

**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.	INSTRUCTION TO BIDDERS : 1.1 Sealed bids are invited for the items mentioned in the tender enquiry conforming to the NIT including Technical Specifications. Bids should be typed and free from overwriting and erasures. Corrections or additions / deletions, if any, must be clearly written and attested, otherwise offer may be rejected. 1.2 Bidder must ensure that their bid is submitted / dropped in the tender box on or before 14-00 Hrs. IST on the due date of opening, unless otherwise specified in the NIT, at the address as follows :- Tender Box, Materials Management, Transmission Business Group, Bharat Heavy Electricals Limited, 5th Floor, Tower-A, Advant Navis IT Business Park, Plot-7, Sector-142, Noida Expressway, Noida, Dist. G. B. Nagar, U. P. ñ 201305 1.3 In case tender enquiry is floated though 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). 1.4 The bids shall be opened at 14-30 Hrs. IST on the due date of opening, in the presence of participating bidders who may like to be present, unless otherwise specified in the NIT. Bids received late are liable for rejection. Bidders sending bids by courier or post will have to ensure that it is timely delivered at the above address. 1.5 Bids are to be submitted duly signed with seal in two parts :- a) Techno-commercial Bid (Part-I) ñ 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 ðUn-Priced Bidð is also to be enclosed in Part-I Bid. b) Price Bid (Part-II) ñ To be submitted only in one set in a separate sealed envelope. This should not contain any Technical and / or Commercial Terms and Conditions. The rates should be quoted both in figures and words. 1.6 The Part-I and Part-II Bids are to be sealed in separate envelopes and marked

Sr. No.	
	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 super scribed with tender enquiry no., item / package name, project name and due date of opening. Bidder's name and address shall also be mentioned on each envelope. 1.7 For any technical clarification, please contact official mentioned in the tender enquiry / NIT. 1.8 For any commercial clarification please contact official issuing tender enquiry / NIT. 1.9 Price bid (Part-II) should not contain any additional information / description other than given in "Un-Priced Bid" submitted with "Techno-commercial Bid (Part-I)" except prices, otherwise bid is liable for rejection. 1.10 Price Bid submitted along with the bid shall remain valid up to validity of offer. Any discount / revised offer submitted by the bidder on its own shall be accepted provided it is received before the due date and time of offer submission (i.e. Part-I Bid). The discount shall be applied on pro-rata basis to all items including optional items, if any, unless specified otherwise by the bidder. Discount offered shall be valid for full duration of validity of the offer including extension of validity, if any. Unsolicited Supplementary / Revised Price Bid submitted after the due date and time of offer submission (i.e. Part-I Bid), during validity period of offer, unless asked by BHEL, shall not be considered. Withdrawal of quotation by the bidder, at any stage after its opening, may entail suitable action against such bidder by BHEL. 1.11 The consultants / firm (and any of its affiliates) shall not be eligible to participate against tender enquiry for the related goods or works or services for the same project, if they were engaged by BHEL-TBG for the consultancy services. 1.12 In case any Foreign OEM / Foreign Principal insists on engaging the services of an agent, such agent shall not be allowed to represent more than one manufacturer / supplier in the same tender. Moreover, either the agent could bid on behalf of the manufacturer / supplier or the manufacturer / supplier could bid directly but not both. In case bids are received from the manufacturer / supplier and the agent, bid received from the agent shall be ignored. 1.13 Non-conformities / errors / discrepancies in quoted prices in price bids shall be dealt as follows :- a) If, in the price structure quoted for the required goods / services / works, there is discrepancy between the unit price and the total price (which is obtained by multiplying the unit price by the quantity), the unit price shall prevail and the total price corrected accordingly, unless in the opinion of BHEL there is an obvious misplacement of the decimal point in the unit price, in which case the total price as quoted shall govern and the unit price corrected accordingly. b) If there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail and the total shall be corrected. c) If there is a discrepancy between words and figures, the amount in

Sr. No.	
	words shall prevail, unless the amount expressed in words is related to an arithmetic error, in which case the amount in figures shall prevail subject to (a) and (b) above. d) If there is such discrepancy in an offer as mentioned in (a), (b) & (c) above, the same shall be conveyed to the bidder with target date upto which the bidder has to send his acceptance on the above lines and if the bidder does not agree to the decision of the BHEL, the bid is liable to be ignored. 1.14 In case the scope of the successful bidder / supplier against this tender enquiry includes Erection, Testing and Commissioning (ETC) of the equipment / material at site in addition to Supply, Purchase Order shall be placed for Supply Portion and Contract shall be separately awarded for ETC at Site Portion. General Terms and Conditions for Tender Enquiry / Contract mentioned herein shall be applicable for both Supply & ETC at Site. Additional Terms and Conditions for Tender Enquiry / Contract for Erection, Testing and Commissioning at Site @BHEL/TBG/GTC-ETC/2016 Rev. 01 shall be applicable for ETC at Site only which is to be read in conjunction with General Terms and Conditions for Tender Enquiry / Contract mentioned herein. However, any breach of either the Purchase Order or the Contract shall be deemed to be breach of the other. 1.15 Taxes and Duties payable extra as per Clause No. 2.3 in NIT, if not specified/quoted clearly as extra shall be considered as included in Ex-works Price and therefore shall not be reimbursed. Taxes and duties not payable extra as per NIT shall be deemed to be included in Ex-works Price. 1.16 If the rates for taxes and duties in respect of the quoted materials and / or services assumed by the Supplier are less than the tariff prevailing at the time of tendering, Supplier will be responsible for such under quotations. However if the rates assumed are higher than the correct rates prevailing at the time tendering, the difference will be to the credit of BHEL. Note : Representative / official deputed by the bidder to witness tender opening must produce authorization letter for the same.
2.	PRICES : 2.1 Unless specifically indicated in the NIT, all prices shall be FIRM. No enhancement of rate for whatsoever reasons unless and until asked by BHEL shall be allowed. 2.2 Unless specifically indicated in the NIT, the prices shall be on INR basis. 2.3 Unless specifically indicated in the NIT, the prices are to be quoted on FOR (Site / Destination) basis excluding GST. The break-up of prices shall be as under :- a) Ex-works Price: Ex-works price including packing & forwarding charges. b) Freight: Freight for door delivery up to destination / site / store are to be quoted separately. c) Insurance: Insurance for door delivery up to destination / site / store are to be quoted separately.

Sr. No.	
	d) Type Test Charges: If asked in the technical specification, it is to be quoted separately for each test. e) Charges for Supervision of Erection, Testing & Commissioning (ETC) at Site: To be quoted separately if specified in NIT/Price Schedule. f) Charges for Testing & Commissioning at Site: To be quoted separately if specified in NIT/Price Schedule. g) Charges for Erection, Testing & Commissioning at Site: To be quoted separately if specified in NIT/Price Schedule. h) Training Charges: To be quoted separately if specified in NIT/Price Schedule. 2.4 GST rates along with HSN/SAC code as applicable on Sr No (a) to (h) above is to be mentioned separately in percentage in both un-priced bid and price bid. Note : i) Unless otherwise specified in the NIT, the purchase order shall be placed on Ex-works basis for Indian bidders. ii) Prices quoted by Indian bidders shall be in Indian Rupees only. iii) In case Supervision of Erection, Testing & Commissioning (ETC) at Site or Testing & Commissioning at Site or Erection, Testing & Commissioning at Site is also in scope of the bidder along with supply, bidder has to ensure that prices quoted for such services also are in line with special terms & conditions of the NIT, if any. iv) Unless otherwise specified in the NIT, Unloading at Site / Destination shall not be in the scope of the supplier. v) Prices in respect of Sr No (a) to Sr No (h) of Clause 2.3 above are to be quoted inclusive of all taxes & Duties, charges. Levies, royalty etc. if any, excluding GST.
3.	TERMS OF PAYMENT : 3.1 For Supply only in scope of the supplier 100% of payment within 60 days from the date of receipt of complete invoice along with documents in 3 sets (original + 2 copies) as follows : · LR / GR duly endorsed by BHEL Site Official. · Material Receipt Certificate issued by BHEL Site Official. · GST Compliant Tax Invoice · Packing List (Case-wise) · Copy of Transit Insurance Certificate from underwriters. · Material Inspection Clearance Certificate (MICC) issued by BHEL Quality Management · Guarantee Certificate · Copy of Performance Bank Guarantee (PBG) · Certificate of acceptance of Type Test Reports issued by BHEL Engineering Management wherever specifically mentioned in the Purchase Order. 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

Sr. No.	
	a) 95% of payment within 60 days from the date of receipt of complete invoice along with documents in 3 sets (original + 2 copies) as follows : · LR / GR duly endorsed by BHEL Site Official. · Material Receipt Certificate issued by BHEL Site Official. · GST Compliant Tax Invoice · Packing List (Case-wise) · Copy of Transit Insurance Certificate from underwriters. · Material Inspection Clearance Certificate (MICC) issued by BHEL Quality Management · Guarantee Certificate · Copy of Performance Bank Guarantee (PBG) · Certificate of acceptance of Type Test Reports issued by BHEL Engineering Management wherever specifically mentioned in the Purchase Order. b) 5% of payment within 60 days from the date of receipt of complete invoice along with documents in 3 sets (original + 2 copies) as follows : · Certificate of successful completion of Supervision of Erection, Testing & Commissioning at Site if it is in the scope of the supplier or Certificate of successful completion of Testing & Commissioning at Site if it is in the scope of the supplier. · Certificate of completion of final documentation as per Purchase Order / Technical Specification issued by BHEL Engineering Management 3.3 For Supply where Erection, Testing & Commissioning (ETC) at Site is in scope of the supplier a) 90% of payment within 60 days from the date of receipt of complete invoice along with documents in 3 sets (original + 2 copies) as follows : · LR / GR duly endorsed by BHEL Site Official. · Material Receipt Certificate issued by BHEL Site Official. · GST Compliant Tax Invoice · Packing List (Case-wise) · Copy of Transit Insurance Certificate from underwriters. · Material Inspection Clearance Certificate (MICC) issued by BHEL Quality Management · Guarantee Certificate · Copy of Performance Bank Guarantee (PBG) · Certificate of acceptance of Type Test Reports issued by BHEL Engineering Management wherever specifically mentioned in the Purchase Order b) 10% of payment within 60 days from the date of receipt of complete invoice along with documents in 3 sets (original + 2 copies) as follows : · Certificate of successful completion of Erection, Testing & Commissioning at Site issued by BHEL Site Official / Construction Management · Certificate of completion of final documentation as per Purchase Order / Technical Specification issued by BHEL Engineering Management 3.4 For Type Test Charges 100% payment along with applicable GST within 60 days from the date of receipt 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

Sr. No.	
	supplier) of main supplies (excluding spares) for which Type Tests are applicable. List of main supplies (excluding spares) for which Type Tests are applicable shall be certified by BHEL Engineering Management. 3.5 For Charges for Supervision of Erection, Testing & Commissioning at Site 100% payment along with applicable GST within 60 days from the date of receipt of complete GST compliant Tax invoice along with certificate of successful completion of Supervision of Erection, Testing & Commissioning at Site issued by BHEL Site Official / Construction Management in 3 sets (Original + 2 copies). 3.6 For Charges for Testing & Commissioning at Site 100% payment along with applicable GST within 60 days from the date of receipt of complete GST compliant Tax invoice along with certificate of successful completion of Testing & Commissioning at Site issued by BHEL Site Official / Construction Management in 3 sets (Original + 2 copies). 3.7 For Training Charges 100% payment along with applicable GST within 60 days from the date of receipt of complete GST compliant Tax invoice along with certificate of completion of training issued by BHEL Engineering Management in 3 sets (original + 2 copies). Note : i) Supplier has to submit invoice(s) as per PO or approved billing break-up of prices (if applicable as per NIT). ii) In case of supplies for overseas project, Material Receipt Certificate issued by BHEL Authorized Representative shall also be acceptable. iii) In case of Transit Insurance under Open Insurance Policy, Intimation / Declaration of Transit Insurance as per terms of the relevant Open Insurance Policy along with copy of Open Insurance Policy from underwriters shall also be acceptable. iv) Supplier has to ensure commencement of transit insurance from the date not later than LR / GR date. v) Supplier has to submit Tax Invoice(s). Supplier should ensure that Tax Invoice should comply all statutory requirements under GST Law to enable BHEL to avail input credit vi) MSMED Act, 2006 and the rules made thereunder as amended from time to time shall be applicable for release of payment to suppliers qualified & registered as Micro & Small Enterprises based on documents mentioned in the NIT for MSME. vii) Supplier has to submit PBG (as per BHEL format) & Guarantee Certificate as per PO terms. viii) In case any shortages and / or damages in supplies, an amount calculated

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

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

Sr. No.	
	iv) Supplier has to confirm one of the applicable options for submission of PBG / Deposit before placement of PO. v) In case of non submission PBG / Deposit, as applicable, BHEL reserve the right for Risk Purchase as per terms of the NIT and impose Suspension of Business Dealings with the Supplier / Contractor. vi) BHEL reserve the right to encash the Bank Guarantee and forfeit the amount in the event of any default, failure or neglect on part of the Supplier in fulfilment of performance of the Purchase Order. vii) Value of the Bank Guarantee (at the time of submission) shall remain unchanged for any subsequent variations in Purchase Order value up to $\pm 20\%$. Beyond this variation of $\pm 20\%$, the Supplier shall arrange to enhance or may reduce the value of the Bank Guarantee accordingly for the total variation promptly. viii) Vendor to ensure submission of Certificate of Final Documentation / Confirmation regarding Non applicability of Final Documentation, as the case may be, as referred in clause No 9 regarding Final Documentation. BG shall be released only after submission of the same to BHEL TBMM.
8.	SUBMISSION OF DRAWINGS / DOCUMENTS FOR APPROVAL : Supplier shall submit the master document list within 7 days from date of Purchase Order / Contract, unless otherwise specified in the NIT, with planned dates for submission which shall be in line with activity schedule as per Purchase Order / Contract and shall be finalized with BHEL Engineering Management. Date of first submission of drawings / documents shall be certified by BHEL Engineering Management after the receipt of applicable drawings / documents (e.g. project specific cover sheet, GTP, OGA drawings, schemes, type test reports etc.) by BHEL. During detailed engineering stage, necessary hard copies of the engineering drawings / documents shall also be submitted by the supplier as per the Purchase Order / Contract requirement. The supplier shall also submit the packing drawings as per technical specifications. In case item(s) offered require any interface details of other item (not in the scope of supplier & required for operating the equipment), the supplier has to submit interfaces schedule along with submission of engineering drawings / documents. It shall be responsibility of the supplier to get the details of the interfaced item from BHEL before manufacturing to avoid any mismatch at site.
9.	FINAL DOCUMENTATION : Final documentation as called in the Technical /contract specification is to be submitted within 3 months from the date of first delivery of respective equipment, item/material. After submission of Final Documentation, BHEL Engineering Management (TBEM) will issue a Certificate of Completion of Final Documentation. Wherever Final Documentation is not applicable, BHEL Engineering Management (TBEM) will issue confirmation regarding the same, Vendor to submit the Certificate of Final Documentation / Confirmation regarding Non applicability of Final Documentation, as the case may be, to BHEL TBMM. In case of Non Submission of Certificate of Final Documentation / Confirmation regarding Non applicability of Final Documentation, BG will be liable for encashment.
10.	INSPECTION : BHEL / customer / third party shall inspect equipment / material before despatch. Stage inspection during manufacturing may also be carried out. Material to be despatched only after getting Material Despatch Clearance Certificate (MDCC) / MICC issued by BHEL. Supplier shall send inspection call on prescribed format / web site only, with an advance notice of 15 days. Supplier to ensure submission of all routine / acceptance test reports, inspection

Sr. No.	
	reports and all other documents related to inspection, immediately to BHEL. BHEL representative is authorised to carry out audits along with Third Party Inspection Agency at vendor's / supplier's works before clearing the items for despatch.
11.	DESPATCH DOCUMENTS : Despatch documents to be immediately sent to BHEL on despatch are as follows :- • Copy of Invoice • Copy of LR / GR in case of Indian suppliers or BL / AWB in case of foreign suppliers • Copy of Packing List (Case-wise) • Copy of Transit Insurance Certificate from underwriters • Copy of Guarantee Certificate
12.	DELIVERY PERIOD : Delivery / Completion requirement shall be mentioned in the NIT. Bidder to specify best delivery / completion period possible in weeks from the date of LOI / PO as per activity schedule for consideration by BHEL. Time required for type test, if applicable, is to be separately indicated. Note : LR / GR date or invoice date (whichever is later) for indigenous supplies and BL / AWB date for FOB / CIF (if applicable) contracts shall be considered as delivery date.
13.	LIQUIDATED DAMAGES FOR DELAYED DELIVERY: In case of delay in execution of Purchase Order beyond the contractual delivery time, an amount of 0.5% of the total Purchase Order value for supply (incl. taxes and duties, freight & insurance as applicable) per week of delay or part thereof subject to a maximum of 10% of the total Purchase Order value for supply (incl. taxes and duties, freight & insurance as applicable) shall be deducted as Liquidated Damages (LD) along with applicable GST (if any) on LD. However, in case of staggered (lot-wise) contractual delivery schedule, an amount of 0.5% of the total 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. Note : i) In case of any amendment / revision in PO /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 purpose. iv) If, as per supplier, delay is not attributable to the supplier, delay analysis with documentary evidence may be submitted by the supplier at the earliest but not

Sr. No.	
	later than six months from the end of the financial year in which the payment is withheld. Based on the above details / documents submitted by the supplier, BHEL shall take final decision and if considered appropriate by BHEL, withheld amount (full or part as the case may be) shall be released, otherwise, full or balance withheld amount shall be treated as deduction of Liquidated Damages (LD) towards delayed delivery.
14.	VALIDITY OF OFFER : The offer shall be valid for 120 days from the due date of opening of tender (i.e. techno-commercial bid unless otherwise specified in the NIT). Prices of Spares, wherever they optional items, shall be valid till two years from the date of placement of PO.
15.	ACCEPTANCE / REJECTION OF TENDER : BHEL reserve the right to reject in full or part, any or all tender without assigning any reason thereof. BHEL also reserve right to vary the quantities as mentioned in the NIT. Acceptance of offer is subject to vendor approval by customer before opening of price bid. BHEL shall not be bound by any power of attorney granted by tenderer or by changes in composition of the firm made subsequent to award of order / contract. BHEL may however recognize such power of attorney and changes after obtaining proper legal advice, cost of which will be chargeable to the seller / contractor concerned. If the tenderer deliberately gives wrong information, BHEL reserves the right to reject such an offer at any stage or cancel the order / contract, if awarded, and forfeit the security deposit and bank guarantee.
16.	DEVIATION : The bids having deviation(s) w.r.t. tender are liable for rejection. However, BHEL, at its discretion, may load the prices for evaluation of offer with prior intimation to bidder.
17.	TENDER EVALUATION : Comparative statement shall be prepared and evaluated on total cost basis at destination/site (as per terms of NIT) considering overall quantity indicated in NIT unless contrary to same is specifically mentioned in the tender enquiry / NIT. Total cost for this purpose shall include cost of scope of work as mentioned in NIT along with applicable taxes & duties, and other services etc. (if applicable). GST input credit available to BHEL shall be reduced from prices while determining L1 status. In case all bidders are foreign & Port of Import (destination port) is same for all the bidders, evaluation of offers shall be done on CIF (Port of Import) basis. Otherwise, evaluation of offers shall be done on the basis of delivered cost at site /destination to BHEL. Further, in case of foreign bidders, marine freight & insurance are to be quoted separately & the purchase order may be placed on FOB basis with an option for delivery on CIF / CFR basis, if required, later. In case of foreign bidders, Exchange Rate (TT selling rate of State Bank of India) as on date of tender opening (Part-I Bid in case of two part bid) shall be considered. If the relevant day happens to be a bank holiday, then the forex rate as on the previous bank (SBI) working day shall be taken for tender evaluation.
18.	LOADING CRITERIA : List of permissible deviations & loading criteria thereof are as follows :- a) Payment Terms Base rate of SBI (as applicable on the date of bid opening / techno-commercial bid opening in case of two part bids) + 6% shall be considered for loading for the period of relaxation sought by bidder(s) against terms of payment in the NIT. b) Liquidated Damages (LD) for Delayed Delivery

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

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

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

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

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

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

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

Signature of Bidder (Authorized Signatory) with Date & Seal

 BHARAT HEAVY ELECTRICALS LIMITED TRANSMISSION BUSINESS ENGINEERING MANAGEMENT NOIDA						
DOCUMENT NO.	TB-405-316-003		Rev 00	Prepared	Checked	Approved
TYPE OF DOC.	TECHNICAL SPECIFICATION		NAME	Vyom	JK SKS	SKS JK
TITLE 336kV Surge Arrester			SIGN	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>
			DATE	27.08.20	27/08/20	27/08/20
			GROUP	TBEM		
			WO No.	88010		
CUSTOMER	SJVN Arun-3 Power Development Company (P) Ltd. (SAPDC)					
Consultant	SJVN Ltd					
PROJECT	4x225MW Arun-3 (HEP), Nepal					
<u>Contents</u>						
Section No.	Description				No of Pages	
Section-1	Scope, Technical Requirements and Quantities				8	
Section-2	Equipment Specification under scope of supplies and				5	
Section-3	Project details and general technical requirements (For all equipment under the Project)				38	
Section-4	Guaranteed Technical Particulars				03	
Annexure-A	Deviation/ Change Request to Technical Specification				01	
Annexure C	Manufacturing Quality Assurance Test Requirements				08	
Annexure-E	Quality and Inspection Format				12	
Annexure -F	Export Worthy Packing				17	
Rev. No.	Date	Altered	Checked	Approved		
Distribution			To			
			Copies			

COPYRIGHT & CONFIDENTIAL
 The information in this document is the property of BHARAT HEAVY ELECTRICALS LIMITED
 This must not be used directly or indirectly in anyway detrimental to the interest of the company.

Copyright & Confidential The information in this document is the property of BHARAT HEAVY ELECTRICALS LIMITED This must not be used directly or indirectly in anyway detrimental to the interest of the company.	 BHARAT HEAVY ELECTRICALS LIMITED TRANSMISSION BUSINESS ENGINEERING MANAGEMENT NOIDA					
	DOCUMENT NO.	TB-405-316-003	Rev 00	Prepared	Checked	Approved
	TYPE OF DOC.	TECHNICAL SPECIFICATION	NAME	Vyom	SKS	AG
	TITLE 336kV Surge Arrester		SIGN			
			DATE	27.08.20		
			GROUP	TBEM		
			WO No.	88010		
	CUSTOMER	SJVN Arun-3 Power Development Company (P) Ltd. (SAPDC)				
	Consultant	SJVN Ltd				
	PROJECT	4x225MW Arun-3 (HEP),Nepal				
	<u>Contents</u>					
	Section No.	Description				No of Pages
	Section-1	Scope, Technical Requirements and Quantities				8
	Section-2	Equipment Specification under scope of supplies and				5
	Section-3	Project details and general technical requirements (For all equipment under the Project)				38
	Section-4	Guaranteed Technical Particulars				03
	Annexure-A	Deviation/ Change Request to Technical Specification				01
	Annexure C	Manufacturing Quality Assurance Test Requirements				08
	Annexure-E	Quality and Inspection Format				12
	Annexure –F	Export Worthy Packing				17
Rev. No.	Date	Altered	Checked	Approved		
Distribution				To		
				Copies		

SECTION – 1

1.1 SCOPE

Scope of work covers Design, Manufacture, Testing at works, Packing and Delivery at site of gapless, metal oxide Surge Arrester complete with accessories as listed in Clause 1.2 and 1.3 below.

This section covers the Specific Technical Requirements of metal oxide Surge Arrester. In case of any discrepancies between the requirements mentioned in this section and those specified in the following sections of this specification, the specifications given herein shall prevail and shall be treated as binding requirements.

No deviation from the requirements specified in various clauses of this specification shall be allowed.

The offered equipment shall also comply with the General Technical Requirements for the project as detailed under Section-3 of this specification.

In case of any discrepancies between the requirements mentioned under various Sections of this Technical Specification. The order of precedence shall be as follows:

- a. Statutory Regulations / International standards
- b. Section – 1
- c. Section – 2
- d. Section – 3
- e. Section – 4

Bidder to submit filled up **Annexure-A**, attached with Section-1 confirming that there are no deviations and the offer is in full compliance with the specification along with other document.

The equipment is required for the following project:

Name of the Customer	: SJVN Arun-3 Power Development Company (P) Ltd. (SAPDC)
Consultant	: SJVN Ltd
Name of Main Contractor	: Bharat Heavy Electricals Limited
Name of the Project	: 4x225MW Arun-3 (HEP), Nepal

1.2 BILL OF QUANTITIES:

Sl. No.	Equipment Description	UOM	Qty
1	SUPPLY- SURGE ARRESTOR : 20KA NOMINAL DISCHARGE, 25MM/KV CREEPAGE, POLYMER TYPE, 336KV SINGLE PHASE, GAPLESS (ZNO) SURGE ARRESTER COMPLETE WITH ALL ACCESSORIES (CORONA RING [IF APPLICABLE], SURGE COUNTER/ MONITOR, INSULATING BASE, LUGS, FIXING & EARTHING HARDWARE ETC) EXCEPT TERMINAL CONNECTOR AND INSULATED CONNECTING CABLE.	NO	6
2	SUPPLY- SURGE ARRESTOR : INSULATED COPPER CABLE CONNECTING SURGE ARRESTER TO SURGE COUNTER	MTR	24
3	SUPPLY- SURGE ARRESTOR : 336KV TERMINAL CONNECTOR SUITABLE FOR TWIN ACSR MOOSE CONDUCTOR	NO	6
4	SPARES- SURGE ARRESTOR : 20KA NOMINAL DISCHARGE, 25MM/KV CREEPAGE, POLYMER TYPE, 336KV SINGLE PHASE, GAPLESS (ZNO) SURGE ARRESTER COMPLETE WITH ALL ACCESSORIES (CORONA RING [IF APPLICABLE], SURGE COUNTER/ MONITOR, INSULATING BASE, LUGS, FIXING & EARTHING HARDWARE ETC) EXCEPT TERMINAL CONNECTOR AND INSULATED CONNECTING CABLE.	NO	2
5	SPARES- SURGE ARRESTOR : INSULATED COPPER CABLE CONNECTING SURGE ARRESTER TO SURGE COUNTER	MTR	8
6	SPARES- SURGE ARRESTOR : 336KV TERMINAL CONNECTOR SUITABLE FOR TWIN ACSR MOOSE CONDUCTOR	NO	4

1.3 ACCESSORIES REQUIRED

1. Insulating base : Yes
2. Surge Monitor : Yes (Millimeter + Surge counter)
3. HV Power connector : Yes
4. Corona grading ring : Yes
5. Insulated interconnecting cable between Arrester and surge monitor. : Yes, 4mtr to be supplied in single length for all SA.(i.e , 8x4 = 32 mtrs)
Suitable lugs shall be supplied as loose items.
6. Hardware for bolting the arrester units (Inter-unit fixing) : Yes
7. Hardware for Fixing the surge arrester & surge monitor to support structure : Yes
8. Bypass shunts : Yes, if required
9. Type tests required to be carried out : No, if relevant valid type test certificates are available.

1.4 Technical Qualifying Requirements:

The Bidder shall have designed, manufactured, type tested at least the minimum specified quantity of all equipment as below covered under the scope of this contract of at least the rating as specified herein under or higher:

Minimum rating required for the 400 kV Surge Arrester : 336kV Surge Arrester for Outdoor installation for minimum of 2 nos of bays.

These equipments should have been supplied in last 20 years & should be in successful operation for at least 2 years in last 7 years as on the date of Bid opening (09.02.2018) in Power Plant or Sub-stations or Industrial Complex etc.

The Bidder shall clearly and unambiguously identify and name the proposed sub-Vendors/sub-contractor for procurement of major bought out items including castings, forgings, semi-finished and finished components/ equipments.

List appended in the contract shall be based on the Bidder Organisation's approved vendor selection/assessment policy. Further details of the major Employer to whom equipment /works/service rendered in last three years by the Sub Vendor shall form a part of the List.

1.5 SPECIFIC TECHNICAL REQUIREMENT

i)	Rated System Voltage	420 kV
ii)	Rated Surge Arrestor voltage	336 kV (RMS)
iii)	Rated Surge Arrestor Current	20 kA
iv)	Minimum continuous operating voltage. (MCOV)	273kV (RMS)
v)	Maximum residual voltage at nominal discharge current (10 kA)	800 kV(peak)
vi)	Class of diverter	Station type, Heavy duty, Metal Oxide, Gapless
vii)	System neutral earthing	Effectively earthed
viii)	Installation	Outdoor
ix)	Maximum discharge current	20 KA of 8/20 Micro sec. wave
x)	Rated frequency	50 Hz
xi)	Energy level	As per IEC
xii)	Max. steep current	As per IEC
xiii)	Max. switching impulse residual voltage at 1 KA	As per IEC
xiv)	Min. switching impulse residual voltage at 1 KA	As per IEC

81910/2020/TBG-TB_ENGG_MSE**Bharat Heavy Electricals Limited****4x225MW Arun-3 (HEP), Nepal****Technical Specification for 336kV Surge Arrester****Doc No. TB-405-316-003**

xv)	Max. internal partial discharge ionization at 267 kV (rms)	As per IEC
xvi)	Long duration discharge class	As per IEC
xvii)	High current short duration test value (4/10 Micro sec. wave)	As per IEC
xviii)	Minimum creepage distance	10500 mm.
xix)	One minute power frequency withstand voltage of arrester housing	630 kV (rms)
xx)	Impulse withstand voltage of arrester housing with 1.2/50 micro sec. wave.	1425 kV (Peak)
xxi)	Switching impulse withstand voltage of arrestor housing	1050 kV (Peak)
xxii)	Prospective symmetrical fault current or pressure relief test.	50 KA (rms)
xxiii)	Pressure relief class	Class A as per IS:3070 Part-1.
xxiv)	Radio interference voltage at 320 kV	Not exceeding 500 micro volt
xxv)	Impulse withstand voltage of equipment to be protected - Transformers - Breakers	i) 1425 kV peak (Winding) ii) 1425 kV peak (Bushing) 1425 kV Peak
xxvi)	Switching surge withstand voltage of equipment to be protected.	1050 kV peak
xxvii)	Seismic forces for consideration: a) Horizontal b) Vertical	As specified in GTP
xxviii)	Corona extinction voltage	320 kV (rms)
xxix)	Partial discharge level, Pico coulombs	10 pc or less
xxx)	Material of Housing	Polymer

It may be noted that :

1. Lightning arresters for outgoing lines shall be mounted on a structure placed near the respective equipment.
2. Materials used in the manufacture of the switchgear equipment shall be of the type, composition and physical properties best suited to their particular purposes and in accordance with the latest engineering practices. All joint surfaces shall be machined, and all castings shall be spot faced for all bolt heads or nuts and washers. All screws, bolts, studs and nuts shall conform to metric system.
3. Temperature rise of current carrying parts shall be limited to the values stipulated in IEC 60694, under rated current and the climatic conditions at site.
4. For system details and transport details refer Project Information in section 3.
5. Bidder to submit list of consumables with shelf life of lesser than two years. It shall be supplied before erection after clearance from BHEL/SAPDC/ SJVN.
6. Supplier will submit detailed bar chart indicating all the milestones from Engineering till manufacturing/ testing, dispatch to site and commissioning.
7. Packing of Surge Arrester shall be suitable for outdoor or indoor storage in project conditions.

