers. To be supplied only if make of oil is other than used in 400 kV power transformer | Lot | 10% |
| 31) | 415V Station service board (4 Bus System) | Nos. | 1 |
| 32) | 415V Park Infrastructure Distribution Board | Nos. | 1 |
| 33) | 415V Lighting distribution board | Lot | 1 |
| 34) | 220V DC distribution board | Nos. | 2 |
| 35) | 220V, battery complete with rack, accessories etc. (Including Discharge Resistance Bank, Battery room MCCB Panel) | Set | 2 |
| 36) | 220V float chargers | Set | 2 |
| 37) | 220V float cum boost chargers | Set | 2 |
| 38) | 230V AC UPS system | Set | 4 |
| 39) | UPS distribution board | | |
| a. | For SAS and other systems of PSS | Set | 2 |
| b. | For HPCMS system | Set | 2 |



| Sl. No. | Item | Unit | Quantity |
|---------|--|------|----------|
| 40) | 415V 750 kVA DG set with acoustic enclosure: Continuous running duty. <i>(however the actual size shall be calculated based on design criteria of DG set in technical specification & detail engineering by vendor, no extra cost to Owner)</i> | Set | 1 |
| 41) | 415V 500 kVA DG set with acoustic enclosure <i>(however the actual size shall be calculated based on design criteria of DG set in technical specification & detail engineering by vendor, no extra cost to Owner)</i> | Set | 1 |
| 42) | Diesel Engine Storage Tank with required civil work. | Lot | 1 |
| 43) | Fuel for DG Sets, for 7 Days continuous running on Full Load. | Lot | 1 |
| 44) | Illumination system complete with, Lighting DB, Lighting Panel, LED lighting fixtures, lighting poles, high mast lighting, switch boxes, single phase receptacles, three phase welding receptacles, conduits, wires, poles, earthing wires, etc. for overall pooling substation. | Lot | 1 |
| 45) | Illumination system complete with LED lighting fixtures, lighting panels, switch boxes, single phase receptacles, conduits, wires, poles, earthing wires, etc. Substation control building and GIS building. | Lot | 1 |
| 46) | Ceiling Fans, Industrial Pedestal fans, wall mounted fans, exhaust fans for all rooms. | Lot | 1 |
| 47) | 19/33kV grade, 3CX185 sq. mm. XLPE insulated armoured FRLS power cables with aluminium conductor | Lot | 1 |
| 48) | 19/33kV grade, 3CX185 sq.mm Cable Termination kit for Station Service Transformers & Capacitor Banks | Lot | 1 |
| 49) | 1.1kV grade, XLPE insulated armoured FRLS power cables | Lot | 1 |
| 50) | 1.1kV grade, PVC insulated armoured FRLS control cables | Lot | 1 |
| 51) | Common Communication panel with all equipment, cables and accessories. | Lot | 1 |
| 52) | VoIP Phone | Nos. | 2 |
| 53) | Signal cables (Screened cables) | Lot | 1 |
| 54) | Fiber optic cables | Lot | 1 |
| 55) | Galvanized steel Cable trays and painted steel supports | Lot | 1 |
| 56) | FOTE panel: 01 for PSS-1 end 01 for ISTS S/s end | Nos. | 2 |
| 57) | RIO (Remote Input Output) Panel for PPC at ISTS S/s | Nos. | 1 |
| 58) | PLCC panel (One for PSS-1 end and one for ISTS S/s end) | Nos. | 2 |
| 59) | Cabling accessories such as cable glands, lug, clamps, pipes, conduits, trefoil clamps, and other accessories | Lot | 1 |
| 60) | Fire stop cable sealing system | Lot | 1 |
| 61) | Buried earth mat with mild steel rod, earth electrodes | Lot | 1 |
| 62) | Earthing and Lightning System for PSS-1 | Lot | 1 |
| 63) | Galvanized steel earthing conductors, clamps, hardware etc. for above ground earthing | Lot | 1 |
| 64) | Electronic earthing for SAS & Computers/Servers | Lot | 1 |



| Sl. No. | Item | Unit | Quantity |
|---------|--|-------|----------|
| 65) | Hand gloves, shock treatment charts (SS/ACP), danger boards (SS), caution boards (SS/ACP) etc. | Lot | 1 |
| 66) | Power Transformer | | |
| 67) | 340/170/170 MVA, 400/33/33 kV, Three phase, three winding, power transformers with ONAN/ONAF cooling OLTC, bushing CTs, first fill oil etc. | Nos | 2 |
| 68) | Remote tap changer panel (RTCC) | Nos. | 2 |
| 69) | Digital type RWTI for HV and LV windings | Nos. | 2 |
| 70) | Nitrogen Fire Protection System for each transformer | Nos. | 2 |
| 71) | On line dissolved gas analyser to monitor 9 gases | Nos. | 2 |
| 72) | Maintenance Free Dehydrating Breather system | Set | 2 |
| 73) | Fibre optic Temperature monitoring system (FOTM) | Set | 2 |
| 74) | On line insulating oil drying system (Cartridge Type) | Set | 2 |
| 75) | On line OLTC oil filter unit | Set | 2 |
| 76) | Power Socket / Panel for Transformer Oil Filtration | Set | 2 |
| 77) | Power and control cable between RTCC panel / cooler control cabinet / Fire protection panel and transformer | Lot | 2 |
| 78) | Foundation bolts and set of rails (for 04 power transformers) | Lot | 1 |
| 79) | Extra Transformer oil for 400 kV Transformers If Make of oil is same for all transformers than 40 Drums of 210 Liters each. If Make of oil is different than 10% of oil for each make in 210 Liters. Drum Packing. | Drums | 35 |
| 80) | 33 kV Switchgear (L1) | Nos. | 1 |
| 81) | 33 kV Switchgear (L3,L4,L5) | Nos. | 3 |
| 82) | 33 kV Busduct between LV1 & LV2 side of each Step up power transformer and 33 kV Pooling Switchgear (The busduct shall be complete with bends, phase terminal adopter boxes, flexible terminal connections, inspection covers, bellows, silica gel breather, space heaters, hardware, support structures, civil foundation etc.) | Set | 4 |
| 83) | 33kV Capacitor Banks (16 MVar) | Set | 8 |
| 84) | PEB for 02 nos. 33kV pooling switchgears (AIS) with illumination, ventilation etc. complete in nature | Nos. | 2 |
| 85) | Hybrid Park Control Monitoring System (HPCMS) | | |
| a) | Main SCADA system with required servers & storage | Lot | 1 |
| b) | PPC with required servers & storage(Phase-1 and Phase-2) | Lot | 1 |
| c) | GPS Master Clock system | Lot | 1 |
| d) | Large Video Screen | Nos. | 2 |
| e) | Historian station | No. | 1 |
| f) | Operator work station | Nos. | 3 |
| g) | Engineering Work station | No. | 2 |
| h) | Laptop for EWS system (High Configuration and all licenced software's) | Nos. | 2 |
| i) | Network controllers and accessories | Lot | 1 |



| Sl. No. | Item | Unit | Quantity |
|---------|---|------|----------|
| j) | Router/Firewall/Gateway | Lot | 1 |
| k) | Colour laser printer A4 | Nos. | 2 |
| l) | Colour laser printer A3 | No. | 1 |
| m) | Fibre optic cables, control cables, data cables, power cables & any other cables with cable accessories such as cable trays, conduits, supports etc as required for complete interfacing requirements | Lot | 1 |
| n) | Power supply (UPS with battery backup) as required for efficient operation of the system | Lot | 1 |
| o) | Furniture for all rooms in Substation Buildings | Lot | 1 |
| p) | Interfacing cables as required for the completeness of Hybrid Park Control & monitoring system as per drawing no. FCE-1721125-CI-DWG-CMS-4100-002 | Lot | 1 |
| q) | Necessary Software for the completeness of Hybrid Park Control & monitoring system | Lot | 1 |
| r) | Licence for Remote web login for Five (05) simultaneous users. | Lot | 1 |
| s) | Weather Monitoring Station with associated system | Lot | 1 |
| t) | Underground 48F FO Cable for PSS-1 to PSS-2 Link | Lot | 1 |
| u) | FODP (SS-304), its supporting structure, extended canopy and required accessories etc. | Lot | 1 |
| v) | Weather Monitoring System with solar radiation sensors, pyranometer, temperature sensors, wind sensors, relative humidity sensor and Wind Mast with complete accessories as required and data logger with capability of interfacing with HPCMS. | Lot | 1 |
| | HVAC works | | |
| 86) | Ventilation for GIS building (AHU and related systems) | Lot | 1 |
| 87) | Air conditioning for Substation Control building (Including but not limited to C&R Panel & SAS Room, Control Room, Server room, conference room, shift in charge room , O&M room etc.) with required "AC Scheduler / AC control System) | Lot | 1 |
| 88) | Ventilation for Substation Control building | Lot | 1 |
| 89) | Ventilation system for 33 kV PEB's | Lot | 1 |
| 90) | Ventilation and air conditioning system Distribution Boards / Panels | Lot | 1 |
| | Fire protection system | | |
| 91) | Fire protection system for overall pooling substation and control building complete with fire alarm panels, repeater panel, detectors, cabling , portable/trolley mounted fire extinguishers, etc. | Lot | 1 |
| 92) | Dry chemical powder type fire extinguishers, 6 kg capacity. | Nos. | 10 |
| 93) | Carbon Dioxide type fire extinguishers, 4.5 kg capacity. | Nos. | 10 |
| 94) | Wheel/Trolley mounted Mechanical foam type fire extinguishers of 45 litre capacity | Nos. | 5 |
| | Civil & structural works | | |
| 95) | Towers and gantry girders and masts in the Substation | Lot | 1 |



| Sl. No. | Item | Unit | Quantity |
|---------|--|------|----------|
| 96) | Equipment supporting structures for all Substation equipment | Lot | 1 |
| 97) | Pre cast or brick stone masonry around the Substation with access gates including necessary foundation | Lot | 1 |
| 98) | All foundations for towers/structures and substation equipment foundations | Lot | 1 |
| 99) | Transformer foundation, Rail, soak pit, NIFPS pit etc. | Set | 2 |
| 100) | Rail foundation and road for Transformers, quantity as per site requirement. | Lot | 4 |
| 101) | Transformer Burnt oil pit with drain pipeline (common for all the transformers). | No. | 1 |
| 102) | Roads, Walkways for the Substation, GIS building and Control building | Lot | 1 |
| 103) | Storm water drain network in Substation | Lot | 1 |
| 104) | Cable trenches for the Substation Control building | Lot | 1 |
| 105) | Cable trenches in the substation | Lot | 1 |
| 106) | Crushed stone paving within the Substation area | Lot | 1 |
| 107) | Foundation for DG sets | Lot | 1 |
| 108) | Foundations for Station Service Transformers | Lot | 1 |
| 109) | Prefab GIS Hall with EOT Crane, Cable Trench etc. | Lot | 1 |
| 110) | Prefab Substation control building | Lot | 1 |
| 111) | Outdoor storage yard (Not less than 20Mx40M) | Lot | 1 |
| 112) | PEBs for 33 kV switchgear & capacitors including Civil & Structural Works with illumination, ventilation etc. complete in nature | Nos. | 2 |
| 113) | Construction of Diesel Storage Yard with Shed | Lot | 1 |
| 114) | Construction of Transformer Oil Storage Yard with Shed | Lot | 1 |
| 115) | Construction of Store for keeping consumables, commissioning spares, mandatory spares, special tools & tackles etc. Adequate space and efficient storage system at store room in PSS- I for storage of mandatory spares , special tools and tackles, various type of bins, metal plates etc. on aluminium racks in a neat and easily accessible manner. Sufficient storage space shall be provided for future requirement. | Lot | 1 |
| 116) | Adequate space and efficient storage system at store room in PSS- I for storage of mandatory spares , special tools and tackles, various type of bins, metal plates etc. on aluminium racks in a neat and easily accessible manner with lockable facility (the same shall be finalized as per Owners' requirement during detail engineering). Sufficient storage space shall be provided for future requirement. | Lot | 1 |
| 117) | Training shall be at Site and at factory | Lot | 1 |
| 118) | AMC support for all the Software's | Lot | 1 |
| 119) | Transformer Oil Storage system | Lot | 1 |
| 120) | Pantry Equipment's as List | Lot | 1 |
| 121) | Miscellaneous items as per list | Lot | 1 |



| Sl. No. | Item | Unit | Quantity |
|------------------------------------|--|------|----------|
| List of Pantry Equipment's | | | |
| 122) | Refrigerator approximately 300 Litters. Make Samsung, LG, Siemens, Bosch, BSH. | No | 1 |
| 123) | Micro Wave Oven 28 to 30 Litre convection type Make Panasonic, LG, Samsung. | No | 1 |
| 124) | 4 Buner built in Hob (Indian LPG Burners), auto electric ignition, SS top. (Make Faber, Kaff, Bosch, Siemens) | No | 1 |
| 125) | Induction cooktop, Philips, Havells, Siemens, Bosch | No | 1 |
| 126) | Electric Kettle, Make Havells | No | 1 |
| 127) | Pop up Sandwich Toaster automatic Make Philips, Havells, Panasonic | No | 1 |
| 128) | Water Filter RO +UV+UF, Eureka Forbes | No | 1 |
| 129) | Water Cooler 40 L SS, Voltas, Blue Star | No | 1 |
| 130) | Turbo Grinder & Blender 3000 W - Kent Product Code 16011 | No | 1 |
| 131) | Crockery Set Corelle Winter Frost White Crockery Set, Dinner Plate 12 Nos, Medium Plate 12 Nos, Small Plates 12 Nos, Veg Dessert Bowl -12, Curry Bowl -12 Nos, Serving Bowl 1 Litre - 4 Nos, Oval Plate-2 Nos | Set | 1 |
| 132) | Kitchen cabinets (top and bottom), finish PU polish , made of Industrial plywood. Plywood make of Century Ply, Greenply ,Kitply | Set | 1 |
| 133) | Wooden Dining Table (size for 6 person), with 6 Nos chair , finish polished Make Godrej, Durian, Nilkamal | Set | 1 |
| 134) | Kitchen Sink 900 mm SS-304, Single bowl. | No | 1 |
| List of Miscellaneous Items | | | |
| 135) | Automatic Hand Dryers SS Make Jaquar (to be provided in each wash room) | Lot | 1 |
| 136) | Automatic Exhaust fan (to be provided in each WC) | Lot | 1 |
| 137) | Automatic Sanitizer (To be placed at all strategic locations) | Lot | 1 |
| 138) | Automatic Liquid Soap Dispenser (to be provided in each wash room) | Lot | 1 |
| 139) | Insect Killer (To be provided at all strategic locations) | Lot | 1 |
| 140) | Paste Control System (To be provided at all strategic locations) | Lot | 1 |
| 141) | LOTO system Items | Lot | 1 |
| 142) | Access control System for PSS | Lot | 1 |
| 143) | Safety Slogan / Cautionary / Hazard / all equipment identification Boards. | Lot | 1 |
| 144) | Set of Standard Steel Hook Key Cabinet, Make Alkosign, Art No AKB 20 and/or 30 and/ or 40 as per requirement at various places as per PSS requirement | Lot | 1 |



| Sl. No. | Item | Unit | Quantity |
|--|---|------|----------|
| 145) | Electrical SLD's of A0 (1200x900 mm approx) size in entry area, Gas SLD GIS room and LV Room / Earthing System Layout at appropriate location. Identification boards for each 400 kV, 33 kV bays, outdoor AIS equipment's (Phase wise), Each room/ Hall / area, all panels, 33 kV capacitor Banks, Entry areas ,panels, cubicle with SLD drawn with color approximate size 2'x2' etc. | Lot | 1 |
| 146) | Executive Glass Writing Board, Make: Alkosign, 8mm thickness, Size: 900x1200mm, Art No: AGWBO90120, Colour: White, Suitable for conceded mounting or SS glass clamps mounting along with magnetic eraser Art no: ABE-1 Grey colour & Universal white board magnetic pen tray Art no: AMPT-4 (for Conference room and control room) | Set | 2 |
| List of Furnitures/Fixtures items | | | |
| 147) | Conference table with chairs to size for 10 persons. Make: Godrej, Durian, Zuari, Lexus. (Electrical Pop up box as per specifications of RFP) | Set | 1 |
| 148) | Sofas make of Durian, Zuari. | Lot | 1 |
| 149) | Desks, Chairs, drawer/cabinet for office rooms, O&M rooms and Reception area Make: Godrej, Durian, Zuari, Lexus | Lot | 1 |
| 150) | Steel Drawer Cabinet to file documents make of Nilkamal, Godrej. | Lot | 1 |
| 151) | Industrial locker for 15 individuals compartments with powder coated, 0.6mm thick, duplicate keys, locker number and name plate pocket, O&M room make of Nilkamal, Godrej. | No | 1 |
| 152) | Almirah with lock-in facility , key and key tag make of Godrej, Nilkamal or equivalent in store room | No | 2 |
| 153) | Aluminum Rack with 4 shelves for storage as per requirement. | Lot | 1 |

PHASE – II:

| Sl. No. | Item | Unit | Quantity |
|---------|---|------|----------|
| | Supply, Construction, Erection, Testing & Commissioning of the following equipment/System | | |
| | 400 kV pooling substation | | |
| 1) | Factory assembled, metal-enclosed, SF6 GIS bay including GIB and relevant support structures with associated Circuit Breaker with CSD, CT, Disconnecting Switch & EMVT for Power Transformers | Nos. | 02 |
| 2) | 420kV Gas to Air Bushings | Nos. | 6 |
| 3) | Relay panel with numerical relay | | |
| | a) For transformer feeder | Sets | 2 |
| 4) | 1.1kV grade, XLPE insulated armoured FRLS power cables | Lot | 1 |
| 5) | 1.1kV grade, PVC insulated armoured FRLS control cables | Lot | 1 |
| 6) | Cabling accessories such as cable glands, lug, clamps, pipes, conduits, trefoil clamps, and other accessories | Lot | 1 |



| Sl. No. | Item | Unit | Quantity |
|---------|--|-------|----------|
| 7) | Fire stop cable sealing system | Lot | 1 |
| | Power Transformer | | |
| 8) | 340/170/170 MVA, 400/33/33 kV, Three phase, three winding, power transformers with ONAN/ONAF cooling OLTC, bushing CTs, first fill oil etc. | Nos. | 2 |
| 9) | Remote tap changer panel (RTCC) | Nos. | 2 |
| 10) | Digital type RWTI for HV and LV windings | Nos. | 2 |
| 11) | Nitrogen Fire Protection System for each transformer | Nos. | 2 |
| 12) | On line dissolved gas analyser to monitor 9 gases | Nos. | 2 |
| 13) | Maintenance Free Dehydrating Breather system | Set | 2 |
| 14) | Fibre optic Temperature monitoring system (FOTM) | Set | 2 |
| 15) | On line insulating oil drying system (Cartridge Type) | Set | 2 |
| 16) | On line OLTC oil filter unit | Set | 2 |
| 17) | Power Socket / Panel for Transformer Oil Filtration | Set | 2 |
| 18) | Power and control cable between RTCC panel / cooler control cabinet / Fire protection panel and transformer | Lot | 1 |
| 19) | Extra Transformer oil for 400 kV Transformers If Make of oil is same for all transformers than 35 Drums of 210 Liters each. If Make of oil is different than 10% of oil for each make in 210 Liters. Drum Packing. | Drums | 35 |
| 20) | Transformer foundation, Rail, soak pit, etc. | Set | 2 |
| 21) | 33 kV Switchgear (L2) | Nos. | 1 |
| 22) | 33 kV Switchgear (L6,L7 & L8) | Nos. | 3 |
| 23) | PEB for 02 nos. 33kV pooling switchgears with illumination, ventilation etc. complete in nature | Nos. | 2 |
| 24) | 33kV Capacitor Banks (16MVAR) | Nos. | 8 |
| 25) | 33 kV Busduct between Step up power transformer and 33 kV Pooling Switchgear (The bus duct shall be complete with bends, phase terminal adopter boxes, flexible terminal connections, inspection covers, bellows, silica gel breather, space heaters, hardware, support structures, civil foundation etc.) | Set | 4 |
| 26) | Civil & structural works Touch-up (if any) for overall PSS-1 of 1200MW capacity | Lot | 1 |
| 27) | Ventilation system for 33 kV PEB's | Lot | 1 |

Note: The BOQ indicated above is tentative. Additional items require for complete and satisfactorily functioning of overall PSS including HPCMS shall be provided to Owner. These items shall be mentioned in bidders' bid (technical and financial); latter on no extra cost shall be claimed by bidder.



ANNEXURE- C: MANDATORY SPARES

| S. No. | Item | Unit | Quantity |
|-----------|--|------|--|
| 1. | 400kV Gas Insulated Switchgear | | |
| a) | SF6 Gas Pressure Relief Devices of Each Type Along With O - Rings | Sets | 4 |
| b) | SF6 Pressure Gauge Cum Switch or Density Monitors And Pressure Switch As Applicable Each Type | Nos. | 8% of total population (max 7 nos. and min. 2 no.) |
| c) | Coupling Device Of Each Type For Pressure Gauge Cum Switch For Connecting Gas Handling Plant | Sets | 2 |
| d) | Rubber Gaskets, "O" Rings And Seals for SF6 Gas of each type | Sets | 3 |
| e) | Molecular Filter for SF6 Gas With Filter Bags | % | 5% of total weight |
| f) | All types of Control Valves for SF6 Gas of each type | Nos. | 3 |
| g) | SF6 Gas In Non-Returnable Cylinders | % | 20% of total gas quantity |
| h) | Locking Device to keep the Dis-Connectors (Isolators) And Earthing Switches in Close Or Open position in case of removal of the Driving Mechanism | Nos. | 3 |
| i) | Spares for Local Control Cabinet Including MCB, Fuses, Timers, Aux. Relays, Contactor, Push Buttons, Switches, Lamps, Annunciation Windows etc. of each type & rating and terminal of each type | Sets | 3 |
| j) | UHF PD Sensors of each type | % | 5% of total population (max 5 Nos. and min. 1 No.) |
| k) | Support Insulator/Gas Barrier of each type along with associated contacts & shields | Nos. | 5 |
| l) | SF6 to Air Bushing of each type & rating along with conductor and enclosure | No. | 2 |
| 2. | 400kV SF6 CIRCUIT BREAKER | | |
| a) | Complete Circuit Breaker (1 Phase Unit) of each type & rating complete with Interrupter, Main Circuit, Enclosure And Marshaling Box With Operating Mechanism to enable Replacement of Any Type/Rating Of CB by spare (as applicable) | Set | 3 |
| b) | Fixed, moving and arcing contacts including insulating nozzles of each type - for Main Chamber | Set | 1 |
| c) | Trip Coil Assembly With Resistor, as applicable, 3 Nos. of each type | Sets | 2 |
| d) | Closing Coil Assembly With Resistor, As Applicable, 3 Nos. of each type | Sets | 2 |
| e) | Relays, Power Contactors, Push Buttons, Timers & MCBs etc. of each type and rating | Sets | 3 |
| f) | Auxiliary Switch Assembly, 3 Nos. of each type | Sets | 2 |
| g) | Operation Counter, 3 Nos. of each type | Set | 1 |
| h) | Window-scope/ Observing Window, 3 Nos. of each type | Sets | 2 |
| 3. | For Spring Operated Mechanism | | |
| a) | Complete Spring Operating Mechanism Including Charging Mechanism etc. of each type | Set | 1 |
| b) | Spring Charging Motor | Nos. | 3 |



| S. No. | Item | Unit | Quantity |
|-----------|--|------|----------|
| 4. | 400kV ISOLATORS | | |
| a) | For Maintenance Earth Switch: 3 No. of Single Phase Maintenance Earthing Switch Of Each Type, Dimension, Current & Voltage Including Main Circuit, Enclosure, Driving Mechanism And Support Insulator etc. to enable replacement of any Type/Rating of Earth Switch by spare | Sets | 3 |
| b) | Complete set of 3-phase dis-connector of each type including main circuit, enclosure, driving mechanism and support Insulator etc. to enable complete one to one replacement of all applicable type of Isolator by spare | Sets | 3 |
| c) | For Fast Earthing Switch: 3 No. of Single Phase Fast Earthing Switch of each Type, Dimension, Current & Voltage Rating Including Main Circuit, Enclosure, Driving Mechanism and Support Insulator etc. to enable replacement of any Type/Rating Of Earth Switch by spare (If Applicable) | Sets | 2 |
| d) | Copper contact fingers for isolator male & female contact along with corona shield– for one complete (3 phase) isolator of each type and rating | Sets | 2 |
| e) | Copper contact fingers for Maintenance Earthing switch male & female contacts along with corona shield, for one complete (3 phase) earthing switch of each type and rating | Sets | 2 |
| f) | Copper contact fingers for Fast Earthing switch male & female contacts along with corona shield, for one complete (3 phase) earthing switch of each type and rating (if applicable) | Sets | 2 |
| g) | For Isolator: Open / Close Contactor Assembly, Timers, Key Interlock, Interlocking Coils, Relays, Push Buttons, Indicating Lamps Power Contactors, Resistors, Fuses, MCBs & Drive Control Cards etc. for one complete MOM Box (3 – Phase Gang Operated or 1 – Phase Unit) of each type and rating. | Sets | 2 |
| h) | For Maintenance Earth Switch: Open / Close Contactor Assembly, Timers, Key Interlock, Interlocking Coils, Relays, Push Buttons, Indicating Lamps Power Contactors, Resistors, Fuses, MCBs & Drive Control Cards etc. for one complete MOM Box (3 – Phase Gang Operated or 1 – Phase Unit) of each type and rating. | Sets | 2 |
| i) | For Fast Earthing Switch: Open / Close Contactor Assembly, Timers, Key Interlock, Interlocking Coils, Relays, Push Buttons, Indicating Lamps Power Contactors, Resistors, Fuses, MCBs & Drive Control Cards etc. for one complete MOM Box (3 – Phase Gang Operated or 1 – Phase Unit) of each type and rating. | Sets | 2 |
| j) | For Isolator: Limit Switch and Aux. Switches for complete 3-Phase Equipment | Sets | 2 |
| k) | For Maintenance Earth Switch: Limit Switch And Aux. Switches for complete 3-Phase Equipment | Sets | 2 |
| l) | For Fast Earthing Switch: Limit Switch And Aux. Switches for complete 3-Phase Equipment | Sets | 2 |
| m) | For Isolator: Drive Mechanism of each type | Nos. | 2 |