400kV Pot Head Yard

1.	Wind pressure on structures & insulator strings, conductor, earth wire	Wind zone -4 As per IS-802.
2	Wind load for gantry and each equipment.	As per calculations during detail engg.
3	Maximum wind span /weight Span	As per calculations during detail engg.
4	Short circuit forces and horizontal clearances.	The maximum design tension shall be decided as per calculations submitted during detail engg. For approval.
5.	Factor of safety	2.0

Performance Guarantees

The equipment / components along with all auxiliaries & accessories shall be capable of performing intended duties under specified conditions. it is the responsibility of contractor to supply the equipment as per guaranteed technical particulars and shall also guarantee the reliability and performance.

1.6 TYPE TESTING

The contractor shall submit the certificates from Govt. approved labs/ accredited laboratories of the type tests listed in **Section 2** which should have been carried out within last five (5) years from the date of bid opening (09.02.2018). These type test reports should be for the tests conducted on the equipment similar to those proposed to be supplied under this contract and the test(s) should have been either conducted at an independent laboratory or should have been witnessed by a client. In case the contractor is not able to submit report of the type test(s) conducted within last five years from the date of bid opening, or in case the type test report(s) are not found to be meeting the specification requirements, the contractor shall conduct the type tests without any cost and delivery implication to BHEL/SAPDC/SJVN.

1.7 TESTS AFTER INSTALLATION AT SITE

As per Section-2

Manual:

The following manuals are required to be supplied by the bidder:

Sr.No	Manual Description
1	Storage and preservation manual
2	Safety manual
3	Erection Manual
4	Testing and commissioning manual
5	Operation manual
6	Maintenance manual
7	Repair process / procedure manual for equipment / system

1.8 QUALITY PLAN

The Bidder shall follow Quality Assurance Programme to ensure that the equipment and services under the scope of contract whether manufactured or performed at the Bidder's works or at his sub-vendor's premises or at the SAPDC's site or at any other place of work are in accordance with the technical specifications. Such programme shall be outlined by the Bidder and be submitted along with the bid. The QA programme shall be generally in line with IS/ISO- 9001, Section-2 & Section-3.

1.9 INFORMATION TO BE FURNISHED BY THE CONTRACTOR

Information/documents to be furnished at the TENDER STAGE shall be as per section 2 & 3.

1.10 DRAWINGS / DOCUMENTS

The drawings / documents submitted shall be project and product specific and shall incorporate all project details and title block and numbering scheme of the customer as detailed in Section 2 & 3.

Drawings / Documents required for providing Manufacturing Clearance:

The Following drawings shall be required for providing the manufacturing clearance of GIS. The date of submission of the last document of the below list, will be treated as the date of submission of GIS documents.

The last date on which the following documents/drawings are approved will be considered as the date of manufacturing clearance:

1	GTP
2	OGA
3	MQP

1.11 PACKING AND DISPATCH:

The packing, marking and documentation within and outside the packages shall comply strictly with such special requirements as shall be expressly provided for in the Contract and, subject to any subsequent instruction ordered by the Employer consistent with the requirements of the Contract AS PER Specification. Reference export worthy packing details is attached "Annexure-Export Worthy Packing".

1.12 OTHER GENERAL INFORMATION:

Other general information for **Vendor** shall be as follows.

- a) **Storage shall be provided by BHEL.** However, bidder shall provide their tentative space requirement for covered and/ or open store area during tender stage only. In addition to this, bidder shall submit their standard storage instruction manual also.
- b) Bidder shall submit list of consumables with shelf life of fewer than two years and same shall be dispatched just before the erection and only after specific clearance from BHEL/SJVN/SAPDC.
- c) In addition to this, packing of Surge Arrester & its accessories shall be suitably robust for long term storage (**minimum 2 years, if required**).
- d) All hardware and structure required for fixing and erection of Surge Arrester in Pothead yard shall be in bidder scope of supply.
- e) The Test Plan for the various items are mentioned in the contract under QATR document.

		PROJECT NAME (MW)		MANUFACTURING / FIELD QUALITY ASSURANCE PLAN					CONTRACTOR NAME, ADDRESS & LOGO						
		ITEM DESCRIPTION		SUB-ITEM		QAP NO.		REV. NO		ISSUE DATE		SUB-CONTRACTOR NAME, ADDRESS & LOGO			
SR. NO.	COMPONENT & OPERATION	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY			REMARKS		
					M/C	S				M	C	S			
1	2	3	4	5	6		7	8	9	10			11		
LEGENDS															
M	MANUFACTURER		C	CONTRACTOR				S	SJVN LTD.						
P	PERFORM		V	VERIFICATION OF RECORDS				W	WITNESS / CHP						
IR	INSPECTION REPORT		DRG	DRAWING				CHP	CUSTOMER HOLD POINT						
MA	MAJOR		MN	MINOR				CR	CRITICAL						
ME	MEASUREMENT		NDT	NON DESTRUCTIVE TESTING				HT	HEAT TREATMENT						
TR1	CERTIFICATE OF COMPLIANCE TO TS/STANDARD REQUIREMENT WITHOUT ANY CHECK LIST OF TESTS CARRIED OUT.		TR2	CERTIFICATE OF COMPLIANCE TO TS/STANDARD REQUIREMENT WITH CHECK LIST OF TESTS CARRIED OUT.				TR3	TEST REPORT/TEST CERTIFICATE WITH TEST RESULTS BASED ON SPECIFIC INSPECTION & TESTING AT MANUFACTURER FACILITY/NABL APPROVED LAB.						
NOTE: QAP SHALL BE READ IN CONJUNCTION WITH QUALITY ASSURANCE REQUIREMENT GIVEN AS PART OF TECHNICAL SPECIFICATION.															
MANUFACTURER / SUB-CONTRACTOR:			CONTRACTOR:			FOR SJVN USE:			REFERENCE DOC NO. OF SJVN:						
PREPARED BY:		REVIEWED BY		REVIEWED & RECOMMENDED By			REVIEWED BY		RECOMMENDED BY			APPROVED BY			
NAME, DESIGNATION & SIGNATURE		NAME, DESIGNATION & SIGNATURE		NAME, DESIGNATION & SIGNATURE			NAME & SIGNATURE		NAME & SIGNATURE			SIGNATURE & SEAL			

Section – 2

SECTION 2

2.1 General

The surge arrester shall be suitable for use in three phase, effectively grounded system of 50 Hz frequency for 420kV substation having climatic conditions as indicated in GTS of this specification.

2.2 Standard & Duty Requirement

The surge arresters shall conform to IEC-60099-1&4 and shall be of hermetically sealed units, self-supporting construction, suitable for mounting on lattice steel structures to be supplied by the bidder. Arresters shall have following duty requirements.

- a) The surge arresters shall be of heavy duty station class and gapless type without any series or shunt gaps.
- b) The surge arresters shall be capable of discharging over-voltages occurring during switching of unloaded transformers and long lines.
- c) Arrester shall be capable of discharging energy equivalent to class 4 of IEC for a 420KV system on two successive operations followed immediately by 50 Hz energization with a sequential voltage profile as specified in IS/IEC.

The surge arresters shall be fitted with pressure relief devices suitable for preventing shattering/damage of polymer housing and providing path for flow of rated fault currents in the event of arrester failure. Details shall be furnished in the bids along with quality checks.

The arresters shall not fail due to arrester housing contamination. Seals shall be in such a way that these are always effectively maintained even when discharging rated lightning current.

Polymer housing shall be so coordinated that external flashover will not occur due to application of any impulse or switching surge voltage upto the maximum design value for arrester.

2.3 Construction Features:

The features and constructional details of lightning arresters shall be in accordance with requirements stipulated hereunder:

1. The features and constructional details of lightning arresters shall be in accordance with requirements stipulated hereunder.
2. Non-linear resistor elements or non-linear resistor blocks shall be of ceramic material. These shall be provided in such a way as to obtain robust construction with excellent mechanical and electrical properties even after repeat operations. The grading network should contain both capacitors and non-linear resistors. Uniform voltage distribution should be maintained under all service conditions .
3. The lightning arresters shall be fitted with pressure relief devices suitable for shattering/damage of polymer housing following prolonged passage of fault current of internal flash over of the arrester .

4. Arresters shall incorporate an anti-contamination feature to prevent arrester failure consequent to uneven voltage gradient across the stack, in the event of contamination of the arrester polymer housing.
5. Seals shall be provided in such a way that these are always effectively maintained even when discharging the maximum lightning current.
6. The name plate shall conform to the requirements of IEC incorporating the year of manufacture.
7. The end fittings shall be made of non-magnetic and corrosion proof material.
8. Arrester shall be suitable for mounting on lattice steel support structure.
9. Self-contained discharge counters, suitably enclosed for outdoor use and requiring no auxiliary or battery supply for operation shall be provided for each single pole unit along with necessary connection. Suitable leakage current meters should also be supplied within the same enclosures. The reading of millimetre and counters shall be visible through an inspection glass panel. The terminals shall be robust and of adequate size and shall be so located that incoming and outgoing connections are made with minimum possible bends.
10. Surge monitor consisting of Discharge counters and millimetres should be suitable to be mounted on support structure of the arrester and should be tested for IP: 55 degree of protection. The standard supporting structure for surge arrester shall be provided with a standard mounting pad, for fixing the surge monitor, grading/corona rings shall be provided on each complete arrester unit as required.

2.4 Fitting & Accessories

1. Arresters shall be complete with insulating bases having provision for bolting to flat surface of structure.
2. Suitable millimetres with push buttons on each pole of the arrester with appropriate connections shall be supplied to measure the resistor grading leakage currents. The push button shall be mounted such that it can be operated from ground level.
3. Grading corona rings shall be provided on each plate arrester unit as required for proper stress distribution.

AUXILIARY SYSTEMS AND MISCELLANEOUS COMPONENTS

2.5 Clamp & Connections Including Terminal Connectors:

1. All power clamp and connectors shall confirm to IS 5561 & NEMA CCI.
2. Each equipment shall be supplied with the necessary terminals and connectors, as required by the ultimate design for particular installation. The conductor terminations of equipment shall be either expansion, or rigid type suitable for Twin Moose ACSR conductor. Sub conductor spacing shall be 450mm for 420 kV. Clamps for connecting SF6 outdoor bushing should be suitable to match with bushing terminal.

3. The requirement regarding external corona and RIV as specified for any equipment shall include its terminal fittings and the equipment shall be factory tested with connector in position. If corona rings are required to meet these requirements they shall be considered of that and include its scope of work.
4. Where aluminium to copper connectors are required bimetallic clamps shall be used, which shall be properly designed to ensure that any deterioration of the connection is kept to a minimum and restricted to parts which are not current carrying or subjected to stress. The design details of the joint shall be furnished to the purchaser by the contractor.
5. Low voltage connector, grounding connector and accessories for grounding all equipment as specified in each particular case, are also included in the scope of work.
6. No current carrying part of any clamp shall be less than 10mm thick. All ferrous parts shall be hot dip galvanized. Copper alloy liner of minimum 2mm thickness shall be cast integral with aluminium body for bimetallic clamps.
7. All casting shall be free from blow holes, surface bliss, cracks and cavities. All short edges and corners shall be blurred and rounded off.
8. Clamp shall be designed to carry the same current as the conductor and its temperature rise shall be equal or less than that of conductor at specified ambient temperature. The rated current for which the clamp/connector is designed with respect to specified reference ambient temperature shall also be indelibly marked on each component of the clamp/connector.
9. All current carrying parts shall be designed and manufactured to have minimum contact resistance. Clamp and connectors shall be designed to be corona controlled. Corona extinction voltage for 420kV class clamp shall not be less than 320 kV (rms) and RIV level shall not be more than 1000 microvolts at the test voltage specified in respective sections.

The temperature-rise of power connector above a reference ambient temperature of 40°C when carrying rated current shall not exceed 45°C.

2.6 SHOP ASSEMBLY, INSPECTION AND TESTS:

Lightening Arrester

Following routine tests shall be carried out on the Lightening arrester.

- a) Measurement of reference voltage
- b) Residual voltage test.
- c) Checking of satisfactory absence from partial discharges and contact noise.
- d) Leakage test for arrester units with sealed housing

2.7 Clamp & Connectors

- a) Visual inspection
- b) Dimensional check

2.8 Type Tests

Reports of following type tests under shall be submitted.

Lightning Arrester

Lightning Arrestor shall conform to the type tests as per IEC-60099-1/4. Type test certificate for the following tests shall be submitted by the bidder. The type test certificate from the manufacturer shall only be acceptable.

1.	Insulation withstands Test.
2.	Residual Voltage Tests.
3.	Long duration current impulse withstand test.
4.	Operating duty test.
5.	Pressure relief test
6.	Artificial pollution test
7.	Partial discharge test.

2.9 Clamp & Connectors

Clamp and connectors shall conform to the type test as per IS-5561. Type test certificate for the following tests shall be submitted by the bidder. The type test certificate from the manufacturer shall only be acceptable.

- 1) Tensile tests
- 2) Resistance test
- 3) Temperature-rise test
- 4) Short time current test
- 5) Dimensional check.
- 6) Galvanizing test, where applicable.

-----XXX-----

SECTION- 3

PROJECT DETAILS AND GENERAL SPECIFICATIONS

3.0 GENERAL

This section stipulates the General Technical Requirements under the Contract and will form an integral part of the Technical Specification.

The provisions under this section are intended to supplement general requirements for the materials, equipment and services covered under other sections of tender documents and are not exclusive. However in case of conflict between the requirements specified in this section and requirements specified under other sections, the requirements specified under respective sections shall prevail.

3.1 PROJECT DETAILS

Name of the Project:	4x225MW , Arun-3 HEP ,Nepal
Name of the Customer:	SAPDC
Name of Consultant :	SJVN

S VN Arun-3 Power Development Company (P) Ltd. (SAPDC), a company promoted by S VN Ltd., as a single shareholder company in Nepal having its registered office at Lokanthali, Kathmandu, Nepal has signed Project Development Agreement with Government of Nepal to plan, promote, organize & execute Arun-3 Hydroelectric Project (900 MW) in Sankhuwasabha District. of Nepal.

The bid prepared by the Bidder and all correspondence and documents related to the bid exchanged by the Bidder and the consultant/owner shall be written in the English, provided that any printed literature furnished by the Bidder may be written in another language, as long as such literature is accompanied by a translation in English, in which case, for purposes of interpretation of the bid, the translation shall govern.

3.2 Location & Land Availability:

The proposed project site is located at a distance of 50 km from Khandbari, the headquarters of Sankhuwa sabha District of Nepal. It is at about 240 km from Biratnagar and about 740 km from Kathmandu. The location details of the proposed project site are as indicated below:

Latitude . . . 27°30'N – 27°-35'N
 Longitude 87° -12'E – 88°-20'E
 Distance from Tumlingtar (domestic airport) town is .About 68 km
 Distance of Kathmandu (international airport) from Tumlingtar ..About 660.km

3.3 Climatic Condition

Average max temp : 30° C

Average Minimum Temp : 20° C

Maximum river water temperature : 25°C

Minimum river water temperature : 10°C

Ambient Temperature for the Equipment : 40° C

3.4 Seismic Zone

The equipment shall be designed for operation in seismic zone IV for earthquake resistance. The equipment and each part of it shall be strong enough and sufficiently well connected to resist total operating stresses resulting from forces in normal operation, abnormal condition and forces superimposed due to occurrence of earthquakes of intensity which cause a ground acceleration of 0.16 g in vertical direction and 0.24 g in the other horizontal directions.

3.5 Transportation

Unless otherwise specified in the **Specification**, responsibility for arranging transportation of plant and equipment lies with the Contractor. The Contractor shall at its own risk and expense transport all plant and equipment to a destination specified in bid document. The contractor shall transport the contracted plant and equipment/ supplies through registered common carriers only.

The nearest major airport is at Kathmandu which is at a distance of 740km from Project Site. Biratnagar is connected to Kathmandu by Road.

The major nearest seaport for the trans-shipment of heavy equipment to Nepal is Kolkata. Other sea ports for imported equipment would be Mumbai or Chennai as convenient. The two sea ports Mumbai & Chennai are connected to Kolkata and ogbani by rail as well as roads.

Railway transport is available from Kolkata and other locations of Indian Cities to the Nepal-India border only. The broad gauge line from Kolkata ends at ogbani, Bihar. All rail freight for Nepal has to be unloaded there. The distance of Kolkata by rail route is about 800 km. From ogbani, the road distance to the projects sites via Biratnagar is about 300km.

Road access to Arun-3 project from Kolkata to ogbani is 600km; from Biratnagar to Project Area via Hile is 300km. Total distance to project area from Kolkata is 900km. Alternative route could be from Kolkata to Raxaul which is 800km, further from Birganj to Dhalkebar to Hile to Project Area which is 450km. Total distance Kolkata to Project Area is 1250km.

Local transportation, insurance and other services incidental to the delivery of facilities to be supplied from Employer's country (Schedule- 2 Items) shall be quoted separately.

3.6 Transport Limitation

The transport limitation by road from ogbani to the project site is the governing factor for determining permissible package size and weight.

The existing roads allow the transport of the packages of the following size and weight.

Size (in mm) (l x b x h) - 9700 x 6000 x 6000

Weight (Tonnes) - 70R

Heaviest package to be transported with suitable number of axle for safe transportation of consignment for 70R bridge capacity.

Height from the ground.

3.7 Salient features of Project

The salient features of Arun-3 HEP are as follows:

A. POWER HOUSE COMPLEX

i. Power House Cavern	Underground on Left bank
ii. Installed capacity	900 MW
iii. No. of units	4
iv. Unit Capacity	225 MW
v. Size of Power House Cavern	179.50m (L) x 22.5m (W) x 49.5m(H)

B. UNDERGROUND TRANSFORMER CAVERN

i. Size	146.14m (L) x 16 m(W)x 23m(H)
ii. Transformer Type	Single Phase
iii. Number and rating	13 nos. (including 1 spare), 15.75/420/√3kV, 50Hz, 92MVA
iv. Transformer Hall level	El. 552 m

C. Switchyard & Transmission

i. Type of Switching	Gas Insulated Substation and Pothead Yard
ii. Size	207m (L) x 106m (W)
iii. Switchyard level	El. 557 m
iv. Transmission System	400kV Arun III HEP – Muzzafarpur via Dhalkebar D/c Quad Moose Lines with LILO of both circuits at Dhalkebar 400/220kV substation

3.7.1 SYSTEM PARAMETERS

1	Continuous current carrying capacity (rms) at 40 °C ambient temperature.	2000A (min)
2	Short time current carrying Capacity	50kA for 1sec
3	Voltage	400KV/420kV (rms) (Nom/Max)
4	Frequency	50Hz
5	System neutral earthing	Effectively earthed
6	Insulation Level	
a	One minute Dry Power frequency Withstand Voltage (kV rms)	630
b	One minute Wet power frequency Withstand Voltage (rms)	630
7	Switching Impulse withstand(250/2500 microsec.) voltage (kV peak)	1050
8	Impulse Withstand Voltage of arrester housing with 1.2/50 micro sec wave.	1425 kVp
9	Creepage distance	25 (mm/kV)
10	Radio Interference voltage at 320kV	As per CEA guidelines

3.7.2 AUXILIARY POWER SUPPLY

3.7.2.1 AC power

Three-phase system with grounded neutral for feeding three-phase and one-phase consumers (connected between phase and neutral), 415/240V ±10% and 50Hz, -5% to +3%. All motors and other electrical apparatus should be designed to work continuously under -5% to +3% frequency variation and ±10% voltage variation.

3.7.2.2 DC power

DC Systems, ungrounded, with earth fault detection 220V plus (+) 10% and minus (-) 20% for the supply of main control circuits for high and medium voltage switchgear, protection circuits and to other larger essentials loads. Other voltage systems eventually needed, shall be generated from the above systems by means of dc/dc converters, inverters etc.

3.7.2.3 Deleted

3.7.2.4 Cabling & wiring

Wiring within cubicles and equipment enclosures shall conform to requirements of this section unless otherwise specified. Control wiring shall be single / stranded copper subjected to prior approval by purchaser during detailed engineering and shall not be smaller than 2.5 Sq. mm, except as otherwise agreed by the purchaser.

All Distribution Boards, Control & Protection panels, Motor Control control panels etc. shall be supplied completely wired internally up to the terminal blocks ready to receive purchaser control cable.

All inter cubicle and inter panel wiring and connections between panels of same Distribution Board, Control & Protection panels, Motor Control panels including all bus wiring for AC and DC supplies shall be provided by the tenderer. Larger size wiring shall be used where needed for the current carrying capacity requirements.

Cables shall have at least 1000 V PVC insulation except for 220V DC and telemetering or communication system equipment for which 650V and 300 V ratings respectively are acceptable.

For current and potential transformer secondary circuits the minimum cross section of the conductors shall not be less than 4.0 Sq. mm.

Wiring shall terminate at terminal blocks at one side only. Where tap connections are required, they shall be made on terminal blocks. Wiring shall be neatly arranged and laid in wire ways accessible from the front door.

Engraved core identification ferrules marked to correspond with panel wiring diagram shall be fitted at both ends of each wire.

Each cubical shall be provided with an earthing bar (PE) of sufficient cross section carrying any possible fault current without undue heating. All metallic parts of the cubicle not forming part of the live circuits, all instrument transformer terminals to be earthed and other earthing terminals as well as all cable screens and PE-wires shall be connected to the earthing bar.

3.7.2.5 Power outlets

Power outlet for utilities such as electric drills, welding equipment etc., shall be provided in all floors of the powerhouse to enable repair and maintenance works to be done locally/ in-situ.

3.7.2.6 Terminal blocks

The terminal blocks shall be located to allow a neat and easy connection work and shall be safely accessible while the equipment is in service. Control circuits and power circuits shall be completely separated by use of divided or separate terminal blocks. Power terminal blocks shall be rated in accordance with applicable standards, and shall be provided with covers. Terminal blocks shall be 1100V grade and have continuous rating to carry the maximum expected current on the terminals.

Terminal blocks for current transformer and voltage transformer secondary leads shall be provided with test links and isolating facilities. The current transformer secondary leads shall also be provided with short circuiting and earthing facilities.

The terminal shall be such that maximum contact area is achieved when a cable is terminated. The terminal shall have a locking characteristic to prevent cable from escaping from the terminal clamp unless it is done intentionally.

The conducting part in contact with cable shall preferably be tinned or silver plated.

The terminal blocks shall be of extensible design. The terminal blocks shall have locking arrangement to prevent its escape from the mounting rails.

The terminal blocks shall be fully enclosed with removable covers of transparent, non-deteriorating type plastic material. Insulating barriers shall be provided between the terminal blocks. These barriers shall not hinder the operator from carrying out the wiring without removing the barriers.

Unless otherwise specified terminal blocks shall be suitable for connecting the following conductors on each side.

All circuits except CT/ PT flexible circuits	Minimum of two of 2.5 sq. mm copper
All CT/ PT Circuits flexible	Minimum of 2 nos. of 6 sq. mm copper

The arrangements shall be made in such a manner so that it is possible to safely connect or disconnect terminals on live circuits and replace fuse links when the cabinet is live.

Wherever duplication of a terminal block is necessary it shall be achieved by solid bonding links.

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

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

3.7.2.7 Protection requirement

For short circuit and overload protection of power and control circuits, air circuit breakers, moulded case circuit breakers or MCBs shall be used. Outlets from AC (and DC) distribution panels are protected in their respective panels.

3.7.2.8 Switches, Lamps & Instruments

General

Control switches, indicating lamps and instruments shall be arranged so that all parts are readily accessible for servicing without the necessity to remove other devices, terminal blocks or excessive amount of wiring.

All control switches and indicating devices mounted in cabinets and enclosures shall be visible with the doors closed.

Identification nameplates shall be provided for all control switches, indicating instruments and lamps, in accordance with clause "Nameplates".

Instruments and controls shall be located so that their dials, indicators and nameplates are clearly readable. Data for all instruments to be provided, including type, size, scale range, electrical ratings, nameplate and name of manufacturer, shall be furnished. Steel panels shall be provided for group mounting of the instruments.

All instruments shall be of an approved type and shall match, insofar as practicable, the other instruments with which they are associated; their dial type, scaled markings and units, type of connection and mounting, shall be co-coordinated. All piping and tubing required for instruments shall be furnished and installed. All instruments and control switches shall be furnished with necessary auxiliaries, i.e. resistors, shunts etc.

3.7.2.9 Control and Selector switches

The switches and push buttons shall be provided with ample contact ratings, suitable cam or block arrangements necessary for the control functions on 230 V AC or 220V DC circuits. The control switches used in mimic diagrams shall be of discrepancy type with built in lamp indication.

Control and Selector switches shall be rotary type with escutcheon plates clearly marked to show the function and positions. The switches shall be of sturdy construction suitable for mounting on panel front.

Switches with shrouding of live parts and sealing of contacts against dust ingress shall be provided.

Circuit breaker control switches shall have three positions and shall be spring return to "NEUTRAL" from CLOSE and TRIP positions and shall have pistol grip handles. They shall have at least two (2) contacts closing in close position, and two (2) contacts closing in trip position unless specified otherwise.

Ammeter and voltmeter selector switches shall have four stay out position with adequate number of contacts for three phase 4 wire system. These shall have oval handles. Ammeter selector switches shall have make before break type contacts to prevent open circuiting of CT secondaries. Contacts of the switches shall be spring assisted and shall be of suitable material to give a long trouble free service.

3.7.2.10 Push buttons

Push-buttons shall be of spring return, push to actuate type. Their contacts shall be rated to make, continuously carry and break 10A at 230V AC and 0.5A at 220V DC.

All push buttons shall have one normally open and one normally closed contact, unless specified otherwise. The contact faces shall be of silver or silver alloy.

All push buttons shall be provided with integral escutcheon plates marked with its function. The colour of the button shall be as follows:

Green : Breaker Close
 Red : Breaker Open
 Black : For overload reset

3.7.2.11 Indicating and signaling lamps

Each indicating and signaling lamp shall have a removable cap, which can be inscribed with wording and shall not be affected with the heat of the lamp.

Indicating lamps are preferably of LED type & low watt consumption and shall be replaceable from the front of the panel. The indicating and signaling lamps shall be of the same size and type.

Lamps shall be provided with series resistors, preferably built-in the lamps assembly.

The lamps shall have escutcheon plates marked with its function, wherever necessary.

Lamps shall have translucent lamp-covers of the following colours, as warranted by the application.

Red : ACB s/MCCB s close
 Green : ACB s/MCCB s open
 White : Auto trip
 Amber : For all healthy conditions e.g. control supply
 Violet : Circuit breaker spring charged
 Blue : For all alarm conditions (e.g. overload) Also for SERVICE & TEST positions indicators

Indication lamps should be located just above the associated push buttons/control switches.

All indicating lamps shall be suitable for continuous operation at 90% to 110% of their rated voltage.

3.7.2.12 HRC Fuses

HRC-Fuses shall have visible operation indicators.

HRC-Fuses shall be mounted on fuses carriers, which are mounted on fuse bases. Wherever it is not possible to mount fuses on carriers, fuses shall be directly mounted on plug-in type of bases. In such cases one set of insulated fuse pulling handles shall be supplied with each switchgear.

HRC-Fuse rating shall be chosen by the tenderer depending upon the circuit requirements.

3.7.2.13 Indicating instruments and Meters

Instruments mounted on panels, shall be of the semi flush type back connected, matching pattern, shape, and of approved finish to present neat and fitting appearance consistent with functional requirements Mechanical quantity measuring instruments which are directly

mounted on equipment shall have circular dials and shall be properly supported and guarded against accidental injury/breakage. These shall be placed in convenient locations.

The instruments shall accurately measure and indicate the quantity under all conditions of operation with minimum instrument errors. Changes in ambient temperature within the range prevailing at site shall not affect the accuracy. Contact making instruments shall have contacts suitable for 240 V AC or 220 V DC circuits.

The reading scales on the dials shall be in metric units only and range shall be such that the normal operating values of the quantities are indicated in the middle 3rd of the scale. The dials pointer etc. shall be designed to facilitate accurate reading by minimizing parallax and glare from instrument window and by providing clear bold dial markings. The size of dial and length of the scales of the indicating instruments shall be large enough to suit the requirements. The scale plates of panel mounted indicating instruments shall have a permanent white mat finish with black graduations and the pointer shall also be of the black colour. Instruments mounted on panels shall be of flush type and shall be back connected. All instruments on a switchgear panel shall be of matching pattern, shape and finish so as to present a pleasing appearance consistent with the functional requirements.

All instruments shall conform to relevant International or national applicable standards. These shall be subjected to tests prior to dispatch. The instruments shall be shock, vibration and moisture proof. The electrical instruments shall withstand dielectric test of 2000 V RMS to ground for one (1) minute as per standards.

The coils of electrical instruments shall be designed for continuous operation at 110% of the full load current at instrument potential. The coil rating of the measuring instruments shall be coordinated with those of the associated instrument transformers (i.e. CTs, PTs, etc.) by the supplier. The VA burden of the instruments shall be as low as possible. The meters shall be of the first grade in respect of accuracy classification.

Energy meter shall be suitable for 3-phase, 4-wire unbalanced system and shall comply generally with the relevant standard. All instruments shall be tested in accordance with the requirements of relevant standards.