| S. No. | Item | Unit | Quantity |
|------------|--|------|--|
| n) | For Maintenance Earth Switch: Drive Mechanism of each type | Nos. | 2 |
| o) | For Fast Earthing Switch: Drive Mechanism of each type | No. | 1 |
| p) | For Isolator: Motor for Drive Mechanism of each type | Nos. | 3 |
| q) | For Maintenance Earth Switch: Motor for Drive Mechanism of each type | Nos. | 3 |
| r) | For Fast Earthing Switch: Motor for Drive Mechanism of each type | Nos. | 3 |
| 5. | 400kV CURRENT TRANSFORMER | | |
| a) | Complete 400kV CT of each Type And Rating with enclosure to enable replacement of any type/ rating of CT by spare | Nos. | 2 |
| 6. | 400kV VOLTAGE TRANSFORMER (EMVT) | | |
| a) | Complete EMVT of each type and rating with enclosure to enable replacement of any type/rating of EMVT by spare | Nos. | 2 |
| b) | 400kV Wave Trap with pedestal and terminal connectors (optional pricing) | No. | 1 |
| c) | 400kV CVT(optional pricing) | No. | 1 |
| 7. | Controlled Switching Device along with Transducers, Sensors, Contactors, Switches etc. | Set | 1 set of each make |
| 8. | SURGE ARRESTOR | | |
| a) | Complete Surge Arrester with insulating base and Terminal connector & structure with Surge counter / Monitor of each type and rating | Sets | 2 |
| b) | Surge counter/ monitor. (In addition to above) | Nos. | 6 |
| 9. | 400kV BUS POST INSULATOR | | |
| a) | Bus post insulator assembly (Complete) | Sets | 3 |
| 10. | 33kV CAPACITOR BANK | | |
| a) | Capacitor cans | No | 5% of Each type and rating subject to minimum 10 units |
| b) | Support Insulator | Nos. | 3 |
| c) | Fuse | Nos. | 6 |
| d) | Series Reactor | No | 1 |
| e) | NCT | No | 1 |
| f) | Capacitor connector | % | 10% of total population |
| 11. | 400 kV Line Relay or Control Panel | | |
| a) | Numerical Relays of each make and type. | Set | 1 |
| b) | Power Quality Meter along with its accessories (PQM) | No. | 1 |
| c) | Phasor Measurement Unit (PMU) | No. | 1 |
| d) | Check synchronising and auto recloser relays (if not integral part of other relay) | No. | 1 |
| 12. | 400 kV Power Transformer Relay and or control Panel | | |
| a) | Numerical Relays of each make and type. | Set | 1 |
| 13. | 400 kV Bus Coupler AND Bus PT Relay and or control Panel | | |
| a) | Numerical Relays of each make and type. | Set | 1 |
| 14. | 400 kV RTCC Panels | | |
| a) | Numerical relays of each type | Sets | 2 |



| S. No. | Item | Unit | Quantity |
|------------|--|------|----------|
| b) | Remote tap position indicator | Nos. | 2 |
| c) | Space Heater, Thermostat, Door switch, Panel Handles, Hinges of each type. | Set | 1 |
| d) | Aux. relays, Contactors, Push Buttons, Switches, Indicating Lamps, LED Cubical illumination Lamp Annunciator, MCB, Fuses with carrier base and links, Timers, Terminal Blocks etc. of each type & rating | Set | 1 |
| e) | Hooter and Annunciator of Each type | Sets | 2 |
| 15. | Common Spares of 400 kV GIS system Relay and or control Panels | | |
| a) | Multi function Meters (MFM) of each type. | Sets | 2 |
| b) | Standby ABT Meters (i.e. SEMS's with Serial Numbers allotted by CA duly tested at NABL Lab) | No | 2 |
| c) | Trip Circuit Supervision Relay for Breaker | No | 2 |
| d) | Trip Circuit Supervision Relay for Master Trip Relay | No | 2 |
| e) | Busbar Protection Relay of each type | Set | 1 |
| f) | Bay control unit of each type (BCU) | Sets | 1 |
| g) | Local Breaker Backup Relay (LBB) | No | 1 |
| h) | Test Terminal Block of protective relays of each type | sets | 1 |
| i) | Test Terminal Block of metering of each type | sets | 1 |
| j) | Space Heater, Thermostat, Door switch, Panel Handles, Hinges of each type. | sets | 2 |
| k) | Aux. relays, Contactors, Push Buttons, Switches, Indicating Lamps, LED Cubical illumination Lamp, Annunciator , MCB, Fuses with carrier base and links, Timers, Terminal Blocks etc. of each type & rating | sets | 2 |
| l) | Electrically operated, Mechanically Latched Bi-stable Master Trip Relays | Nos | 3 |
| m) | DC Failure, AC Failure, Fuse Failure relay of each type. | Sets | 2 |
| n) | Hooter of Each type. | Nos | 2 |
| o) | Meters of each type (other than MFM's) | Sets | 2 |
| p) | Communication Probes / wires / connectors of each type for numerical relay | Sets | 2 |
| q) | Semaphore of each type and size | Set | 2 |
| 16. | 220 V DC Battery Sets | | |
| a) | Spare battery dry cell | Nos | 22 |
| b) | Inter cell connectors complete set of one Battery Bank with Nut Bolts, Washers etc. | Set | 1 |
| c) | Inter row connectors complete set of one Battery Bank with Nut Bolts, Washers etc. | Set | 1 |
| d) | SAN container of battery bank with top cover (Empty) | Nos | 5 |
| e) | Vent plugs | Nos | 50 |
| f) | Electrolyte for one battery Bank | Set | 10% |
| 17. | 220 V DC Battery Charger and associated DCDB | | |
| a) | SMPS module of each rating | Set | 2 |
| b) | Main Controller and or HMI of each type | Set | 2 |
| c) | MCCB's of each rating (Including Battery room MCCB's) | Set | 1 |
| d) | Voltage regulator of each type and rating with set of heat sinks | Set | 2 |
| e) | Power and Control Fuses (Base , Carrier and Links) of each type and rating | Set | 2 |
| f) | Meters / Transducer / Shunts/ SPD / Switches of each | Set | 2 |



| S. No. | Item | Unit | Quantity |
|------------|---|------|----------|
| | type and rating. | | |
| g) | Insulation monitoring device of each type | Nos | 1 |
| h) | Annunciator of each type | Nos | 1 |
| i) | LED indicating lamp and Push Button of each type and rating | Set | 20% |
| j) | Discharge resistance Bank elements of each type and rating | Set | 1 |
| 18. | 415 V Station Service Board and Park Infrastructure Distribution Board (DB) | | |
| a) | Air Circuit Breaker (ACB) of each type and rating | Set | 1 |
| b) | Numerical relay of each type. | Set | 2 |
| c) | Test Terminal Block of protective relays of each type | Set | 1 |
| d) | Test Terminal Block of Metering system of each type | Set | 1 |
| e) | CT of each rating and class | Set | 3 |
| f) | PT of each type and rating | Set | 3 |
| g) | Multi function Meters (MFM) of each type. | Set | 5 |
| h) | Power MCCB of each rating and type | Set | 3 |
| i) | Power Contactor of each rating and type | Set | 3 |
| j) | Trip Circuit Supervision Relay for Breaker | No | 2 |
| k) | Trip Circuit Supervision Relay for Master Trip Relay | No | 2 |
| l) | Space Heater, Thermostat, Door switch, Panel/Handles, Hinges of each type. | set | 2 |
| m) | Aux. relays, Auxiliary Contactors, Auxiliary contact block of control contactor, Push Buttons, Switches, Indicating Lamps, LED Cubical illumination Lamp, Annunciator, Control MCB, Control Fuses with carrier base and links, Timers, Power and Control Terminal Blocks etc. of each type & rating | set | 3 |
| n) | Electrically operated, Mechanically Latched Bi-stable Master Trip Relays | Nos | 3 |
| o) | DC Failure, AC Failure, Fuse Failure relay of each type. | Set | 2 |
| p) | Hooter of Each type. | Nos | 2 |
| q) | Meters of each type (other than MFM's) | Set | 2 |
| r) | Communication Probes / wires / connectors of each type for numerical relay | Set | 2 |
| s) | Spring charging motor of each type and rating. (ACB) | no | 4 |
| t) | Set of Fixed contact assembly of one 4-Pole ACB of each type and rating. | Lot | 2 |
| u) | Set of Moving contact assembly of one 4-Pole ACB of each type and rating. | Lot | 2 |
| v) | Set of Arcing contact assembly of one 4-Pole ACB of each type and rating. | Lot | 2 |
| w) | Closing coil of each type (ACB) | no's | 10 |
| x) | Tripping coil of each type (ACB) | no's | 10 |
| y) | Auxiliary switches / contact block (ACB) of each type and rating | no's | 10 |
| z) | Water Level controller of each type with set of sensors | Set | 2 |
| aa) | Control Transformer of each type and rating | Set | 2 |
| bb) | Limit switches of each type and rating | Set | 3 |
| cc) | Electronic Motor Protection Relay of each type and rating | Set | 4 |
| dd) | CT & PT for LT system of each type and rating | Set | 2 |



| S. No. | Item | Unit | Quantity |
|------------|---|-----------------|--------------------|
| ee) | Each type of Timer | Set | 3 |
| ff) | Buzzer / Hooter / Bell of each type | Set | 4 |
| gg) | Panel hardware accessories like Gasket, Knobs, Door Locks, Handle, Hinges, filter, Power Terminal Block shroud etc. of each type | Set | 3 |
| 19. | UPS (HPCMS and SAS system) and its DB | | |
| a) | Set of control cards (All PCB cards) | Set | 1 |
| b) | Set of relays | Set | 1 |
| c) | Cooling fan with motor assembly | Set | 1 |
| d) | MFM of each type | Nos | 1 |
| e) | Measuring instruments of each type and rating (Other than MFM) | Nos | 1 |
| f) | Static Transfer Switch of each type and rating. | Set | 1 |
| g) | Bypass switch of each type and rating | Set | 1 |
| h) | Set of contactor and MCB's of each type and rating | Set | 1 |
| i) | Filter capacitor | No | 1 |
| j) | IGBT Power Module / Stack / Rack | Set | 1 |
| k) | Set of fuses for each type and rating | Set | 1 |
| l) | SPD of each type and rating | Set | 1 |
| m) | Aux. relays, Auxiliary Contactors, Push Buttons, Switches, Indicating Lamps, LED Cubical illumination Lamp, Annunciator, Control MCB, Control Fuses with carrier base and links, Timers, Power and Control Terminal Blocks etc. of each type & rating | Set | 1 |
| n) | Panel hardware accessories like Gasket, Knobs, Door Locks, Handle, Hinges, filter, Power Terminal Block shroud etc. of each type | Set | 1 |
| 20. | Substation Automation System (SAS) | | |
| a) | SAS server PC, Gateway PC/Standalone Gateway along with software of each type | Set | 1 |
| b) | SMPS used for Master station, HMI, Printer server (each type) | Set | 1 |
| c) | Bay control unit (BCU) of each type with configuration software | Sets | 2 |
| d) | CB Control Unit of each type | Sets | 2 |
| e) | Auxiliary relays used in bay control unit for control applications | % | 10% of population |
| f) | FO patch card of each type | Sets | 5 |
| g) | Ethernet Switch of each type | Set | 1 |
| h) | Fan assembly used for Master station, HMI, Printer server | Set | 1 set of each type |
| 21. | 400/33/33 kV Step up Power transformers | | |
| a) | HV Bushing with metal parts | Nos. | 3 |
| b) | LV Bushing with metal parts | Nos. | 6 |
| c) | HVN Bushing with metal parts | No. | 2 |
| d) | HV Neutral Bushing CT of each type and rating | Set | 3 |
| e) | LVN Bushing with metal parts | No. | 2 |
| f) | LV (33 kV) Neutral Bushing CT of each type and rating | Set | 3 |
| g) | Oil temperature indicator with all accessories | Set | 2 |
| h) | Pressure relief device (Plug & Socket Type with required length of armoured cable) | No. | 2 |
| i) | Set of valves for all types | No of each type | 1 |



| S. No. | Item | Unit | Quantity |
|--------|---|------|----------|
| j) | Magnetic oil level gauge with float arm assembly (Plug & Socket Type with required length of armoured cable) | Set | 2 |
| k) | Prismatic Oil Level Gauge (POG) assembly | Set | 2 |
| l) | Silica gel breather for Main Tank and OLTC | No. | 4 |
| m) | Maintenance Free Dehydrating Breather system | Set | 1 |
| n) | Recommended spares for On line dissolved gas analyser to monitor 9 gases including consumables for 2 years (Rota meter, SOV, Filter, Pressure Gauge, Isolation Valves etc.) | Set | 1 |
| o) | OEM Recommended Spares of Fibre optic Temperature monitoring system (FOTM) | Set | 1 |
| p) | OEM Recommended Spares for On line insulating oil drying system (Cartridge Type) and consumables for 2 Years | Set | 1 |
| q) | Air Cell (COPSV) | No. | 1 |
| r) | Conservator Protection Relay (Plug & Socket Type with required length of armoured cable) | No. | 1 |
| s) | Power and Auxiliary contactors, electronic relays, Push Buttons, MCB, fuses and switches of each type and rating for cooler control panel | Set | 2 |
| t) | Complete set of OLTC with Selector Switch , Diverter Switch, fix and moving contacts etc. | Set | 1 |
| u) | Bevel gear assembly, Inspection window, diaphragm for OLTC | Set | 1 |
| v) | Complete set of Diverter Switch assembly | Set | 1 |
| w) | Complete set of Gasket, "O" rings for OLTC | Set | 1 |
| x) | Transition resistors of each type, Bleeder screw, Braided Contact Lead for OLTC | set | 2 |
| y) | Power and Auxiliary contactors, electronic relays, Push Buttons, MCB, fuses and switches and limit switches of each type and rating, Local tap indication Mechanism assembly, spare handle , electronics for remote tap signal transmission for OLTC Drive Panel. | Set | 2 |
| z) | Winding and Oil temperature transducers for remote indication of each type and rating. | set | 2 |
| aa) | Winding temperature indicator with all accessories | Set | 2 |
| bb) | WTI CT of each type and rating | Set | 1 |
| cc) | HV Neutral support insulators of each type and each rating | Set | 2 |
| dd) | LV Neutral support insulators of each type and each rating | Set | 4 |
| ee) | Complete set of Gaskets for transformer. | Set | 2 |
| ff) | Buchholz relay (Plug & Socket Type with required length of armoured cable) | No. | 3 |
| gg) | Gas Collection Device assembly | Set | 2 |
| hh) | Cooling fan with motor assembly | Nos. | 4 |
| ii) | Motor for OLTC | Nos. | 2 |
| jj) | MCCB/MCB / MPCB of each type and rating | Set | 2 |
| kk) | Tap changer contacts | Nos. | 2 |
| ll) | OLTC surge relay (Plug & Socket Type with required length of armoured cable) | Nos. | 3 |



| S. No. | Item | Unit | Quantity |
|------------|--|-----------------|----------|
| 22. | NITROGEN INJECTION FIRE PREVENTION SYSTEM | | |
| a) | Transformer Conservator Isolation Valve (TCIV) with limit / position switch assembly. | No. | 1 |
| b) | Electrical control panel with Annunciation printed circuits Boards (For solid state annunciation) in the control panel | No | 1 |
| c) | Quartzoid bulb detectors (Qty = used in one transformer) | Set | 1 |
| d) | Limit switches for Quartz Bulb(Qty = used in one transformer) | Set | 1 |
| e) | Valves (each size each type) | Set | 1 |
| f) | Pressure gauge, limit switches etc of each type | Set | 1 |
| g) | Signal box & Junction box | Set | 1 |
| h) | Nitrogen Cylinder. (Qty = used in one transformer) | Set | 1 |
| i) | Fire Survival cables (Qty = used in one transformer) | Set | 1 |
| j) | OEM Recommended spares for Fire Extinction Cubicle (FEC) including but not limited to Gas Release Unit, Oil Release Unit, Pressure Setting Device, Gas Flow Control Unit | Set | 1 |
| 23. | 33/0.433 kV Oil type Transformer | | |
| a) | HV Bushing with metal parts | Nos. | 3 |
| | i. LV Bushing with metal parts | Nos. | 4 |
| | ii. LVN Bushing with metal parts | No. | 1 |
| | iii. LV Neutral Bushing CT of each type and rating | Set | 1 |
| | iv. LV Neutral support insulators of each type and each rating | Set | 2 |
| | v. Buchholz relay (Plug & Socket Type with required length of armoured cable) | No. | 1 |
| | vi. Gas Collection Device assembly | Set | 1 |
| | vii. Pressure relief device (Plug & Socket Type with required length of armoured cable) | No. | 1 |
| | viii. Oil temperature indicator with all accessories | Set | 1 |
| b) | Winding temperature indicator with all accessories | Set | 1 |
| c) | WTI CT of each type and rating | Set | 1 |
| d) | Winding and Oil temperature transducers for remote indication of each type and rating. | set | 1 |
| e) | Magnetic oil level gauge with float arm assembly (Plug & Socket Type with required length of armoured cable) | Set | 1 |
| f) | Prismatic Oil Level Gauge (POG) assembly | Set | 1 |
| g) | Set of valves for all types | No of each type | 1 |
| h) | Silica gel breather | No. | 2 |
| i) | Air Cell (COPSY) | Nos | 1 |
| j) | Complete set of OCTC. | Set | 1 |
| k) | Complete set of Gaskets for transformer. | Set | 1 |
| l) | Conservator Protection Relay (Plug & Socket Type with required length of armoured cable) | No. | 1 |
| 24. | 33 kV Switchgear (Indoor VCB) | | |
| a) | Vacuum Circuit Breaker for Incomer | Nos | 1 |
| b) | Vacuum Circuit Breaker for outgoing Transformer (SST) feeder | Nos | 1 |
| c) | Vacuum Circuit Breaker for WPP/SPP Transmission Line | Nos | 3 |
| d) | Vacuum Circuit Breaker for Capacitor Bank Feeder | Nos | 2 |



| S. No. | Item | Unit | Quantity |
|--------|--|------|---------------------|
| e) | 33 kV LA | Nos | 12 |
| f) | 33 kV HRC Fuses of PT | Nos | 9 |
| g) | Busbar support Insulators | Nos | 10 |
| h) | Power Quality Meter along with its accessories (PQM) | No. | 1 |
| i) | Multi-function Meters (MFM) of each type. | No. | 4 |
| j) | Main ABT Meters (i.e. SEMs's with Serial Numbers allotted by CA duly tested at NABL Lab) | No. | 2 |
| k) | Numerical relay of each type. | Set | 10 |
| l) | Electrically operated, Mechanically Latched Bi-stable Master Trip Relays | Nos | 4 |
| m) | Annunciation units of each type. | Nos | 6 |
| n) | Trip Circuit Supervision Relay for Breaker | No | 4 |
| o) | Trip Circuit Supervision Relay for Master Trip Relay | No | 4 |
| p) | Tariff Metering PT of each rating and Class duly tested at NABL Lab | Nos | 3 |
| q) | Tariff Metering CT of each rating and Class duly tested at NABL Lab | Nos | 3 |
| r) | CT of each rating and class (Other than Tariff Metering CT) | Set | 3 |
| s) | PT of each type and rating (Other than Tariff Metering PT) | Set | 3 |
| t) | DC Failure, AC Failure, Fuse Failure relay of each type. | Set | 3 |
| u) | Hooter of Each type. | Set | 4 |
| v) | Meters of each type (other than MFM's) | Set | 2 |
| w) | Communication Probes / wires / connectors of each type for numerical relay | Set | 2 |
| x) | Spring charging motor of each type and rating. (VCB) | set | 10% (Minimum 2 Nos) |
| y) | Set of Fixed contact assembly of one VCB of each type and rating. | Lot | 3 |
| z) | Set of Moving contact assembly of one VCB of each type and rating. | Lot | 3 |
| aa) | Closing coil of each type (VCB) | no's | 10 |
| bb) | Tripping coil of each type (VCB) | no's | 10 |
| cc) | Auxiliary switches / contact block (VCB) of each type and rating | no's | 10 |
| dd) | Limit switches of each type and rating | Set | 10 |
| ee) | Space Heater, Thermostat, Door switch, Panel Handles, Hinges of each type. | set | 3 |
| ff) | Aux. relays, Auxiliary Contactors, Auxiliary contact block of control contactor, Push Buttons, Control Switches, Limit switches, Indicating Lamps, LED Cubical illumination Lamp, Annunciator , Control MCB, Control Fuses with carrier base and links, Timers, Power and Control Terminal Blocks etc. of each type & rating | set | 4 |
| gg) | Panel hardware accessories like Gasket, Knobs, Door Locks , Handle , Hinges, filter , Power Terminal Block shroud etc. of each type | Set | 4 |
| hh) | Test Terminal Block of protective relays of each type | Set | 1 |
| ii) | Test Terminal Block of Metering system of each type | Set | 1 |
| jj) | VCB operating Handle and Inspection window glass with gasket | Set | 4 |



| S. No. | Item | Unit | Quantity |
|------------|---|------------------------------|----------|
| 25. | DG Set | | |
| | Diesel engine | | |
| a) | Fuel injection nozzles | sets | 2 |
| b) | Crank shaft with standard size journals | set | 1 |
| c) | Main bearings | set | 1 |
| d) | Big-end bearings | set | 1 |
| e) | Diesel filter packs | nos. | 20 |
| f) | Mobile oil filter packs | nos. | 20 |
| g) | V-belt for radiator fan | nos. | 5 |
| h) | Fuel injector | nos. | 5 |
| i) | Fuel injection piping | set | 1 |
| j) | Ring gear for fly wheel | set | 1 |
| k) | Self-Starter | set | 1 |
| l) | Nozzle tester, barring bar, slings, eyebolts and other special equipment necessary for servicing the engine | set | 1 |
| m) | Solenoid Coil assembly | set | 1 |
| n) | Lube oil pressure safety control | Nos | 1 |
| o) | High Water Temperature safety control | Nos | 1 |
| p) | OEM Recommended spares for electronic governor. | Set | 1 |
| | Generator | | |
| a) | Timers | no. of each type | 1 |
| b) | Rotating diodes and fuse for main field excitation | nos. each | 2 |
| c) | Temperature scanner | no. | 1 |
| d) | Complete assembly of Digital Automatic Voltage Regulator (DAVR) for one channel | set | 1 |
| e) | Battery Charger | set | 1 |
| f) | Exhaust fan of each type | set | 1 |
| | AMF panel with integral / external ACB facility | | |
| a) | Protection relays | no. of each type | 1 |
| b) | Auxiliary relays | no. of each type | 1 |
| c) | Indicating lamp | nos. of each type and colour | 2 |
| d) | Multi Function Meters | no. of each type | 1 |
| e) | Fuses | nos. of each type and rating | 2 |
| f) | Microprocessor based Diesel Engine Control Unit / Relay | no. of each type | 1 |
| g) | Air Circuit Breaker | no. of each type | 1 |
| h) | Annunciator | no. of each type | 1 |



| S. No. | Item | Unit | Quantity |
|------------|--|-------|---|
| 26. | Hybrid Park Control & Monitoring System | | |
| a) | I/O cards | | 10% of each type [or at least 2 nos. of each type], whichever is more. |
| b) | All types of electronic modules, processors, controllers, function modules, cards, communication modules terminal boards, relay boards, power supply cards, server, workstation, FOTE, PLCC etc. for above mentioned system and other Control System/Sub-systems and any other type of PCB not covered above | Nos. | 10% of each type [or at least 2 nos. of each type], whichever is more. |
| c) | Power supply unit | Nos. | 10% [at least 1 no.] of each type, whichever is more. |
| d) | Control logic power supply fuses/MCB/MCCB of each current rating in printers, in OS, in control panels elsewhere supplied for each system. | No. | 100% |
| e) | Plug-in type keyboard and mouse | No. | 1 no. |
| f) | Interposing/coupling relays | No. | 10% of each type and rating [at least 100 no.], whichever is more |
| g) | Power supply modules (AC to DC Converter). | Set | 10% [at least 1 no.] of each type, whichever is more. |
| h) | Electronics cards for servers | Nos. | 10% or min. 2 of each type of servers supplied with control system whichever is higher. |
| i) | DVD/CD for project | Nos. | 10 boxes of DVD/CD along with five no DVD/CD drive unit |
| j) | Data highway cable with connectors | Mtrs. | 200 Mtrs. of data highway cable with adequate connectors of each type |
| k) | Hard disk Drive | Nos. | Five nos hard disk drive unit as offered for system complete |
| l) | Prefab cable connectors | Nos. | 10% of prefab cable connectors |
| m) | Ethernet switches & other communication hardware etc. (Network switches, connectors repeaters, hubs, routers etc.) | Nos. | 10% of the number of hardware offered for this project from each type or minimum of 2 numbers from each model, whichever is more. |



| S. No. | Item | Unit | Quantity |
|------------|---|------|---|
| n) | Interface cables | Set | 2 sets of each type |
| o) | Gateway | Set | 1 set with all accessories |
| p) | Optical Fiber cable with highest length of each type | Lot | 2 |
| q) | Patch cord cable | Nos | 10% or min. 2 of each type of supplied with control system whichever is higher. |
| r) | Patch Card | Sets | 05 sets of each type. |
| s) | IEC-61850 Industrial Ethernet switch | Set | 02 of each type |
| t) | LIU | Nos. | 02 nos. each type |
| u) | Media Converter (If applicable) | Nos. | 02 nos. each type |
| v) | Router | Nos. | 01 nos. each type |
| w) | LAN cable | Drum | 1 |
| x) | RJ45 Connectors (Pack of 100) | Lot | 2 |
| y) | Connectors | Nos. | 50 nos. of each type |
| z) | Control and communication cables | Mtr | 500 mtr of each type & size |
| aa) | Printer Cartridges | Nos. | 03 nos. of each type |
| bb) | FODP accessories | Lot | 1 lot of each type |
| 27. | LVS | | |
| a) | Projection Unit, Illumination Unit, I/O cards, Colour Wheel, Power supply & Power factor, Lamp, Dust Filter, Fan. | No | 1 no of each type |
| b) | LEDs | Nos | 20% or min. 3 nos. whichever is more. |
| c) | LVS Filters | Nos | 20% or min. 3 nos. whichever is more |
| d) | Electronic cards of each type of LVS controller | No | 1 no of each type |
| e) | Interfacing cables | Nos | 10 % or 2 sets of prefab cable, whichever is more |
| 28. | GPS Master Clock | Lot | 1 |
| 29. | Power Plant Controller including RIO at ISTS S/s End. | | |
| a) | Controller CPU hardware | Nos | One no of each type |



| S. No. | Item | Unit | Quantity |
|------------|--|---------------------|--|
| b) | Ethernet Switches | Nos | 10% of each type [or at least 1 nos. of each type], whichever is more. |
| c) | I/O cards | Nos | 10% of each type [or at least 2 nos. of each type], whichever is more. |
| d) | Communication Cards | Nos | One no of each type |
| e) | Prefab Cables | Nos | One no of each type |
| f) | Terminators | Nos | One no of each type |
| g) | Back Plane Bus | Nos | One no of each type |
| 30. | Historian | | |
| a) | Hard disk Modules | Nos. | 1 no of each type |
| 31. | Air-conditioning system | | |
| a) | Each components electrical panel "AC Scheduler / AC control System "of each type and rating. | Set | 1 |
| b) | Spare remote control of each type. | Set | 1 |
| c) | Any other spare recommended by OEM (Bidder to list the items) | | |
| 32. | Ventilation system | Lot | 1 |
| a) | Drive Motor | Nos | 1 |
| b) | Blower with Shaft and bearings etc. | Set | 1 |
| c) | Panel type air pre-filter for complete AHU system | Set | 1 |
| d) | Spare for AHU Electrical panel like , Aux. relays, protective relays, Auxiliary Contactors, Main Contactor, Power MCB / MCCB, Power Switch/ SFU, Push Buttons, Control Switches, Indicating Lamps, Annunciator, Control MCB, Control Fuses with carrier base and links, Timers, Power and Control Terminal Blocks etc. of each type & rating | Set | 1 |
| e) | Any other spare recommended by OEM (Bidder to list the items) | | |
| 33. | Fire Protection System | | |
| a) | Manual Call points, detectors, Hooters, Isolators, response indicator of each type. | Lot | 20% |
| b) | Card / Module of each type. | Lot Minimum 2 | 20% |
| c) | SMPS module of each rating and type | Lot Minimum 2 | 20% |
| d) | Special cables (Ribbon or patch type etc. of within panel) of each type | Nos | 5 |
| 34. | EOT CRANE | | |
| a) | Electric motor of each type | Set | 1 |