3.7.2.14 Integrating instruments

The Wh and VARh meters shall be of the semi-flush-mounted type. Each meter shall be connected to terminal blocks suitable for opening and short-circuiting for testing purposes. The meter cases shall be dust-tight and with removable covers. The meters shall be three-phase, three element, equipped with an impulse contact mechanism, potential free for remote metering purposes, and shall be suitable for continuous operation from secondary of potential transformers and from secondary of current transformers, with transformer ratios and connections indicated on the contract drawings.

The meters shall be provided with primary-rated, direct reading registers, with five or more digits and a suitable multiplier. The meters for the outgoing lines shall be of the two-way type and all meters shall have mechanism to prevent negative registration.

The meters shall have built in over-voltage protection and isolation according to IEC Publication 60521. The tolerance ambient temperature range of the meters shall be 0 to 45 degrees C.

The protection class of the Wh meters shall be 0.2 and the VARh meters 0.2 according to IEC Publication 60687.

3.7.2.15 Measuring converters

The converters shall be suitable for direct connection to the secondary circuits of the potential and current transformers used, or other sensors, each as they apply. The converters shall be static type, having all accessories to provide an output signal of 4-20 mA, filtered DC.

For the measuring converters the following minimum requirements shall be fulfilled:

Current transducers shall be single-phase, of accuracy class 0.5 or better. Voltage transducers shall be single-phase of accuracy class 0.5 or better. W and VAR transducers shall be two elements, three-phase. Accuracy class of the transducers shall be 0.5 or better.

3.7.2.16 Measuring transformers

All current and voltage transformers shall be completely encapsulated cast resin insulated type suitable for continuous operation at the temperature prevailing inside the switchgear enclosure, when the distribution board is operating at its rated condition and the outside ambient temperature is 40 deg.C.

All instrument transformers shall be able to withstand the thermal and mechanical stresses resulting from the maximum short circuit and momentary current ratings of the associated switchgear.

All instrument transformer shall have clear indelible polarity markings. All secondary terminals shall be wired to a separate terminal on an accessible terminal block where star-point formation and earthing shall be done.

All VTs shall have readily accessible HRC current limiting fuses on both primary and secondary sides. The class of insulation should be E or better.

The parameter & rating of CTs & PTs are minimum requirement & tentative only. Contactor shall submit the calculations for selection of CT/PT for approval to purchaser. Potential transformer secondary windings shall be rated 110 / $\sqrt{3}$ V Current transformer secondary windings shall have a rated current of 1A / 5A.

3.7.2.17 Nameplates and Labels

Each major and auxiliary item of equipment shall have a nameplate permanently affixed thereto, or as directed, showing in a legible and durable manner the serial number, name and address of the manufacture, rated capacity, speed, electrical characteristics, and other significant information, as applicable.

The module identification plate shall clearly give the feeder number and feeder designation wherever applicable. For single front switchboards, similar panel and board identification labels shall be provided at the rear also.

All name plates shall be of non rusting metal or 3-ply lamicaid with white engraved lettering on black back-ground, inscriptions and lettering sizes shall be as per their standard practice. Suitable plastic sticker labels shall be provided for easy identification of all equipment, located inside the panel/module. These labels shall be positioned so as to be clearly visible and shall give the device number, as mentioned in the module wiring drawings.

3.7.2.18 Motors

All electric motors for driving various equipment shall conform to relevant standards viz. IEC, BS or IS as applicable. The motor rating, torque characteristics, speed etc. shall be selected to suit the duty requirements.

Type of starter for motors shall be duly approved by the purchaser during detailed engineering. The detailed design calculation for selection of type of starters is to be submitted for approval. The priority for type of starters shall be in the following order:

1. Variable frequency drive
2. Soft starter
3. Star delta/ auto –transformer
4. Direct on-line starter

The enclosure of each motor shall be of the type best suited for the service conditions of the motor. The motor insulation shall be resistant to moisture, oil or oil vapor and the motors in general shall be so designed as to suit the tropical climate. Varnished cambric or glass insulation class F shall be used for connection from the windings to the terminals.

The terminal box shall be closed conduit box type conveniently located, and shall have means for terminating the external wiring for outdoor use. The motor terminals shall be of the stud type totally enclosed. Eye bolts or lugs shall be provided for lifting.

Space heaters to avoid condensation shall also be provided. Special type of motors, not adequately covered by these specifications, shall be offered for any special application, but these shall be subject to the approval of purchaser.

3.7.2.19 Space heaters

Space heater shall be provided in the Distribution Boards, Control & Protection panels, Motor Control panels etc. The space heaters shall be suitable for continuous operation on 240V AC, 50 H single phase supply, and shall be automatically controlled by thermostats. Necessary isolating switches and fuses shall also be provided.

3.7.2.20 Auxiliary relay, contacts and devices

All relays and timers in protective circuits shall be flush mounted on panel front with connections from the inside. They shall have transparent dust tight covers removable from the front. All protective relays shall have a draw out construction for easy replacement from the front. They shall either have built-in test facilities, or shall be provided with necessary test blocks and test switches located immediately below each relay. The auxiliary relays and timers may be furnished in non-draw out cases.

All AC auxiliary relays shall be suitable for operation with VTs and CTs secondaries.

DC auxiliary relays shall be designed for 220V DC unless otherwise specified and shall operate satisfactorily between 80% and 110% of the rated voltage. Relays shall have adequate thermal capacity for continuous operation in circuits in which they are used.

All protective relays and timers shall have at least two potentially free output contacts. Relays shall have contacts as required for protection schemes. Contacts of relays and timers shall be silver faced and shall have a spring action. Adequate number of terminals shall be available on the relay cases for applicable relaying schemes.

Suitable number of auxiliary contacts or auxiliary relays shall be provided with each VCBs / ACB's for indication, remote indication, annunciation and automatic changeover and interlocking scheme.

All protective relays, auxiliary relays and timers shall be provided with hand reset operation indicators (flag) for analysing the cause of operation.

3.7.2.21 Welding & NDT

Preparation of base material

Members to be joined by welding may be cut to shape and size by mechanical means such as shearing, machining, grinding, or by gas or arc cutting, to suit the conditions. Edges shall be shaped according to ASME requirements. Design of welded joints and selection of weld filler metal shall be in accordance with approved standards and shall allow thorough penetration and good fusion of the weld with the base metal. The edges of surfaces to be welded shall be sound metal free of visible defects such as laminations or defects caused by cutting operation at least 30 mm back from the edge of the weld, and free from rust, oil, grease, and other foreign matter.

The establishment of welding procedures, welder's qualifications shall conform to the requirements of the ASME Boiler and Pressure Vessel Code Section VIII and IX. The approved copy of the WPS & WPQR in accordance with the ASME requirements shall be submitted to the purchaser for review and record.

3.7.2.22 Field welding

Filler material required for field-welded joints shall be furnished by the Contractor. The Contractor shall perform all welding work at site in accordance with the applicable WPS. Only qualified welders shall be used for undertaking welding as per the applicable WPS. NDT shall be performed as per the approved drawings.

Preparation for field welding

All cutting, chamfering, and other shaping of metals necessary for the field connection shall be done as far as possible in the shop. Adequate temporary bolted field connections shall be provided to hold the assemblies rigidly and in proper alignment during shop and field assembly.

To ensure proper alignment during field erection, a minimum of two dowels shall be provided for each field connection between subassemblies. The holes shall be drilled and the dowels fitted at shop assembly after the subassemblies have been satisfactorily aligned. All stipulations for welding, structural work and other, shall be applied to fieldwork as well as to shop work, except where otherwise stated.

3.7.2.23 Painting

All the equipment furnished and installed by the Contractor shall be completely painted for final use, with the exception of those parts or surfaces that are expressly designated as unpainted. Surfaces to be painted shall receive the preparatory treatment and required number of coats. The Contractor shall perform all painting work in the shop, before shipment, followed by a final coat of paint at site after installation as per the standard procedure.

All materials, supplies, and articles furnished shall be the standard products of recognized reputable manufacturers. Colour schedule of equipment supplied shall be finalized during detailed design stage.

3.7.2.24 Galvanization

All materials to be galvanized shall be of the full dimensions shown or specified and all punching, cutting, drilling, screw tapping and the removal of burrs shall be completed before the galvanizing process commences. All galvanizing shall be done by the hot dip process with

smelter, not less than ninety eight percent (98%) of which must be pure zinc. No alternative process shall be used without the approval of the purchaser. No components shall be galvanized which are likely to come into subsequent contact with oil. Bolts shall be completely galvanized including the threads, but the threads shall be left uncoated in the case of nuts.

The zinc coating shall be uniform, clean, smooth and as free from spangle as possible. In the case of component parts the zinc coating shall weigh not less than 0.6 kg/m² over the area covered and be not less than 0.09mm in thickness. All galvanizing shall comply with the requirements of the relevant ASTM standards/Indian Standards. All galvanized parts shall be protected from injury to the zinc coating due to differential aeration and abrasion during the period of transit, storage and erection. Damaged areas of the coating shall be touched up with an approved zinc dust paint or other approved flake metallic compound.

3.7.2.25 Pumps

All pumps forming part of the generating units and other plant and equipment shall be of high performance requisite type (viz. centrifugal, rotary etc.) and rating, of reputed make, and shall be directly coupled to their driving motors. The pumps shall be of self-priming type and with proper sealing systems and protection.

The materials of construction of pumps in general shall suit the service conditions. The materials of construction of the pumps handling water, such as drainage & dewatering pumps, turbine top cover drainage pumps etc. shall be resistant to abrasive effects of silt in such water. The pumps shall operate quietly without undue noise and vibration in their full operating range of head and flow. They shall be easy to maintain.

3.7.2.26 Embedded parts, Anchor Bolts and Fasteners

All embedded anchor bolts, rods, pipes, welding plates and support plates shall be provided by contractor. Anchor bolts shall consist of a threaded steel rod installed inside a pipe sleeve to provide lateral adjustment after the sleeve is embedded. The threaded end of the rod shall be provided with two steel nuts and two steel washers to permit leveling and anchoring the equipment prior to grouting.

Approved types of expansion or chemical anchors shall be used where practicable for small equipment.

3.7.2.27 Rust Prevention and Protection during Transit:-

Bright steel parts including all machined surfaces shall be given a thick coat of tar or tallow or any other approved rust resisting paint in plain colour to prevent rusting during shipment and transport.

3.7.2.28 Civil Works

Civil foundations for equipment of the generating units and other plant and equipment will be prepared by the Purchaser in accordance with the basic design data to be supplied by the Contractor.

The Contractor shall provide design for foundations and install the concrete inserts/embedment; support steels and/or components for foundation /supports purpose, shall do any chipping / levelling works, denting / painting etc.

3.7.3 Erection, Testing, Commissioning and performance of Guarantee Tests

3.7.3.1 Testing and inspection

Materials used for construction of major & important sub-assemblies shall be thoroughly shop tested and inspected by the Contractor at his own expense prior to dispatch. Shop test shall comprise of routine test & type tests.

The shop tests and inspections shall be as spelt out in individual equipment specifications as dealt in succeeding sections but shall not be limited to the same. Any other tests and inspection not specifically listed but are otherwise considered essential and advisable shall also be conducted.

The Bidders shall furnish schedule of the shop tests and inspections on materials and equipment. Important tests/inspections shall be subject to witness by the purchaser for which the Contractor shall give sufficient advance notice. In case purchaser is unable to witness shop tests/inspections, the Contractor shall be so intimated and the tests/inspections may then be carried out in the absence of the Purchaser.

Equipment on which tests and inspections have been duly witnessed and approved by the Purchaser may be dispatched by the Contractor. Equipment on which tests and inspections have not been witnessed by the purchaser shall be dispatched only after the shop tests and inspection Certificates have been approved by the Purchaser.

3.7.3.2 Dimensional Checks and Visual Inspection

Dimensional checks shall be performed on all major parts, components and partial assemblies, especially when close tolerances and fits are involved (tolerance of shafts, between stationary and moving parts, connecting dimensions for the assembly with other supplies, etc.). If the dimensional checks show discrepancies in measurement, which may affect the fit, assembly or dismantling of the respective part or component, the same have to be corrected correspondingly. Such correction or modification shall, however, in no way lead to sacrifices with respect to reliability of operation or inter-changeability, and shall be performed only after the agreement of the Owner has been obtained. If the correction or modification cannot be carried out in accordance with the terms mentioned above, the part or component concerned may be subject to rejection. Faulty machine parts or equipment shall by no means be delivered.

3.7.3.3 Functional Tests

Functional tests on partial assemblies and/or complete assemblies shall be carried out as much as possible already in the manufacturer's workshops. Such tests shall be performed as far as possible under operation-like conditions.

When requested by the Owner, the functional tests shall be repeated until full proof has been obtained that the functioning of the assemblies will comply with the requirements of the Contract Documents.

3.7.3.4 Erection, commissioning & field tests

The Contractor has to do all the work related to assembly, erection, testing and commissioning complete in all respects. All necessary tools, plants, labour, materials including consumables for performing installation, testing and pre-commissioning shall be provided by the Contractor.

The Contractor shall submit the necessary data/information, layout and foundation/support drawings well in advance. The Contractor shall provide and install the concrete inserts/embedment, support steels and/or components for foundation/supports purpose as per approved erection drawings and coordinate the activities with civil contractors to keep his activities in synchronism with civil work. All installation for foundation shall be verified and accepted by the Engineer.

The Contractor shall use anchor fasteners for installation of piping, fixtures, mountings, conduits, cabling, panels etc. Minor Chipping of concrete is permitted. However, taking support from reinforcement bars shall not be allowed.

3.7.3.5 Installation procedure

The Contractor shall submit six copies of all detailed programs and the procedures to be adopted for erection / installation, testing and commissioning well in advance, before start of erection activities/ installation.

The installation procedure shall also have a section “site quality assurance plan” containing erection data sheets / site protocols for various components. These sheets should specify site measurements/ inspections required to be made for ensuring proper installation.

3.7.3.6 Cable laying

Wiring between equipment enclosures shall be made with cables, laid in trenches and/or cable trays and in cable conduits. The Contractor shall submit for review to the Engineer a cable route layout-showing location of trenches, conduits and trays. All material for cable laying such as cable trays supports and fastening material shall be furnished and placed by the Contractor. Cables shall be properly fastened and marked where they enter enclosures by either cable clamps or nipples.

Cables in horizontal cable trays shall be fastened properly with clamps or plastic strips. Power and control cables shall be placed in separate trays or conduits. Cables shall be clearly marked at each terminal point and appropriate intermediate locations as per Standard.

Conduits shall be of heavy gauge rigid steel, hot-dip galvanized, cut square reamed, threaded and screwed tight at all joints.

Conduit entrances to pull boxes and switches shall have double lock nuts & insulating bushings. No running thread shall be used.

Flexible metallic conduit shall be used for connection to equipment, which are subject to vibration, and also for connection to level/limit/pressure switches.

3.7.3.7 Field inspection

The Contractor shall permit Engineer to perform inspections of the assembly which will include a complete verification of the assembly of all parts as to their levels, clearances, pertinent fits, alignments and quality of workmanship. The field supervisor of the Contractor shall provide Engineer with three (3) copies of all the clearances, tolerances and data of all pertinent fits, alignments and levels, so that the latter may repeat the Contractor's measurement, if desired.

Unless otherwise specified, any rejection based on the inspection will be reported to Contractor within fifteen (15) days.

3.7.3.8 Field tests

All field tests including tests during installation, pre-commissioning, commissioning, performance and field acceptance tests shall be conducted by the Contractor, in the presence of representative of the Employer. Procedure to be adopted for conducting these tests shall be submitted well in advance, before start of relevant testing, for approval of the Employer.

The equipment / system shall be deemed to be commissioned and ready for trial run only after successful operation for a test service period specified in sub clause "Performance Testing". In the event of any failure this period shall be repeated for any number of times till the successful operation as described above is achieved.

All test equipment and instruments shall be furnished by the Contractor and will remain the Contractor's property after the fulfillment of all field tests.

Any defects or leaks disclosed in the tests shall be duly mended/ repaired to meet the desired function and retested. All necessary materials and labour for performing all the above tests shall be provided by the Contractor.

The Contractor shall prepare written test certificates in a form agreed upon by the Contractor and Employer of all tests results and hand them over to the Employer in due time.

The design, location and approval tests of anchoring rings for the fixing of lifting apparatus necessary for assembly and dismantling of equipment and plant accessories shall be the responsibility of the Contractor.

3.7.3.9 Taking over of facilities

Taking over" means that the Facilities (or a specific part thereof where specified) have been completed operationally and structurally and put in a tight and clean condition, and that all work in respect of pre-commissioning of the Facilities or such specific part thereof has been completed and commissioning has been attained as per Technical Specifications. The contractor shall make formal request for taking over the facility to the EIC.

3.7.3.10 Operation acceptance

The operational acceptance by the Employer of the Facilities (or any part of the Facilities where the Contract provides for acceptance of the Facilities in parts), which certifies the Contractor's fulfillment of the Contract in respect of Functional Guarantees of the Facilities (or the relevant part thereof) in accordance with the provisions of Specification.

3.7.3.11 Consumables, oils and Lubricant

The Contractor shall deliver to the Owner all equipment complete with initial fill of fluids, grease or lubricants, transformer oil, Nitrogen, SF6 gas and other used gases in non returnable drums / containers and replace any quantity used up or lost during installation and testing.

The oil used for the lubrication and oil pressure systems for the turbine, governor, shutoff valve and generator shall be preferably of the same type.

Supply

The Contractor shall furnish the following:

- (i) All oil for initial filling of all equipment supplied, plus additional oil equivalent to the first filling requirement of one unit.
- (ii) Grease if required for initial filling of all of the equipment, plus 10% additional.

- (iii) Gases for initial filling of all equipment supplied, plus 10 % additional quantity.
- (iv) Flushing fluids to flush and clean all systems.

3.7.3.12 Deleted:

3.7.3.13 Submission of Drawings, Documents, Manual, software, Calculations, Safety Margin Details etc.

All drawings and documents shall be submitted to purchaser in hard form as well as in editable soft form. Bidder shall submit Ten (10) number hard copies of the documents & drawings to purchaser for reference / review / approval. A comprehensive list of all such drawings/documents planned to be submitted for reference/approval shall be provided beforehand to the purchaser.

Loading drawings

For all larger pieces of Works which, due to their dimensions and/or weight and transport limitations, will require special means for their transportation, the Contractor shall submit binding loading drawings indicating dimensions, weights, etc., of the respective pieces of Works and the necessary trailer for its transportation to the site.

Foundation drawings

If a piece of works requires its own foundation or needs a special area for installation, the contractor shall submit drawings indicating all pertinent dimensions, static and dynamic loads, etc. They shall include all essential details required for proper design and construction of the foundations and/or buildings.

In addition, they shall include openings, sleeves, slopes and the arrangement of any supporting structure, i.e. base-frames or other steel constructions for permanent fixing or erection purposes.

If conduits are to be installed in the foundations, the relevant information such as diameter, length, and purpose shall be indicated on the drawings.

Arrangement drawings

All arrangement drawings shall be drawn to scale. The General Arrangement Drawings shall show the physical arrangement of Works (constructions, machines, complete switchgears, control panels, instrument cubicles, etc.), civil constructions (buildings, rooms, foundations, ducts, etc.) and reserved areas (for pipes, cables, lines, etc.) in relation to each other and to agreed co-ordinates and boundaries. Such drawings shall be prepared for the whole plot, for separate plots and for each building (building, hall, room, ducts and trenches, etc.).

Outline drawings

The Outline Drawing shall show all elements and the main dimensions of individual components where necessary in plan view, cross-section, side and top views. If reasonably possible such dimensions can be shown on Arrangement Drawings.

Design drawings

The Design Drawings shall include the shop drawings, assembly drawings, erection drawings, piping diagrams and piping arrangement drawings, etc., showing the dimensions, design and data of all constructions, apparatus and Works to be furnished under this Contract. The

drawings shall - where applicable - substantially conform to the Contract Drawings and shall show:

3-D Assembly drawings for major components in hard and soft form.

Details of manufacturing and treatment of major single work pieces specially manufactured for this Contract

Assembly of the Works in plan and elevation with main dimensions Sub-assembly of the principal components of the Works with overall dimensions, adjustment and clearance tolerances, numbers of corresponding detail drawings

Sub-assemblies in which the Contractor proposes to ship the Works

All necessary details of the parts connecting to the Works supplied by others

Location and sizes of auxiliary connections for oil, grease, water, air, electrical power etc.

Location and size of the instruments and accessories provided

Methods of lubrication and sealing

Instructions for heat treatment, pressure tests, surface preparation and anticorrosive protection

Full details of parts for which adjustment is provided or which are subject to wear

Method and sequence of installation, field joints, erection and lifting devices, jacks, grout plugs, anchoring details, etc., if not shown on foundation drawings.

Installation drawings

The construction, mechanical, electrical and I & C Installation Drawings shall provide detailed information on the disposition of the various items of a system (e.g. lighting fixtures, socket outlets, connection boxes, transmitters, actuators, loudspeakers, telephones, pipes, valves, pumps, compressors, etc.) and of the piping and wiring respectively included in the installation or assembly. They shall be based on dimension drawings of cubicles, rooms, buildings or areas containing the Works.

Diagrams

Single-line diagrams

This is a simplified diagram of the essential electrical Works and their interconnections. Each circuit shall be represented by a single line only. It shall contain all required technical information of the Works represented, e.g. voltage, current, capacity, shortcircuit level, ratios, voltage variations, positive and zero sequence impedances, measuring transformer and protection relay indices, interlocking, kind of switch drive, code designation, etc. as applicable.

Circuit diagrams

The Circuit Diagrams shall show the power circuits in all the phases with the main apparatus as well as the pilot circuits (measuring and control circuits). It shall show in full the functioning of part or all installations, Works or circuits with all required technical details.

Block diagrams

The Block Diagrams shall be used to show in a simplified manner the main inter - relationships between the elements of a system by means of symbols, block symbols and pictures without necessarily showing all the connections. The symbols used for the individual kinds of

components, e.g. servomotors, computing modules, etc., shall clearly be explained on the diagram or on an attached legend.

Logic diagrams

The Logic or Functional Diagrams shall be used for representation of logic and sequence controls and interlocking by showing only binary logic elements and their effect on the various process equipment disregarding their electrical realisation. Logic function elements (AND, OR, NOR, NAND, STORAGE, etc.) shall be used for processing and combining binary signals.

Terminal diagrams

Such diagrams shall be prepared for any type of terminal box, marshalling rack, control cubicle, switchboard, etc., and shall show the terminals (properly numbered) and the internal and/or external conductors (wires or cables) connected to them.

The terminal diagram of each individual switchboard, terminal box, panel, etc., shall contain, but not be limited to the following information:

Protection co-ordination diagrams

These diagrams shall show in a graphical manner separately for each power supply circuit:

- A simplified single-line diagram of the circuit with technical data of all instrument transformers and relays
- Co-ordinated tripping curves of related protection devices
- Setting of the protection devices.

Emergency shutdown diagram

This diagram shall show the sequential steps and interdependencies during emergency closure.

Flow Charts

Flow charts shall be used for representing sequence of events for start / stop / shut down of the machine including associated equipment and auxiliaries.

Manuals

The following manuals covering all equipment of EM works shall be supplied as per the time schedule in both editable soft and hard form:-

Sr.No.	Manual Description
1.	Storage and preservation manual
2.	Safety manual
3.	Erection Manual
4.	Testing and commissioning manual
5.	Operation manual
6.	Maintenance manual
7.	Long term storage manual for Generator Transformer
8.	Long term storage manual for boxed up component / equipment.
9.	Repair process / procedure manual for equipment / system

As built drawing to be provided incorporating changes made during erection, testing and commissioning.

Drawing & Document Submission Schedule

Drawings & documents submission schedule of the EM package with the categorization (i.e. Approval / reference) & tentative submission date shall be submitted to purchaser.

Preliminary list of drawings under various categories have been prepared and appended at Section 1 of the Technical Specification.

3.8 DRAWINGS & DOCUMENTS TO BE SUBMITTED BY THE SUCCESSFUL BIDDER AFTER AWARD OF CONTRACT

One set of soft copies of all the approved drawings, documents including as built drawings shall be furnished by the Bidder to the Owner / Consultant in compact discs.

White prints or other non-reproducible drawings can be mailed folded. Blue prints shall generally not be used.

All drawings, prepared by the Bidder shall be as per IS: 696. Supplier's standard drawings are exempted from the above size limitation, unless his standard includes drawings of very large size or length. There shall be sufficient reference notes on the drawings to permit identification of all the drawings which are required for a proper understanding.

Bills of material and drawings shall be cross-referenced for easy identification.

All drawings shall be dimensioned in the metric system. Where drawings are usually made in the British (or other) system, they shall also have metric system dimensions in parentheses or below dimension line. Titles and written notations shall be in English. If the original is in another language it shall carry English translation. The translations will appear immediately on the drawings. Attached lists of translated words shall not be accepted.

Drawings and bills of material shall be identified by a numbering system to be mutually agreed later on. Any additional identification numbers or symbols that the Bidder selects to use for his own purposes are permissible so long as Owner's number is the prime means of identification.

The scale of the drawing shall be shown clearly in the title block of the drawing. Wherever possible, scales of drawings shall be:-

1:1	1 : 2.5	1 : 5	1 : 10	1 : 20	1 : 25
1:50	1 : 100	1 : 200	1 : 300	1 : 500	
1: 1000	1 : 2000	1 : 5000			

All reproducible must be made from original drawings.

All revised drawing shall clearly indicate the number, date and subject to each revision. All the revisions carried out in the drawings shall be clearly identified and marked.

Drawing list shall be kept up-to-date, incorporating all new additions, cancellations and changes, and will be reissued periodically with Progress Report.

General arrangement drawings shall be submitted for approval to the Owner/ Consultant prior to the commencement of detail engineering by the Bidder. These drawings shall show to scale all major equipment including electrical equipment and building outlines and overall dimensions as well as tie-in dimensions and clearances shall be clearly indicated. Approved arrangement drawings shall be used as basis for design and preparation of detail drawing to be prepared by the Bidder. The Bidder shall furnish all the necessary drawings, data etc., of the plant/equipment with appropriate Status stamp in adequate no. of copies as indicated below:

S. No.	DESCRIPTION	TENDER STAGE	CONTRACT STAGE FOR APPROVAL	FINAL DOCUMENTATION	
				Prints	CDs
1	Drawings and Data Sheets	1	6	10	-
2	Drawings "As Built "	-	-	10	-
3	Type Test Reports	1	6	10	02
4	Erection Manuals	-	6	10	-
5	Operation and Maintenance Manuals	-	6	10	-
6	Manufacturing Quality Plan	1	6	10	-
7	Field Quality Plan	1	6	10	-
8	Inspection Test Reports	-	-	10	-

All instruction manuals / O&M Manual/"as built drawing": 10 copies each

3.8.1.1 QUALITY ASSURANCE PROGRAMME

The Bidder shall follow Quality Assurance Programme to ensure that the equipment and services under the scope of contract whether manufactured or performed at the Bidder's works or at his sub-vendor's premises or at the SAPDC's site or at any other place of work are in accordance with the technical specifications. Such programme shall be outlined by the Bidder and be submitted along with the bid. The QA programme shall be generally in line with IS/ISO- 9001 and generally cover the following:

- ORGANISATION STRUCTURE FOR THE MANAGEMENT AND IMPLEMENTATION OF THE
- PROPOSED QUALITY ASSURANCE PROGRAMME
- QUALITY SYSTEM MANUAL
- DESIGN CONTROL SYSTEMS
- DOCUMENTATION AND DATA CONTROL SYSTEMS

- QUALIFICATION/EXPERIENCE OF BIDDER'S KEY PERSONNEL.
- PROCEDURE FOR PURCHASE OF MATERIAL, PARTS, COMPONENTS AND SELECTION OF SUB-VENDOR'S SERVICES INCLUDING VENDOR ANALYSIS, SOURCE INSPECTION, INCOMING RAW-MATERIAL INSPECTION, VERIFICATION OF MATERIALS PURCHASED, ETC.
- SYSTEM FOR SHOP MANUFACTURING AND SITE ERECTION CONTROLS INCLUDING PROCESS, FABRICATION AND ASSEMBLY.
- CONTROL OF NON-CONFORMING ITEMS AND SYSTEM FOR CORRECTIVE ACTIONS AND
- RESOLUTION OF DEVIATIONS.
- CONTROL OF CALIBRATION AND TESTING OF MEASURING / TESTING EQUIPMENT.
- SYSTEM FOR QUALITY AUDITS.
- SYSTEM FOR IDENTIFICATION AND APPRAISAL OF INSPECTION STATUS.
- SYSTEM FOR AUTHORISING RELEASE OF MANUFACTURED PRODUCT TO THE PURCHASER.
- SYSTEM FOR TRANSPORTATION /DELIVERY, HANDLING, STORAGE AND PRESERVATION.
- SYSTEM FOR MAINTENANCE OF RECORDS.

GENERAL REQUIREMENTS - QUALITY ASSURANCE

All materials, components and equipment covered under scope and its technical specifications shall be procured, manufactured, erected, commissioned and tested at all the stages, as per a comprehensive Quality Assurance Programme agreed mutually.

Minimum Quality Assurance Test Requirement (QATR) to be followed during Manufacturing and Field erection indicating requirement of various tests / inspections, on major equipment / items, to be carried out as stipulated in technical specification and standards mentioned therein, are attached hereto and are part of bidding documents.

Clarification, if any, on these quality assurance test requirement, raised by bidder shall be discussed and resolved during pre-bid meeting.

After the award of contract, the contractor shall submit the detailed Manufacturing & Field Quality Assurance Plans for complete equipment / material during detailed engineering in the format attached hereto (format of quality plan F-060-02 issue 2.0 rev. 01, Total 1 Page) for approval and acceptance by SAPDC/Consultant in line with technical specification, Quality Assurance – General & Test Requirements and detailed engineering.

Manufacturing Quality Assurance Plans shall detail out for all the components and equipment & various tests/inspection, to be carried out in conformity with relevant latest IEC/IS/ISO etc, quality practices and procedures to be followed by Contractor's / Subvendor's Quality Control Organization, the relevant reference documents, standards and acceptance norms etc. during all stages of material procurement, manufacture, assembly and final testing / factory acceptance tests.

The Field Quality Assurance Plans shall detail out the various tests/inspection to be carried out in conformity with relevant latest IEC/IS/ISO, quality practices and procedures etc. to be followed by the contractor's / sub-contractor's site Quality Control Organisation during

various stages of site activities from receipt of material/equipment at site till final commissioning/ acceptance/handover.