| S. No. | Item | Unit | Quantity |
|------------|---|------|----------------------------|
| b) | Electro-Hydraulic Thrustor Brake of each type | Set | 1 |
| c) | DC Disk Brake of each type | Set | 1 |
| d) | Control Panel assembly | Set | 1 |
| e) | Lubricants | Set | 1 |
| f) | Master Controller | Set | 1 |
| g) | Travelling cable for one Crane | Set | 1 |
| h) | Pendent Controller cable for one Crane | Set | 1 |
| i) | Transmitter and Receiver of radio remote control system. | Set | 1 |
| j) | Aux. relays, Overload relays, Auxiliary Contactors, SPP, Push Buttons, Limit Switches, Control Switches, Indicating Lamps, LED Cubical illumination Lamp, Annunciator, Control MCB, Control Fuses with carrier base and links, Timers, Power and Control Terminal Blocks etc. of each type & rating | Set | 1 |
| k) | Beacon LED Lamp, Glass LED Busbar Crane DSL Indicator Lamp | Set | 1 |
| 35. | PLCC Panel | | |
| a) | Hand-held BER Meter for G.703, V.24, V.11, V.35 and Jitter / Wander Measurements (Make: G L Communications) | No. | 1 |
| b) | Optical Time Domain Reflecto-meter | No. | 1 |
| c) | Optical Power Meter | No. | 1 |
| d) | Test equipment for Tele protection module | | |
| e) | Card/Module of each type | No | 1 |
| f) | Connector of each type | Set | 1 |
| g) | Connecting cables of each type | No | 1 |
| h) | High Frequency (Co-axial) Cable (One Length from PLCC Panel to LMU) | Lot | 1 |
| i) | Line Matching Unit assembly (Coupling Device) | Set | 1 |
| 36. | FOTE Panel | | |
| a) | Card/Module of each type | No | 1 |
| b) | Connector of each type | Set | 1 |
| c) | Connecting cables of each type | No | 1 |
| d) | Protection coupler | No | 1 |
| 37. | Online PD system | | |
| a) | Cables | Nos. | 5% of the total population |
| b) | Fan | No | 1 |
| 38. | Online OLTC Oil Filter Unit | | |
| a) | Cartridge | No | 1 |
| b) | Inlet Hose (size & length similar to the original supplied by OEM) | Lot | 1 |
| c) | Outlet Hose (size & length similar to the original supplied by OEM) | Lot | 1 |
| d) | Any other required item as spare recommended by OEM | Lot | 1 |
| 39. | Power Cables and its accessories | | |
| a) | HT Power Cables of each size, type and rating. Highest Length used in s/s (To be supplied in single length only) | Lot | 2 |
| b) | HT Power Cable termination Kit of each type and rating. | Nos | 3 |
| c) | HT Power Cable straight jointing Kit of each type and rating. | Nos | 3 |
| d) | LT Power Cables of each size, type and rating. Highest | Lot | 2 |



| S. No. | Item | Unit | Quantity |
|------------|---|------|----------|
| | Length used in s/s (To be supplied in single length only) | | |
| e) | LT Power Cable Heavy duty brass double compression Gland of each type and size. | Nos | 30 |
| f) | LT Power Cable Heavy duty long barrel Lugs each type and size. | Nos | 30 |
| 40. | Control Cable | | |
| a) | Control Cables of each size, type and rating. Highest Length used in s/s (To be supplied in single length only) | Lot | 5 |
| b) | Control Cable Glands of each type and size. | Lot | 50 |
| c) | Control Cable lugs of each type and size. (Pack of 100 Nos) | Nos | 2 |
| 41. | Lighting Fixtures and its accessories. | | |
| a) | Street Light fixtures of each type and rating | Lot | 10% |
| b) | Outdoor Light fixtures of each type and rating, | Lot | 10% |
| c) | Lighting Mast fixtures Drivers of each type and rating | Lot | 10% |
| d) | Lighting Mast fixtures of each type and rating | Lot | 10% |
| e) | Lighting Mast spares as recommended by OEM. (other than light fixture and drivers, list to be submitted by Bidder) | Lot | 1 |
| f) | Indoor Light fixtures of each type and rating, | Lot | 10% |
| g) | Line driver of LED lighting fixtures (outdoor and indoor) each type, rating. | Lot | 10% |
| h) | Receptacles of each type and rating | Lot | 10% |
| i) | Occupancy Sensor | Lot | 10% |
| j) | Ceiling fan / Pedestal / Wall fan / Exhaust fan / Supply fan of each type and rating | Lot | 10% |
| k) | Modular Switch board plates, switches, sockets, boxes, fan regulator (if applicable), RJ45, Blanks etc. of each type, colour, rating. | Lot | 10% |
| l) | Lighting Distribution board components like MCBs, ELCBs, contactors, Power Switches, Control Switches, Fuse, Terminal Block, timers etc. of each type and rating. | Lot | 10% |
| m) | Street Light Control Panels components like MCBs, ELCBs, contactors, Power Switches, Control Switches, Fuse, Terminal Block, timers etc. of each type and rating. | Lot | 10% |
| n) | Multistrand flexible copper wires for Lighting system each size, rating, colours (Red, Yellow, Blue, Black, Green, white) in pack of 90 meter coil | Nos. | 10 |
| o) | Flexible, multicore copper sheathed unarmoured cable. 100 meter coil of 3Cx1.5 Sqmm, 3Cx2.5 Sqmm, 3Cx4.0 Sqmm, 4Cx1.5 Sqmm, 4Cx2.5 Sqmm, 4Cx4.0 Sqmm | Nos. | 5 |
| p) | Power Fuse Link of each type and rating | Sets | 9 |
| q) | Control Fuse Link of each type and rating | Sets | 30 |
| 42. | CCTV | | |
| a) | Camera of each type | Nos. | 2 |
| b) | Each type of electronic module / PCB of each type and rating (of NRV system) | Nos. | 2 |
| 43. | 33 kV Bus Duct | | |
| a) | Support Insulator of each type | Set | 6 |
| b) | Expansion Joints and Gaskets of each type | Set | 3 |



| S. No. | Item | Unit | Quantity |
|--------|---|--------------|----------|
| c) | Bi-metallic connectors of each type (If applicable) | Set | 3 |
| d) | Silica Gel Breather of each type | Set | 3 |
| e) | Space Heater, Thermostat of each type. | Set | 2 |
| f) | Set of flexible connection at both end | Set | 1 |
| 44. | Submersible/Sump Pump / water pumps of each type and rating | Set | 1 |
| 45. | Each type of Clamp, Connector, Hardware etc. with complete accessories & necessary nuts & bolts etc. | Complete Set | 3 |

- Note:**
- 1) Once the IO list is finalized considering all requirements of 2375 MW Renewable Solar Park and future expansion during detailed engineering. The spares shall be counted on this finalized IO list. If somehow IO list is not finalized during detailed engineering then bidder shall supply spares based on temporary IO list of detailed engineering but once IO list is finalized after commissioning balanced spares shall be supplied to Owner.
 - 2) The quantity of spares to be reckoned for % indicated shall be rounded off to the next higher whole number. For example if the % arrived is 0.2 the quantity to be supplied shall be 1 and if the % arrived is 5.1 the quantity to be supplied shall be 6.
 - 3) Wherever all LOT or SET is mentioned, successful bidder shall provide detail description and specifications of each item, make, unit, quantity etc. during detail engineering stage. OEM part Number / drawing etc shall be provided for ordering of the parts by owner in future. Interchangeability certificate shall be provided for each spare items.
 - 4) Mandatory spares as above are for Phase-I and Phase-II and to be supplied during Phase-I



ANNEXURE- D: SPECIAL TOOLS

| Sr. No. | Item | Unit | Quantity |
|----------|--|------|----------|
| A | 400kV GIS | | |
| 1 | SF6 Gas Multi Analyzer, Make DILO , Model No 3-038R-R303, with standard equipment's (Transport Case, 6 meter long hose, , DN8, DN20, coupling, 2 meter long cable, USB stick with data files, user manual, router set with case, wireless operation via mobile, two year direct connect service plan and training) with optional Adapter case for measuring device Kit DN8 Testing & Filling (if applicable), optional 6 m long connecting extension hose with self-closing couplings etc. | Set | 1 |
| 2 | SF6 Gas Leakage Detector / Pointer Make DILO, Model No 3-033-R002 with spare sensor kit, carrier case, and operating manual. | Set | 1 |
| 3 | SF6 gas service carts DILO Make , Model No B057R17 with Digital weighing scales, DN8 hose and coupling - 6-1037-R050 (If required), tool box, shelf plate, DN20 Braided Hose and coupling tongue (if required), and spare part kits. | Set | 1 |
| 4 | SF6 Gas Refilling Device Make DILO Model No 3-001-R002 with optional packing and SF6 Bottle connection of required thread. | Set | 1 |
| 5 | SF6 Gas Dew Point Measurement Make DILO Model No 3-037-R001 with standard equipment's and optional packing, | Set | 1 |
| B | Electrical Test equipment's | | |
| 1 | Multifunctional Primary Test System for EHV GIS substation Make: Omicron, Model: CPC100, with extended range of accessories for CT, VT, Power Transformer Testing, Line Impedance Measurement, Grounding System Testing, Switchgear and circuit breaker testing (Accessories like CP TD15, CP SB1, CP TC12, CP DB1, CP CU1, CP GB1, HGT1, CP CB2, CPOL2 etc) , with HP ProBook latest version (8GB DDR, 1TB SSD with carrying case) preloaded with required software's., case, trolley and standard accessories. | Set | 1 |
| 2 | Universal protection test set and commissioning tool Make Omicron, Model CMC 356 with standard testing software package, measuring equipment testing addon, basic IEC 61850 addon, CMC wiring accessory package, with HP ProBook latest version (8GB DDR, 1TB SSD with carrying case) preloaded with required software's Transport case and standard accessories. | Set | 1 |
| 3 | Surge Arrester Leakage Current Analyser, Scope Make SA 30i+ with Communication port RS232 and Ethernet, Standard Accessories, 6 meter field probe, small and large both CT, Indian Plug, CT inputs as required. | Set | 1 |
| 4 | Oil BDV test Kit, Megger Make, Model No OTS100AF with required electrode set and standard accessories. | Set | 1 |
| 5 | Fluke 1550C FC 5 kV Digital Insulation Tester with all accessories | No | 1 |
| 6 | Fluke 1623-2 GEO/Earth Ground Tester Kit | No | 1 |
| 7 | FLIR Thermal camera TG297, with required software, communication cables, carrying case and standard accessories. | No | 1 |
| 8 | Electronic Battery load Kit , Megger Make, Model Torkel 910, with required extra load unit TXL-865/870, extension cable as per current ratings of Battery sets supplied, sensing cables, Power DB software, Clamp-on /-probe, calibration certificate, Large Transport case and accessories. (Or equivalent IBEKO Power AB, Sweden "DV Power") | Set | 1 |



| Sr. No. | Item | Unit | Quantity |
|----------|--|------|----------|
| 9 | Portable cell charging unit (trolley type) suitable for initial charging of supplied batteries up to 05 cells (same as per supplied Battery Charger make) | Set | 1 |
| 10 | 33 kV, Earthing trucks (with making capacity) for bus earthing per PEB. | Nos | 1 |
| 11 | 33 kV, Earthing trucks for cable earthing (with making capacity) per PEB. | Nos | 1 |
| 12 | 33 kV Breaker (VCB) Trolleys of each type per PEB. | Nos | 2 |
| 13 | 415 V Breaker (ACB) Trolleys for each type and rating of Breaker. | Nos | 2 |
| 14 | Insulation Resistance Tester, Fluke 1507 with carrying case and standard accessories | No | 2 |
| 15 | Digital Multimeter and Clamp meter combo kit, Fluke 117/323 with carrying case, holster, extra probes and standard accessories. | Sets | 4 |
| 16 | AC/DC Digital Clamp Meter, Make Kyoritsu, Model No KEW 2009R with standard accessories and output cord (7256), calibration certificate etc. | Nos | 2 |
| 17 | Multi fingered Relay Test Plug type P992 with accessories - 6 Nos shorting Links and 2 Nos of 2 meter test wires with each test plug | Set | 4 |
| 18 | Multi fingered Relay Test Plug type P993 with accessories - 2 nos x 2 meter of test wires with each test plug | Set | 4 |
| 19 | 400 kV, Single Phase, FRP Earth/ Discharge Rod with 35 Sqmm Copper multistrand wire of 12 meter, Die cast alu. Grounding "C" Clamp complete set for with test certificate, carrying case and standard accessories. | Nos | 4 |
| 20 | Leakage Clamp Meters Make Kyoritsu, Model No KEW 2413R with standard accessories and output cord (7073), calibration certificate etc. | Sets | 2 |
| 21 | DC Milliamp Clamp Meter Make Kyoritsu, Model No KEW 2500, with standard accessories and output cord (7256), calibration certificate etc. | Sets | 2 |
| 22 | Crimping Tool, Dowell Make, Model SYT-7 with set of Hex Dies 25-400 Sqmm with standard accessories , carrying case etc. | No | 1 |
| 23 | Crimping Tool, Dowells Make, Model SYT-50 16-50 Sqmm with standard accessories , carrying case etc. | No | 1 |
| 24 | Crimping Tool, Dowells Make, Model SYT-02 0.5-16 Sqmm with standard accessories , carrying case etc. | Nos | 4 |
| 25 | Phase Sequence Meter, Make Kyoritsu, Model No KEW 8035 with standard accessories and calibration certificate etc. | Nos | 2 |
| 26 | Receptacles plug top of each type and rating | Nos | 6 |
| 27 | Portable foldable Tripod Site Work Light with one head, Tripod Material Aluminium alloy, Length 1.0 meter to 3.5 meter, LED Flood light , 230 V, 50 W, 6000 K, IP 65, Lamp body material aluminium , with 4 meter cable, Make Hesham Industrial Solutions Vadodara , Model No : HIS-LED-PTL-001S 50W (Or equivalent) with carrying case (preferably hard case) etc. | Set | 1 |
| 28 | Portable foldable Tripod Site Work Light with one head, Tripod Material Aluminium alloy, Length 1.0 meter to 3.5 meter, LED Flood light , 230 V, 100 W, 6000 K, IP 65, Lamp body material aluminium , with 4 meter cable, Make Hesham Industrial Solutions Vadodara , Model No : HIS-LED-PTL-001S 100W (Or equivalent) with carrying case (preferably hard case) etc. | Set | 1 |
| C | Instruments Test equipment's | | |
| 1 | Optical Time domain Reflectometer (OTDR) Make Yokogawa, Model: AQ1210D (English Language) with AQ7933 Emulation software, Fibre surface test function, Visible Light source, Power checker, Fibre inspection probe, Universal adapter for OTDR, soft carry bag, shoulder belt, USB cable, Battery pack and other accessories. | Set | 1 |