All major items/ equipment/ components to be manufactured in house as well as procured from sub-vendors (Bought out Items, BOI) to be listed in the bid. Bidder shall submit Quality Assurance Plan submission schedule in the bid for above listed items in attached Format (duly filled in the format F-060-05 Issue 2.0 Rev. 00, Total 1 Page) in line with L2 Schedule.

For components / equipment / Bought out Items procured by the contractor for the purpose of the contract, the Contractor's purchase specifications and inquiries shall call for quality plans to be submitted by the sub-vendors.

The quality plans called for from the sub-vendors shall detail out, during the various stages of manufacture and installation, the quality practices and procedures followed by the sub-vendor's quality control organisation, the relevant reference documents/standards used, acceptance level, inspection of documentation raised, etc.

Such quality plans of the successful sub-vendors shall be finalized with the SAPDC/Consultant in line with requirement mentioned above and such approved Quality Plans shall form a part of the purchase order/contract between the contractor and his sub-vendor.

Within three weeks of the release of the purchase orders /contracts for such bought out items /components, a copy of the same without price details but together with the detailed purchase specifications and other related documents such as data sheet, drawings, quality plans and delivery conditions shall be furnished to the SAPDC/Consultant by contractor along with a report of the Purchase Orders placed, on the monthly basis, so far for the contract.

The Quality Plans shall be submitted on electronic media e.g. CD or E-mail in addition to hard copy, for review and approval of SAPDC/Consultant. After approval, the same shall be submitted in compiled form on CD-ROM by contractor.

For all spares, replacement items and additional similar items, the quality requirements/Quality Plans as agreed for the main equipment supply shall be applicable.

All material of construction shall be as per technical specification / approved drawings / GTP.

Contractor's Plant internal standards must be traceable to acceptable International / National standards & salient points of difference (if any) shall be clearly stated with submission of plant standards. The contractor shall furnish copies of reference documents, plant standards, acceptance norms, test and inspection procedure etc. as referred in Quality Plans along with Quality Plan to SAPDC/Consultant. These Quality Plans and reference documents/standards etc. will be subject to approval of SAPDC without which manufacturer shall not proceed. These documents shall form a part of the contract.

Tests on components and sub-assemblies shall be carried out at various stages of manufacturing, till the product undergoes the final tests in conformity with the relevant standards.

The Customer Hold Points (CHPs), identified in approved quality plan, i.e. testing checks which shall be carried out in the presence of the SAPDC, beyond which the work will not proceed without written consent of SAPDC's authorized representative.

The contractor / sub-vendor shall carry out routine test on 100% items at his works. The quantum of check / test for routine and acceptance test by SAPDC/Consultant shall be generally as per criteria / sampling plan defined in referred standards. Wherever standards have not been mentioned, quantum of check / test for routine / acceptance test shall be as agreed during detailed engineering.

The quantum of check when specified in percentage (%) / sampling basis shall be treated as per lot per sub-vendor. When the quantum of check is indicated to in whole no., then same quantum of check shall be applicable to each sub-vendor supplying the same equipment.

For sub-vendors identified during pre-award stage for submission of vendor details/ credentials (category "DR"), contractor shall submit documents in format F-060-01 after placement of award in the manner as specified as under prior to any procurement and within a month after placement of award or a period as agreed at the time of pre-award discussions.

The proposed sub-vendors should be registered vendors of the bidder and must have proven experience for successful operation for similar equipment / items / processes as mentioned elsewhere in technical specification.

Before assigning any portion of work to the sub-vendor, other than one specified and duly accepted in the contract, the contractor will take prior approval of BHEL/SAPDC.

Normally no request for change of sub-vendors or inclusion shall be entertained by SAPDC. But in exceptional circumstances, if the request for change of sub-vendors or inclusion is found reasonable and justified, then the same shall be entertained and the decision of SAPDC in this respect shall be final and binding. The time consumed for the change / inclusion of sub-vendors shall not be excluded from the stipulated time of the completion of the contract. This change shall not relieve the contractor from the responsibility to complete the work within stipulated time in any manner.

The contractor's proposal shall include sub-vendor's facilities established at the respective works, the process capability, process stabilization, Q.C. system followed, experience list etc. along with his own technical evaluation of sub-vendor. (Format F- 060-01 issue 2.0 rev. 01, Supplier / Sub-vendor Assessment Sheet, Total 14 pages).

However, whenever felt necessary, sub-vendor assessment will also be carried out by SAPDC/Consultant in accordance with the above procedure and by factory visits; for existing/proposed vendors/sub-vendors. This approval shall not relieve the contractor from any obligation, duty or responsibility under the contract & SAPDC shall not be responsible for any complications arising between the contractor and his subcontractor(s) / sub-vendor (s) and / or any other liabilities.

SAPDC/Consultant reserves the right to carry out quality audit and quality surveillance of the system and procedures of the contractor / or their sub-vendor. The contractor shall provide all

necessary assistance to enable SAPDC/Consultant to carry out such details & surveillance including Quality Manuals, if required by SAPDC/Consultant.

All welding and brazing shall be carried out as per procedure drawn and qualified in accordance with requirement of ASME section-VIII/IX or other International equivalent standard acceptable to SAPDC/Consultant. All welding/brazing procedures shall be submitted to SAPDC/Consultant/BHEL for review / verification prior to carrying out the welding/brazing. However, wherever required by the SAPDC/Consultant, tests shall be conducted in presence of SAPDC's authorized representative.

All Brazers, Welders and welding operators employed on any part of the contract either in Contractor/his sub-vendor's works or at site or elsewhere shall be qualified as per ASME section-VIII/IX or other equivalent International Standards acceptable to SAPDC/Consultant.

Unless otherwise proven and specifically agreed with SAPDC/Consultant, welding of dissimilar material and high alloy materials shall be carried out at shop only.

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

All material used for equipment manufacture including castings and forgings, etc. shall be of tested quality as per relevant codes/standards. Details of results of the tests conducted to determine the mechanical properties; chemical analysis and details of heat treatment procedure recommended and actually followed shall be recorded on certificates and time temperature chart. Tests shall be carried out as per applicable material standards and/or agreed details.

Contractor shall submit Field Welding Schedule for field welding activities like field welding location, numbers, welding procedure to be used, requirements, codes and NDT requirement along with all supporting documents, like welding procedures, heat treatment procedures, NDT procedures, etc. to SAPDC/Consultant for review at least ninety days before schedule start of erection work at site.

Any other statutory requirements as applicable for the equipment / systems shall also be complied with.

The inspection calls (duly filled in the format F-060-06 Issue 2.0 Rev. 00, total 1 Page) shall be placed at least 06 weeks in advance for overseas inspections excluding India and 15 days in advance for inspections within India and Nepal.

Before submitting the inspection call to SAPDC for witnessing the Customer Hold Points (CHP's) and/or requesting SAPDC for issuance of Material Dispatch Clearance Certificate (MDCC) based on Test Certificate (TC) review / Certificate of Conformance (COC), the contractor shall ensure that all Drawings / documents / GTP / technical data sheet, relevant to respective CHP / MDCC requirement, has been duly approved /accepted / noted by SAPDC.

Contractor shall ensure readiness of offered equipment by all means, before raising such call to SAPDC to attend CHP inspections. In case, SAPDC engineer (s) on reaching at a place of inspection found that material is not ready for inspection due to whatsoever reason, the complete inspection expenditure of SAPDC engineer(s) as per actual shall be chargeable to the contractor.

Only calibrated testing & measuring instruments shall be used while performing tests during manufacturing and erection, testing & commissioning at site by the contractor. Copy of the calibration certificates will be submitted to SAPDC/Consultant by the contractor during inspection as an evidence.

Non-conformities observed during manufacturing, shop testing, handling, packaging, transportation, storage, preservation, erection, testing & commissioning are required to be intimated by the contractor (Format for reporting, F-060-04 issue 2.0 rev 01, Total 5 pages). The acceptance/rejection of the non-conformities will be at the discretion of SAPDC.

Repair/rectification procedures to be adopted to make the job acceptable shall be subject to the acceptance of SAPDC. Action taken in accordance with decision of disposal of non-conformity for repair / rework / modification of the item / equipment and to prevent re-occurrence. The corrective and preventive action may involve modification of item / equipment, change in procedure and system etc. to achieve quality improvement at all stages and levels.

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

No material shall be dispatched from the manufacturer's works before the same is duly accepted, subsequent to pre dispatch/final inspection including verification of records of all previous tests/inspection by SAPDC and duly authorised for Dispatch by issuance of Material Dispatch Clearance Certificate (MDCC).

The test reports of type tests conducted as per contract, in line with requirement stipulated in the technical specification / quality plan should be got accepted from SAPDC/Consultant before final inspection / issuance of MDCC.

All materials used or supplied shall be accompanied by valid and approved material certificates and tests and inspection reports. These certificates and reports shall indicate the heat numbers or other such acceptable identification numbers of the material. The material certified shall also have the identification details stamped on it to ensure physical correlation and traceability of material vis-a-vis test certificate. Such identification no. shall remain same and verifiable for all stages of manufacturing and installation.

3.8.1.2 QA DOCUMENTATION

The contractor shall be required to submit the QA Documentation in two hard copies and two CD ROMs, as identified in respective quality plan.

Each QA Documentation shall have a project specific Cover Sheet bearing name and identification number of equipment including index of its contents with page control on each document. The QA Documentation file shall be progressively completed by the Contractor/sub-vendor to allow regular reviews by all parties during the manufacturing.

The final quality document will be compiled and issued at the final assembly place of equipment before despatch. However CD-ROM may be issued not later than three weeks.

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

The contractor shall be required to submit copies of the following quality assurance documents in original duly reviewed and accepted by contractor along with the request letter for issuance of MDCC (Material Dispatch Clearance Certificate):

- QUALITY PLAN CHECK LIST.
- MATERIAL MILL TEST REPORTS ON COMPONENTS AS SPECIFIED IN QUALITY PLAN.
- SKETCHES AND DRAWINGS USED FOR INDICATING THE METHOD OF TRACEABILITY OF THE RADIOGRAPHS TO THE LOCATION ON THE EQUIPMENT.
- NON-DESTRUCTIVE EXAMINATION RESULTS REPORTS INCLUDING INTERPRETATION REPORTS.
- CALIBRATION CERTIFICATE OF ALL METERS & MEASURING INSTRUMENTS PROPOSED TO BE SUPPLIED AS PART OF RELEVANT BILLING BREAKUP ITEM.
- ROUTINE TEST REPORTS FOR TESTING REQUIRED AS PER APPLICABLE CODES AND STANDARDS REFERRED IN THE SPECIFICATIONS.
- INSPECTION REPORTS DULY SIGNED BY AUTHORIZED REPRESENTATIVE OF SAPDC AND CONTRACTOR FOR THE AGREED CUSTOMER HOLD POINTS.
- ALL THE ACCEPTED DEVIATIONS SHALL BE INCLUDED WITH COMPLETE TECHNICAL DETAILS.
- LIST OF BALANCE POINTS IF ANY.
- CERTIFICATES IN RESPECT OF CALIBRATION, WELDERS & BRAERS QUALIFICATION ETC.
- COPY OF ALL REFERENCE DRAWINGS AND REFERENCE TECHNICAL DOCUMENTS
- ACCEPTANCE OF TYPE TEST REPORTS BY SAPDC/CONSULTANT.

Similarly, the Contractor shall be required to submit two sets (two hard copies and two CD ROMs), containing QA Documentation pertaining to field activities as per Approved Field Quality Plans and other agreed manuals/procedures, within 2 weeks after commissioning of individual system.

On release of QA Documentation by Inspector, one set of quality document shall be forwarded to Consultant and other set to SAPDC. For the particular case of phased deliveries, the complete quality document to the SAPDC/Consultant shall be issued not later than 3 weeks after the date of the last delivery of equipment.

ASSOCIATED DOCUMENTS / FORMATS

F-060-01 VENDOR / SUB-VENDOR ASSESSMENT SHEET
 F-060-02 QUALITY PLAN SUBMISSION BY CONTRACTOR.
 F-060-04 NON-CONFORMANCE REPORT (NCR)
 F-060-06 INSPECTION CALL REQUEST.

3.8.1.3 Safety

Safety of personnel

All equipment and services provided under this contract shall abide by international standards commonly accepted in the hydroelectric utility industry for safety of personnel whether involved with operation or maintenance.

Safety of operation

All equipment and services provided under this contract shall abide by commonly accepted standards for safety of operation.

The various system and sub-systems supplied under this contract shall be designed to follow and operate under a clear hierarchical structure:

- Plant control level,
- Unit control level,
- Functional control level, functional drive group level,
- Local drive level.

Each hierarchical control level shall perform its specific tasks and always depend on the subordinate lower control levels. In general, should a higher control level failure occur, the lower control level shall not be affected and shall be able to control the power plant with full safety.

The Contractor shall accordingly build into the Electrical & Mechanical System adequate levels of autonomy, independence, redundancy and functional distribution to insure that safety is maintained at all times.

3.8.1.4 Earthing

Earthing terminals for equipment of these specifications shall form part of equipment supplies. The contractor shall connect the earthing conductors to these terminals as required.

Risers from earthing bus shall be in the scope of purchaser. However, extension from these risers to the equipment shall be in the scope of supplier in the Power House, Transformer Hall, Switchyard and Butterfly Valve House.

However, overall earthing arrangement required for HT panel, LT panel, DG set, motor & motor control panels etc. at isolated location such as Dam Site, TRT Outfall area and Surge

Shaft either by pit earthing or counter poise etc. shall be in the scope of supplier including civil works, design, material supply (for main earthing risers, interconnection, charcoal, salt, Bentonite etc.), erection, testing & commissioning etc.

A copper ground bus, sized to carry maximum short circuit current, shall run along the entire length of panel structure and shall have terminal connector at each end for connection to station ground grid (50 X 6 mm G.I. flat).

Tests

Each panel shall be completely assembled, wired, adjusted and tested at the factory prior to shipment. The test shall include wiring continuity tests, insulation tests and functional tests to ensure satisfactory operation and control of individual equipment.

Special Cables

Special cables for specific purpose, as required, shall be supplied and installed by the Bidder.

3.8.1.5 Completeness of the specification

Any fittings, accessories, equipment or any other things required for successful commissioning of Arun-III Hydro Electric Project, though may not have been specifically mentioned in the specification but are usually necessary for the completeness of the equipment shall be deemed to be included in the specification and shall be supplied by the contractor without any extra cost to the Employer.

3.8.1.6 Packaging and Shipment

The Contractor shall provide such packing of the Goods as it is required to prevent their damage or deterioration during transit to their final destination as indicated in the Contract. The packing shall be sufficient to withstand, without limitation, rough handling during transit and exposure to extreme temperatures, salt and precipitation during transit and open storage. Packing case size and weights shall take into consideration, where appropriate, the remoteness of the final destination of Goods and the absence of heavy handling facilities at all points in transit.

The packing, marking and documentation within and outside the packages shall comply strictly with such special requirements as shall be expressly provided for in the Contract and, subject to any subsequent instruction ordered by the Employer consistent with the requirements of the Contract.

After unpacking of Goods the packing material shall become the property of Employer

The contractor shall wrap, pack and crate all plant included in the work or part thereof, suitable for shipment to a tropical location, facilitating proper handling and protection from damage in rail, truck, ocean or air shipment as applicable. An approved drying agent, such as Silica Gel, shall be packed in containers or packages holding plant which may be adversely affected by moisture or excessive humidity.

All packing crates shall be clearly marked before shipping to indicate the contract number, shipping address, volume, weight, name, number and unit number of the contents, slinging and weight bearing points.

All plant parts shall be marked to facilitate erection. Each packing crate shall contain a packing list in a waterproof envelope. Parts shall be described and also identified by their numbered marking in the packing list.

Three copies of the packing list shall be forwarded to the purchaser prior to dispatch. The ownership of packaging materials shall be of Employer. All wooden packaging crates and steel support structures shall be dumped to the designated area within 5kms of the power house as per the direction of Engineer in charge.

The supplier shall be entirely responsible for the insurance, shipment, handling and transportation.

The equipment shall not be dispatched by the Bidder from the place of manufacture to the site until the dispatch instructions are issued by the Owner.

3.8.1.7 PACKAGING, HANDLING AND SITE STORAGE

The Contractor shall pack all the consignment in sea worthy packaging strong enough to withstand rough handling during transit. Machine surface shall be suitably protected against scratches, corrosion, shocks, impact etc. Packages shall be suitably and distinctly identified for type of handling and kind of storage.

Electronic equipment shall be packaged, shipped and stored in anti-static packing. All packages shall be stored indoor. Packages containing electronic equipment shall be stored in humidity controlled environment.

The Bidder shall indicate the number of packages of consignment together with the size (L x W x H) and weight for transporting the equipment in the Bidding Document.

3.9 SPECIAL INSTRUCTIONS TO BIDDERS

General

The Bidder shall base the equipment design on the information given in this specification. The equipment shall be complete in all respects. Any item which is not specifically mentioned herein but found essential for safe and efficient operation and maintenance and satisfactory performance of the system shall be deemed to have been included in the scope of the Bidder. It shall be presumed that the Bidder has studied the site, all the drawings, tender documents and is fully aware of the scope of work involved and the site conditions prevailing.

3.10 Codes and Standards

- a) All equipment, systems and works covered under this specification shall comply, in all respect, with requirements of applicable latest statutes and that of latest editions of codes and standards. Latest regulations and safety & environmental requirements as applicable in India / state of installation shall also be complied with.
- b) All codes and standards mentioned shall mean as relevant and applicable to a particular equipment / system.
- c) All other codes/standards not covered in Section 1 / Section 2 but required for the plant and system offered shall also be referred / followed by the Bidder. The Bidder, along with the bid, shall submit a comprehensive list of codes and standards to be followed for various equipment / system.
- d) In all cases where IBR does not govern, German, American, British, ISO or other international standards established to be equivalent or superior to the codes specified are also acceptable. In the event of any conflict between the requirements of equivalent codes and standards and the requirements of Indian standards / regulations, the latter will govern unless specified otherwise in the specifications.
- e) The Bidder shall be responsible to be in possession of all the specified Codes / Standards and ensure reference to the same before submitting the offer/ bid.
- f) Mandatory codes / local regulations to be followed for safety, design, fabrication and operation of the switchyard shall be, followed:
- g) If the equipment supplied does not conform to the codes and standards mentioned in this specification, but is manufactured to the Bidder's own standard, developed as a result of his experience, is also acceptable provided the same is found to be superior to the above mentioned codes and standards. The Bidder shall identify such equipment and shall also present sufficient data to the Owner / Consultant to support his design and to establish the superiority. The design may be accepted by Owner/ his Consultants only if the Purchase / his consultant is satisfied that sufficient experience exists with the design proposed.
- h) Design not meeting the stipulations of the codes and standards will not be acceptable.
- i) Apart from various codes and standards mentioned in Section 1/2, the Manufacturer shall comply with other requirements of codes and standards mentioned in this Specification for detailed design, manufacture, testing, erection, construction etc.

Control System	IEEE – 122 , 1992
Metering / Dosing pumps	API 675 – 1987 (Positive displacement pumps – controlled volume) API 676 – 1987 (Positive displacement pumps – Rotary).

Centrifugal pumps	API 610 – 1990, ASME PTC 8.2 – 1965
Gear Box	API 613 – 1993 & AGMA 420 & 421
Coupling	API 671 – 1993
Structural	IS 1893 – 1991, IS 875-1992 & IS 800 – 1991
Pressure Vessel	ASME Sec. VIII, Div. 1 – 1995
Piping	ANSI B 31.1-1995 / 31.3 – 1993, IBR
Valve	API
Instrument	ISA, API
Electrical	As per specification attached & relevant
	IS/IEC
Tanks	API 650- 1993
Electrodes	AWS, IS
Painting	IS Standards
Performances Tests	
Overload test of crane and hoists	IS 3177

3.11 Deviations and Assumptions

Bidders requested to carefully examine and understand the specifications and seek clarifications, if required, to ensure that they have understood the specifications. The Bidder's offer should not carry any sections like clarifications, interpretations and/or assumptions. In the event of conflict between the Technical Specifications and the condition of contract, the requirements as indicated in the technical specification shall govern, unless confirmed otherwise by the Owner in writing before the award of contract, based on written request from the bidder for such a clarification.

In the event of conflict between requirements of any two clauses of the specification documents, the more stringent requirements shall apply, unless otherwise confirmed by the Owner in writing before the award of this contract, based on a written request from the Bidder for such clarification.

The Bidders are advised that while making their Bid Proposals and quoting prices, all terms and conditions of bidding documents may appropriately be taken into consideration. Bidders are required to furnish a certificate indicating their full compliance to the terms and conditions of the bidding documents.

3.12 Limit of Contract

Equipment furnished shall be complete in all respect with all mountings, fittings, fixtures and standard accessories normally provided with such equipment and/ or needed for erection, completion and safe operation of the equipment as required by applicable codes though they may not have been specifically detailed in the respective specifications, unless included in the list of exclusions. All similar standard components/ parts of similar standard equipment provided shall be interchangeable with one another.

This review by the Owner's Engineer / Consultant may not indicate a thorough review of all dimensions, quantities and details of the equipment, materials, any devices or items indicative of the accuracy of the information submitted. This review and/ or approval by the Engineer shall not be construed by the Bidder, as limiting any of his responsibilities and liabilities for mistakes and deviations from the requirements specified under these specifications and documents.

3.13 Latent Defects

Notwithstanding the issue of the Take Over Certificate, the Contractor shall be responsible for making good with all possible speed any Latent Defect in any Works /equipment of the plant which appears at any time before the expiry of defect liability period. And shall remedy such defect at its own cost and expense. The latent defect liability period shall be a minimum of 5 years from the end of defect liability period. The defects to which this applies are defects in design, materials or workmanship or defects arising from any act or omission of the Contractor done or omitted prior to Take-over of the portion of the Plant affected by the defects or during the Warranty Period which a reasonable examination at the end of the Warranty Period would not have disclosed.

3.14 Defect Liability

The Contractor warrants that all the facilities or any part thereof are new, unused, and of the most recent or current models, and that they incorporate all recent improvements in design and materials, unless provided otherwise in the Contract.

The Contractor further warrants that the Plant and equipment shall be free from defects arising from any act or omission of the Contractor or arising from design, materials, and workmanship, under normal use in the conditions prevailing in the

If during the Defect Liability Period any defect should be found in the design, engineering, materials and workmanship of the Plant and equipment supplied or part thereof, the Contractor shall promptly, in consultation and agreement with the Employer regarding appropriate remedying of the defects, and at its cost, repair, replace or otherwise make good (as the Contractor shall, at its discretion, determine) such defect as well as any damage to the Facilities caused by such defect. The Contractor shall not be responsible for the repair, replacement or making good of any defect or of any damage to the Facilities arising out of or resulting from any of the following causes:

- (a) Improper operation or maintenance of the Plant and equipment by the Employer
- (b) Operation of the Facilities outside specifications provided in the Contract
- (c) Normal wear and tear.

3.15 Completion Schedule

The Bidder shall submit Time Bar chart indicating completion date of major activities such as submission of design data / calculations and drawings for approval, manufacturing of components / units, supply, inspection etc. without which the Tender shall not be considered. Time Bar Chart furnished shall afterwards form part of the contract and cannot be altered arbitrarily except Force Majeure conditions as may be agreed with the Owner.

3.16 Drawings & Documents for Owner's use and Archives

The Bidder shall submit all final drawings, documents, manuals for Owner's use and for reference / record required during course of operation and maintenance of the plant. Numbers of copies and their form (hard copy, electronic form, reproducible) to be submitted and the details of the documents, drawings, manual etc. to be furnished by the Bidder are described elsewhere in the specification.

Drawings, documents, calculation, data & Information to be submitted by the Bidder along with the offer:

Technical Data to be submitted with the Tender

- 1) List of performance tests proposed by the Bidder to demonstrate the guaranteed parameters for generator and other electrical equipment.
- 2) Specific energy consumption.
- 3) Type test certificates for major categories of equipment, issued by independent testing authority.
- 4) Guaranteed Technical Parameters.
- 5) Technical catalogues.
- 6) Manufacturing Quality Plan

Operation & Maintenance Manuals

Instruction manuals, presenting the basic categories of information for the operating and/or maintenance personnel, as detailed herein below shall be furnished by Bidder.

The instruction manuals shall present the following basic categories of information in particular complete and comprehensive manner and prepared for the use by operating and/or maintenance personnel.

- i. Instructions for initial commissioning, short duration and long duration shut down.
- ii. Instruction for operation, routine inspection and maintenance including preventive maintenance.
- iii. Recommendation for inspection points, method of inspection and period of inspection.
- iv. Information on detection, cause and rectification of troubles and faults.
- v. Instructions on normal repairs and overhaul.
- vi. Complete parts list with proper and complete identification (Tag nos./Serial nos. as shown in the respective approved drawings) and ordering information for all replaceable parts. The identification details of equivalent and alternative makes for these spare parts which are not manufacturer's own product shall also be listed.
- vii. List of all special tools and tackle & spares and instructions for use of such tools and tackle & spares.
- viii. One complete set of as built drawings of the entire systems.
- ix. The information shall be organized in a logical and orderly sequence. A general description of equipment including significant technical characteristics shall be

- included to familiarize operating and maintenance personnel with the equipment. Such description and technical characteristics shall not differ from the approved data.
- x. Necessary drawings, curves and other illustrations shall be included or copies of appropriate approved drawings shall be bound in the manuals. Tests, adjustment and calibration information, as appropriate, shall be included. Safety and other warning notices and installation, maintenance and operating cautions shall be emphasized.
 - xi. Write-up, figures, part list etc., shall be clearly legible. The manuals shall be prepared on good quality paper securely bound in durable folders.
 - xii. The instruction manuals shall be subject to Consultant's approval in the same fashion as that for drawings.
 - xiii. Instruction manual shall give step by step procedure for Erection, testing and commissioning
 - xiv. Operation, Maintenance and Repair Instruction manual shall also contain:
 - xv. List of spare parts with ordering specifications and manufacturer's catalogues
 - xvi. List of consumables, lubricants, chemicals with specifications, brand names and annual consumption figures.
 - xvii. Drawings relevant for erection, operation, maintenance and repair of the equipment.
 - xviii. Procedure for ordering spares.
 - xix. Maintenance Manual shall also include:
 - xx. Diagnostic trouble shooting / fault location charts
 - xxi. Tests for checking of proper functioning.

Drawings / documents for approval

Quality Control & Quality Assurance plan.

G.A. and Cross Sectional drawings of all equipment indicating weights, material of construction, bill of material, dimension, specification etc.

Final design calculations and assumptions.

Actual performance data and characteristic curves based on the testing at site.

Technical specification of all equipment, motors, for all system and all other accessories.

Final list of drawings.

As built drawings.

Miscellaneous

- i. General arrangement and cross sectional drawings of all major components with bill of material.
- ii. Foundation drawings, load data & design calculation for all equipment.
- iii. Erection drawings for all equipment and structures showing complete erection details.
- iv. Engineering and design calculations of installations and units.
- v. QAPs

- vi. Detailed procedures of shop testing of all the items applicable shall be submitted to the Owner/ Consultant for approval before conducting tests.
- vii. Following shop test certificates/test curves/data, shall be furnished.
 - Materials and components test certificates.
 - Performance test results and characteristic curves of all fans, pumps, and electric drive motors etc.
 - Non-destructive test results as applicable.
 - Reports and test certificates of shop tests.
 - Type test & routine test certificates.
- viii. Detailed quality assurance program along with quality plan shall be submitted.

Following data shall be furnished:-

- a) Technical data of all the plant, equipment, drive motors, instruments, panels, etc. shall be furnished.
- b) Following lists/tables / write ups shall be furnished, complete with tag nos. and brief specification. Proper numbering system as approved by Consultant/Owner shall be adopted.
 - i) Instrument schedule (with service, range, make of instrument).
 - ii) Flow element schedule.
 - iii) Valve schedule.
 - iv) Pipe schedule.
 - v) Cable schedule (Power & Control).
 - vi) Schedule of actuators (electric/pneumatic)

The scheduled dates for the submission of these as well as for, any data/information to be furnished by the Employer would be discussed and finalized at the time of award. The supplier shall also submit required no. of copies as mentioned in this specification of all drawings/design documents/test reports for approval by the Employer.

Note: The contractor may please note that all resubmissions must incorporate, all comments given in the submission by the Employer failing which the submission of documents is likely to be returned. Every revision shall be a revision number, date and subject, in a revision block provided in the drawing, clearly marking the changes incorporated.

3.17 Workmanship and Quality Control

All moving parts of equipment, which can conceivably cause injury to the operator and otherwise authorized personnel within the vicinity of working area shall be suitably guarded and warning displays shall be put at prominent places.

The Bidder shall clearly indicate and identify the plans and procedures, which shall be followed in the design, manufacture and installation of plant and equipment to control and assure to the Owner of the desired quality.

FUNGI STATIC VARNISH

Besides the space heaters, special moisture and fungus resistance varnish shall be applied on parts which may be subjected or predisposed to the formation of fungi due to the presence or deposit of nutrient substances. The varnish shall not be applied to any surface of part where the treatment will interfere with the operation or performance of the equipment. Such surfaces or parts shall be protected against the application of the varnish.

3.17.1 Equipment Mounting

All instruments, switches etc. mounted on the front face of the panels shall be of flush type.

All equipment shall be so mounted that removal and replacement may be accomplished individually without interruption of service to others.

All equipment inside the panel shall be so located that their terminals and adjustments are readily accessible for inspection and maintenance. Adequate ventilation shall be provided in enclosed panel.

Each of the LV switchboards shall be designed for 1.1 times the required rating as a spare capacity. Further all LV Switchboard shall be provided with 20 % spare modules of each rating and type of module.

81910/2020/TBG-TB_ENGG_MSE

Bharat Heavy Electricals Limited
 4x225MW Arun-3 (HEP),Nepal
 Technical Specification for 336kV Surge Arrester

Doc No. TB-405-316-003

3.18 Title Block :

Project	4x225MW Arun-3 (HEP),Nepal			
Customer	S VN Arun-3 Power Development Company (P) Ltd. (SAPDC)			
Consultant	 S VN Ltd			
	BHARAT HEAVY ELECTRICALS LTD. TRANSMISSION BUSINESS GROUP NOIDA		Name	Sign
		Drawn		
		Checked		
		Approved		
Title	Drawing Number :			Rev

-----XXXX-----

Section – 4

GTP Format

Bharat Heavy Electricals Limited
4x225MW Arun-3 (HEP),Nepal
Technical Specification for 336kV Surge Arrester

Doc No. TB-405-316-003

B)	LIGHTNING ARRESTOR	
1.	Name of Manufacturer	
2.	Manufacturer s type Designation.	
3.	Standard to which it conform.	
4.	Arrester class and type.	
5.	Rated voltage of arrester (kV/rms)	
6.	Maximum continuous operating voltage of arrester at designed ambient temperature kV (rms).	
7.	Nominal discharge current at 8/20 micro sec. wave (kA)	
8.	Rated frequency.	
9.	i) Energy dissipation capability (K /KV). ii) Line discharge class.	
10.	Maximum residual voltage for 8/20 micro second current wave. a) at 50% nominal discharge current(kvp) b) at 100% nominal discharge current (kvp) c) at 200% nominal discharge current (kvp)	
11.	Impulse current withstand. a) High current short duration (4/10 micro sec. wave) KAP. b) Low current long duration KAP.	
12.	Reference voltage and corresponding reference current of arrester.	
13.	Maximum internal leakage current at (mA) a) Continuous Operating Voltage (COV) b) 1.1 COV. c) COV at 150 degree C. d) Reference voltage.	
14.	Pressure relief class.	
15.	Energy absorption capability in k per operation of the Arrester , during a switching surge discharge.	
16.	Maximum amount of energy that may be dispatched into the arrester during discharge, assuming that discharge takes place within 1 minute period and state the switching surge current.	
17.	Internal pressure required to operate pressure relief device as a percentage of burst pressure of housing.	
18.	Dynamic over voltage withstand kvp. a) For 3 peaks. b) For 0.01 sec. c) For 0.1 sec. d) For 1 sec.	

Bharat Heavy Electricals Limited
4x225MW Arun-3 (HEP), Nepal
Technical Specification for 336kV Surge Arrester

Doc No. TB-405-316-003

19.	Minimum prospective symmetrical fault current (kA rms)	
20.	Rated voltage of nO disc (kV) a) No of nO discs in a unit. b) No. of units/arrester c) Height/thickness of nO discs (mm) d) Diameter of nO discs (mm)	
21.	External Insulation a) Type b) Applicable standard c) Impulse withstand test voltage of housing with 1.2/50 micro sec. wave (kvp). d) One minute power frequency withstand voltage of arrester housing dry and wet (kVrms) e) Total creepage distance of arrester housing (mm) f) Cantilever strength of arrester (kg).	
E)	CLAMPS & CONNECTORS	
1.	Manufacturer Name & address	
2.	Applicable standard	
3.	Application.	
4.	Type	
5.	For connection to: a) Conductor size and arrangement b) Equipment terminal and arrangement	
6.	Material (state % age composition of constituents and impurities present). a) Clamp body. b) Bolts & nuts. c) spring washer d) Liners if any.	
7.	Rated current.	
8.	Maximum temperature rise over reference ambient temperature when carrying rated current (°C).	
9.	Rated terminal load and Factor of Safety (kg).	
10.	Minimum thickness of any part (mm).	
11.	Weight of clamp complete with hardware (kg).	
12.	Machine accuracy for making surface.	
13.	Service (Indoor/outdoor).	

ANNEXURE - A**SCHEDULE OF TECHNICAL DEVIATIONS**

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
---------	----------	------------	-----------	------------------------

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

	Manufacturing Quality Assurance Test Requirements			
	Project Name: Arun- III HEP (4 x 225 MW)		Doc. No.: QAI/A/M/EM/GIS/01	Rev. No.: 02
	Item Description: 420 KV Gas Insulated Switchgear		Issue Date: 30.05.17	Pages : 7
Sr. No.	Component, Operation & Characteristics	Applicable Standard	Remarks	
1	2	3	4	
1	Switchgear to be completely assembled in sub-assemblies of max. size for shop testing. 3- phase Transmission line switchgear bay module to be completely assembled including a representative section of outdoor SF6 to Air GIS Busduct and one outdoor SF6 to air bushing as per cl. no. 16A.7.1 of Technical Specification or otherwise when switchgear and controlgear are not completely assembled before transport, separate tests shall be made on all transport units. In this event, the manufacturer shall demonstrate the validity of his test (example: leakage rate, test voltage, resistance of part of the main circuit) as per cl. no. 16A.7.2	TS/REL STD	W	
2	Gas tightness leakage test on complete assembly (As per above)	TS/REL STD	W	
3	CIRCUIT BREAKER			
3.1	Casting/ Welded enclosures			
i	Review of WPS and PQR.	ASME Sec IX	V	
ii	NDT.	-do-	V	
iii	Physical & Chemical properties of incoming material.	Manufacturer Plant standard	V	
iv	Visual Dimensional & Cleanliness check	Approved Drg./Tech. Spec/IEC 62271-203	V	
v	Tightness test (Helium test)	Approved GTP/Tech. Spec/referred standard	V	
3.2	Bought out items like Stress Shield, Breaking & Connecting Elements etc			
	i) Make, Model & Routine test	Approved datasheet/ Tech. Spec	V	
3.3	Pressure test of enclosure	Approved GTP/Tech. Spec/ IEC 62271-203	V	
3.4	Corrosion protection test of the enclosures	TS/ REL STD	V	
3.5	Dielectric tests on auxiliary and control circuits	Approved GTP/Tech. Spec/ IEC 62271-203	W	
3.6	Insulation resistance checking (LV wiring)	Tech. Spec/ IEC 60204-1		
3.7	Verification of LV wiring	Tech. Spec/ Approved drg./ IEC 62271-203	W	
3.8	Mechanical operating tests including timing and speed tests			
3.8.1	25 Open& 25 Close operation at rated voltage & pressure	Approved GTP / Tech. Spec / IEC 62271-100	W	
3.8.2	5 open & 5 close operations at minimum voltage & minimum pressure	-do-	W	
3.8.3	5 open & 5 close operations at maximum voltage & maximum pressure	-do-	W	
3.8.4	5 close-open cycles at rated voltage & rated pressure	-do-	W	
3.8.5	5 CB operation sequences O-0.3 sec-CO-3 min-CO for line breakers	Approved GTP/Tech. Spec/IEC62271-100	W	
3.8.6	5 CB operation sequences O-0.3 sec-CO-3 min-CO for Generator Transformer and bus coupler breakers	Approved GTP/Tech. Spec/IEC62271-100	W	
3.8.7	Opening time & speed measured at rated supply voltage for each pole	Spec/Drgs./ IEC 62271-203	W	
3.8.8	Closing time & speed measured at rated supply voltage for each pole	-do-	W	
3.8.9	Recharging time after one opening & one closing operation	-do-	W	
3.8.10	Measurement of resistance of Close and Trip coils	Approved GTP/Tech. Spec	W	
3.8.11	Measurement of Current consumption of Motor operating mechanism at rated supply voltage.	Approved GTP/Tech. Spec	W	
3.9	Dimension check- Major & Interface	Approved DRG/ GTP/TS	W	
3.10.	Measurement of Resistance of main circuit	Approved GTP/Tech. Spec/IEC 62271-203	W	
3.11	Gas tightness test	Approved GTP/Tech. Spec/IEC 62271-203	W	
3.12	P.F. voltage tests of the main circuit at 650 kV, 50 Hz for 1 min	Approved GTP/Tech. Spec/App. Drg./IEC 62271-203	W	
3.13	PD measurement	-do-	W	
3.14	Checking of operation of interlock	-do-	W	
3.15	Design and General details of construction	Applicable drawings	W	
4	DISCONNECTORS, EARTHING SWITCHES& HIGH SPEED EARTHING SWITCHES			
4.1	Casting/Welded enclosures			
i	Review of WPS and PQR, if applicable	ASME sec. IX	V	
ii	NDT , if applicable	-do-	V	
iii	Physical & Chemical properties of incoming material.	Manufacturer Plant standard	V	
iv	Visual Dimensional & Cleanliness check	Approved Drg./Tech. Spec/IEC 62271-203	V	
v	Tightness test (Helium test)	Approved GTP/Tech. Spec/referred standard	V	
4.2	Pressure test of the enclosures	Approved GTP/Tech. Spec/IEC 62271-203	V	
4.3	Corrosion protection test of the enclosures	TS/ REL STD	V	
4.4	Test on Driving mechanism without Disconnector & Earth switch			
4.4.1	Verification of LV wiring	Approved Drg./Tech. Spec/IEC 62271-203	V	
4.4.2	Dielectric tests at 2 kV, 50 Hz for 1 min	Approved GTP/Tech. Spec/IEC 62271-203	V	
4.4.3	Insulation resistance checking (LV wiring)	Tech. Spec/IEC 60204-1	V	
4.4.4	5 O/C cycles at U norm, min & max voltage	Approved GTP./Tech. Spec/IEC 62271-102	V	

81910/2020/TBG-TB_ENGG_MSE

Sr. No.	Component, Operation & Characteristics	Applicable Standard	Remarks
1	2	3	4
4.4.5	Measurement of current consumption of Motor operating mechanism at rated supply voltage.	Approved GTP/Tech. Spec	W
4.5	Test on Driving mechanism with Disconnect & Earth switch		
4.5.1	Measurement of current consumption	Approved GTP./Tech. Spec/IEC 62271-102	V/W
4.5.2	Manual open close operation (5 O/C)	Approved GTP./Tech. Spec/IEC 62271-102	V/W
4.5.3	Measurement of Torque drive inlet	Approved GTP./Tech. Spec/IEC 62271-102	V/W
4.5.4	Electrical operation 5 CO at U norm, Umin & Umax voltage	Approved GTP./Tech. Spec/IEC 62271-102	V/W
4.6	Measurement of the resistance of the main circuit	Approved GTP/Tech. Spec/IEC 62271-203	W
4.7	Gas tightness test	Approved GTP/Tech. Spec/IEC 62271-203	W
4.8	P.F. voltage tests of the main circuit	Approved GTP/Tech. Spec/App. Drg./IEC 62271-203	W
4.9	P.D. measurement	-do-	W
4.10.	Checking of operation of interlock	-do-	W
4.11	Design and General details of construction	Applicable drawings	W
5	CURRENT TRANSFORMER		
5.1	Casting/Welded enclosures		
i	Review of WPS and PQR, if applicable	ASME Sec IX	V
ii	NDT, if applicable	-do-	V
iii	Physical & Chemical properties of incoming material.	Manufacturer Plant standard	V
iv	Visual Dimensional & Cleanliness check	Approved Drg./Tech. Spec/IEC	V
v	Tightness test (Helium test)	Approved GTP/Tech. Spec/referred STD	V
5.2	Verification of terminal markings	Approved Drgs./IEC 60044-1	W
5.3	Checking of polarity	Approved GTP/ App. Drgs./IEC 60044-1	W
5.4	Pressure test of enclosure	Approved GTP/ App. Drgs./IEC 60044-1	V
5.5	Corrosion protection test of the enclosures	TS/ REL STD	V
5.6	RCT measurement for PS class CT	-do-	W
5.7	Excitation characteristic , Knee Point Voltage test, Turn Ratio test for PS class CT	-do-	W
5.8	Inter turn over voltage test	Approved GTP/Tech. Spec/IEC 60044-1	W
5.9	Accuracy test (Ratio and Phase angle error)	Approved GTP/App. Drg./IEC 60044-1	W
5.10.	1 Min. Power Frequency with stand test Voltage on Secondaries	Approved GTP/App. Drg./IEC 60044-1	W
5.11	Composite error Accuracy	Approved GTP/IEC 60044-1	W
6	VOLTAGE TRANSFORMER		
6.1	Casting/Welded enclosures		
i	Review of WPS and PQR, if applicable	ASME Sec IX	V
ii	NDT, if applicable	-do-	V
iii	Physical & Chemical properties of incoming material.	Manufacturer Plant standard	V
iv	Visual Dimensional & Cleanliness check	Approved Drg./Tech. Spec/IEC	V
v	Tightness test (Helium test)	Approved GTP/Tech. Spec/referred STD	V
6.2	Verification of terminal marking	Approved Drgs./IEC 60044-2	V
6.3	Pressure test of enclosure	Approved GTP/ App. Drgs./IEC 60044-2	V
6.4	Corrosion protection test of the enclosures	TS/ REL STD	V
6.5	partial discharges measurement	Approved GTP/Tech. Spec/IEC 60044-2	W
6.6	Power frequency withstand tests between sections and on primary & secondary windings	Approved GTP/Tech. Spec/App. Drg./IEC 60044-2	W
6.7	Accuracy class designation	-do-	V
6.8	Limits of Voltage errors and Phase displacement	-do-	W
7	SURGE ARRESTOR		
7.1	Casting/Welded enclosures		
i	Review of WPS and PQR, if applicable	ASME Sec IX	V
ii	NDT, if applicable	-do-	V
iii	Physical & Chemical properties of incoming material.	Manufacturer Plant standard	V
iv	Visual Dimensional & Cleanliness check	Approved Drg./Tech. Spec/referred STD	V
v	Tightness test (Helium test)	Approved GTP/Tech. Spec/referred STD	V
7.2	Pressure test of the enclosures	Approved GTP/Tech.Spec/Drags./IEC 62271-203	V
7.3	Corrosion protection test of the enclosures	TS/ REL STD	V
7.4	Residual voltage test	Approved GTP/Tech.Spec/IEC 60099	W
7.5	Measurement of reference voltage and Recording of Leakage current in ma	Approved GTP/Tech.Spec/IEC 60099	W
7.6	PD test (PD test at 1.05 at 1.05 MCOV)	-do-	W
7.7	Satisfactory absence from partial discharges & contact noise to be checked on each unit by any sensitive method adopted by manufacturer	-do-	W
7.8	Current distribution test for multi- column arrestor	-do-	W
7.9.	Gas tightness test	Approved GTP/IEC 62271-203	W
8	OTHERS GIS COMPONENTS (Busbar Conductor, Busbar enclosure, Support Insulator, Gas Barrier (Cone), Accessories, etc.)		
8.1	Bus Enclosure		
i	Review of WPS and PQR, if applicable	ASME Sec IX	V
ii	NDT, if applicable.	-do-	V
iii	Physical & Chemical properties.	Manufacturer Plant standard	V
iv	Visual Dimensional & Cleanliness check	Approved Drg./Tech. Spec/referred STD	V
v	Tightness test (Helium test)	Approved GTP/Tech. Spec/referred STD	V
vi	Dimension	As approved per drawing	V

81910/2020/TBG-TB_ENGG_MSE

Sr. No.	Component, Operation & Characteristics	Applicable Standard	Remarks
1	2	3	4
vii	Leak testing of all the welds/flanges with SF6 leak detector. (Gas tightness test)	Approved GTP/Tech. Spec./referred STD	V
viii	Pressure test	Approved GTP/Tech. Spec./referred standard	V
ix	Welding X-ray	As per referred STD	V
x	DPT	As per referred STD	V
xi	Corrosion Protection test (One test sample piece for Aluminium)	App. GTP/TS/App. Drg/ Rel. STD	V
xii	RIV free	App. GTP/TS/App. Drg/ Rel. STD	V
xiii	Cleanliness & Packing	As per Manufacturer operating Instruction	V
8.2	Bus bar conductor		
i	Dimension,	As per drawing	V
ii	Mechanical & Chemical Properties	Manufacturer Plant standard	V
iii	Electrical Conductivity/ Resistivity/Resistance	Approved GTP/Tech. Spec./referred STD	V
iv	Silver plating Thickness	-do-	V
v	Cleanliness	Plant standard	V
vi	Contact resistance at Plug in contact	Plant standard	V
vii	Corrosion Protection test (One test sample piece for Aluminium)	App. GTP/TS/App. Drg/ Rel. STD	V
viii	RIV free	App. GTP/TS/App. Drg/ Rel. STD	V
ix	Packing	As per Manufr. packing Instruction	V
8.3	Support Insulator & Gas Barrier (Cone)		
i	Visual & Dimension	As per drawing	V
ii	Pressure Test (only for gas barrier)	Approved GTP/Tech. Spec.	V
iii	P.F. voltage tests of the main circuit	Approved GTP/Tech. Spec./App. Drg./IEC 62271-203	W
iv	Tightness test	Approved GTP/Tech. Spec./App. Drg./IEC 62271-203	W
v	P.D. measurement	-do-	W
vi	RIV free	App. GTP/TS/App. Drg/ Rel. STD	W
vii	Cleanliness & Packing	As per Manufacturer operating Instruction	W
8.4	Assembly of conductors and Enclosures including cones of each type and accessories.		
i	PF Voltage tests on main Circuit	App GTP/ App. Drg/ Tech. Spec /referred STD	W
ii	PD Measurement	-do-	W
iii	Design and general details of construction	Applicable drawings	W
8.5	Measurement of losses in bus conductor and enclosure	Approved GTP/Tech. Spec./ App Procedure	W
8.6	Bushings- SF6 to Air bushing		
8.6.1	Hollow insulator (Porcelain)		
	All Routine tests	Approved GTP/TS/IEC 62155	V
8.6.2	Assemble bushing		
	All Routine tests	Approved GTP/TS/IEC 60137	V
8.7	Bellows (Lateral, Axial, Parallel, tolerance and vibration)		
i	Review of WPS and PQR	ASME Sec IX	V
ii	NDT, if applicable	-do-	V
iii	Physical & Chemical properties.	Manufacturer Plant standard	V
iv	Visual Dimensional & Cleanliness check	Approved Drg/Tech. Spec./referred STD	V
v	Tightness test (Helium test)	Approved GTP/Tech. Spec./referred STD	V
vi	Corrosion Protection test	App. GTP/TS/App. Drg/ Rel. STD	V
8.8	Copper Strips		
i	Physical & Chemical Properties	Manufacturer Plant standard	V
ii	Visual & Dimensional Check.	Approved Drg/Tech. Spec./referred STD	V
8.9	Power, Control & Instrumentation cables		
i	Make & Type	Approved datasheet/Tech. Spec.	V
ii	Routine tests	Approved GTP/Tech. Spec./referred STD	V
8.10.	Pressure Gauges, Density Switches, Rupture Disc, Endoscope arrangement, Valves, Moisture absorbers, UHF Sensors, etc		V
i	Make & Type	Approved datasheet/Tech. Spec.	V
ii	Functional Tests	Approved GTP/Tech. Spec./referred STD	V
8.11	ACCESSORIES		
8.11.1	SF6 Gas		
	Make	DRG/Data sheet/TS	V
	Weight and pressure after filling of SF6 Gas (Weight of SF6 Gas)	DRG/Data sheet/TS	V
	Purity check (Composition)/ Impurities in Percentage	DRG/Data sheet/TS/IEC	V
	Acidity (SO2) measurement	IEC 60376/TS/ Relevant Standard	V
	Measurement of dew point & Moisture content/water content	DRG/Data sheet/TS	V
	Testing of electrical properties of SF6 Gas	DRG/Data sheet/TS	V
	Verification of manufacturer seal & label	DRG/Data sheet/TS	V
	Check of leakage before dispatch	DRG/Data sheet/TS	V
8.11.2	Density Monitoring Equipment		
	Make, Type, rating & Switching Point Pressure	Approved datasheet/ Tech. Spec	V
8.11.3	Tools & Tackles		
	Size, Make and condition of the tools in terms of aesthetics, etc.	As per approved datasheet/ Catalogue	V
8.11.4	PD Monitoring system (UHF Sensors)		
	i) Make, Type, rating	Approved GTP/Tech. Spec/Drg/referred STD	V
	ii) Continuity and Insulating Test on UHF Sensors	-do-	V
	iii) Operational & Functional test	-do-	V

81910/2020/TBG-TB_ENGG_MSE

Sr. No.	Component, Operation & Characteristics	Applicable Standard	Remarks
1	2	3	4
8.11.5	Gas Handling Unit		
i	Make & Model	As per approved datasheet/ Catalogue	V
ii	Operational & Functional test	Tech. Spec/Drq/referred STD	V
8.11.6	Vacuum Pump		
	i) Make & model	REL. STD/DRG/TS	V
	ii) Visual Inspection	REL. STD/DRG/TS	V
	iii) Verification of :		
	a) Free air displacement & revolution	REL. STD/DRG/TS	V
	b) Ultimate Vacuum	REL. STD/DRG/TS	V
8.11.7	Power & Control Cable and Cable Tray		
	Make, Type, Rating	REL. STD/DRG/TS	V
	Routine Tests	REL. STD/DRG/TS	V
8.12	Steel Structure		
8.12.1	Raw Material		
8.12.1.1	Hot-rolled Structural Steel Angle Sections, Bars & Plates		
	Chemical Composition, Tensile Test (TS, YS% Elongation), Bend Test, Visual Check for Surface Finish, Dimension 1) For angle-Leg length out of squareness, camber, weight ii) for bars-diameter, ovality iii) for plates- thickness weight, Y Groove Crackability Test	DRG/ IS 2062/ IS 8500/ IS 228/ IS 10842	V
8.12.1.2	Zinc		
	Chemical Composition	IS 209	V
8.12.2	In process Inspection		
8.12.2.1	Fabrication of steel structure		
	Straightening, Cropping (Cutting), Stamping, Marking Hole by punching/ drilling, Edge Security, Hole to Hole Distance, Overall length of member, Gauge Distance, Notching Flange cut, corner cut & level cut, Heel Grinding, Bending MS Section, Bending- MS Plate, Other Dimensions	IS 802 (P-II)/ DRG	V
8.12.2.2	Welding Fillet Weld		
	Suitability	IS 822/ ASME Sec IX	V
8.12.2.2.1	Welding Procedure Specification (WPS)		
	Qualification	IS 822/ ASME Sec IX	V
8.12.2.2.2	Procedure Qualification Record (PQR)		
	Qualification	IS 822/ ASME Sec IX	V
8.12.2.2.3	Welder Performance Qualification		
	Weld Size, Weld Quality	DRG/ ASME Sec VII	V
8.12.2.2.4	Inspection of Welds		
	DP Test	ASTM- 65	V
8.12.2.3	Inspection of Fabricated Parts (Black) before Galvanizing		
	Dimensions, Surface Finish	DRG/ IS 802 (P-II)	V
8.12.2.4	Proto Assembly		
	Dimensions, Fit up/ Fowling/ Notching	DRG	W
8.12.2.5	Revision of Drawings/ Shop Sketch on proto feedback		
	Revision of Drawing (For re-approval)	DRG	V
8.12.2.6	Galvanising		
8.12.2.6.1	Degreasing		
	Solution Strength, pH value	IS 2629	V
8.12.2.6.2	Rinsing		
	Cleanliness	IS 2629	V
8.12.2.6.3	Pickling		
	Acid Content, Iron Content	IS 2629	V
8.12.2.6.4	Rinsing		
	Cleanliness (Mill Scale Paint Marks etc)	IS 2629	V
8.12.2.6.5	Pre-Fixing		
	Dry fluxing, Iron Content, Specific Gravity, pH value, Temperature	IS 2629	V
8.12.2.6.6	Pre-heating		
	Temperature	IS 2629	V
8.12.2.6.7	Hot Dip Galvanizing		
	Temperature, Immersion Time, Removal of excessive Zinc while lifting from Zinc Bath by bumping process	IS 2629	V
8.12.2.6.8	Quenching of Running Water		
	Cooling & Cleaning	IS 2629	V
8.12.2.7	Post Treatment or Dichromating		
	Solution Strength	IS 2629	V
8.12.2.8	Checks on members		
	Surface defects & finish, Thickness of zinc coating, Mass of zinc coating, Uniformity of zinc coating (Preece Test), Adhesion Test of zinc coating (Pivoted Hammer Test/ Knife Test)	IS 4759/ IS 6745	V
8.12.2.9	Stenciling of Mark/ Numbers		
	Marking	DRG	V
8.12.3	Final Inspection		
8.12.3.1	Fabricated Members after galvanizing		
	Surface finish, defects & dichromating, Dimensions	IS 2629/ IS 4759	V
8.12.3.2	Verification of Basic Material Quality		
	Chemical Composition, Tensile Strength, Bend Test	DRG/ IS 2062/ IS 8500/ IS 228/ IS 10842	V
8.12.3.3	Fillet Welding Quality		
	Weld Quality	IS 822	V
8.12.3.4	Galvanizing Test		
	Thickness of Zinc Coating, Mass of Zinc Coating, Uniformity of Zinc Coating (Preece Test), Adhesion Test of Zinc Coating (Pivoted Hammer Test/ Knife Test)	IS 2629/ IS 4759/ IS 6745/ IS 2633	W
8.12.4	Packing, Storing, Bundling and Handling	IS 2629	V
8.12.5	Corrosion Protection test (One test sample piece for steel structure)	App. GTP/TS/App. Drq/ Rel. STD	V
8.12.6	Dispatch		
	Verification, Sequential Supplies, Stenciling/ Part no., Quantity, Quality	DRG/ BOM/ LOA	V
8.12.7	Cadmium plated Bolts, Foundation Bolts, Step Bolts and Hexagonal Nuts		

81910/2020/TBG-TB_ENGG_MSE

Sr. No.	Component, Operation & Characteristics	Applicable Standard	Remarks
1	2	3	4
8.12.7.1	Mechanical test		
	Surface Integrity, Dimension, Hardness, Head soundness, Proof Load, Strength under wedge loading, Tensile Test, Shear Strength	TS/DRG/Rel. STD	V
8.12.7.2	Cadmium plating Test		
	Coating Thickness Weight, Stripping Test, Magnetic/ Electronic Measurement, Uniformity of Coating, Adhesion of Coating	TS/DRG/Rel. STD	V
8.12.8	Spring Washer		
	Surface Integrity, Dimensions, Hardness, Permanent Set Test, Permanent Load Test, Twist Test, Thickness of Coating, Adhesion Test	TS/DRG/Rel. STD	V
8.12.9	Packing of Hardware		
	Packing	TS/DRG	V
9	BAY MODULE CONTROL CUBICLE, ALL ASSOCIATED PANELS & ONLINE MONITORING SYSTEM PANELS FOR GIS		
9.A	Raw Material		
9.A.1	Insulating Material: FRP, SMC & DMC Sheet & components, Insulator		
	a) Visual	DRG & IS9431	V
	b) Dimensional & Creepage distance	-do-	V
	c) 1 Min Dry PF Test (as applicable)	-do-	V
	d) Cantilever Strength (as applicable)	-do-	V
9.A.2	Cards: Input & Output Cards, power supply cards, Communication/ Network Cards, Processors, Converters		
	Make, type & Functional test	DRG/ Rel STD/TS	V
	Burn-in test, temperature and voltage stress tests	DRG/ Rel STD/TS	V
9.A.3	HMI, SF6 gas & partial discharge monitoring equipment, control switching device equipment		
	Make, Model/ Type & Functional test, Datasheet compliance	DRG/ Rel STD/TS	V
9.A.4	Power & Control Cable and Instrumentation cable		
	Routine & Acceptance test	DRG/ Rel STD/TS	V
9.A.5	Bus Bar (Copper)		
	Material test	DRG/ Rel STD/TS	V
	Dimension check, Silver plating on contact surface	DRG/ Rel STD/TS	V
9.A.6	CT, PT & Control Transformer		
	Routine & Acceptance test	DRG/ Rel STD/TS	V
9.A.7	MCB, Relays, Contactors, Timer, Auxiliary & Selector Switches, Transducers (All Type), Sensors		
	Make, Type & Rating	DRG/TS/ REL. STD	V
	Routine & Acceptance test	DRG/TS/ REL. STD	V
	Measurement of Resistance	DRG/ Rel STD/TS	V
9.A.8	Meters (all type) , Indicating & Monitoring instruments		
	Make, Model & Type and Calibration certificate	DRG/ Rel STD/TS	V
	Accuracy test, HV test & routine test	DRG/ Rel STD/TS	V
9.A.9	Indicators, Push Button, Selector Switch		
	Make, Type & Operation check	DRG/ Rel STD/TS	V
9.A.10	Earthing flat (Galvanized steel)		
	Dimension & Material test, Galvanization Check	DRG/ Rel STD/TS	V
9.A.11	Gasket		
	Dimension check, Chemical & Physical properties, Surface finish	DRG/ Rel STD/TS	V
9.A.12	Sheet Steel for fabrication & Steel for structure		
	Dimension, Chemical & Mechanical properties, Bend test	DRG/ Rel STD/TS	V
9.B	Final Inspection		
9.B.1	Dimension check for height, width, depth & sheet thickness of panel	REL. STD/DRG/TS	W
	Dimension check for bus bar & check phase to phase, phase to earth clearance	REL. STD/DRG/TS	W
	Visual check as per OGA, DRG & verification of BOM	REL. STD/DRG/TS	W
	Visual check of alignment of Boards, Operation of Doors, Locks, Shutters, Base grouting & gland plates	REL. STD/DRG/TS	W
	Verification of correct wiring, Ferruling, dressing, routing,, bunching, continuity check, colour coding and earthing	REL. STD/DRG/TS	W
	Insulation resistance measurement before & after HV test	IEC 60204-1	W
	Dielectric test on Main, auxiliary & control circuit	IEC 62271-203 § 7.2	W
	Functional test on all AC & DC circuit including heating, Lighting, Fan & thermostat	REL. STD/DRG/TS	W
	Verification of Setting, Operational & scheme test of all relay	DRG/Data sheet/Plant Standard	W
	Operational & Functional Check, Protection & Interlock Check		
	a)Hardwire Healthiness Check, Checking of control & relay logics	DRG/ Rel STD/TS	W
	b) Functional checks as per approved schematics. Functional checks of electronic & Power Module	DRG/ Rel STD/TS	W
	c)Functional & Operation test of control switching devices & SF6 gas monitoring system, partial discharge monitoring system	DRG/ Rel STD/TS	W
	d)Parameterisation of software. Functional testing of continuous online monitoring & diagnostic system	DRG/ Rel STD/TS	W
	Verification of protection against electrical shock	TS/DRG/REL STD	W
	Verification of IP Class	Approved GTP/Tech. Spec./Drg	V
	Visual Inspection for Paint Shade, Surface Finish, Coating, Thickness & Adhesion.	Approved GTP/Tech. Spec./Drg	W
9.B.2	Packing & Marking	DRG/Data sheet/TS/Mfr. Std.	V
LEGENDS			
W: CUSTOMER HOLD POINT (CHP)		DRG: DRAWING	
TS: TECHNICAL SPECIFICATION		REL. STD: RELEVANT STANDARD	
V: VERIFICATION OF RECORDS / REPORTS / TCs			
NOTES:			
1	Any test at any stage not covered in Quality Assurance Test Requirement (QATR), but part of technical specification of contract, shall also be carried out by Contractor / firm.		
2	QATR shall be read in conjunction with General Quality Assurance Requirement given as part of Technical Specification.		
3	Dielectric Test voltage shall be corrected, if installed at an altitude higher than 1000m as per clause no. 4.2.2 of IEC 60071-2		