| Sr. No. | Item | Unit | Quantity |
|----------|---|------|----------|
| 2 | High Precision Multi meter, Yokogawa, Model: TY720 with Test leads, Fuse, TC-K Probe, Carrying Case, and Current Clamp Probe. | Set | 1 |
| 3 | Fluke 773 Milliamp Process clamp Meter with additional 1 pair TL75 test lead, one no. AC72 detachable clip, 1 pair TL 940 mini hook test leads, one no. magnetic hanging strap | Set | 1 |
| 4 | Telecommunication Tool Set Make , Stanley Model No STHT89883-812 (53-Piece) | Set | 1 |
| 5 | Regulated DC Power Supply Aplab Make , Model H3010, 30 to 300 V DC, 10 Amp | No | 1 |
| 6 | Regulated DC Power Supplies Aplab Make , Model No L1282, 0-128 V , 2.5 Amp | No | 1 |
| 7 | Pressure calibrator, Make Fluke, Model: FLK -719Pro 300G | No | 1 |
| 8 | Temperature bath, Make Nagman, Model: MTC 350 with additional thermowell / insertion tube of 1/8", 1/4 " , 3/8", 1/2" and 3/4" | No | 1 |
| 9 | Decade resistance box, Make Yokogawa, Model: 279301 | No | 1 |
| D | Material Handling and storage system | | |
| 1 | Galvanized Hydraulic Pallet Truck 2.5 ton, Make Wont Industrial Equipment's, Model: W-HGPT-25 with all required accessories. | No | 1 |
| 2 | Galvanized Hydraulic Pallet Truck 1.0 ton, Make Wont Industrial Equipment's, Model: W-HGPT-10 with all required accessories. | No | 1 |
| 3 | Hydraulic Platform Make CTR Pune Model No CLT-7 or equivalent VANJAX Chennai Make, with all required accessories. | No | 1 |
| 4 | Hydraulic jack for Power Transformer | Nos | 4 |
| 5 | Fiberglass 28' Ladder rated ANSI Type IA .and compliant to OSHA and CSA safety standards, with advanced Rung Lock System for securing the fly and base sections, non-marring durable top with multiple tool slots, slip resistant rubber tread fully serrated for a slip resistant surface, rope and pulley, rung caps, heavy duty metal boot with steel swivel safety shoes Make Dewalt, Model No DXL3020-28PT or equivalent reputed make. | No | 1 |
| 6 | High tensile aluminium alloy wall supported ladder, closed height 16 ft, extended height 28' with Pulley, Safety Ring, Safety Locks, shall be of sturdy construction. (Make: Overseas Aluminium) | No | 1 |
| 7 | High tensile aluminium alloy telescopic tillable extension tower Ladder, height 32 ft, with Pulley, Safety Ring, Safety Locks, shall be of sturdy construction. (Make: Overseas Aluminium) | No | 1 |
| 8 | Steel Portable Foldable Platform Trolley Truck / Dolly Cart, Stanley PC528, for all indoor and outdoor manoeuvring-300 kg Capacity. | No | 1 |
| E | Mechanical Tools | | |
| 1 | Single Phase Portable 200 Amp, welding machine, inverter IGBT based, Make ESAB, Model Arc 200i, with input cable 10 meter, welding cable set 10 meter, electrode holder, earthing cable set 10 meter, safety welding helmet ESAB Eco Arc II, ESAB heavy duty welding hand gloves, cleaning chisel and metallic Brush. Welding rods ESAB Make 6013 - 3.15 mm, 308-3.15 mm, 2 Packet each. | Set | 1 |
| 2 | Diesel engine driven industrial dewatering pump set, 6 HP, Self-priming, air cooled, Make Kirlsokar, Model TAF1-SP3L, part no 20.1332.01, delivery 80 mm , ultra-light flexible spiral ribbed PVC suction AND delivery hoses each of 5 meter and foot valve, 4 male connector, 8 SS clamps. | Set | 1 |
| 3 | Portable Genset (Inverter) , Rated output 5.5 kVA (max 7.0 kVA) , 230 V, 50 Hz, 23.9 Amp, full transistor ignition, electronically controlled fuel injection system, Start System Recoil and Electric Starter, Make: Honda | Set | 1 |



| Sr. No. | Item | Unit | Quantity |
|----------|---|------|----------|
| | Siel Power Product Ltd. Model EU70is | | |
| 4 | Master Tool Set Kit, Stanley 150 Pieces 94-181. | No | 1 |
| 5 | Drawer Roller Cabinet, 7 Drawer , Stanley 547-23ID | No | 1 |
| 6 | Nylon rope, Dia 0.5", 0.75", 1" each of 100 meter, Make: Garware | Set | 5 |
| 7 | Chain Pully Block -5 ton capacity , Make Morris | Nos | 1 |
| 8 | Wire rope Pully Block -3 ton capacity , Make Morris | Nos | 1 |
| F | Safety Item | | |
| 1 | Arc Flash Safety Kit , arc flash coat, bib overalls, Pro-Hood, hard hat, safety glasses, and a carrying bag , meeting requirement of NFPA 70E and ASTM F2178. Cal/cm2 rating as per 400 kV substation requirement. Make Honeywell, Size "L" | Set | 1 |
| 2 | Full Body Harness Kit Honeywell FBH110 | Nos | 2 |
| 3 | High Visibility Reflective Safety Zipper Jacket with 2 pockets Polyester Fabric, Universal size | Nos | 10 |
| 4 | Electrical Safety shoes Make Allen Cooper / Honeywell or better , UK Sizes 8,9,10,11 each. | Set | 2 |
| 5 | Industrial Safety shoes Make Allen Cooper / Honeywell or better , UK Sizes 8,9,10,11 each. | Set | 4 |
| 6 | First Aid Kits with wall mount accessories (Thadani Medic 7500 or equivalent) at strategic locations | Lot | 1 |
| 7 | Premium A59I Safety Helmet for Industrial / Outdoor Application Blue Colour, Make Honeywell (for PSS staff) | Nos | 15 |
| 8 | Premium A59I Safety Helmet for Industrial/Outdoor Application Blue Colour Make Honeywell (for visitors) | Nos | 5 |
| 9 | 33 kV Electrical safety Gloves (Pair) Honeywell Class 4 | Lot | 2 |
| G | Miscellaneous Tools | | |
| 1 | Tent standard quality, water proof, made from HDPE material, with 5 no's of Bamboos rods, having capacity of 8 to 10 person 10'x10', multipurpose. | set | 1 |
| 2 | Tarpaulin, HDPE 200 GSM, 5x5 meter reputed make. | Nos | 5 |
| 3 | Hot air blower 2.0 m3/min, wolf make | Nos | 1 |
| 4 | Stanley STPT600 600W Variable Speed Blower with all accessories and carrying bag | No | 2 |
| 5 | Bosch GSB 600 RE 13mm 600 Watt Corded Smart Drill Kit. | No | 2 |
| 6 | Forbes Wet & Dry NXT Vacuum cleaner, 1380 Watts, 1800 mm WC | No | 2 |
| 7 | Combination Spanner Set (Pack of 23) , Stanley 70-965E | Nos | 4 |
| 8 | Stanley Electrician Kit | No | 4 |
| 9 | Stanley STST512114 12" Tools Storage Water Proof Open Mouth Bag | Nos | 4 |
| 10 | Electrical Tester 100-500 VAC , 178 mm , Stanley 66-120 | Nos | 10 |
| 11 | 5 Meters Measurement Tape , Stanley STHT43067-12. | Nos | 4 |
| 12 | Straight Cutter Stanley 2-14-563, 254 mm | Nos | 2 |
| 13 | Plier 10" Stanley 71-669 | Nos | 4 |
| 14 | Pipe Wrench 12", Stanley 71-642 | Nos | 4 |
| 15 | Tools Storage Water Proof Nylon Bag, 660 mm Stanley 93-225 | Nos | 4 |
| 16 | Wire Stripper, 5.5" Stanley 84-214-22 | Nos | 6 |
| 17 | Hex key set (10-Pieces) Stanley 69-253 | Nos | 4 |
| 18 | Mini Hack Saw 10" , Stanley 0-20-807 | Nos | 4 |
| 19 | Stanley STHT57528-8 Rubber Mallet (680gms) | Nos | 2 |
| 20 | 2 Outlet extension Box (Reel) with switch 5/15 Amp Indian standard 3-pin, cable 3 x 1.5 mm ² , cable Length 10 meter , Make MX, Catalogue No 3157 | No | 2 |
| 21 | 2 Outlet extension Box (Reel) with switch 5/15 Amp Indian standard 3- | No | 2 |



| Sr. No. | Item | Unit | Quantity |
|---------|---|------|----------|
| | pin, cable 3 x 1.5 mm ² , cable Length 20 meter , Make MX, Catalogue No 3157A | | |
| 22 | 2 Outlet extension Box (Reel) with switch 5/15 Amp Indian standard 3-pin, cable 3 x 1.5 mm ² , cable Length 30 meter , Make MX, Catalogue No 3157B | No | 1 |
| 23 | 2 Outlet extension Box (Reel) with switch 5/15 Amp Indian standard 3-pin, cable 3 x 1.5 mm ² , cable Length 50 meter , Make MX, Catalogue No 3157C | No | 1 |
| 24 | 4 Outlet Universal Power Strip, Indian Standard with Power Cord , 1.5 meter Make, MX, Model No 3126 | Nos | 6 |
| 25 | 4 Outlet Universal Power Strip, Indian Standard with Power Cord , 3.0 meter Make, MX, Model No 3126A | Nos | 2 |
| 26 | 4 Outlet Universal Power Strip, Indian Standard with Power Cord , 5.0 meter Make, MX, Model No 3126B | Nos | 2 |
| 27 | 4 Outlet Universal Power Strip, Indian Standard with Power Cord , 10.0 meter Make, MX, Model No 3126C | Nos | 2 |
| 28 | 2 Outlet indian standard extension box 5/15 AMP. 4.6 meter, Make MX, Catalogue no 3081A | Nos | 4 |
| 29 | Insulation tape, Scotch:23, size 19mmX9.15 mtrsX0.75mm self bonding electrical tape roll, make: Birla 3M | Nos | 5 |
| 30 | Self adhesavie PVC electrical Insulating tap , of each Color (Red, Yellow, Blue, Black, Green, White) Make Steelgrip | Set | 20 |
| 31 | Magic rubber tape, 3 meters, for water proof cable joint, Make: Perfect Polymers. | Nos | 20 |
| 32 | CRC 2-26 multi uses electro cleaner, 500 ml aerosol can | Nos | 20 |

Note

1. Bidder's scope of supply for special tools includes spares for two years, consumables for two years, standard warranty/guarantee, and software support and its free updates, training etc.
2. For all hydraulic items, spare set of "O rings" and gasket shall be provided.



ANNEXURE-E: VENDOR LIST

| S. No. | Equipment | Vendor |
|---------------|---|---|
| 1) | 400/33/33 kV Power Transformers | a) Hitachi b) GE c) Siemens d) Bharat Heavy Electricals Ltd. e) Transformers & Electricals Kerala Ltd., Kerala. f) Toshiba Transmission & Distribution Systems (India) |
| 2) | 400 kV GIS | a) Hitachi b) Siemens c) GE d) Toshiba Transmission & Distribution Systems (India) e) Hyosung T&D India Pvt. Ltd. |
| 3) | 400 KV Capacitor Voltage Transformers – Outdoor Equipment | a) Hitachi b) MEHRU c) GE d) Siemens |
| 4) | 400 kV Lightning Arrestors– Outdoor Equipment | a) OBLUM b) LAMCO c) GE d) CGL e) ELPRO |
| 5) | 400 kV Wave trap | a) GE b) Quality Power Electrical Equipments Pvt. Ltd. c) BPL |
| 6) | EOT Crane | a) Reva b) Anupam Industries Limited c) Skyline Millars Limited d) Unicorn Crane |
| 7) | DG Set | a) Kirloskar b) Mahindra Powerol c) Cummins d) Sudhir Cummins e) Ashok Leyland |
| 8) | Battery Sets | a) EXIDE |
| 9) | Substation Automation System | a) HITACHI(Formerly ABB) b) SIEMENS c) GE |
| 10) | Relays | a) ABB b) ALSTOM c) SCHNEIDER d) SIEMENS e) GE |
| 11) | 33/0.433kV Station Service Transformers | a) TESLA b) Danish c) CGL d) TRANSFORMERS & RECTIFIER INDIA e) VOLTAMP f) BHARAT BIJLEE g) KANO HAR |
| 12) | AL59 Moose conductors | a) Sterlite Power |



| S. No. | Equipment | Vendor |
|--------|--|--|
| | | b) Apar Industries Ltd. c) JSK Industries Pvt. Ltd. d) Lumino Industries Ltd. e) Dynamic Cables Ltd. |
| 13) | GI Earth-wire | a) Usha Martin, Ranchi b) UIC Udyog Ltd., Kolkata c) Rumika Engineering Company, Vadodara d) Ratlam Wires, Ratlam e) Ramsarup Industrial Corporation, Kolkata f) Geekay Wire Ltd. g) Nirmal Wires Pvt. Ltd., Howrah, WB h) Bedmutha Industries Ltd., Nashik |
| 14) | Insulators | a) ADITYA BIRLA INSULATOR b) MODERN c) BHEL d) WSI |
| 15) | Multi-Function Meters and Digital Meters | a) SIEMENS b) L&T c) RISHABH d) SCHNEIDER e) SECURE f) Konzerv |
| 16) | Clamps, Connectors, Hardware | a) EXCELL b) RAJ TRANSMAT c) BURMA d) EXALT ENGG e) ASBESCO f) TYCO g) EMI h) EMC i) STEEL LAL ENGG. j) ITPL k) IAC l) RASHTRA UDYOG m) NOOTAN ENGG. n) MILIND ENGG. WORKS o) KLEMMAN ENGG p) PEE VEE ENGG q) BEST & CROMPTON r) MEGHA ENGG s) Hyosung t) Raychem RPG |
| 17) | Exhaust Fans | a) BAJAJ b) CGL c) KHAITAN |
| 18) | Ceiling fans (BLDC) | a) USHA b) CROMPTON c) KHAITAN d) ORIENT e) BAJAJ f) ATOMBERG |
| 19) | Lighting Fixtures | a) PHILIPS b) BAJAJ c) CGL |



| S. No. | Equipment | Vendor |
|--------|---|---|
| | | d) WIPRO e) HAVELLS |
| 20) | PLCC Communication Equipment | a) ABB b) GE |
| 21) | HT Panels and HT Breaker | a) ABB b) SIEMENS c) Schneider d) GE e) L&T |
| 22) | LT Panels and LT Breaker | a) ABB b) Siemens c) Schneider d) GE e) L&T |
| 23) | CT / PT (For LT Panels) | a) AE b) C&S c) Kappa d) Gilbert Maxwell e) Intrans f) ABB g) Pragati h) GE i) BHEL j) Siemens k) Precise l) Diana Electrical m) Kalpa Elect n) Narayan Powertech o) Silkans p) EC&S |
| 24) | Electronic Motor Protection Relay for LT System | a) Schneider b) ABB c) Siemens |
| 25) | Semaphore Indicators | a) ABB b) Alstom/GE c) JVS Electronics d) Nova Espower Corpo e) Steam Airetric Controls f) DAV Industries |
| 26) | Electronic Timer | a) GE b) ABB c) Schneider d) Siemens e) Telemechnic |
| 27) | Busduct | a) C&S b) UNILEC c) Power gear d) BHEL |
| 28) | Aluminium Tube | a) BALCO b) Century c) HINDALCO d) NALCO e) SUDAL f) BANCO |



| S. No. | Equipment | Vendor |
|--------|---|---|
| | | g) JINDAL Aluminium |
| 29) | Battery Charger | a) Emerson b) HBL c) Chloride d) Hitachi HI-REL e) Mass-Tech Controls f) Chhabi |
| 30) | G. I. Cable Trays | a) Indiana Gratings b) Rukmani Electricals c) Vatco, d) Universal Engg e) MDM Engineering & Technologies f) G M Engineers, Vadodara g) R R Ispat h) Akshar Energy Structures P. Ltd i) Parmar Metals Pvt. Ltd. j) Bilmat Engineering, Vadodara |
| 31) | 33 kV HT Cables | a) Universal b) KEI c) KEC RPG Cables d) Dynamic Cables e) APAR |
| 32) | LT Power & Control Cables and wires | a) Universal b) Gloster c) Dynamic Cables d) KEI e) R R Kable f) Finolex g) KEC RPG Cables h) APAR i) LAPP j) SIECHEM |
| 33) | Hybrid Control system- Servers-Redundant with Windows OS & AV | a) HP b) Dell c) Lenovo d) Advantech e) Technics Infosol f) Portwell-Laxsons g) Avhis Technologies |
| 34) | Historian Servers- Redundant with Windows OS & AV | a) HP b) Dell c) Lenovo d) Portwell- Laxsons e) Avhis Technologies f) Advantech g) Technis Infosol |
| 35) | Network Switches- Redundant | a) Hrishmann b) SIEMENS c) Cisco d) Brocade e) GarrettCom |
| 36) | PPC Controller with IOs | a) ABB b) SIEMENS c) Schneider |



| S. No. | Equipment | Vendor |
|--------|--|--|
| 37) | GPS Master Clock | a) Meinberg b) SERTEL c) SANDS d) Qualitrol Hathaway e) Siemens f) Masibus |
| 38) | Gateway | a) SIEMENS b) MOXA c) FORTINET d) Checkpoint e) SOPHOS f) CISCO g) PALO ALTO |
| 39) | Large video screen with Digital Controller | a) BARCO b) DELTA |
| 40) | Historian station with Windows OS & AV | a) HP b) Dell c) Lenovo d) Portwell- Laxsons e) Avhis Technologies f) Advantech g) Technis Infosol |
| 41) | Operator work station with Windows OS & AV | a) HP b) Dell c) IBM d) Portwell- Laxsons e) Avhis Technologies f) Advantech g) Technis Infosol |
| 42) | Engineering Work station with Windows OS & AV | a) HP b) Dell c) IBM d) Portwell- Laxsons e) Avhis Technologies f) Advantech g) Technis Infosol |
| 43) | Laptop | a) DELL b) IBM c) HP |
| 44) | Router | a) Moxa b) SIEMENS (Ruggedcom) c) Cisco d) Checkpoint e) SOPHOS f) PALO ALTO |
| 45) | Modbus to TCP/IP converters | a) Moxa b) CMS |
| 46) | Multifunction A3/A4 Colour Laser printer | a) HP b) Brother c) CANON d) RICOH |
| 47) | UPS system in redundant configuration with Servo | a) Emerson b) Fuji Electric Consult Neowatt |



| S. No. | Equipment | Vendor |
|--------|---|--|
| | Bypass | c) EATON d) Hitachi Hirel |
| 48) | Optical Fiber Cables | a) Finolex b) Aksh c) HFCL d) Sterlite |
| 49) | Connectors (Type A / B) for OFC System | a) AE Connect b) Tyco |
| 50) | Fiber optic patch cords | a) Finolex b) Amp c) AE Connect |
| 51) | Interfacing FO cables as required for the completeness of Hybrid Park Control & monitoring system | a) Tyco b) Aaksh c) Finolex d) Apar |
| 52) | IEC-61850 protocol Ethernet Switches with FO port | a) SIEMENS (Ruggedcom) b) CISCO c) Hirschman d) GarrettCom |
| 53) | LAN cables with RJ45 connectors | a) Tyco b) Digisol c) DLINK d) Sterlite |
| 54) | Server Panels with accessories | a) Rittal |
| 55) | PPC Controller Panel with accessories | a) Rittal |
| 56) | OWS, EWS and Printer Desk Furniture & Chair (PSS-1: HPCMS and SAS) | a) Pyrotech Workspace Solutions Pvt. Ltd. b) CSE Solutions Pvt. Ltd. c) TANSWA d) ADARSHA CONTROL SYSTEM PVT. LTD. e) TECHRMOTECH (PUNE) |
| 57) | Chairs (PSS-1: HPCMS & SAS system) | a) Durain b) Zuari c) Lexus d) Godrej |
| 58) | Remote IO panel with accessories | a) Schneider b) Siemens c) ABB |
| 59) | Power Quality Meter | a) GE b) ABB c) Schneider d) Siemens e) Secure |
| 60) | Fe-500D T.M.T. with Anti Corrosive treatment to TMT with Fusion Bonded epoxy coating | a) SAIL b) TATA Steel c) RINL d) Jindal Panther or, equivalent of JSPL e) JSW |
| 61) | Split type Air Conditioner (5 Star energy efficiency) | a) Carrier b) Voltas c) Blue Star |



| S. No. | Equipment | Vendor |
|--------|--|--|
| | | d) Hitachi e) Samsung f) LG g) O'General |
| 62) | TMT Rebar | a) SAIL b) TATA Steel c) RINL d) Jindal Panther or, equivalent of JSPL e) JSW |
| 63) | Cement (SRC/OPC/PPC) | a) ACC b) Ambuja c) UltraTech d) Sanghi e) Hathi f) Hi-Bond |
| 64) | Cement (PSC) | a) ACC b) Birla Gold c) JSW Cement d) Nuvoco (Lafarge) |
| 65) | 33 kV Capacitor Bank | a) Hitachi (Formerly ABB) b) Unistar c) Powercap |
| 66) | Online PD system for 400 kV GIS | a) Pdix b) Qualitrol c) DMS,USA d) Alstom, France |
| 67) | ABT / SEM's / Tariff Meters and its accessories. | a) Secure |
| 68) | FOTE Communication Equipment | a) ABB b) GE |
| 69) | Phasor Measurement Unit (PMU) | a) Siemens b) ABB/Hitachi c) GE |
| 70) | Bay Control Unit (BCU) | a) Siemens b) ABB/Hitachi c) GE |
| 71) | Digital RTCC | a) MR, Germany (Model: TAPCON BU/BPL) b) E-Berle (Model: REG-D) c) Equivalent or, better from ABB / Siemens / GE |
| 72) | Enclosures for control and relay panels, control panels, relay panels, RTCC panels, NIFPS electrical panels, LCC , SAS panels, ABT meter panels, PLCC, FOTE, FODP, Battery charges, UPS , HPCMS, CCTV , CVT JB, Fire Panels, Weather Station Panel / JB etc. | a) Rittal |



| S. No. | Equipment | Vendor |
|--------|--|--|
| 73) | Control and relay panel | a) Siemens b) ABB/Hitachi c) Schneider d) ALSTOM e) GE |
| 74) | NIFPS System | a) CTR |
| 75) | Transformer Valves | a) Apex Piping System Pvt. Ltd b) GG Valve c) Leader Valves Ltd d) MvW-ISG, Hungary e) Delta Engineers f) Petson Valves, Coimbatore g) Bimal Techno Industries |
| 76) | Cooling Fan and Motor Assembly (For Transformer) | a) Maschinenfabrik Schormann GmbH, Germany b) Airochem Engineering Company c) Marathon Ltd. |
| 77) | Nitrile Rubber Sheet, Gasket and O-rings | a) Bando Chemicals Co. Ltd., South Korea b) Bombay Oil Seal Mfg Co. c) Ma-Gumi Kft, Kiraly Hungary d) Nu Cork Products Pvt. Ltd. e) Scorpion Industrial Polymers Pvt. Ltd. |
| 78) | OLTC | a) Easun MR b) ABB AB Components, Sweden c) BHEL, Bhopal d) MR, Germany |
| 79) | Surge Relay (with plug and socket) | a) Approved OEM of OLTC b) Easun MR c) Weir Electric, UK d) VEB, Germany e) ASPE, Italy f) Cedaspe, Italy |
| 80) | Maintenance Free Dehydrating Breather system | a) Qualitrol |
| 81) | Fibre optic Temperature monitoring system (FOTM) | a) Qualitrol b) Lumasense, Canada c) Neoptix (Qualitrol Company LLC) d) Opsens INO, Canada e) Rugged Monitoring Qbec Inc., Canada |
| 82) | OCTC for SST | a) Easun MR b) OLG c) BHEL d) Paragon Associates, Thane |
| 83) | On line dissolved gas analyser to monitor gases | a) Qualitrol b) Kelman (GE) c) A-EBERLE, Germany d) Morgan Shaffer, Canada e) Serveron Corporation USA |
| 84) | CCTV Camera & Monitoring System | a) Sony b) Honeywell c) Milestone |
| 85) | Fire and Alarm system | a) Honeywell b) Siemens |