	Field Quality Assurance Test Requirements		
	Project Name: Arun 3 HEP (4x225 MW)	Doc. No. QAI/A/F/EM/EP/05	Rev. No. 02
	Item Description: Motor Starter Panel	Issue Date: 30.05.17	Page No. 2
Sr. No.	Component, Operation & Characteristics	Applicable Standard	Remarks
1	2	3	4
1	Material Receipt		
	External conditions of Equipment free from Damages etc	TS/Instruction Manual/ Reference standard	W*
	Number of packages in each Equipment and physical condition of each package	TS/Instruction Manual/ Reference standard	W*
2	Storage of Material		
	Proper Placement of equipment as per the Instruction Manual.	TS/Instruction Manual/ Reference standard	W*
	Ensure that no damage or rusting takes place during storage	TS/Instruction Manual/ Reference standard	W*
	Ensure that all delicate Equipment are stored in protected area.	TS/Instruction Manual/ Reference standard	W*
3	Embedments		
3.1	Installation/fixing of embedments as per drawing		
	Leveling & alignment before and after concreting	TS/Instruction Manual/ REL.STD	W*
3.2	Blockout		
	Check for visual, dimensions & Co-ordinates of blockout	TS/Instruction Manual/ REL.STD	W*
3.3	Civil Work		
	Check for all Civil work as per instruction manual	TS/Instruction Manual/ REL.STD	W*
4	Test During Installation		
	Check for correct nameplate details	DRG, TS & Relevant STD	W*
	Ensure that the handling tools & tackles like strings, manila ropes, pulleys, etc. are free from damage.	DRG, TS & Relevant STD	W*
	Ensure that proper tying, loading/packing on the vehicle/transport	DRG, TS & Relevant STD	W*
	Ensure for proper unloading, positioning on an even Surface at erection site	DRG, TS & Relevant STD	W*
	Ensure that panels are vertically upright during transport, loading, unloading and erection	DRG, TS & Relevant STD	W*
	Check for foundation frame and its dimensions	DRG, TS & Relevant STD	W*
	Check for layout of Panels	DRG, TS & Relevant STD	W*
	Ensure correct sequence, orientation and alignment of panels	DRG, TS & Relevant STD	W*
	Check for verticality of panels within ± 5 mm	DRG, TS & Relevant STD	W*
	Check for clearances on all sides	DRG, TS & Relevant STD	W*
	Check for proper tightness of base plate bolts, bolts joining panels	DRG, TS & Relevant STD	W*
	Check for tightness of bus bar joints including earth bus bar, all terminals, CTs, PTs, meters and relays	DRG, TS & Relevant STD	W*
	Covering of joints with Compounds (if specified)	DRG, TS & Relevant STD	W*
	Ensure that all unused holes are plugged properly	DRG, TS & Relevant STD	W*
	Ensure that all the unwanted bolts/nuts, wires, hands tools etc. inside the panels are removed	DRG, TS & Relevant STD	W*
	Check tightness of covers, check for proper laying, dressing, crimping and terminal of all cables	DRG, TS & Relevant STD	W*
	Ensure that proper earthing is carried out for the panels as per norms and Check for continuity of each bus	DRG, TS & Relevant STD	W*
5	Pre- Commissioning Test		
1	General Test for Motor Switchgear		
	Check for Lubrication of all moving parts like doors etc.	DRG, TS & Relevant STD	W*
	Dimension check of busbar and clearance between phase and phase to earth	DRG, TS & Relevant STD	W*
	Check for alignment of Bus Bars with the Insulators	DRG, TS & Relevant STD	W*
	Check for cleanliness/breakage/chipping of Insulators	DRG, TS & Relevant STD	W*
	IR before & after HV test	DRG, TS & Relevant STD	W*
	HV test on Bus Bars with CTs and breaker/contractor in position	DRG, TS & Relevant STD	W*
	Verification of phase sequence for incoming supply	DRG, TS & Relevant STD	W*
2	MCCB		
	Check for Proper alignment of Trucks for free movement and correct operation of shutters	DRG, TS & Relevant STD	W*
	Check Control wiring for correctness of connections, continuity and IR values	DRG, TS & Relevant STD	W*
	Contact resistance measurement of Circuit Breaker	DRG, TS & Relevant STD	W*
	Check for manual operation of breakers completely assembled	DRG, TS & Relevant STD	W*
	Check for proper closing and opening operations electrically at extreme conditions of control supply voltage and anti pumping operation	DRG, TS & Relevant STD	W*
	Measurements of IR values, Resistance and minimum pickup voltage of Coils	DRG, TS & Relevant STD	W*
	Checking of mechanical and electrical interlocks	DRG, TS & Relevant STD	W*

Sr. No.	Component, Operation & Characteristics	Applicable Standard	Remarks
1	2	3	4
	Checking of spring charging motor and recharging time, correct operation of Limits switches	DRG, TS & Relevant STD	W*
	Calibration of release for MCCB	DRG, TS & Relevant STD	W*
3	Current Transformer		
	Insulation Resistance between windings and terminals to body	DRG, TS & Relevant STD	W*
	Measurements of secondary winding resistance	DRG, TS & Relevant STD	W*
	Shorting and earthing of spare CT cores	DRG, TS & Relevant STD	W*
4	Potential Transformer		
	IR Test	DRG, TS & Relevant STD	W*
	Ratio and Polarity Test	DRG, TS & Relevant STD	W*
	Checking of line connections as per connection diagram	DRG, TS & Relevant STD	W*
5	Heating & Lighting		
	Visual check- Make, Type & Rating	DRG, TS & Relevant STD	W*
	Dielectric test of main, auxiliary & control circuit	DRG, TS & Relevant STD	W*
	Functional Check	DRG, TS & Relevant STD	W*
6	Cable (Interpanel wiring)		
	Continuity Check	DRG, TS & Relevant STD	W*
	IR Test	DRG, TS & Relevant STD	W*
	HV Test	DRG, TS & Relevant STD	W*
7	Cubical Wiring for all cable		
	IR of all wires with respect to earth	DRG, TS & Relevant STD	W*
	Checking of wiring of control and selector switches and all interconnectors/terminals between panels and fields	DRG, TS & Relevant STD	W*
	Transducers/Instruments		
	Operational and functional checks	DRG, TS & Relevant STD	W*
	Verification of Glanding & Cable Tagging	DRG, TS & Relevant STD	W*
8	Relays		
	Checking of IR between all terminals and earth & between AC and DC Terminals	DRG, TS & Relevant STD	W*
	Checking of CT and PT Connection with particulars reference to their polarities as called in Drawing	DRG, TS & Relevant STD	W*
	Checking of operating characteristics by secondary current injection	DRG, TS & Relevant STD	W*
	Relay setting & Co-ordination vis-à-vis other protection relays/ release provided in the entire system including Motor-Starter/ LT & MV system	DRG, TS & Relevant STD	W*
9	Measuring, indication and indicating Instrument		
	IR between all terminal and earth	DRG, TS & Relevant STD	W*
	Checking of CT and PT connection with particular reference to their polarities as called in Drawing	DRG, TS & Relevant STD	W*
6	Commissioning Test		
	Function & Operation test including checking of protection and interlocking scheme	DRG, TS & Relevant STD	W*
	Verification of component temperature	DRG, TS & Relevant STD	W*
7	Performance Test as per Technical Specification	DRG, TS & Relevant STD	W*
LEGEND			
W: CUSTOMER HOLD POINT(CHP)		DRG: DRAWING	
TS: TECHNICAL SPECIFICATION		REL. STD: RELEVANT STANDARD	
V: VERIFICATION OF REPORT/TCs		W*: WITNESS BY SAPDC / MAIN CONTRACTOR	
NOTE:			
1. Any test at any stage not covered in Quality Assurance Test Requirement (QATR), but part of Technical Specification of contract, shall also be carried out by Contractor/ firm.			
2. QATR shall be read in conjunction with General Quality Assurance Requirement given as part of Technical Specification.			
3. Dielectric Test voltage shall be corrected, if installed at an altitude higher than 1000m as per clause no. 4.2.2 of IEC 60071-2.			
4. Responsibility for witnessing (W*) at site shall be finalized mutually at the time of finalization of FQAP as per the criticality of test.			

 MANUFACTURING & FIELD QUALITY ASSURANCE TEST REQUIREMENT			
PROJECT NAME: ARUN III HEP (4X225 MW)		DOC.NO.QA/I/A/M/F/EM/S&S/01	REV. NO. 02
ITEM DESCRIPTION: SECURITY & SURVEILLANCE SYSTEM		ISSUE DATE: 30.05.17	PAGES: 01
SR. NO.	CHARACTERISTICS	APPLICABLE STANDARD	REMARKS
1	2	3	4
1	Make , Model , Type , Rating and Serial No. Identification	DRG. / Rel. Std / TS/ Data Sheet	V
2	Shop Test		
2.1	A compliance/performance certificate for all equipments as specified in the technical specification shall be submitted by the contractor stating that the equipments are manufactured and tested in accordance with relevant IEC/IS standards and shall meet the performance guarantees to meet the provision of contract.	Rel. IEC/IS/TS	V
3	Receipt of Material		
3.1	External conditions of Equipment free from Damages etc	Packing list /Drawings /TS	W*
3.2	Number of packages in each Equipment and physical condition of each package	Packing list /Drawings /TS	W*
4.0.	Storage		
4.1	Proper Placement of equipment as per the Instruction Manual.	All parts fully covered	W*
4.2	Ensure that no damage or rusting takes place during storage	All parts fully covered	W*
4.3	Ensure that all delicate Equipment are stored in protected area.	All parts fully covered	W*
5.0.	Field Test		
5.1	All field test including tests during installation,Pre-commissioning, commissioning,performance & field acceptance tests shall be conducted by the contractor, in presence of representative of employer	DRG. / Rel. Std / TS/ Erection & Commissioning Protocol	W*
6	Installation & Pre- Commissioning Check		
6.1	Installation check as per drawing of all equipment	DRG. / Rel. Std / TS/ Erection & Commissioning Protocol	W*
6.2	Function test of subsystem	DRG. / Rel. Std / TS/ Erection & Commissioning Protocol	W*
6.3	System function & Operational check	DRG. / Rel. Std / TS/ Erection & Commissioning Protocol	W*
6.4	Software Test of function program	DRG. / Rel. Std / TS/ Erection & Commissioning Protocol	W*
7	Commissioning Test		
7.1	Complete functional testing of security system	DRG. / Rel. Std / TS/ Erection & Commissioning Protocol	W*
7.2	Complete functional testing of surveillance system	DRG. / Rel. Std / TS/ Erection & Commissioning Protocol	W*
8	Performance Test		
8.1	Performance Test as per Technical specification	DRG. / Rel. Std / TS/ Erection & Commissioning Protocol	W*
LEGENDS			
W: CUSTOMER HOLD POINT (CHP)		DRG: DRAWING	
TS: TECHNICAL SPECIFICATION		REL. STD: RELEVANT STANDARD	
V: VERIFICATION OF RECORDS / REPORTS / TC		W*: WITNESS BY SAPDC / MAIN CONTRACTOR	
NOTES:			
1	Any test at any stage not covered in Quality Assurance Test Requirement (QATR), but part of technical specification of contract, shall also be carried out by Contractor / firm.		
2	QATR shall be read in conjunction with General Quality Assurance Requirement given as part of Technical Specification.		
3	Responsibility for witnessing (W*) at site shall be decided mutually at the time of finalisation of FQAP as per the criticality of test.		

Annexure –E

QA&I Formats

	SJVN	FORM NO.: F-060-01 PAGE: 1 of 14 ISSUE: 2.0 REV. 01 DATE: 30/06/2016
	FORM	

VENDOR / SUB-VENDOR ASSESSMENT SHEET

TO BE FILLED-IN BY SUPPLIER / SUB-VENDOR

NAME OF SUPPLIER / SUB-VENDOR IN FULL					
		REGISTERED OFFICE		FACTORY / WORKS	
ADDRESS					
TELEPHONE NO.					
FAX NO.					
EMAIL ID					
PERSON(S) TO BE CONTACTED (NAME & DESIGNATION & MOBILE NO.)					
WEEKLY OFF					
SHIFT WORKING		Type of Company (Pl. Tick)		Type of Industry (Pl. Tick)	
OFFICE	WORKS	Pvt. Ltd	Public Ltd.	MSME	Large Scale
ONE	ONE	☐	☐	☐	☐
☐	☐	Proprietary	Partnership	Govt.	Contractor
TWO	TWO	☐	☐	☐	☐
☐	☐	Public Sector			
THREE	THREE	☐			
☐	☐				

	SJVN	FORM NO.: F-060-01 PAGE: 2 of 14 ISSUE: 2.0 REV. 01 DATE: 30/06/2016
	FORM	

Sr. No.	Items / Services / Process for which Approval is desired for	Rating / Size & Type	Applicable Standards IS/DIN/BS/IEC Etc.

REGISTRATION DETAILS

PAN / TAN NO.	CENTRAL SALES TAX REG. NO.	STATE SALES TAX / TIN NO.	EXCISE DUTY REGISTRATION NO.
ENCISE CONTROL CODE NO.	SERVICE TAX REG. NO.	CATEGORY OF INDUSTRY	REGISTRATION NO. & VALIDITY DATE
		Micro ☐	
		Small ☐	
		Medium ☐	
		Large ☐	

ARUN-III HEP

	SJVN	FORM NO.: F-060-01 PAGE: 3 of 14 ISSUE: 2.0 REV. 01 DATE: 30/06/2016
	FORM	

A. ORGANISATIONAL SOUNDNESS						
Sr. No.	DESCRIPTION		DETAILS TO BE FURNISHED			
1.	Nature of Business (Strike whichever is not applicable)		Manufacturing Unit / Engineering Consultant / Agents / Distributors / Stockists / Dealers / Traders / Indian Subsidiary / EPC contractor / Channel Partner (Attach authorization certificate of principal) / Erection contractor / Other			
2#	Year of commencement of Business / Factory Establishment					
3.	Year of Commencement of Manufacture / Services					
4.	Total Area/Covered Area in Sq. m.		Total Area	Covered Area		
5.	Electric Power-Connected Load					
6#	Electric Power Standby Load & System					
7.	Details of Directors					
Sr. No.	Name	Designation	Qualification	Experience		
8.	Details of Employees					
Please attach copy of Company's Organization Chart (For Unit)						
Division Status	Graduate		Diploma	Skilled	Un-Skilled	Remarks
	Technical	Non-Technical				
Production						
Engineering & Quality Control						
Administration & Other Supporting activities.						

	SJVN	FORM NO.: F-060-01 PAGE: 4 of 14 ISSUE: 2.0 REV. 01 DATE: 30/06/2016
	FORM	

9. Brief Details of Product and Manufacturing Capability					
Sr. No.	Item & Material	Description (Type, Size Rating)	Annual Production for Last Three Years		
			I	II	III
10.#	Details of Foreign or Indigenous Collaborator				
Sr. No.	Product	Name & Address of Collaborator	Collaboration		
			Scope	Year	Valid up to
11#	Have your product been type tested by any external agency? If so, give details				
Sr. No.	Product	Test (Size / Type & class	Test Report No.	Next Due date	

ARUN-III HEP

	SJVN	FORM NO.: F-060-01 PAGE: 5 of 14 ISSUE: 2.0 REV. 01 DATE: 30/06/2016
	FORM	

12.#	Have you been approved by any Statutory agency / third party agency like LLOYD, ASME, NTPC, PGCIL, EIL, Railways etc. ? If so, indicate details and enclose copies of approval letters				
Sr. No.	Item / Material / Service / Process	Description (Size, Type & Class)	Agency	Date of approval	Next Due date
13.#	Indicate Approval / Certification by National / International Standards / Agencies applicable for the subject product.				
Sr. No.	Product	Codes / Standards	License No. & Date		
14.#	Reference List (Experience in Particular Type of Equipment / Service / Process). Please indicate since how many years similar type of item / equipment / service / process provided (please furnish documentary evidence).				
Sr. No.	Item / Material / Service / Process	Type & Capacity / Rating	Customer (End User with Address)	Date of Supply / Service provided	Under Operation since year / Month
#Note: Please furnish the performance feedback certificate for proposed item / equipment / process / service form end user in line with requirement stipulated in Technical Specification.					

	SJVN	FORM NO.: F-060-01 PAGE: 6 of 14 ISSUE: 2.0 REV. 01 DATE: 30/06/2016
	FORM	

15.#	Business Commenced with SAPDC/SJVN in past				
Sr. No.	Year	Name of Department / Project Dealt with	Item Supplied / Services Offered.		
16.A#	Machinery, Instrument & other Equipment Specific to Process & Product Facilities / service				
Sr. No.	Description of Machine	Capacity & Nos.	Location Shop	Make	Year of Manufg.
16.B#	Other General Facilities				
Sr. No.	Description of Machine	Capacity & Nos.	Location Shop	Make	Year of Manufg.
i	Material Handling Mobile Crane Fork Lift Over Head Cranes				
ii	Metal Cutting &				

ARUN-III HEP

	SJVN		FORM NO.: F-060-01		
	FORM		PAGE: 7 of 14 ISSUE: 2.0 REV. 01 DATE: 30/06/2016		

	Bending				
iii	Casting				
iv	Forging				
v	Fabrication				
vi	Welding				
vii	Machining				
viii	Heat Treatment				
ix	Sheet Metal				
x	Fettling & Cleaning, Sand Blasting, Shot Blasting & Pickling				
xi	Painting				
xii	Metal Coating				
xiii	Protection before packing				
xiv	Packing				
xv	Other				
17.#	If In-House Manufacturing Facilities not available, inform source of manufacturing details along with their facilities and experience				
Sr. No.	Process outsourced	Name of the company	Description of machine / Equipment	Remarks	
18. A#	Facilities for In-house Testing & Inspection				
Sr. No.	Description	Capacity & Nos.	Make & Year of Mfg.	Calibration Status	Approval Qualification

	SJVN		FORM NO.: F-060-01			
	FORM		PAGE: 8 of 14 ISSUE: 2.0 REV. 01 DATE: 30/06/2016			

18. B#	If In-house testing facilities are not available, indicate source of testing with relevant details.				
Sr. No.	Source of Testing	Description	Capacity & Nos.	Make & Year of Mfg.	Approval Qualification
Note: In case of outsourcing of major testing such as NDT, Electrical & Mechanical testing, no marks will be awarded. However, material composition testing by chemical method from NABL Lab shall not attract negative marking.					
18 C #	Details of any Government Laboratory facility available in area				
	Product related testing facility (type / Performance / Routine / Acceptance Test)				
19	Sources of Raw Material and Bought out Items				
Sr. No.	Description of Raw Material / Bought Out Items			Source	
20 #	Storage Area Availability				
	Storage for finished goods (Open / Close)				
	Raw Material storage and identification				

	SJVN	FORM NO.: F-060-01 PAGE: 9 of 14 ISSUE: 2.0 REV. 01 DATE: 30/06/2016		
	FORM			
21 #	Do you have in-house Design / R&D departments?			
22 #	Details of pending legal issues on contractual aspects with customers, if any.			
23 #	Please furnish details of Labour problems in the last three years, if any?			
B. FINANCIAL SOUNDNESS OF ORGANIZATION				
Financial Information for last Three Years (Please furnish copy of annual report)				
Sr. No.	Parameters	Year 20	Year 20	Year 20
1#	Please furnish annual turnover of the company.			
	Growth in annual turnover w.r.t. previous years (%)			
2#	Please furnish Profit before tax (PBT) of the company.			
	Growth in PBT w.r.t. previous years (%)			
3#	Please indicate the net worth (Net current assets – Net current liabilities) of the company?			
4#	Whether the vendor has been referred to BIFR / NCLT / any other similar Govt. agency.			
5#	Whether the supplier is a potentially sick company.			
6	Please mention current order book position, as on date in terms of Value and time			
C. QUALITY SYSTEM				
Sr. No.	DESCRIPTION	Sub-vendor response (along with supporting document)		
1*	Are you an ISO 9001 company? If yes, please furnish the certificate and what is your quality policy?			
2*	Is the company an ISO 14000 approved?			
3#	Is the company an OHSAS approved?			
4*	Have your company won any Quality award like Rajeev Gandhi National Quality Award, DMC Ramkrishna Bajaj National Quality Award, Golden Peacock National Quality Award etc? If yes provide documentary evidence.			
5*	Have you received appreciation letter from your customer. Please provide evidence.			
6	To whom your Q.C./Q.A. Chief reports to? (Please furnish your organization structure)			
7*	If you have a written quality control manual/procedure, then please furnish the same.			

	SJVN	FORM NO.: F-060-01 PAGE: 10 of 14 ISSUE: 2.0 REV. 01 DATE: 30/06/2016	
	FORM		
7 (i) *	Incoming Material Control System (Furnish a copy of system and organization)		
7 (ii) *	Process Control: Are written procedure defining stage wise operations and functions on shop floor established and followed? (Furnish copy of work instruction and record of process control parameter)		
7 (iii) *	Manufacturing/Testing Procedure Qualification & Personnel Qualification (Procedure qualification specification & Record of personnel qualification (PQR) to be submitted).		
7 (IV) *	Are written Quality Control Instruction sheets prepared & properly used? (Please furnish evidence)		
7 (V) #	Are records generated during inspection maintained & available for review? (Please furnish evidence)		
7 (VI) *	Are quality control checks / procedure adequate to maintain desired quality level right from the incoming stage to final stage? Please furnish copy of such control checks / procedure.		
8 #	Documentation Control		
8 (i)	Does a system for clear and precise stipulation of responsibilities for documentation issue & change control exists?		
8 (ii)	Are changes made in writing?		
9*	Control of Inspection, measuring and testing equipment		
9 (i)	Are necessary gauges, testing and measuring equipment's, available and used?		
9 (ii)	Are testing and measuring equipment properly maintained?		
9 (iii)	Is recorded control on calibration of equipment available?		
10*	System of Identification & Traceability of materials, tools, jigs, fixtures & processed components, etc. (Copy of procedure to be submitted).		
11*	System of Storage / Preservation / Painting and Packing (copy of Procedure to be submitted)		
12*	Do you have written procedure for disposing off the non-conformities? If yes, please furnish the copy of the same also furnish three copies of NCR & CAPA.		
13*	Safety measures (Submit copy of safety system & record of accidents for last two years)		
14#	What type of Sampling Inspection Plan is used in your factory/company? Please furnish details.		
15	How good are you in keeping your dispatch commitments? Please give details of last ten deliveries stating details as below (Provide documentary evidence) Within delivery period:		

	SJVN	FORM NO.: F-060-01 PAGE: 11 of 14 ISSUE: 2.0 REV. 01 DATE: 30/06/2016
	FORM	

	Delayed but accepted by user: Delayed but accepted with penalty:	
16 [#]	Have you ever been de-listed or put in under temporary suspension by any customer / contractor.	
D. AFTER SALES SERVICE		
Sr. NO.	DESCRIPTION	Sub-vendor response (along with supporting document)
1 [#]	For overcoming product deficiencies what are the analytical methods used at Customer's premises?	
2 [#]	What is the strength of your "after-sales service" team?	
3 [#]	What is the response time after receiving complaints from the customers? Provide evidence.	
4 [#]	Customer complaints handling system (Submit list of customer complaints & status for the last three years) Please furnish complete list of complaints attended to during last one year.	
5 [#]	How do you keep your "after-sales service" team updated?	
6 [#]	Provide certificate from 02 customers (end user) for satisfactory after sales services.	

Declaration by Director/ Partner/ Proprietor

I declare that the information furnished above and attached documents are correct to the best of my knowledge. I undertake to inform you at the earliest any change(s) in the details mentioned above.

Signature and Date

Name & Designation

	SJVN	FORM NO.: F-060-01 PAGE: 12 of 14 ISSUE: 2.0 REV. 01 DATE: 30/06/2016
	FORM	

TO BE FILLED BY MAIN CONTRACTOR FOR SUB-VENDOR (MC)

Sr. No.	Parameters	Supplier response (along with supporting document)
1	Name and address of sub-vendor:	
2 (a)	Type of equipment / item / process / service for which approval is sought:	
2 (b)	Details of equipment / item / process / service for which approval is sought (i.e. Rating, capacity, type, size, weight, etc.):	
3	Experience of main contractor with sub-vendor:	
(a) [#]	Since how many years sub-vendor is registered with you for proposed type of equipment / item / process / services (furnish documentary evidence):	
4 [#]	Whether sub-vendor is meeting the qualification criteria indicated in the technical specification (furnish documentary evidence).	
5 [#]	Sub-vendor rating as per contractor's internal procedure in the scale 0-10 or 0-100% (furnish documentary evidence).	
6 [#]	Any dispute of main contractor with vendor during execution of last 05 contracts.	
7 [#]	Have you ever de-listed or put in temporary suspension the proposed sub-vendor? If yes, please provide the reason for same.	
8	Please indicate the reason for re-approving / re-listing the sub-vendor.	

I declare that the information furnished by Sub-vendor has been verified and found in order / minor changes which have been marked and initialed on this form itself / observed the following discrepancies.

(Signature & Designation)

ARUN-III HEP

	SJVN	FORM NO.: F-060-01 PAGE: 13 of 14 ISSUE: 2.0 REV. 01 DATE: 30/06/2016
	FORM	

**GUIDELINES TO SUPPLIERS FOR FILLING-UP VENDOR/SUPPLIER
REGISTRATION FORM**

- All columns are to be filled up properly in the space provided for. Wherever it is not applicable / not available, please mention "Not Applicable" / "Not Available". All pages of the form are to be signed along with seal by the authorized signatory.
- A separate sheet may be attached if the space provided is insufficient or additional information is to be given, Please put proper identification tag on the separately attached sheet.
- Any information / clarification required by SAPDC/ Consultant during evaluation must be given expeditiously.
- Please ensure that all required enclosures are attached with the filled up Vendor Registration Form.
- Marks shall be awarded on the basis of documentary evidences submitted by Vendor / sub-vendor wherever called in vendor / sub-vendor assessment form.
- Incomplete or incorrect forms will be rejected.
- Please fill up the check list given below and send along with the vendor registration forms to SAPDC/Consultant.
- In case any information found incorrect / false, the vendor shall be rejected / de-listed at any stage.
- Information with # marks is score able.
- Accepting or rejecting a vendor is sole discretion of SAPDC.
- Product catalogue / manual for the proposed item / equipment / process / service, if available, shall be submitted alongwith other documents.

	SJVN	FORM NO.: F-060-01 PAGE: 14 of 14 ISSUE: 2.0 REV. 01 DATE: 30/06/2016
	FORM	

Furnish following information/Documents:-

Sr. No.	Description	Yes / No	Page No / Annexure
1	Latest audited annual account.		
2	Balance Sheet.		
3	Valid Income Tax Clearance Certificate.		
4	Details of Pending Arbitration cases.		
5	Details of pending disputes with Statutory Authorities.		
6	Organization chart		
7	Copy of Performance certificate (minimum 03)		
8	Copy of minimum three (03) completion certificates of similar work / service.		
9	Letter of approval from ASME / NTPC/ EIL / Railway / Lloyds / Power Grid etc. if any.		
10	ISO: 9001 certificate		
11	Quality Manual		
12	ISO: 14000 certificate		
13	OHSAS, ISO 18000 certificate		
14	Experience list		
15	Type test report & approval certificate		
16	Product Approval certificate from national / international agency.		
17	Quality award certificate		
18	Process and Personnel qualification certificates		
19	Copy of registration / enlistment with reputed / large organizations		
20	Detail of existing clients and details such as address, contact number and mail address.		
21	List of works / projects of similar nature executed with documentary evidences of works executed in last 02 years.		
22	Other documents mentioned elsewhere in vendor / sub-vendor assessment form.		

(Signature & Designation)

	SJVN	FORM NO.: F-080-02 PAGE: 1 of 1 ISSUE: 2.0 REV. 01 DATE: 30/06/2016
	FORM	

	PROJECT NAME (MW)			MANUFACTURING / FIELD QUALITY ASSURANCE PLAN				CONTRACTOR NAME, ADDRESS & LOGO		
	ITEM DESCRIPTION			SUB-ITEM	QAP NO.	REV. NO	ISSUE DATE	SUB-CONTRACTOR NAME, ADDRESS & LOGO		
SR. NO.	COMPONENT & OPERATION	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK M/C S	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY M C S	REMARKS
1	2	3	4	5	6	7	8	9	10	11
LEGENDS										
M	MANUFACTURER		C	CONTRACTOR		S	SAPDC LTD.			
P	PERFORM		V	VERIFICATION OF RECORDS		W	WITNESS / CHP			
IR	INSPECTION REPORT		DRG	DRAWING		CHP	CUSTOMER HOLD POINT			
MA	MAJOR		MN	MINOR		CR	CRITICAL			
ME	MEASUREMENT		NDT	NON DESTRUCTIVE TESTING		HT	HEAT TREATMENT			
TR1	CERTIFICATE OF COMPLIANCE TO TS/STANDARD REQUIREMENT WITHOUT ANY CHECK LIST OF TESTS CARRIED OUT.		TR2	CERTIFICATE OF COMPLIANCE TO TS/STANDARD REQUIREMENT WITH CHECK LIST OF TESTS CARRIED OUT.		TR3	TEST REPORT/TEST CERTIFICATE WITH TEST RESULTS BASED ON SPECIFIC INSPECTION & TESTING AT MANUFACTURER FACILITY/NABL APPROVED LAB.			
NOTE: QAP SHALL BE READ IN CONJUNCTION WITH QUALITY ASSURANCE REQUIREMENT GIVEN AS PART OF TECHNICAL SPECIFICATION.										
MANUFACTURER / SUB-CONTRACTOR:			CONTRACTOR:		FOR SAPDC USE:		REFERENCE DOC NO. OF SJVN:			
PREPARED BY:		REVIEWED BY		REVIEWED & RECOMMENDED BY		REVIEWED BY		RECOMMENDED BY		APPROVED BY
NAME, DESIGNATION & SIGNATURE		NAME, DESIGNATION & SIGNATURE		NAME, DESIGNATION & SIGNATURE		NAME & SIGNATURE		NAME & SIGNATURE		SIGNATURE & SEAL

Prepared By:	Reviewed By:	Approved By:
		Process Owner

 सूर्यवासीय SJVN	SJVN	FORM NO.: F- 060-04 PAGE: 2 of 5 ISSUE: 2.0
	FORM	REV. 01 DATE: 28/06/2016

NON-CONFORMITY REPORT FOR MANUFACTURING, TRANSPORTATION, STORAGE & ERECTION STAGES	FOR SAPDC USE ONLY
	NC NO.
	Date:
	PAGE 2 of 5

STEPS TO PREVENT RECCURANCE (For Corrective Action):

ENCLOSURE SUBMITTED BY CONTRACTOR:-

☐ DRAWINGS/ DETAILS
 ☐ INSPECTION REPORT
 ☐ ROOT CAUSE ANALYSIS
☐ PROCEDURE OF DISPOSAL OF NCR
 ☐ ANY OTHER (Please specify) _____

DATE	NAME & DESIGN	SIG.OF CONTRACTOR	SEAL
FINAL DISPOSITIONING BY SAPDC			Disposition Code
INCHARGE of RIO or FQA (In case of Minor) SAPDC (In case of Major)			

DATE	NAME & DESIG.	SIGNATURE
------	---------------	-----------

ARUN-III HEP

	SJVN	FORM NO.: F-060-04 PAGE: 3 of 5 ISSUE: 2.0 REV. 01 DATE: 28/06/2016
	FORM	

NON-CONFORMITY REPORT FOR MANUFACTURING, TRANSPORTATION, STORAGE & ERECTION STAGES		FOR SAPDC USE ONLY NC NO. Date: PAGE 3 of 5
FOR SAPDC INTERNAL USE ONLY		
RECOMMENDATION of INCHARGE of RIO or FQA (In case of Major)/ CONCERNED SAPDC 's INSPECTION/ SITE ENGINEER (In case of Minor)		Disposition Code
DATE NAME & DESIG. SIGNATURE		
RECOMMENDATION OF SAPDC CONCERNED ENGINEER		Disposition Code
DATE GROUP HEAD	NAME & DESIG. SIGNATURE	
DATE NAME & DESIG. SIGNATURE		
RECOMMENDATION OF SAPDC (FOR MAJOR CATEGORY) (Comments of Engineering / Others deptt as applicable to be considered)		
DATE NAME & DESIG. SIGNATURE		

	SJVN	FORM NO.: F-060-04 PAGE: 4 of 5 ISSUE: 2.0 REV. 01 DATE: 28/06/2016
	FORM	

NON-CONFORMITY REPORT FOR MANUFACTURING, TRANSPORTATION, STORAGE & ERECTION STAGES		FOR SAPDC USE ONLY NC NO. Date: PAGE 4 of 5
PART B (Verification of Corrections of Non-Conformity) (Filled after Completion of corrections of Non-Conformity)		
ACTION TAKEN BY SUPPLIER/ CONTRACTOR (Attach Report of verification)		
DATE NAME & DESIGN SIG.OF SUPPLIER/ CONTRACTOR SEAL		
VERIFICATION BY SAPDC'S SITE ENGINEER/ INSPECTION ENGINEER		
DATE IN-CHARGE of RIO/ FQA	NAME & DESIG. SIGNATURE	
DATE NAME & DESIG. SIGNATURE		
COMMENTS OF SAPDC ENGINEER		
DATE GROUP HEAD	NAME & DESIG. SIGNATURE	
DATE HOD	NAME & DESIG. SIGNATURE	
DATE NAME & DESIG. SIGNATURE		

	SJVN	FORM NO.: F-060-04
	FORM	PAGE: 5 of 5 ISSUE: 2.0 REV: 01 DATE: 28/06/2016

NON-CONFORMITY REPORT FOR MANUFACTURING, TRANSPORTATION, STORAGE & ERECTION STAGES	FOR SAPDC USE ONLY
	NC NO.
	Date:
	PAGE 5 of 5

INSTRUCTIONS 'MAJOR' NONCONFORMITY IS DEFINED AS DEPARTURE FROM SPECIFICATION WHICH AFFECTS PERFORMANCE RELIABILITY. SAFETY INTERCHANGEABILITY. ERECTION, COMMISSIONING OR WORKING LIFE ALL OTHER NON-CONFORMITIES SHALL BE TREATED AS CATEGORY 'MINOR'. - ACCEPTANCE OF DISPOSITIONED NON-CONFORMANCE IS WITHOUT PREJUDICE TO SAPDC RIGHT TO CLAIM COMMERCIAL REBATE AND DOES NOT ABSOLVE CONTRACTUAL OBLIGATIONS. - OBTAINING APPROVAL OF STATUTORY AUTHORITY IF ANY W.R.T. ABOVE NON CONFORMANCE IS THE RESPONSIBILITY OF SUPPLIER/ CONTRACTOR. - DISPOSITIONING OF THIS NON-CONFORMANCE IS FOR THIS SPECIFIC CASE ONLY AND NOT TO BE REGARDED AS PRECEDENCE. DISPOSITION CODE THE NON-CONFORMANCE SHALL BE DISPOSITIONED AS UNDER BY SAPDC AND SUPPLIER. (GIVE CODE AT APPROPRIATE BOXES):- (01) NC-REJECTED (02) NC- CONDITIONALLY ACCEPTED (SPECIFY CONDITION) (03) NC-ACCEPTED AS-IT-IS (04) NC-ACCEPTED WITH REPAIR. NC NUMBER - THIS NO. SHALL BE ALLOTTED BY SAPDC AND SHALL HAVE SAPDC PROJECT NAME, PACKAGE, FOLLOWED BY RUNNING SERIAL NO. & ENTER TO NC REPORT BY RIO/ FQA/ CQAL.

RESPONSIBILITIES OF CONTRACTOR - ASCERTAIN EXACT NATURE OF NON-CONFORMANCE AND ALONGWITH SUPPORTING DRAWING OF ITEMS/ EQUIPMENT ETC WITH WHICH NON-CONFORMANCE EXISTS. - IDENTIFY THE CAUSE OF NON CONFORMITY. - DECIDE ON CODE OF DISPOSING. - FINALISE THE CAUSE OF NON-CONFORMITY AND PROPOSE CORRECTIVE ACTION. - ENSURE AND CERTIFY THAT THE PRODUCT QUALITY PERFORMANCE, RELIABILITY AND WORKING LIFE IS NOT AFFECTED FOR MINOR NON-CONFORMITIES AND QUANTIFY THE EXTENT TO WHICH IT IS AFFECTED IN THE CASE OF CATEGORY 'MAJOR' NON-CONFORMITIES. - IMPLEMENT AGREED CORRECTIVE ACTION IN A TIME BOUND PROGRAMME AND PROVIDE FEEDBACK AS PER PART-B OF THE FORMAT

RESPONSIBILITIES OF RIO/ FQA - IDENTIFY THE PRODUCT APPROPRIATELY. - ANALYSE THE CAUSE OF NON-CONFORMITY AND PROPOSE RECOMMENDATION
--

ARUN-III HEP

	SJVN	FORM NO.: F-060-06
	FORM	PAGE: 1 of 1 ISSUE: 2.0 REV. 00 DATE: 30/06/2016

INSPECTION CALL REQUEST

Inspection Call No.		Date:				
Project:		Contract No. :				
Contractor/Supplier's Name & Address:		Sub-vendor/Sub-Supplier's Name & Address:				
Contact Person:		Contact Person:				
Telephone/Mobile No.:		Telephone/Mobile No.:				
Fax No.		Fax No.				
email ID:		email ID:				
Details of Equipment with Unit No.:						
Sr. No.	Equipment/Item Description and Sr. No.	Unit No.	BBU Ref.	QAP No. & Rev. No.	Relevant QAP Clause No.	Approved Drawing No. & Rev. No.
Status of Type Tests		Approved / Not Approved / Not Applicable		Place of Inspection:		
Proposed date of Inspection:				Anticipated Working Days Required		
Status of internal inspection by Vendor/sub-vendor		Completed		In-progress	Yet to be done	
Tentative date of completion of internal inspection in case inspection is in-progress/yet to be done:						
Note: Readiness status is to be submitted separately after completion of internal inspection by Manufacturer.						

Date:
Place:

Signature
Name
Designation
Department
Company

Annexure F - Export Worthy Packing

1.0 SCOPE:

For export jobs, sea worthy packing capable of performing all necessary functions like prevention of damage to the contents, sufficient to support frequent handling and lengthy periods of outdoor storage in adverse weather conditions are required. Workmanship and material used shall meet the technical requirements and be in accordance with best commercial export packing practices. Vendor shall be responsible for the packing, however, it shall meet the minimum requirements specified herein. Equivalent or better packing methods may be deployed subject to approval of the purchaser. Vendor shall submit the packing procedure for its equipment for purchaser's approval during detailed engineering.

2.0 TECHNICAL SPECIFICATION OF WOOD:

The wood shall be Fir, Chir, Silver Oak (Grevillea Robusta) or chemically treated mango with moisture content not exceeding 50 %. The wood shall have flexural & compressive strength, stiffness, shock absorption and nail retention properties. The wood shall be free from common defects such as warp, bone, twist, knot, cracks, splits, end splits, bend, visible sign of infection and any kind of decay caused by insects, fungus etc. Surface cracks with a maximum depth of 3 mm are permissible. A continuous crack of any depth all along the length is not allowed.

The wood shall be chemically treated to provide protection against deterioration due to fungi and attack by termites, borers, marine organism and any other kind of infection. It shall be treated only after final processing like cutting, planing, joint grooving etc.

3.0 TYPE, DESIGN & DIMENSION OF WOODEN PACKING CASES:

3.1.1 PACKING OF EQUIPMENTS:

Various mechanical, electrical and C&I equipment e.g. pumps, motors, equipment skids, heat exchangers, control panels, switch gears, transformers etc. shall be wrapped in weather proof packing and then secured in wooden packing cases. The construction of wooden packing cases shall be as per details given below and also in figures 1 to 11.

3.1.1 BOTTOM FRAME:

The construction of bottom frame shall be as per fig. 2. The number of slides/runners for bottom frames shall be selected depending upon the weight and overall dimension of the load to be carried. The equipment shall be secured by fixing their base frame/plate with the help of bolt & nuts etc to the bottom frame of the wooden packing cases. The equipment not provided with the base frame/plate like

81910/2020/TBG-TB_ENGG_MSE

cylindrical vessels etc. to be secured to the bottom frame of the wooden case with 'C' clamps fabricated from steel channels/angle irons.

3.1.2 TOP FRAME:

The construction of top frame shall be as per fig. 3.

3.1.3 END PANELS:

The dimensions of the end and lateral panels shall be calculated according to overall dimensions of the items to be packed.

Diagonal braces shall be used for packing cases having height exceeding 500 mm. Detail of bracing shall be as per figure 5 to 8.

3.1.4 SLING PLATE:

To facilitate lifting of cases, longitudinal under slide boards shall be fixed. To avoid damage to the box while lifting sling plates shall be provided. Refer fig. 11.

3.1.5 ANGLE IRON CLEATS :

Angle iron cleats shall be used for strengthening the joints as indicated in fig. 10.

3.1.6 OTHER REQUIREMENTS:

The thickness of planks for top, bottom, side and end panels shall be at least 25 mm. Planks used for this purpose shall be joined with each other by tongue & groove joint. The groove dimension shall be such that tongue fits tightly into groove to make good joint.

Runners/slides, traverse bars etc. shall be of single length i.e. without any joint. Planks for sheathing, diagonal bracing etc shall also be of single length upto 2400 mm. For sizes larger than 2400 mm, proper jointing is permitted for planks for sheathing and diagonal bracing.

Each equipment to be individually covered with double polyethylene petticoat. Sheet thickness of polyethylene sheet shall not be less than 0.175 mm (175 microns). The sealing shall be such so as not to allow moisture inside.

The inner surface of 4 sides of shooks shall be nailed with bituminised water proof kraft paper. Wherever 2 pieces of kraft paper are used, the joint shall have an overlap of minimum 20mm.

All the inner sides of the box shall be nailed with bitumen coated hessian polyethylene kraft paper. For top frame it shall project on all sides by 100mm and shall be nailed on sides. Wherever 2 pieces of kraft paper are used, the joint shall have an overlap of minimum 20mm.

For delicate equipment like control panels, switchgears etc suitable cushioning material like rubberized coir shall be provided on their bottom support. The thickness of coir shall be 50 mm (minimum) and width 100 mm (minimum).

For control panels and switchgears, the gap between the panel and casing shall be filled with rubberized coir with distance between consecutive supports less than 500 mm (ref fig 15). For other equipment suitable support from sides of the casing to be provided.

Switchgear cubicles, control panels and control desks shall be packed and shipped in separate convenient sections. The components e.g. circuit breakers relays and instruments etc. which are removed from panels for shipping purpose shall be separately packed and shipped as per packing instructions in clause 3.2.

Packing case for control panels & switchgear panels shall be finally covered with GI sheet of minimum thickness of 0.4 mm.

Packing cases shall be bound at edges by nailing MS clamps/brackets at sufficient intervals. Further, heavier boxes shall be strapped with 'C' clamps (ref fig 4) fabricated from steel channels/angles and lighter boxes shall be strapped with hoop iron strips.

3.1.7 ALTERNATIVE PACKING CASES FOR CONTROL PANELS AND SWITCHGEARS

If required, for control and switchgear panels, construction of wooden packing cases may be provided as per fig 14 & 15 and as detailed below:

Thickness of planks for all sides, binding and jointing battens shall be atleast 25 mm. Width of planks shall be at least 125mm and that of binding and jointing planks shall be at least 100 mm.

Top frame shall be suitable so that it does not collapse due to sandwiching between slings while lifting. Longitudinal and traverse bars for the bottom wooden pallet to be suitably selected.

Diagonal bracings shall be as per clause 3.1.3 and All other requirements shall be as per clauses 3.1.4 to 3.1.6.

3.2 PACKING OF LOOSE ITEMS:

Loose mechanical, electrical and C&I items eg valves, fittings, pressure/temperature gauges/switches, circuit breakers, relays etc shall be individually wrapped using polyethylene sheets/U foam/thermocole sheets/air bubbled sheets depending upon the item and then packed in wooden boxes. The left out spaces and top of the boxes shall be filled with rubberized coir to get proper cushioning effect. Special attention is to be paid to relays, instruments etc for arresting the movement of their operating mechanisms during transportation.

The construction of wooden packing case shall be as per clause 3.1 retaining its all features concerning strength of box. The construction of wooden packing case for loose electrical and C&I items shall be as per fig. 16.

Inner surface of 6 sides of the box shall be lined with Bitumen coated hessian polyethylene kraft paper. Rubberized coir of min. 25 mm thickness and 100 mm width shall be nailed to inner surfaces of bottom and 4 sides of the box.

Loose items such as Galvanised Steel Structure, Cable support racks, Cable Trays and GI Pipes etc. shall be individually wrapped using polyethylene sheets and further lots may be wrapped in Bitumen coated hessian cloth.

4.0 MOISTURE ABSORBER:

Silica gel is used for this purpose to protect contents over sufficiently long time from corrosion. Silica gel shall be of indicating type conforming to IS-304-1979 packed in cotton bags placed at different positions inside the packing for absorbing moisture and shall not come directly into contact with the equipment / material inside the package. The quantity of silica gel shall be enough for storage period of one (1) year, however, it shall not be less than 4 gms per litre volume of case subject to minimum of 400 gms per case.

5.0 INDICATION MARKS ON THE BOXES:

Markings shall be provided on the boxes indicating position of boxes for handling, storage and nature of consignment. For guidelines refer figure 12. The ink used for this purpose as well as for marking despatch instruction shall be indelible/nonwashable marking ink.

6.0 DESPATCH DETAILS:

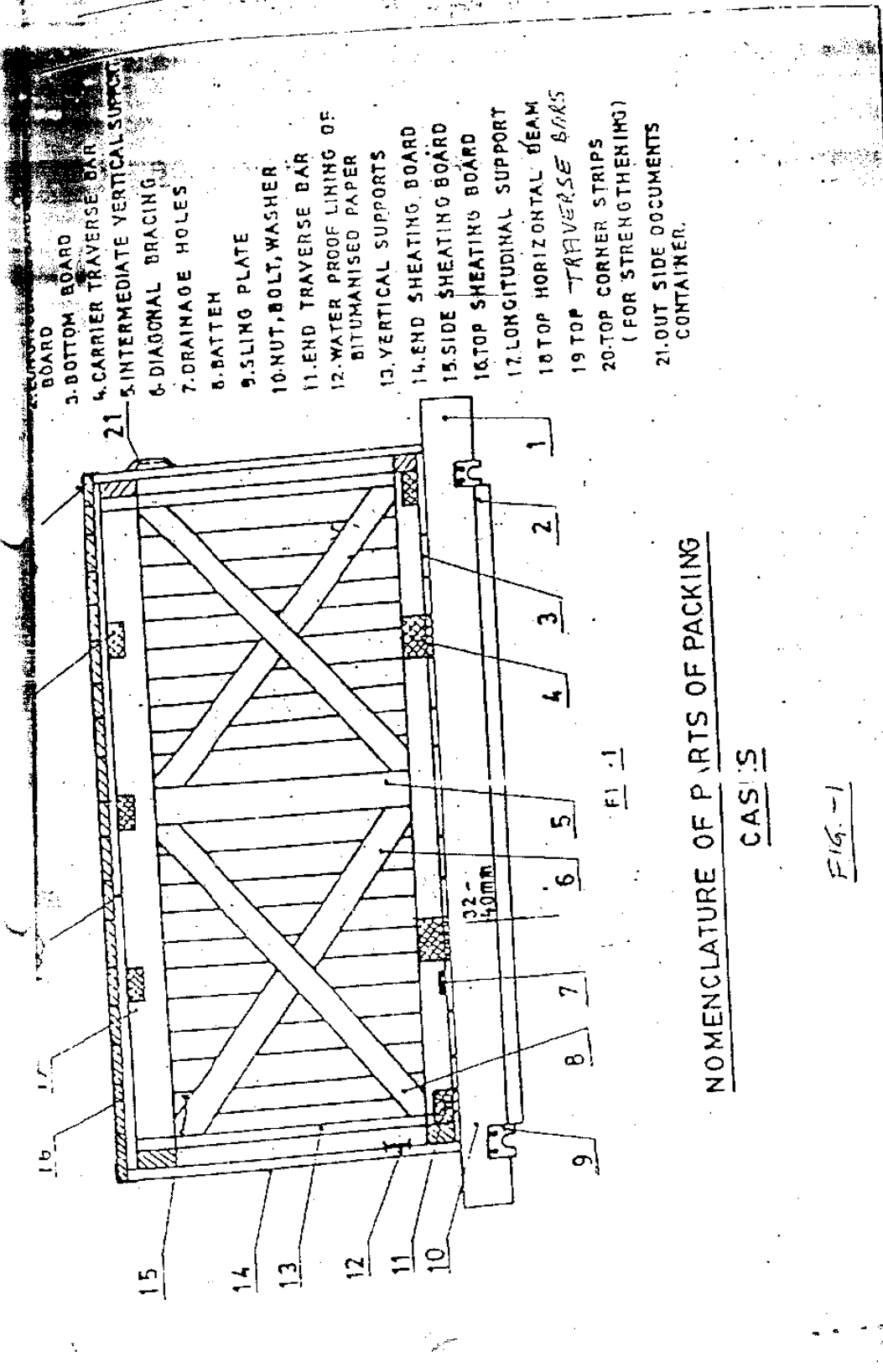
External front and rear sides of the boxes to be planed for writing instructions.

Dispatch details such as consignor/consignee address, contract and case details, country of origin , port of delivery, stacking instructions shall be written on one of the side of boxes. An anodised aluminium plate shall be provided on one side of the boxes.

One copy of packing slip wrapped in polyethylene bag covered with aluminium packing slip holder to be nailed on the external surface of the box. One more copy of the packing slip wrapped in polyethylene bag to be kept inside the box at the prominent place.

7.0 INSPECTION:

There shall be a Customer Hold Point (CHP) for inspection of final assembly of packing. During above inspection, the records for Chemical Treatment shall be reviewed.



NOMENCLATURE OF PARTS OF PACKING

CASIS

FIG. -1

EC 009

BOTTOM FRAME ARRANGEMENTS

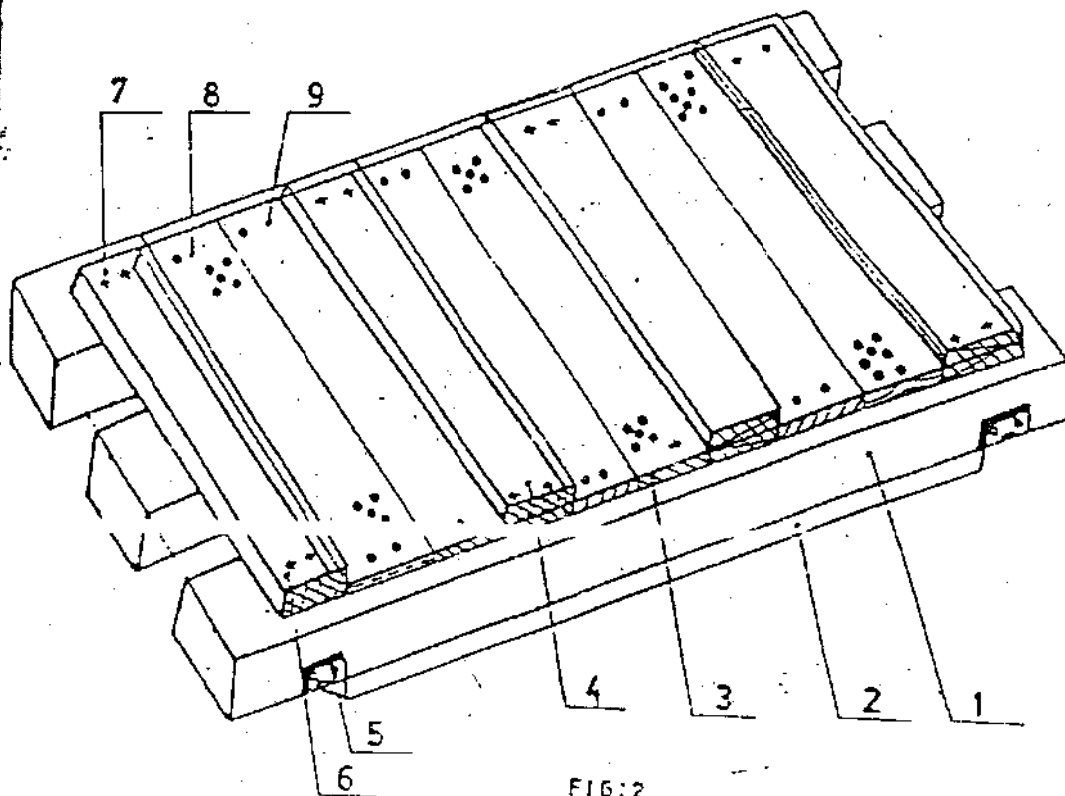


FIG:2

Nos. of slides : Minimum 2 nos.

For length more than 1800 mm or
load more than 1000kg, Nos. of
slides shall be minimum 3 nos.

For dimensions of slides, refer Table 1

Cross section of end traverse bar; 100 X 100 mm
(minimum)

1. SLIDE
2. UNDER SLIDE BOARD
3. BOTTOM BOARD
4. CARRIER TRAVERSE BAR
5. SLING PLATE
6. TRAVERSE BAR
7. BOLT, NUT & WASHER
8. DRAINAGE HOLES
9. NAILS

TOP FRAME ARRANGEMENT

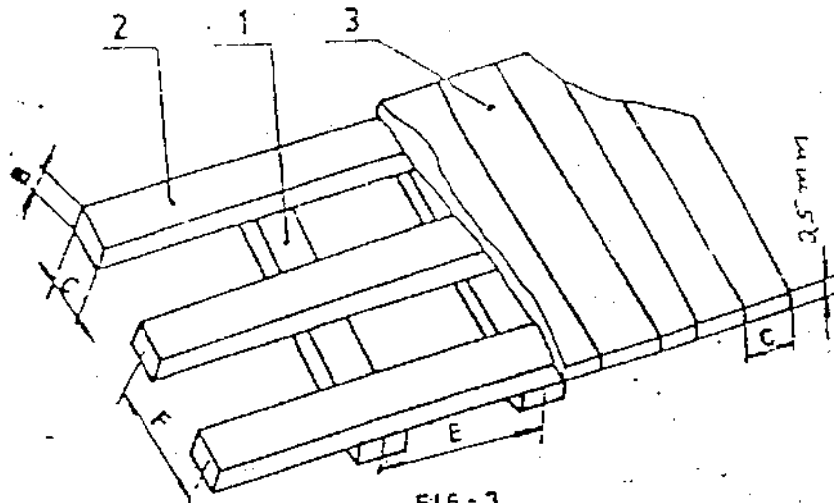


FIG-3

Dim F : 700 to 1000 mm
 Dim E : 500 to 900 mm
 B x C : 30 x 100 mm.

- 1 - Traverse Bars
- 2 - Horizontal Soams
- 3 - Top Board

ARRANGEMENT OF C-CLAMPS AROUND CASES

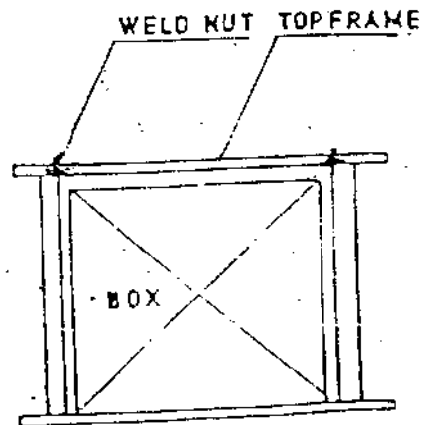
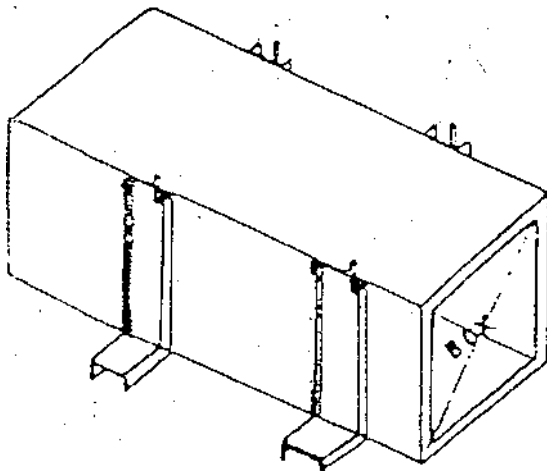


FIG-4

ARRANGEMENT OF DIAGONAL BRACING AND HORIZONTAL SUPPORT

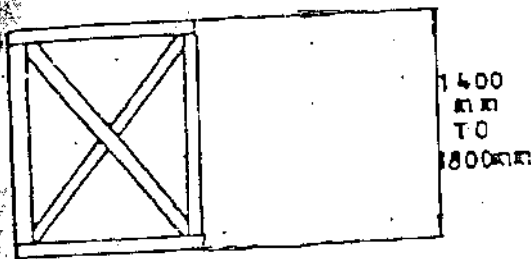


FIG: 6

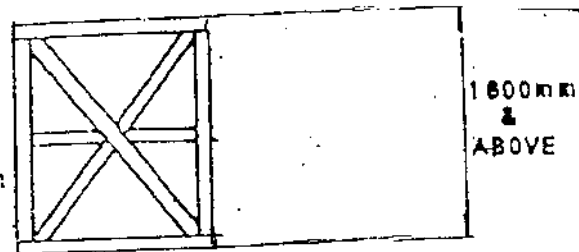


FIG: 8

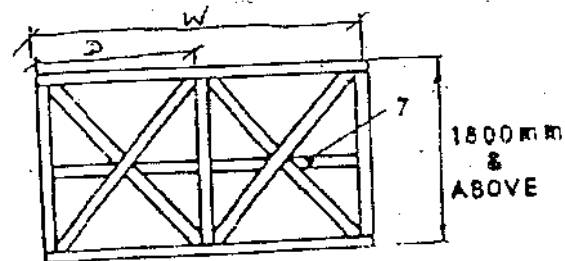


FIG: 9

7- Middle Horizontal Support

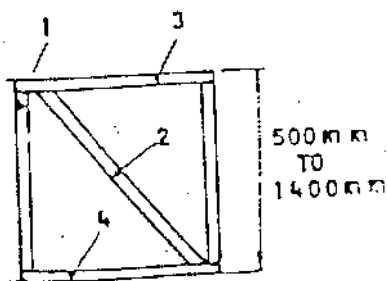


FIG: 5

- 1- Vertical Support
- 2- Diagonal Bracing
- 3- Upper Horizontal Support
- 4- Lower Horizontal Support