| S. No. | Equipment | Vendor |
|--------|--|---|
| | | c) Nittan Ltd, UK |
| 86) | 33 kV CT , PT, CBCT, Neutral CT | a) Jyoti Switchgear Ltd. (JSL) b) AE c) Pragati Electricals d) Electrical Control & Systems (ECS) e) Insutech Industries Limited f) Precise Electrical |
| 87) | 33 kV LA | a) Oblum b) ELPRO c) Raychem |
| 88) | Insulating Oil for Transformers. | a) Apar b) Savita c) Raj Petro specialities d) Shell Eastern Petroleum Ltd. e) Nynas Sweden |
| 89) | Oil Sampling Bottle | a) Atul Enterprises b) Scieno Tech Industries c) Mahabali Industries. d) Top Syringe Mfg Co. e) Monarch Electronics |
| 90) | HT termination and Jointing kits | a) Raychem |
| 91) | Pyranometer (WMS) | a) Kipp & Zonen |
| a) | Temperature Measurement and Tripod Stand (WMS) | b) Met One Inc c) Climatronics d) Thies Clima |
| 92) | Wind Speed | a) Met One Inc b) NRG Systems c) Thies Clima |
| 93) | Wind direction (WMS) | a) NRG Systems b) Thies Clima |
| 94) | Rainfall Sensor (WMS) | a) NRG Systems b) Thies Clima |
| 95) | Passive Cloud Cover Detector -PCCD (WMS) | a) Optical Sensors Sweden AB |
| 96) | Humidity Sensor (WMS) | a) NRG Systems b) Thies Clima |
| 97) | Atmospheric Pressure Sensor (WMS) | a) NRG Systems b) Thies Clima |
| 98) | Data Logger (WMS) | a) NRG System |
| 99) | Access Control System for Server Room (Bio Matic type) | a) Honeywell b) Bosch c) MATRIX COMSEC d) Tyco |
| 100) | Firewall | a) Fortinet b) Check Point c) Palo Alto d) SOPHOS |
| 101) | VoIP Phone | a) Alcatel-Lucent b) MATRIX COMSEC c) Cisco |
| 102) | Occupancy Sensor / Presence Sensor | a) Schneider b) Honeywell |



| S. No. | Equipment | Vendor |
|--------|---|---|
| 103) | Buchholz Relay (Plug & Socket type) | a) Instruments & Controls b) Yogya c) Cedaspe, Italy d) Sukrut e) Viat Instruments Pvt. Ltd. f) EMB Control AB, Sweden g) A.J. Services (Prayog) h) Weir Electric, UK i) VEB, Germany j) ASPE, Italy |
| 104) | Gas Collecting Device | a) Yogya b) Atvus -Viat Instruments c) ETI CEDASPE MR, Italy |
| 105) | Conservator Protection Relay (CPR) (with plug and socket and cable) | a) Sukrut b) EMB Control AB, Sweden c) A.J. Services (Prayog) d) Weir electric, UK e) VEB, Germany f) ASPE, Italy |
| 106) | Air cell (COPS) | a) Sukrut b) Nu Cork Products Pvt Ltd, Bhiwadi c) Fujikura, Japan d) Unirub Techno India Pvt Ltd, Pune e) Zenith Industrial Rubber Products, Thane f) Pronal, France |
| 107) | Breather | a) Yogya b) Instruments & Controls c) COMEM, Italy d) Tanjin Industries, South Korea |
| 108) | PRV / PRD | a) Sukrut b) Yogya c) QUALITROL Company LLC, USA d) MESSKO, Germany e) VIAT Instruments f) Atvus Industries, Kolkata |
| 109) | MOG | a) Sukrut b) Yogya c) Atvus -Viat Instruments d) Instruments & Controls e) COMEM, Italy f) MESSKO, Germany g) QUALITROL, USA h) Tanjin Industrieis South Korea i) Press N Forge |
| 110) | WTI | a) Precimeasure b) Perfect Controls c) QUALITROL AKM, Sweden d) MESSKO, Germany |
| 111) | OTI | a) Precimeasure b) Perfect Controls c) QUALITROL AKM, Sweden d) MESSKO, Germany |
| 112) | Online Insulating Oil Drying System | a) Cee Dee Vacuum Equipment Pvt Ltd, Pune b) PTSS, Coimbatore |



| S. No. | Equipment | Vendor |
|--------|--|--|
| | | c) Transec Ltd, UK d) Siemens - Sitram Dry |
| 113) | Auxiliary Electromechanical Relays (Master Trip-86) | a) ABB b) Alstom |
| 114) | Contactors | a) Schneider b) Siemens c) ABB d) GE e) Merlin Gerin f) Telemecnic |
| 115) | MCCB / MCB / ELCB / RCBO / RCCB | a) SIEMENS b) ABB c) Schneider d) Hager e) Merlin Gerin f) GE g) AREVA h) EATON i) Allen Bradley |
| 116) | Receptacles | a) MDS Legrand b) Schneider c) BCH Power |
| 117) | Power and Control Fuses | a) Bussmann b) Siemens c) GE d) ABB |
| 118) | Transducers | a) Schneider b) GE c) Siemens d) ABB |
| 119) | Annunciator | a) Allen b) Proton c) Bharani Electronics d) Shayadri Electro Control e) Minilec f) JVS Electronics |
| 120) | Water Level Controller | a) Minilec b) Selec c) Schneider d) GIC e) L&T |
| 121) | Single Phase Preventor and Phase Sequence Reversal Relay | a) Minilec b) Selec c) Schneider d) GIC e) L&T |
| 122) | Buzzer / Hooter / Bell | a) Alan b) Bharani Electronics c) Sahyadri Electro Control d) Vaishno e) JVS Electronics |



| S. No. | Equipment | Vendor |
|--------|---|---|
| 123) | Meters (Other than MFM , PQM and ABT Meters) | a) AE b) DIP c) Rishabh d) Secure |
| 124) | Control / Selector switches | a) Selzer b) Kaycee c) Switron d) Alstom e) TEKNIC f) ABB g) SIEMENS |
| 125) | Relay test Block | a) Alstom |
| 126) | Test Terminal Block (TTB) | a) Dev b) DIP c) Deepl Elec. d) Nelster Welcon e) JVS Electronics |
| 127) | Terminal Block (TB's) | a) Elmax b) CONNECTWELL c) Phoenix d) WAGO |
| 128) | Earthing rod and Back fill compound | a) Ashlok b) ERICO c) JEF Techno |
| 129) | Lugs and Cable Glands (Metallic) | a) Dowell b) Comet c) 3D |
| 130) | Polyamide Glands | a) Hansel b) LAPP c) Rittal |
| 131) | Junction Boxes | a) Rittal |
| 132) | Modular Switches, Plates, Boxes, Power Sockets etc. | a) Schneider b) Legrand c) Panasonic |
| 133) | UPVC conducts and its accessories | a) Precision Pipes and fittings |
| 134) | LED Indicating Lamp and Push Buttons | a) SIEMENS b) ABB c) Schneider d) TEKNIC e) L&T f) RASS Controls (C&S) |
| 135) | Cubicle Illumination Lamp (LED) | a) Philips b) Bajaj c) Wipro d) Panasonic e) Havells |
| 136) | Fire Extinguishers (SS-304 Body) | a) Cease Fire b) Kanex c) MinMax d) Safex e) Kanadia Fyr Fyter f) Zenith |



| S. No. | Equipment | Vendor |
|--------|--|---|
| | | g) United Fire Equipments h) Intime Fire Appliances |
| 137) | Submersible / Sump Pumps | a) Kirloskar b) KSB c) CGL d) CRI e) Jyoti |
| 138) | Air conditioner (Split / Casstte /Ductabel / Tower etc.) | a) Mitsubishi Heavy Industries b) O-General c) Blue Star d) Voltas |
| | CIVIL ITEMS | |
| 139) | Admixtures / Water proofing compounds / Hardener | a) Dr. Fixit b) Sika c) BASF d) Fosroc |
| 140) | Aluminum Sheet | a) Hindalco b) Jindal |
| 141) | Structural steel | a) Jindal b) Tata Steel |
| 142) | Metal cladding puff panel / Sandwich panel | a) Kingspan Jindal b) Sintex c) ThyssenKrupp d) Tata Blue Scope |
| 143) | Aluminum doors/windows/partition | a) Hindalco b) Banco c) Jindal |
| 144) | Hand Rail Stainless steel SS-304 | a) Tata Steel b) Jindal c) SAIL |
| 145) | Vitrified tiles/ Ceramic tiles-premium class | a) Nitco b) Kajaria c) Asian d) RAK |
| 146) | Acid resistant tiles | a) Johnson b) Kajaria c) SOMANY |
| 147) | Glass | a) Saint-Gobain b) Modi Glass |
| 148) | Bricks / Bocks (Light Weight) | a) As approved by owner during detail engineering stage. |
| 149) | Rolling Shutter | a) As approved by owner during detail engineering stage. |
| 150) | Steel doors | a) TATA steel |
| 151) | Door / Window fixtures (like lock, handle, closer etc.) | a) Godrej b) Doma c) Kich d) Yale |
| 152) | Panic Bar / Push bar (with safety sign display sticker) | a) Dorma b) As approved by owner during detail engineering stage |
| 153) | Acrylic and emulsion paint, weather proofing paint | a) Asian b) Indigo |



| S. No. | Equipment | Vendor |
|--------|--|--|
| | | c) Burger |
| 154) | Putty | a) Birla b) Asian c) Burger |
| 155) | Acid /epoxy resistant paint | a) Fosroc b) Jotun |
| 156) | Fire proof Sealant | a) Sika, Fosroc, Hilti b) Fosroc c) Hilti |
| 157) | Non Shrink grout | a) Sika b) Fosroc |
| 158) | PVC Water stop/water bar | a) Sika b) Fosroc |
| 159) | CI / FRP / RCC Manhole cover | a) As approved by owner during detail engineering stage |
| 160) | False ceiling (Gypsum or Fiberglass board) | a) Armstrong b) Saint Gobain |
| 161) | Raised floor | a) As approved by owner during detail engineering stage |
| 162) | RCC pipe | a) As approved by owner during detail engineering stage. (as per B.I.S. standards) |
| 163) | GI pipe-class C heavy | a) Jindal b) Tata |
| 164) | GI fittings | a) Jindal b) Tata |
| 165) | PVC/CPVC pipes | a) Supreme b) Finolex c) Astral |
| 166) | Plumbing fittings (Chrome plated) | a) Jaquar b) Kohler |
| 167) | Plumbing fixtures | a) Jaquar b) Kohler |
| 168) | Sanitary hardware | a) Jaquar b) Kohler |
| 169) | Mirror | a) Nilkamal b) Kohler |
| 170) | Stainless steel sink | a) Nirali b) CERA c) Hindware |
| 171) | Wall mounted clock | a) TITAN b) AJANTA |

NOTES:

1. The final make selected out of the recommended makes listed above shall be subject to the Owner's approval during detailed Engineering.
2. Wherever the make is not specified for any other items, the contractor shall submit credential for vendors for relevant items / equipment, out of which Owner shall decide acceptance of vendor based on review of credentials. This shall have no price implication. Owner reserves the right to reject the proposed vendor without assigning any reason.



3. Bidder may suggest /request for approval of Additional vendor with credentials and details for review and approval of Owner. Owner may consider the request in case proposed additional vendor is reputed and meeting the tender specification requirements. Owner reserves the right to reject the proposed vendor without assigning any reason.



ANNEXURE-F: LIST OF DRAWINGS

| Sl. No. | Drawing No. | Description |
|---------|---------------------------------|--|
| 1) | FCE-1721125-EL-DWG-SLD-2100-001 | 400 kV Substation-Single Line Diagram: PSS-1 |
| 2) | FCE-1721125-EL-DWG-SLD-2100-006 | SLD for 415 V AC System-PSS-1 |
| 3) | FCE-1721125-EL-DWG-SLD-2100-008 | SLD For 220V DC System |
| 4) | FCE-1721125-EL-DWG-SLD-2100-010 | SLD For 230V AC UPS System |
| 5) | FCE-1721125-EL-DWG-SCM-2100-011 | Substation Automation System Diagram-PSS-1 |
| 6) | FCE-1721125-CI-DWG-CMS-4100-001 | Hybrid Park Communication scheme |
| 7) | FCE-1721125-CI-DWG-CMS-4100-002 | Simplified Conceptual Communication Architecture |
| 8) | FCE-1721125-EL-DWG-LAY-2100-015 | 400 kV Substation Layout-PSS-1 (Preliminary) |
| 9) | FCE-1721125-EL-DWG-LAY-2100-016 | 33 kV Pre Engineered Building Layout |
| 10) | FCE-1721125-EL-DWG-MIS-2100-022 | Typical Electrical Installation Details - Cable Tray |
| 11) | FCE-1721125-EL-DWG-MIS-2100-023 | Typical Electrical Installation Details - Earthing |
| 12) | FCE-1721125-EL-DWG-MIS-2100-024 | Typical Electrical Installation Details - Lightning protection |
| 13) | FCE-1721125-EL-DOC-LST-2050-001 | Typical Electrical Installation Details - Road Lighting Pole |

A

Doc No. TB-PBTU-GIPL-GIS

Technical Specification

400kV Gas Insulated Switchgear with its accessories

ANNEXURE-A: COMPLIANCE CERTIFICATE OF TECHNICAL SPECIFICATION

The bidder shall confirm compliance to the following by signing and stamping this compliance certificate and furnishing same with the offer.

1. The scope of supply, technical details, construction features, design parameters etc. shall be as per technical specification & there are no exclusion/ deviation with regard to same.
2. There are no deviation(s) with respect to specification other than those furnished in the schedule of deviations.
3. Only those technical submittals which are specifically asked for in Notice Inviting Tender (NIT) to be submitted at tender stage shall be considered as part of offer. Any other submission, even if made, shall not be considered as part of technical offer.
4. Any comments/ clarifications on technical/ inspection requirements furnished as part of bidder's covering letter shall not be considered by BHEL, and bidder's offer shall be construed to be in conformance with the specification.
5. Any changes made by the bidder in the price schedule with respect to the description/ quantities from those given in 'BOQ' of the specification shall not be considered (i.e., technical description & quantities as per the specification shall prevail).

Date:

Bidder's Stamp & Signature

ANNEXURE-B: DEVIATION/ CHANGE REQUEST OF TECHNICAL SPECIFICATION

Bidder shall list out all technical potential deviation/ change request (s) along with clause with respect to technical specifications.

| Sl. No. | Page No. | Clause No. | Deviation | Reason/ Justification(s) |
|---------|----------|------------|-----------|--------------------------|
|---------|----------|------------|-----------|--------------------------|

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:

Bidder's Stamp & Signature