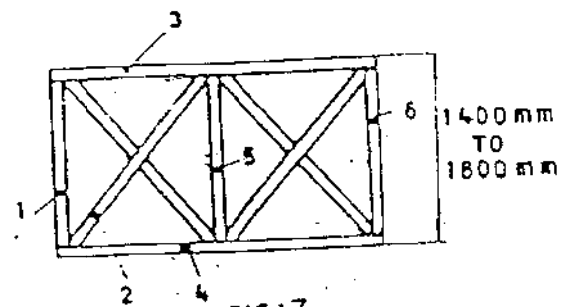
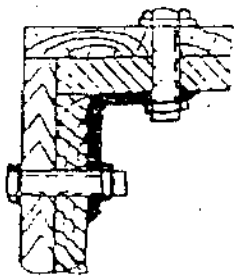
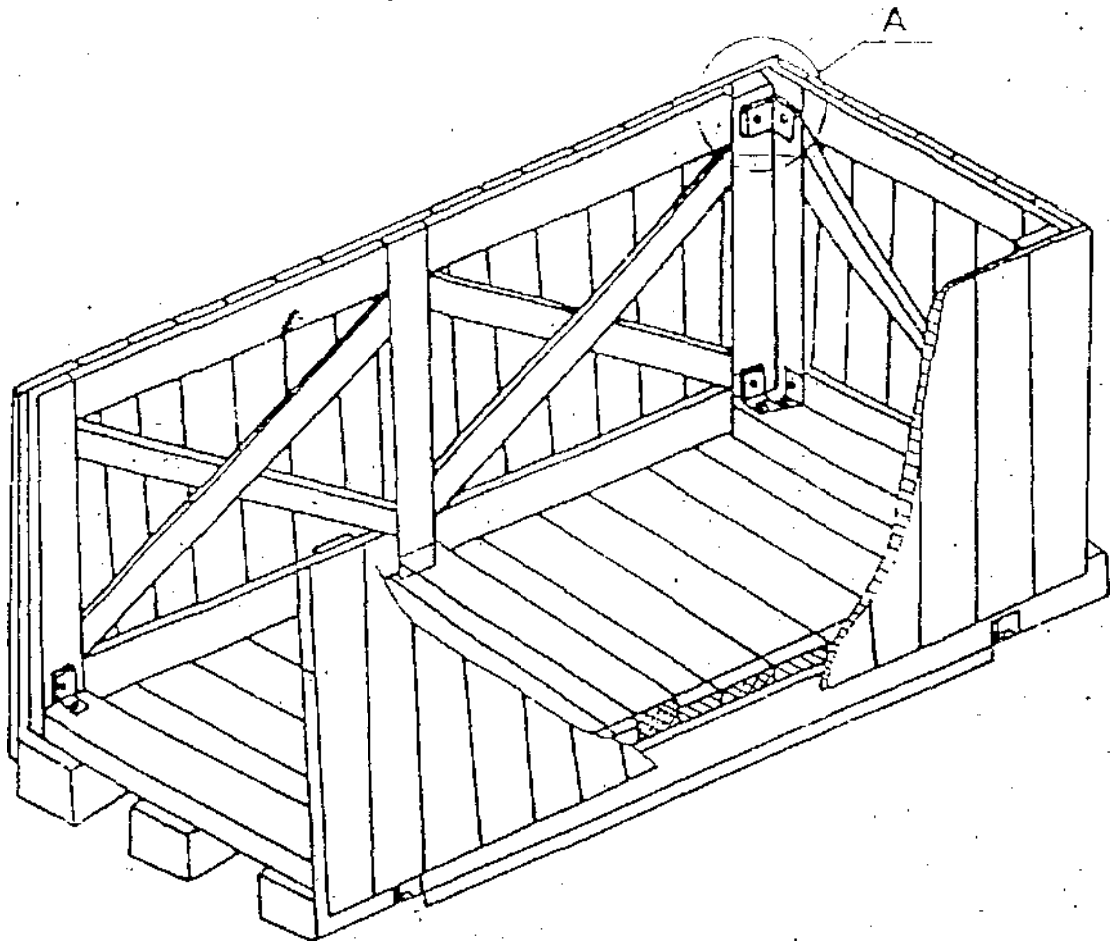


FIG: 7

- 1, 5, 6 - Vertical Support
- 2 - Diagonal Bracing
- 3 - Upper Horizontal Support
- 4 - Lower Horizontal Support

The dimensions of various items shall be as Table-2

ARRANGEMENT OF PACKING CASE



DETAIL-A

HOLE DIAMETER
MUST CONFORM
TO BOLT DIA

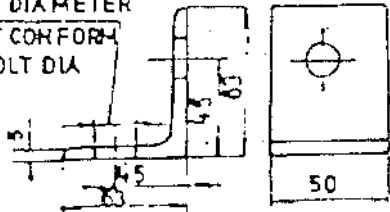


FIG:1D

ARRANGEMENT OF SLING - PLATE ON
CASES

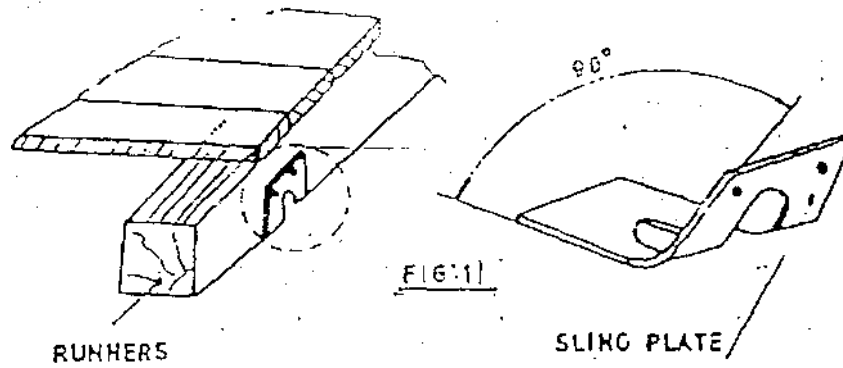


Table 1

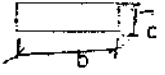
load	Length of Slides						
	600	800	1000	1200	1300	1500	2000
	Cross Section $b \times c$ 						
500	50 x 100	50 x 100	50 x 100	50 x 100	75 x 100	75 x 100	100 x 100
800	50 x 100	50 x 100	75 x 100	75 x 100	75 x 100	75 x 100	100 x 100
1000	75 x 100	75 x 100	75 x 100	100 x 100	100 x 100	100 x 110	100 x 150
1500	75 x 100	75 x 100	100 x 100	100 x 100	100 x 100	100 x 150	100 x 150
2000	75 x 100	100 x 100	100 x 100	100 x 150	100 x 150	100 x 150	150 x 150
2500	75 x 100	100 x 100	100 x 150	100 x 150	100 x 150	150 x 150	150 x 150
3000	100 x 100	100 x 150	150 x 150	150 x 150	150 x 150	150 x 150	

Table 2

End and side Panels	Width of the panel W	Distance between longitudinal support DIM 'D'						
		600	800	1000	1200	1400	1600	1800
		Cross Section (b : c)					Item 1 to 7	
Fig 5 to	600 to 1200	30 x 100	30 x 100	30 x 100	30 x 130	30 x 130	30 x 130	30 x 130
	1201 to 1600	30 x 130	30 x 130	30 x 130	30 x 130	30 x 130	30 x 130	30 x 130
	1601 to 2000	30 x 130	30 x 130	30 x 130	30 x 130	30 x 130	30 x 130	30 x 130
Fig 9	2001 to 3000	30 x 130	30 x 130	30 x 130	30 x 130	30 x 130	30 x 130	40 x 150
	3001 to 4000	30 x 130	30 x 130	40 x 150	40 x 150	40 x 150	40 x 150	40 x 150

INDICATION MARKS ON CASES

SL. NO.	INDICATION MARK	MEANING
1		TOP SIDE
2		KEEP AWAY FROM HEAT
3		SLINGING POSITION
4		FRAGILE MATERIAL. TO BE HANDLED WITH CARE
5		CENTRE OF GRAVITY
6		KEEP DRY

BHEL-PEM-DELHI-INDIA			
CONSIGNEE			
MATERIAL		MO. NO.	
CUSTOMER REF.		CASE NO.	
DESPATCH ADVICE NOTE NO.		NET WT -KGS	GROSS WT -KGS
DIMENSIONS(MM) LXBXH			
SPECIAL INSTRUCTIONS		HANDLE WITH CARE - KEEP DRY DO NOT DROP - DO NOT TILT	

FIG-13: MARKING PLATE.

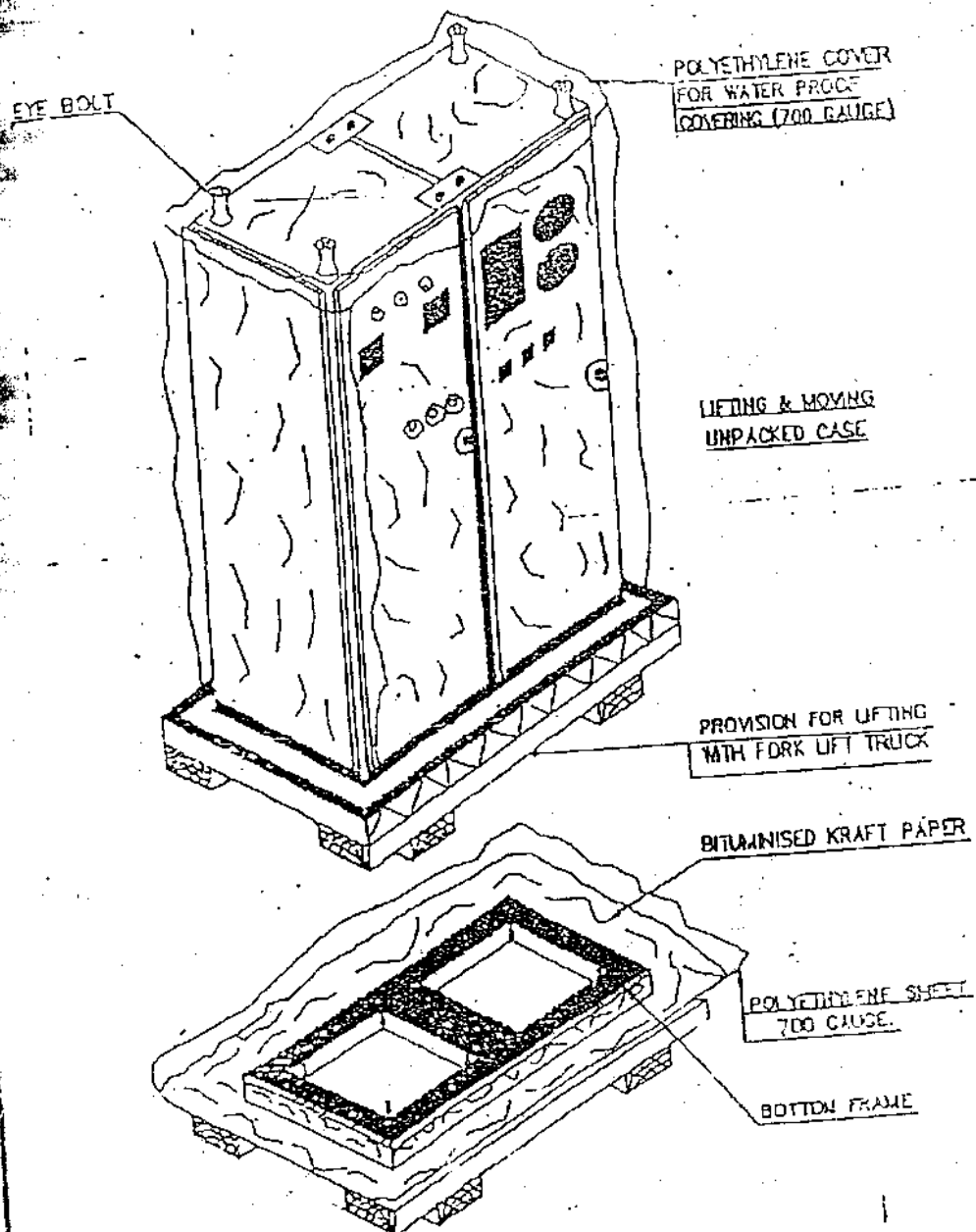


FIGURE-14

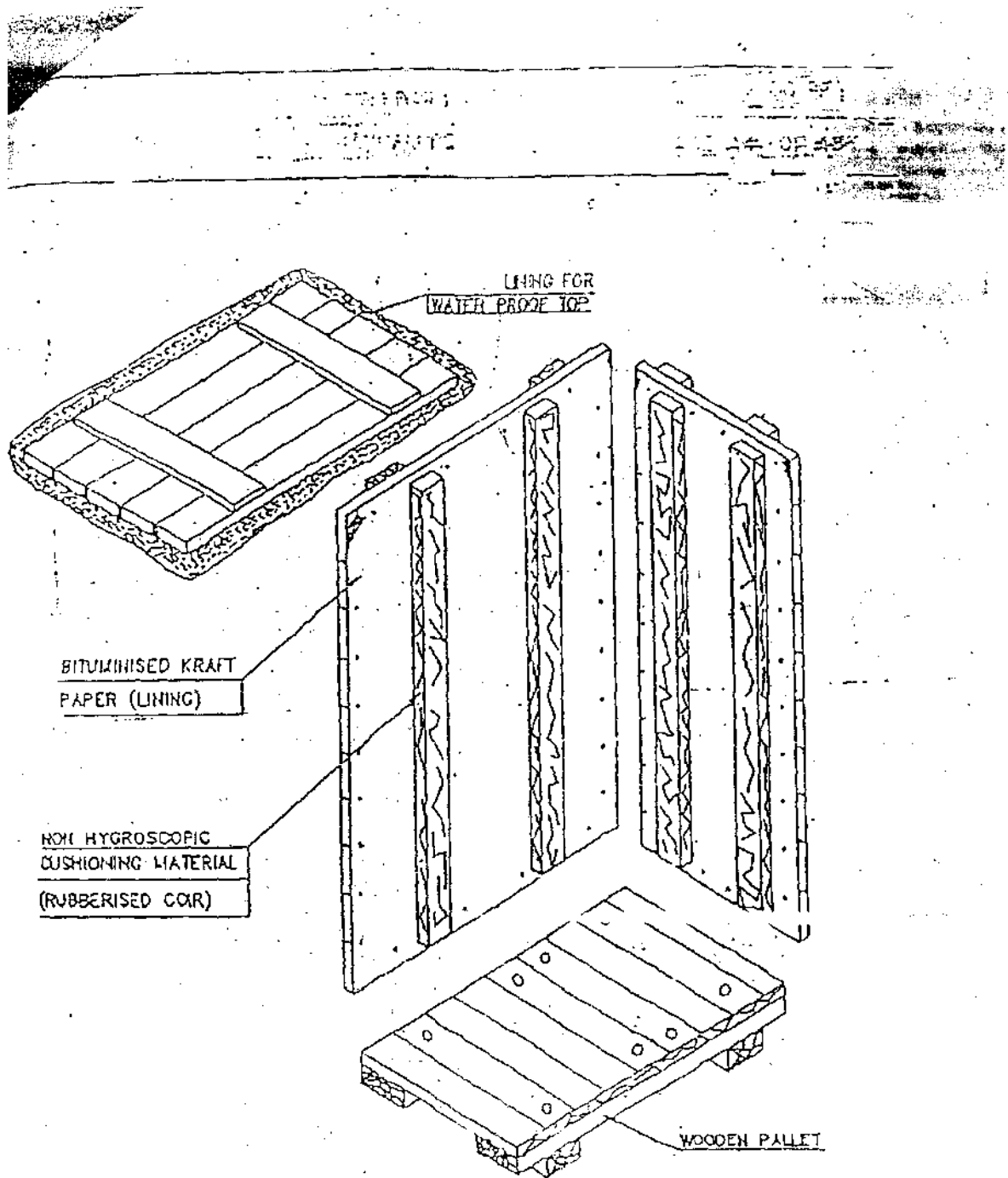


FIGURE-15

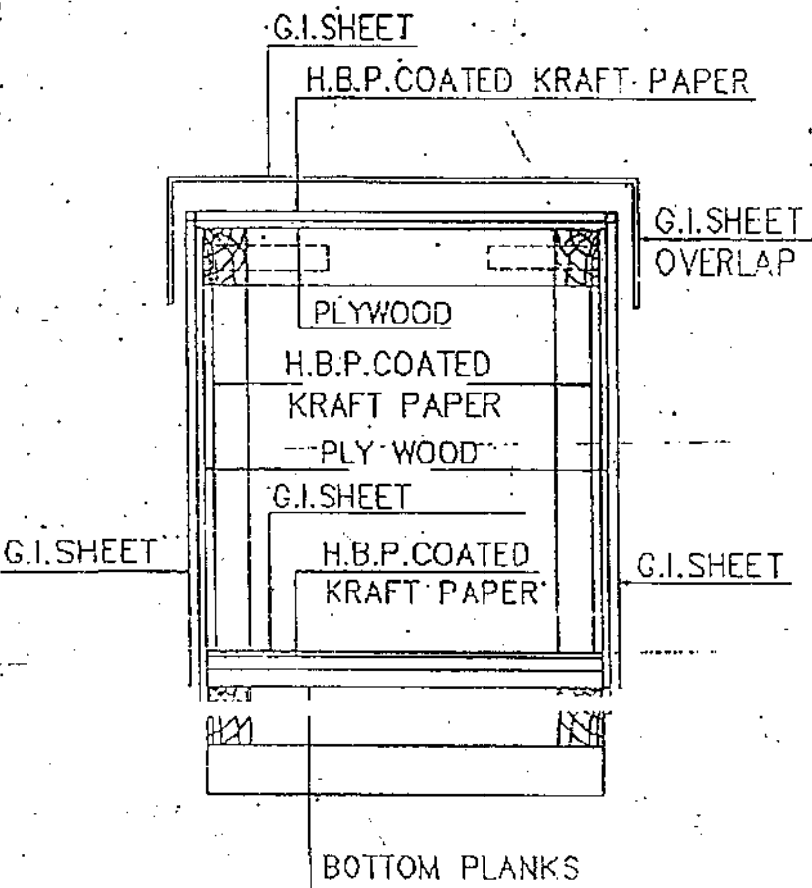


FIG-16 : CLOSED PACKING CASE WITH G.I.SHEET
SHOWING LAYERS OF PACKING MATERIALS.

SPECIAL TERMS & CONDITIONS
Enquiry No. – 34Q2100255 dated 02.11.2020

1. **Clause No. 1.3 of GTC** – The tender is invited through e-Procurement System only. The bidder shall submit his response through bid submission to the tender on e-Procurement platform at <https://bhel.abcpurchase.com>
Vendors participating through this tender will necessarily have to buy Class-II/III Digital Signature Certificate (DSC) for Signing & Encryption (Required both digital signature certificate: Signing & Encryption) of bids issued by any of the valid Certifying Authorities (approved by Controller of Certifying Authorities) in India.
2. **Clause No. 1.7 of GTC** - For any technical clarification, please contact Mr. Vyom, Sr. Engineer (TBEM); Contact No. 0120-06748522; e-mail: vyom@bhel.in
3. **Clause No. 1.8 of GTC** - For any commercial clarification, please contact Ms. Archana Kumari, Manager (TBMM) / Sh. A K Chowdhary, AGM (TBMM); Contact No. 0120-6748467 / 8129; e-mail: archanak@bhel.in / akchowdhary@bhel.in
4. **Clause No. 2.1 of GTC** - Prices shall be on FIRM basis including export worthy packing and forwarding charges.
5. **Clause No. 3 of GTC** - Payment Terms: - As per clause 3.1.
6. Delivery plan – **September 2021**. Bidder to mention delivery plan in the activity schedule accordingly.
7. Permissible Technical Deviations: No permissible Technical Deviation has been envisaged.
8. Project Status ñ Export. GST shall be payable as applicable. Custom Duty Benefit ñ No benefit available.
9. **Clause No. 5 of GTC** - Guarantee period is required 18 months from the date of last delivery or up to 06/07/2023 whichever is later.
10. **Clause No. 7 of GTC** - Option – B shall be considered. Validity period of BG is required as per Guarantee Clause mentioned above with claim period of 3 months extra over and above.
11. **Clause no. 13 of GTC - (Liquidated Damage)** - 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.
12. **Clause No. – 17 of GTC** - Tender Evaluation – As per GTC. Place of Delivery - Indo-Nepal border - Jogbani (Bihar).
13. **Clause No. – 19 of GTC** - Arbitration - This clause shall be read as per Annexure-1.
14. **Clause No. 33 for Reverse Auction** ñ Not Applicable.
15. **Clause No. 34 of GTC** - Integrity Pact ñ Not Applicable.
16. **Clause No. 39 of GTC** – Quantity Variation ñ (+/- 30%).
17. **Pre qualifying requirement :**
Technical: As per clause 1.4 for Technical Qualifying Requirements of Section 1 of Technical Specification.
The Bidder must ensure that they confirm the Pre-qualifying requirement.
BHEL Reserves the Right to reject any offer from Bidder in case of Non – Compliance to the Pre-qualifying criteria.
18. The link for Online Supplier registration Portal is <https://supplier.bhel.in/>.

19. Endorsed LR is not required in GST regime.
20. Offer of techno – commercially acceptable vendors shall be considered for Price Bid Opening / RA subject to their approval from Customer.
21. **Make in India Declaration:**

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.

“Bidder to specify the percentage of local content as per the format of self-declaration for local content” as per **Annexure-2**.

“This tender is not a global tender and **only class I and ~~Class II~~** suppliers as defined under the DPIIT order no. P-45021/2/2017-PP (BE-II) dated 04.06.2020 are eligible to bid in this tender. Bids received from **Class II & Non-Local** supplier shall be rejected.”

22. Please refer Clause at **Annexure-3** and Certification at **Annexure-4 / Annexure-5** (whichever is applicable) regarding restrictions under Rule 144 (xi) of General Financial Rules (GFRs), 2017. Bidder to comply the clause and submit the certification. Non-compliance/ Non-submission of certification will lead to rejection of Offer.
23. Bidder to comply the MOP circular dated 02-07-2020 (**Annexure-6**) and its subsequent amendment, if any, in prescribed format (**Annexure-7**). Non-compliance/ Non-submission will lead to rejection of Offer. **[Not Applicable for cases where local content is 100%]**

Vendor to quote as per specified price format of NIT, otherwise their offer shall be liable to be rejected.

Following confirmation to be provided by vendor:

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

IMPORTANT INSTRUCTION: -

- The Notice Inviting Tender (NIT)/ the tender requirement of BHEL will not be henceforth published in newspapers. All the concerned are hereby notified that tender enquiries of BHEL will be published on BHEL tender website (www.bhel.com) and Government’s Central Public Procurement Portal (<https://eprocure.gov.in/>).
- You are requested to kindly note and refer above website for tender of BHEL.
- Bidder to mention their works address below from where material will be supplied to Site.

Works Address- _____

ALL OTHER TERMS AND CONDITIONS SHALL BE AS PER GTC Rev-1.

(Sign and seal of Bidder)

Name:

Signature:

Stamp:

SCHEDULE OF PRICE (Part III) (UNPRICED COPY)

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

VENDOR NAME / OFFER REF:

MENTION THE WORKS FROM WHICH MATERIAL SHALL BE SUPPLIED -

ENQUIRY No. - 34Q2100255 dated 02.11.2020

S.No.	Description of Item	HSN Code	Unit	Quantity	Unit Price	Total Ex-Works (Rs.)	GST @__on Ex Works	Unit Freight & Insurance Jogbani (Bihar)	Total Freight & Insurance Jogbani (Bihar)	GST @__on Freight & Insurance	TOTAL (FOR Destination) PRICE (Rs.)
					Ex-works (Rs.)						
1	SUPPLY- SURGE ARRESTOR : 20KA NOMINAL DISCHARGE, 25MM/KV CREEPAGE, POLYMER TYPE, 336KV SINGLE PHASE, GAPLESS (ZNO) SURGE ARRESTER COMPLETE WITH ALL ACCESSORIES (CORONA RING [IF APPLICABLE], SURGE COUNTER/ MONITOR, INSULATING BASE, LUGS, FIXING & EARTHING HARDWARE ETC) EXCEPT TERMINAL CONNECTOR AND INSULATED CONNECTING CABLE		NO	6							
2	SUPPLY- SURGE ARRESTOR : INSULATED COPPER ROD/ STRIP CONNECTING SURGE ARRESTER TO SURGE COUNTER		MTR	24							
3	SUPPLY- SURGE ARRESTOR : 336KV TERMINAL CONNECTOR SUITABLE FOR TWIN ACSR MOOSE CONDUCTOR		NO	6							
4	SPARES- SURGE ARRESTOR : 20KA NOMINAL DISCHARGE, 25MM/KV CREEPAGE, POLYMER TYPE, 336KV SINGLE PHASE, GAPLESS (ZNO) SURGE ARRESTER COMPLETE WITH ALL ACCESSORIES (CORONA RING [IF APPLICABLE], SURGE COUNTER/ MONITOR, INSULATING BASE, LUGS, FIXING & EARTHING HARDWARE ETC) EXCEPT TERMINAL CONNECTOR AND INSULATED CONNECTING CABLE.		NO	2							
5	SPARES- SURGE ARRESTOR : INSULATED COPPER ROD/ STRIP CONNECTING SURGE ARRESTER TO SURGE COUNTER		MTR	8							
6	SPARES- SURGE ARRESTOR : 336KV TERMINAL CONNECTOR SUITABLE FOR TWIN ACSR MOOSE CONDUCTOR		NO	4							
	Total cost to BHEL (in figures)										
	Total cost to BHEL (in words)										

1. It is certified that M/s _____ have quoted as per the specified price format of the tender, otherwise offer shall be liable for rejection.

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

3. Vendor to mention the word "QUOTED" against each item in UNPRICED SCHEDULE.

SEAL & SIGNATURE OF TENDERER

SCHEDULE OF TECHNICAL DEVIATION

TENDER ENQUIRY NO. -34Q2100255 dated 02.11.2020

The following are the deviations/ variations exception from the Technical Specifications:

SL.NO.	CLAUSE NO. OF GENERAL TERMS AND CONDITIONS	STATEMENT OF DEVIATION

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

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.

All deviations must be mentioned in this format only. Deviation(s) to terms mentioned else where will not be considered.

Place: ě ě ě ě ě ě ě
Date : ě ě ě ě ě ě ě .

Signature of the authorised representative of

[illegible]

SCHEDULE OF COMMERCIAL DEVIATION

TENDER ENQUIRY NO. - 34Q2100255 dated 02.11.2020

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

SL.NO.	CLAUSE NO. OF GENERAL TERMS AND CONDITIONS	STATEMENT OF DEVIATION

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

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

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

All deviations must be mentioned in this format only. Deviation(s) to terms mentioned else where will not be considered.

Place: ë ë ë ë ë ë
Date : ë ë ë ë ë ë .

Signature of the authorised representative of

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

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 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:
- On the date of signing of the Settlement agreement by the Parties; or,
 - 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,
 - 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,
 - 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.
 - 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
		In cases involving claim and/or counter-claim of exceeding Rs 5 crores but less than Rs 10 crores. Rs 75,000 (per Conciliator) In cases involving claim and/or counter-claim of more than Rs 10 crores. Rs 1,00,000/- (per Conciliator) 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.
3	Secretarial expenses	Rs 10,000/- (one time) for the whole case for Conciliation by a Sole Member IEC. Where Conciliation is by multi member Conciliators –Rs 30,000/- (one time)- to be paid to the IEC
4	Travel and transportation and stay at outstation i) Retired Senior Officials of other Public Sector Undertakings (pay scale wise equivalent to or more than E-8 level of BHEL)	As per entitlement of the equivalent officer (pay scale wise) in BHEL.
	Others	As per the extant entitlement of whole time Functional Directors in BHEL.

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 Claim(s)/Counter Claim(s):

Sl. 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-2

Item/Package Name :	Surge Arrester
Enquiry No.:	34Q2100255 dated 02.11.2020
Project:	Arun III
Type of project	TRANSMISSION
Percentage of Local Content	(Bidder to enter the applicable % of local content)

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

Format of Self certification regarding Local Content in line with PPP-MII order, 2017 & its revision dated 04.06.2020.

Date: / /2020

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

That I will agree to abide by the terms and conditions of the Public Procurement (Preference to Make in India) Order, 2017 (*hereinafter PPP-MII order*) of Government of India issued vide Notification No: P-45021/2/2017-BE-II dated 15/06/2017, its revision dated 04/06/2020 and any subsequent modifications/ Amendments, if any.

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

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

That the goods/ services/ works supplied by me for (Enter the name of the Equipment/Item for Project) **contains.....%** (mention the Local content in %age) Local Content.

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

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

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

i Name and details of the Local Supplier
 (Registered Office, Manufacturing unit location, nature of legal entity)

ii. Date on which this certificate is issued

Annexure-2

Item/Package Name :	Surge Arrester
Enquiry No.:	34Q2100255 dated 02.11.2020
Project:	Arun III
Type of project	TRANSMISSION
Percentage of Local Content	(Bidder to enter the applicable % of local content)

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

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

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

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

<Insert Name, Designation and Contact No.>

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

- 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's 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.

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

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 GoI has extended lines of credit or in which the GoI 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-4

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

Sl 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 GoI 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

Annexure-5

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 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> <i>Evidence of valid registration by the Competent Authority is attached.</i>	<i>Agreed</i>

(Note: Non-compliance of above said GoI 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

No.25-111612018-PG
Government of India
Ministry of Power
Shram Shakti Bhawan, Rafi Marg, New Delhi • — 110001
Tele Fax: 011-23730264

Dated 02/07/2020

ORDER

Power Supply System is a sensitive and critical infrastructure that supports not only our national defence, vital emergency services including health, disaster response, critical national infrastructure including classified data & communication services, defence installations and manufacturing establishments, logistics services but also the entire economy and the day-to-day life of the citizens of the country. Any danger or threat to Power Supply System can have catastrophic effects and has the potential to cripple the entire country. Therefore, the Power Sector is a strategic and critical sector.

The vulnerabilities in the Power Supply System & Network mainly arise out of the possibilities of cyber attacks through malware / Trojans etc. embedded in imported equipment. Hence, to protect the security, integrity and reliability of the strategically important and critical Power Supply System & Network in the country, the following directions are hereby issued:-

1. All equipment, components, and parts imported for use in the Power Supply System and Network shall be tested in the country to check for any kind of embedded malware/trojans/cyber threat and for adherence to Indian Standards.
2. All such testings shall be done in certified laboratories that will be designated by the Ministry of Power (MOP).
3. Any import of equipment/components/parts from "prior reference" countries as specified or by persons owned by, controlled by, or subject to the jurisdiction or the directions of these "prior reference" countries will require prior permission of the Government of India
4. Where the equipment/components/parts are imported from "prior reference" countries, with special permission, the protocol for testing in certified and designated laboratories shall be approved by the Ministry of Power (MOP).

This order shall apply to any item imported for end use or to be used as a component, or as a part in manufacturing, assembling of any equipment or to be used in power supply system or any activity directly or indirectly related to power supply system.

This issues with the approval of Hon'ble Minister of State for Power and New & Renewable Energy (Independent Charge).



(Goutam Ghosh)

Director Tel: 011-23716674 To:

1. All Ministries/Departments of Government of India (As per list)
2. Secretary (Coordination), Cabinet Secretariat
3. Vice Chairman, NITI Aayog

सेवा भवन, आर. के. पुरम-I, नई दिल्ली-110066 टेली: 011-26732257 ईमेल: ce-rndcea@nic.in वेबसाइट:
www.cea.nic.in

Sewa Bhawan, R.K Puram-I, New Delhi-110066 Tele: 011-26732257 Email: ce-rndcea@nic.in Website: www.cea.nic.in

Annexure-7

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 :
Project :
Name of items/Package :

SI No	Description	Bidder confirmation
1	The vendor should supply all items in strict compliance to directions issued by Ministry of Power, Govt. of India vide order No. 25-111612018-PG dated 02.07.2020.	Agreed / Disagreed / Not Applicable
2	Vendor shall be responsible for conducting all necessary testing in accordance with testing protocol in line with MoP order.	Agreed / Disagreed / Not Applicable
3	All necessary permissions and approvals from Govt of India for import of equipment/ parts/ components shall be submitted, if equipment/ parts/ components are sourced from prior reference countries.	Agreed / Disagreed / Not Applicable

Note: Non-compliance of MoP 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**